

# Colonial Becomings

## *The Makings of a World-Historical Substance*

In 1860, a team of British botanists set off into the jungles of South America, searching for cinchona. They had the winds of empire at their back. The British government had recently authorized an ambitious experiment to bring the fever tree to India and grow it at plantation scale. With malaria wreaking havoc in the colonies, appropriating the fever tree from the indigenous Andes wasn't simply in the empire's interest. It was, as British officials had it, a "duty to humanity."<sup>1</sup>

Tasked with this historic work, Richard Spruce and Robert Cross ventured into Ecuador's interiors. G. J. Pritchett probed the cloud forests of Peru. The expedition's leader, Clements Markham, set his sights on the coveted yellow bark cinchona varieties of upland Peru and Bolivia.<sup>2</sup> The stakes were high. Independent from Spanish rule since the 1820s, the new republics of Ecuador, Peru, and Bolivia were intensely protective of their bark forests. Breaking their monopoly on cinchona promised to be dangerous. "In the Bolivian forests," Markham noted before his mission, "the difficulties of procuring plants and seeds [are] very great. The Bolivians are the most ignorant, barbarous, and jealous of all the South American republics, and they have an intense hatred and suspicion of foreigners."<sup>3</sup> Particularly those looking for cinchona.

After days traversing precipitous ridges and dank valleys, Markham penetrated the remote Tambopata Valley in the borderlands of Peru and Bolivia and found what he had come for: the coveted yellow bark variety, *Cinchona calisaya*.<sup>4</sup> He and his helpers wrapped the plants in moss and strapped them to their mules. But as they turned for the coast, word arrived that the Peruvian government "had received positive intelligence that an English stranger had entered the forests to collect cinchona plants, to the serious injury of the people of this country."<sup>5</sup> The English stranger, the notification read, was to be imprisoned and prevented

from taking “even a single plant.” On hearing of posses organizing for his capture, Markham cleverly sent his helpers as decoys down the original route while he escaped to the coast via a less traveled path, cinchona in tow. Markham managed to get his specimens aboard an outbound steamer at the Port of Islay, but not before a “patriotic Bolivian” made a last-ditch effort to sabotage the mission by pouring boiling water into the glass Wardian cases where the tender cinchona plants were to make their transoceanic journey.<sup>6</sup>

Having narrowly escaped, Markham escorted the plants across Panama, through the Caribbean, and on to London’s Kew’s Royal Botanic Gardens. Markham deposited samples of his plants at Kew and proceeded onward to the Nilgiri Hills of southern India, where the British aimed to start their first cinchona plantation at Ootamacund. The plants suffered terribly on their journey across the seas, but some survived. Thinking his mission a success, Markham handed over his seedlings to the head of Ootamacund, W. G. McIvor. The botanists’ exuberance soon wilted, however, when Markham’s specimens all perished in the days ahead.<sup>7</sup>

To the British Empire’s fortune, Markham’s deputies had better luck. In Ecuador, Spruce and Cross made indigenous cinchona farmers an offer they couldn’t refuse and thus obtained red bark varietals.<sup>8</sup> Pritchett brought gray bark varietals down from the Peruvian mountains and propagated cuttings at his Lima nursery, before sending them on to Kew. In April 1861, Cross arrived at Ootamacund with his red bark specimens and six yellow barks raised at Kew. This time the plants survived.<sup>9</sup> With seeds sprouting and the fever tree taking root in Indian soil, the British quinine project was a go.

. . .

How did history, empire, and life get made with quinine? At the time of Markham’s expedition, malaria was not the “tropical disease” it is now.<sup>10</sup> Along with Africa and Asia, the poorly understood disease still affected large swaths of Europe and North and South America. Affording seemingly miraculous treatment for malarial fevers, quinine was already on its way to becoming one of the world’s first modern pharmaceuticals.<sup>11</sup> The chemical isolation of quinine from cinchona bark in 1820 sparked a growing industry of quinine-based medicines and health-boosting tonics. The colonial thirst for the bitter alkaloid was insatiable. By the 1850s, the demand had significantly depleted the bark forests of South America. With supplies running short, the British were getting nervous. Something needed to be done.

In 1852, Dr. Forbes Royle, a colonial official in India, proclaimed to the British government in London, “Among the vast variety of medical drugs there is not one, with probably the single exception of opium, which is more valuable to man than quinine-yielding cinchona.” Pleading for the empire to do whatever was necessary get the fever tree out of the indigenous jungles of the Andes and onto more ruly ground, Royle argued, “The successful introduction into India of the cinchona will be of great benefit not only to that country, but to the world in general.”<sup>12</sup> The early 1850s would see British and Dutch attempts to grow cinchona

fail miserably, including a botched experiment at Darjeeling in 1853.<sup>13</sup> These were largely unsystematic experiments—a curious botanist trying a few seeds here, a few saplings there. A more scientific approach would be needed if the fever tree and quinine were to do empire’s bidding. In 1857, Royle doubled down, arguing for “the almost inappreciable value of the cinchonas” and imploring the British government to get the imperiled fever tree out of the Andes and to India.<sup>14</sup> This time the empire heeded the call, dispatching Markham to South America.

Going forward, quinine would be in empire’s hands. There the alkaloid would become a world-historical substance. I’ve taken the term “world-historical” from Hegelian philosophy. The megalomaniac German philosopher believed that the spirit of history moved through particular people and “world-historical individuals,” using them as vehicles for its own advancement before moving on to others.<sup>15</sup> For Hegel, a triumphant Napoleon, riding his horse across the battlefield, inspired yet largely unaware of how he was carrying out the work of history, was the consummate example.<sup>16</sup> The teleological assumptions of Hegel’s philosophy are repellent; its anthropocentrism is overblown. That said, *world-historical*, when affixed to substances, not individuals, can be useful for understanding how particular things shape our worlds. Like Napoleon, world-historical substances don’t necessarily *know* what they are doing, yet there is something deep within them that allows them to change the course of history. That something, in the case of quinine, is material: a potential encoded in the chemical structure of the substance itself. So figured, history is full of this kind of things: petroleum, sugar, spices like nutmeg and pepper, antibiotics, DDT, plastics, silicon, and so on. The list is long and ever evolving. Importantly, these things do not structure the world on their own.<sup>17</sup>

Consider quinine. The alkaloid’s ability to disrupt the malaria plasmodium’s life cycle and thereby head off malaria’s intermittent fevers boiled down to the structure of the chemical itself. Quinine’s power was, in this regard, molecular.<sup>18</sup> Yet in becoming a game-changing pharmaceutical, quinine required—and brought into existence—a broader infrastructure of frontiers, labor, technology, and markets to realize the transformative potential locked inside cinchona’s bark. Never was this medical assemblage stable.<sup>19</sup> The elements were constantly moving, constantly transforming one another. On the colonial cinchona plantations, extreme weather and blights killed plants by the score. Botanists “discovered” and bred stronger varietals. Chemists experimented with various alkaloid extraction techniques to formulate more “advanced” medicines. Plantation land and labor produced until they couldn’t. Empire’s war on malaria found new weapons. Mosquitoes and parasites developed new resistances to the latest insecticides and drugs. Quinine consequently became something much bigger than the molecules that comprised it: an assemblage of human and nonhuman elements, tenuous, alive, and dynamic.<sup>20</sup> This would prove its greatest source of vitality and vulnerability.

“Rescued” from the jungles of South America, colonial cinchona cultivation spread from British India and Dutch Java onward to Ceylon (Sri Lanka), the Caribbean, Africa, and beyond. The bark forests and monopolies of the South American

republics subsequently collapsed. Pressed into colonial service, quinine proved amenable to mass manufacture and traveled well. Quinine pills and tablets soon became essential medicine for colonial officials and soldiers manning empire's front lines.<sup>21</sup> Quinine subsequently facilitated the expansion of European colonial rule (particularly into sub-Saharan Africa) and stabilized imperial projects, more broadly, by mitigating malaria's physical and fiscal costs. These consolidations of health and capital required frontiers: not only geographic frontiers where cinchona could be grown at scale, but also scientific frontiers where better drugs could be discovered, invented, and manufactured. The Darjeeling-Kalimpong Hills became one of those frontiers.

This chapter chronicles the makings of quinine and life on this medical frontier. British administrators spilled considerable ink detailing the plants, lands, and chemicals of the empire's quinine industry. They wrote little, however, about the actual people who came to work and live on Darjeeling's cinchona plantations. To offset this archival silence, this chapter turns to oral histories with plantation elders, as well as images—most notably, a singular collection of glass lantern slides shot at Mungpoo and Munsong by an anonymous British photographer between 1906 and 1916.<sup>22</sup> The grainy images of crews clearing steep hillsides, men struggling with massive machinery, and women and children stripping cinchona bark help anchor quinine's global history in the everyday worlds of the community that made it. Many of these scenes would prove eerily similar to those I encountered ethnographically a century later.

This is also, necessarily, a story of quinine's unmakings. Today Darjeeling's cinchona plantations are decaying, but they are not decaying "back" into a pristine Nature but rather into an ecology fundamentally transformed by empire's impulses.<sup>23</sup> That the British pursuit of quinine radically reformatted life and land in this corner of India comes as no surprise. That's how empires and their world-historical substances work. They bring things together. They transform. They build worlds one molecule at a time to serve bigger interests—in this case, the power, profit, and well-being of some people largely at the expense of others. They work this way for a time. But when that time is up, the ecologies, regimes, and lives they brought into being often outlive the salience of the substances themselves. They remain.

Set in the time *after* quinine, this book principally explores life amid these colonial remains. To understand life after quinine, however, one first needs to reckon with the elements that made empire's medicine to begin with. Unearthing these makings (and their undoing) is my goal here.

## LAND

The British framed the Indian quinine experiment as an imperial *and* humanitarian endeavor. The imperial designs are undeniable: combatting malaria was vital to British military and economic interests. Yet the British also insisted that the project was "not to be a commercial object, but one having reference solely to the supply of a cheap febrifuge to the people of India."<sup>24</sup> History eventually laid

bare the imperial economic and military priorities of this “noncommercial” industry. The humanitarian impulse nevertheless carved Indian quinine a unique niche in the global quinine trade and the annals of colonial medicine more generally. Government made and sold cheap, Indian quinine was to be both a biomedical backstop to empire and a public good, the goal being to produce enough quinine to meet India’s immense demands—and perhaps that of the empire writ large. The aim, in short, was medicinal resource autonomy.

To meet these lofty goals, the British first needed to get cinchona to India. For this, they dispatched Markham. Then they needed to make the plants grow. Here, on India’s soils, cinchona presented a catch. How would the fever tree from South America’s Andes grow in India? Or more specifically, *where* would it grow? “The great difficulty,” as Royle and many colonial botanists after him noted, was “to find a suitable climate in a mountainous region for their healthy growth.” Cinchona originally didn’t take well to India’s hot climes. The finicky tree gave colonial botanists fits as they experimented with different locales and cultivation techniques. What they needed were moist, elevated places similar to the Andes where cinchona could be grown at scale.<sup>25</sup> And so began the ceaseless quest for cinchona frontiers.

The Darjeeling Hills were not originally high on the list. The Himalayan weather was thought to be too harsh for the delicate fever tree. One colonial botanist thought otherwise. Thomas Anderson, then superintendent of the Royal Botanic Gardens in Calcutta, was convinced that cinchona could thrive in montane Darjeeling. Not unlike the cloud forests of the Andes, the Darjeeling Hills were cool, wet, and situated at altitude. It didn’t seem too far of a stretch to think that the finicky plant might take to these Himalayan lands.

In 1861, Anderson traveled to Dutch Java to gather seeds, plants, and knowledge of cinchona cultivation. On the way back, he stopped at Ootamacund, where Markham and McIvor were busy setting up operations.<sup>26</sup> Anderson shared his findings and appreciated the progress that his colleagues were making on the Nilgiri frontier. Ultimately, though, he believed the empire could do better.<sup>27</sup> Before leaving, Anderson filled eight Wardian cases with every cinchona strain available at Ootamacund and brought them to Calcutta.<sup>28</sup> He had another frontier in mind.

Anderson proposed to the Bengal Presidency to start an experimental nursery at Darjeeling. The Bengal government approved, allotting Anderson 5,000 acres and a modest budget to commence his project.<sup>29</sup> In March 1862, Anderson and his assistant brought 249 cinchona plants from Calcutta to Darjeeling.<sup>30</sup> Relieved to get his plants out of the wilting heat, Anderson started exploring the forests surrounding the up-and-coming hill station. “I hoped to procure land near enough to Darjeeling,” Anderson recounted. “This I soon discovered was quite impossible, as all the land within several miles of Darjeeling had been purchased for the cultivation of tea.”<sup>31</sup> Anderson accordingly set up temporary operations on the Sinchal ridge at an elevation of 8,500 feet—too high and cold for cinchona. He then shifted the temporary nursery to a lower location at Lebong (elevation 6,000 ft.) on the

outskirts of Darjeeling Town. There he began the experiment in earnest in June 1862. The initial results were mixed. Many plants died, but some lived. By August, he and his staff had managed to propagate from the original 200-plus plants more than 1,600 (1,300 from seed).<sup>32</sup>

Anderson meanwhile used his 5,000-acre allowance to establish the Government Cinchona Plantations at a remote site known as Rungbee (later called Mungpoo), 12 miles outside of Darjeeling Town, in 1862. Anderson quickly realized he had underestimated the challenge of establishing a cinchona plantation in this rugged land. By 1863, Anderson was confessing of “being quite ignorant of the nature of the country.”<sup>33</sup> Things that he assumed would be available—land, roads, skilled laborers, sand, glass, flowerpots—were not. Then there was getting to Rungbee. “To reach this spot,” Anderson wrote, “an almost impenetrable forest had to be passed through, requiring every step to be cleared by Lepchas with their long knives.”<sup>34</sup> The three-month timetable Anderson set for establishing the plantation’s propagation houses, European residences, and coolie (laborer) huts delayed to two years, as laborers painstakingly cut a bridle-path road through the steep, dense jungles. In 1864, the road finally reached Rungbee and the first tracts were cleared for cinchona planting. With some basic infrastructure in place, Anderson could finally focus on what he knew best: plants.

Anderson and his staff initially struggled with cinchona’s persnickety nature. Each varietal required particular combinations of soil composition, moisture, sun, and elevation to survive. This was particularly tricky in the Darjeeling Hills, where elevations drop precipitously from 7,000 feet on the chilly ridges above to just 400 feet in the steamy valleys below, and soils and weather can change drastically from one acre to the next. Anderson and his team of European, Bengali, and local workers shot high in some places, low in others, losing “plants by the thousands.”<sup>35</sup> Gradually, though, they discovered the right combinations of botany, geology, meteorology, and cultivation to make cinchona grow. Cinchona didn’t just grow in montane Darjeeling. If cultivated properly, it thrived.

Anderson was on his way to proving cinchona’s viability. What he needed now was land—and lots of it. Darjeeling’s best lands had already fallen into the hands of private tea planters. But two factors shifted the equation in cinchona’s favor. First, in 1864, Anderson became Bengal’s first conservator of forests (in addition to his duties as superintendent of Calcutta’s Royal Botanic Gardens and in charge of cinchona cultivation in Bengal). Under his watch, the original 5,000-acre allowance for cinchona mysteriously jumped to 37,000 acres—a transfer for which this bureaucrat-of-many-hats left no paper trail.<sup>36</sup> Second, at the conclusion of the Anglo-Bhutan War in 1865, the British annexed a vast swath of territory east of the Teesta River, in what is now the Kalimpong District. With Anderson keeping watch, much of this land was declared a “reserve forest” and earmarked for future cinchona cultivation.





FIGURE 6. Head European gardener and *Cinchona succiruba* at Rungbee/Mungpoo, 1867.  
Credit: Photo by Benjamin Simpson, British Library, Photo 1000(40)/1855–1880s/Print 4200.

The cinchona frontier followed a familiar script. By designating this tract a reserve forest, the colonial state stamped its sovereignty on this newly gotten territory, conveniently eliding the native Lepcha and other cultivators (*ryots*) who inhabited it. Figured at the edge of colonial space and time,<sup>37</sup> this was a “wild,” “pristine,” “uninhabited” territory—a forest, as it were, ready for colonial transformation. Declaring the tract a reserve forest was a masterstroke.<sup>38</sup> Most immediately, it prevented the unbridled expansion of the tea industry into the Kalimpong Hills, thereby ensuring the cinchona frontier ample room to grow when the time came. Holding tea at bay, it effectively prioritized one form of primitive accumulation (the colonial state’s) over another (that of private capital). It would be some time before the cinchona frontier crossed into the Kalimpong Hills. In the meantime, the freshly annexed territory could produce another vital commodity: timber.<sup>39</sup>

Back at Rungbee/Mungpoo, the plantations were taking off. Anderson retired in 1869 due to chronic fever and liver troubles (common symptoms of malaria). He died soon thereafter, in 1870.<sup>40</sup> The government cinchona plantations nevertheless carried on. By 1875, there were more than three million trees in the ground.<sup>41</sup> News of the Bengal frontier's burgeoning success spread quickly through the global networks of colonial botany. Seeds came in from Dutch Java and South America (courtesy of Markham) to be tried on Mungpoo's vertiginous slopes. The diverse topography lent itself to experiments with different varietals—some better suited for the highlands, others for the steamy valleys below. Mungpoo reciprocated by supplying seeds and knowledge to extant and would-be frontiers across the colonies.<sup>42</sup> As momentum grew, the remote outpost became a key node in a newly configured geography of colonial medicine, science, and power.<sup>43</sup>

For the British, the conviviality of plants and land was encouraging, but there was still much to be done to realize the ambitions of this great experiment. Getting quinine from bark to blood required more than just plants and land. Enter labor, a decidedly *human* element of the quinine assemblage.

## PEOPLE

Transforming mountains into plantations required tremendous labor—far more than the local populations could provide. When Anderson obtained Rungbee/Mungpoo, the forested tract was dotted with Lepcha settlements, from which the plantations got their name. The arrival of cinchona triggered significant demographic and ecological changes. Thousands of Nepali speakers came from the surrounding hills to clear the jungles, level the ground, tend the plants, and strip the fever tree of its bark. In time, they developed their own lives and culture with cinchona. In time, these lands became home. At the outset, though, getting laborers to the plantations—and making them stay—posed challenges.

Darjeeling was undergoing profound colonial transformations during this period. The British East India Company obtained the crescent-shaped ridge of Dorje-ling from Sikkim in 1835 in order to establish a hill-station sanatorium where colonial officers could escape the heat of the plains below. The empire annexed additional territory from Sikkim in 1850, expanding once again into the Kalimpong region at the conclusion of the Anglo-Bhutan War. The budding tea industry quickly claimed huge swaths of land across the region. As folk songs about gold growing on the tea bushes traveled down the Himalayas' footpaths, tens of thousands came from the surrounding hills of British India, Nepal, Sikkim, and Bhutan to try their hand and sell their labor in the colonial hill station. Many came fleeing feudal conditions of forced labor, debt, and slavery.<sup>44</sup> Much of this population moved back and forth between colonial Darjeeling and their ancestral homelands. Eventually, though, a conglomerate community of Himalayan ethnic groups like Tamangs, Gurungs, Limbus, and others



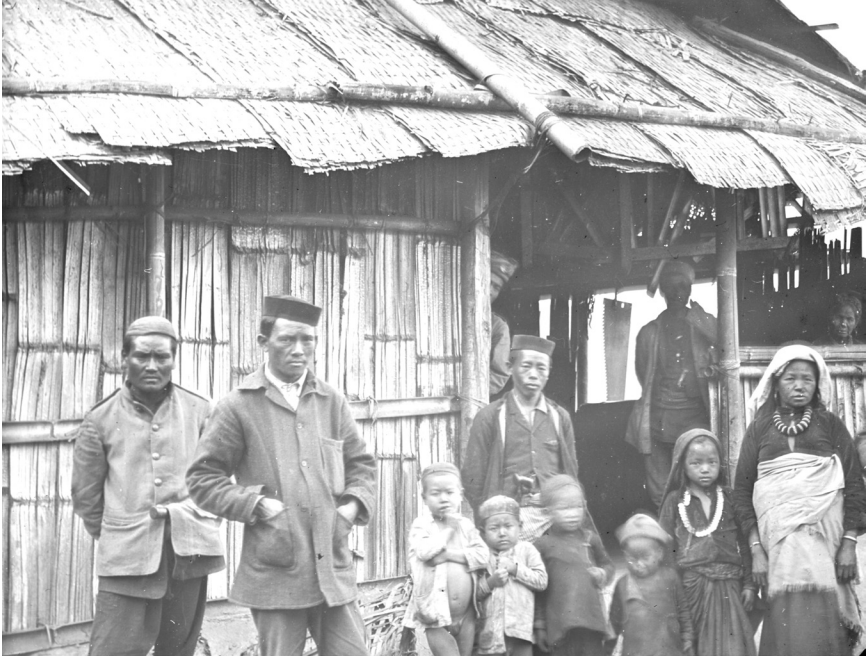


FIGURE 7. Cinchona workers standing in front of a home in Darjeeling, ca. 1910. Credit: Lantern Slide, British Library, Photo 397 (67).

established themselves as the region's demographic majority. They would later call themselves the Gorkhas.

Cinchona plugged into this budding political economy in particular ways—a little late and somewhat askant. Unlike the private tea estates proliferating across the hills, the government-run cinchona plantations were not geared toward profit (at least not directly). Framed as an imperial qua humanitarian endeavor, the cinchona plantations were meant to produce cheap medicine for the general population (after, of course, colonial officials). And while quinine clearly served the British Empire's economic interest, the cinchona plantations themselves—as purportedly noncommercial entities—were not driven by profit. This fundamentally affected how the land was and was not capitalized.

Similar to the private tea estates, the government cinchona plantations relied on word of mouth and informal labor recruiters, or *sardars*, to obtain workers. Workers brought their own traditions to the plantations. Many of these lifeways ran counter to the plantation's designs: most notably, the fluid migration patterns and swidden agriculture practices common throughout this part of the Himalayas. In 1875, the lieutenant governor of Bengal, George Temple, weighed in on these practices of cinchona's laborers: "The establishment of workpeople—hillmen in



FIGURE 8. Workers stripping cinchona bark, ca. 1910. Credit: Lantern Slide, British Library, Photo 397 (54).

the plantations—has become considerable. . . . They settle down on the hillside and burn the jungle or forest for their temporary cultivation, which they abandon after a short time, moving on to some other spot.” Clearly, these practices were anathema to the plantation’s mutual disciplining of land and labor. “Providing them with suitable homesteads and fields” and teaching them “to cultivate with the plough and to establish themselves permanently,” Temple argued, was thus “a matter of prime necessity.”<sup>45</sup>

Cinchona helped. Because it is so finicky, cinchona would only cover a small fraction of the land allotted to it—historically, about one-third of the plantations’ acreage. This left land for other purposes. The government was therefore able to offer workers housing and ample land, often doling out acres at a time to lure laborers to the plantations and make them stay. Cinchona’s materiality, in these regards, profoundly influenced its human dimensions. The homesteads and fields allowed workers’ families to maintain a peasant lifestyle, while workers themselves labored for wages on the plantation. Families used their fields to grow subsistence



FIGURE 9. Cinchona laborers at a work camp to clear the jungle, ca. 1910. Credit: Lantern Slide, British Library, Photo 397 (18).

crops like corn, potatoes, and fresh vegetables and raise livestock like cattle, chickens, and pigs. The surrounding forests likewise provided a bounty of raw materials (firewood, thatch, bamboo, water, rock, etc.) that the plantations and workers required to sustain themselves in these remote reaches of the eastern Himalayas. These affordances helped establish deep connections between the people and their land. The fields allotted to cinchona workers were a particularly powerful draw, especially when compared to the neighboring tea estates, where land for laborers was scarce due to tea's ability to cover nearly all the plantations' land. Given the discrepancies, many cinchona laborers came straight from the private tea estates, where benefits paled in comparison. And so began the contrasting relationship between tea and cinchona that continues to this day (see chapter 2). Where Darjeeling became famous for its tea, cinchona emerged as Darjeeling's *other* plantation crop—a very different plant, bearing different forms of life.<sup>46</sup>

For laborers, life among the cinchona bore its assortment of possibilities and constraints. Work and life on the colonial plantation took shape through strict rhythms and hierarchies. The day began with the morning bell ringing out through the plantation dawn. Workers hustled from their homesteads and made their way to the day's muster to await orders. Once their assignment was called,



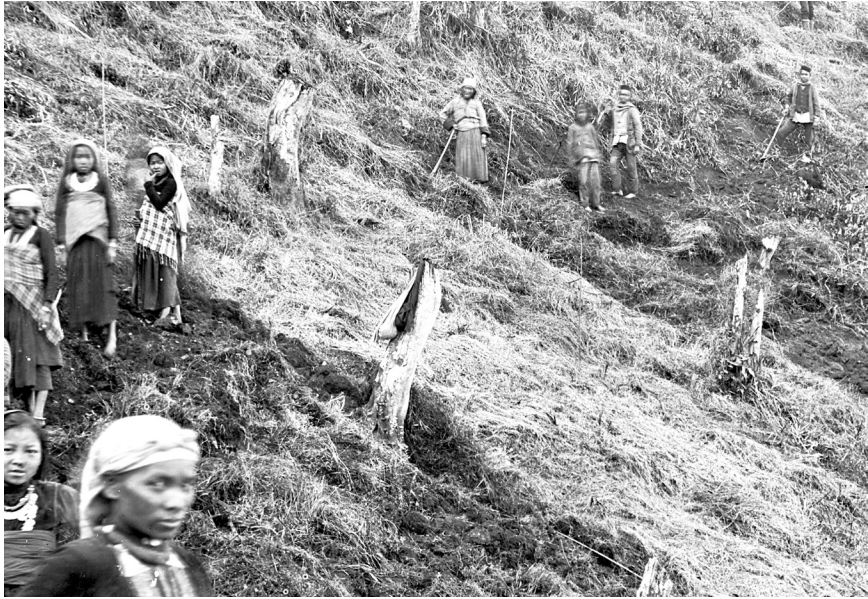


FIGURE 10. Cinchona workers preparing a freshly cleared field for planting, ca. 1910. Credit: Lantern Slide, British Library, Photo 397 (24).

some would head to the nursery to tend seedlings arranged in bamboo propagation houses. Others went to the hillsides to do the brutal work of clearing jungle, leveling ground, and tending and harvesting cinchona. During the drier months of winter, workers cleared virgin forests and dug out the roots and stumps from previously harvested cinchona stands.

In spring, workers prepared the ground for planting, using picks and shovels to etch terraces and four-by-four-foot plots into the steep hillsides, where each fever tree would live out its plantation life. The summer monsoon was planting season—a time when laborers traversed the plantations' wet, soft grounds, ferrying baskets of young cinchona saplings from the nursery to the surrounding hillsides. These tender specimens would be transplanted and staked with bamboo *khutti* to help them withstand the Himalayan winds and rain. Laborers planted *uttis* (Nepalese alder trees) among the cinchona for shade and *sik-sikey* (a nitrogen-fixing *Crotalaria* species of legumes) to mitigate cinchona's exhaustion of the soils. Fall was harvest season—time for the backbreaking work of coppicing eight-year-old cinchona trees down to the stump and then uprooting the trees fully and harvesting the bark again at sixteen years—thus completing cinchona's shortened plantation life cycle.<sup>47</sup>

Next came the painstaking work of stripping the felled trees and branches of their bark, a task often performed by women and children. Once the bark was stripped, porters and ponies transported the wet bark to nearby drying sheds.



FIGURE 11. Children stripping coppiced branches, with overseer in background, ca. 1910. Credit: Lantern Slide, British Library, Photo 397 (53).

After several months, the dried bark would be sent on to the factory to be ground into powder and prepared for processing. Inside the factory, workers manned steaming cauldrons of oils, acids, and sodas throughout the year to extract and manufacture the quinine that the British Empire demanded.

All the while, pith-helmeted colonial officers roamed the plantations on horseback, ensuring that plants, land, chemicals, and people were working in lockstep. At day's end, workers returned to their homesteads, only to begin again the next morning. Such were the rhythms of life with cinchona and quinine.

All of this transpired under rigid hierarchies. At the plantations' top was the British director, who, as superintendent of the Royal Botanical Gardens, Calcutta, and of cinchona cultivation in Bengal, answered directly to the colonial government of Bengal. Below him was the quinologist (typically British but later Indians from the plains), who focused on the chemical and manufacturing side of the industry. The plant side fell to the head European gardener and his staff, who concentrated on the nurseries and cinchona fields. As the industry grew, the hierarchy incorporated a range of officer-level positions (e.g., managers, assistant managers, and divisional



FIGURE 12. Workers weighing bark at the drying shed, with ponies for transport to the factory, ca. 1910. Credit: Lantern Slide, British Library, Photo 397 (61).

officers) to run the plantations' expanding administrative units. Below the officers were the local *gangmen*, *chaprasis*, and *dafadars*, who organized laborers and guided them through their work in the fields and factory. *Chowkidars* brandishing *khukuris* (the iconic knives of the Gorkha) and their signature brass belt buckles prowled the plantations twenty-four hours a day, guarding against human and animal invaders. *Syces* tended the horses, making sure they were fed and ready for the difficult work of transporting materials—and colonial officers—across the plantations' precipitous grounds. *Paniwallas* brought water from the local springs and tea from the local villages to keep workers in the field and working.

Tying this all together was the *badli kam* system, mandating one member of each household to sell their labor to the plantations, six days a week. In addition to workers' wages and homesteads, the colonial government provided "facilities," which included yearly rations of firewood for cooking and thatch and wood for mending roofs and homes, as well as rubber boots and umbrellas for the wet, unrelenting work of cinchona cultivation. The *badli kam* system was rigid, yet internally dynamic. When a worker retired or died, the *badli kam* post stayed with the family, thereby providing households the stability of intergenerational employment, homes, facilities, and so on. Yet the system also allowed for mobility within the plantation hierarchy. When a higher-level post, say, a *dafadar*, was vacated, a laborer would be promoted to that post, and another laborer would subsequently be appointed to take that person's place. Over a lifetime, this enabled rank-and-file laborers to ascend to become *dafadars*, *chaprasis*, *gangmen*, and *clerks*,





FIGURE 13. Workers struggling with a boiler, as a colonial officer stands among them, ca. 1910. Credit: Lantern Slide, British Library, Photo 397 (83).

positions that carried greater pay, benefits, and social prestige within the cinchona community. For workers, *badli kam* thus provided stability and mobility; for the colonial government, it ensured a relatively stable plantation workforce, continually replenished from below.

But there were limits to Gorkha workers' mobility. The plantations' officer-level positions were the privileged domain of white colonial officials and, as time wore on, a growing number of upper-caste Indians from the plains (mostly Bengali elites). The postcolonial era would see Gorkhas gradually ascend to the ranks of assistant manager and manager, but only in 2008 did a Gorkha finally shatter the last glass ceiling, when a son of the cinchona soil, G. C. Subba, became director.

In recounting the days of old, elders told me stories that their forefathers told them of dragging monstrous machines and boilers through steep, densely forested jungles, en route to the factory at Mungpoo. And they shared their own experiences of joining the workforce at age nine and manning the same boilers brought by the British, of rising to become factory foremen and rising still to become revered leaders of their trade union and community writ large.<sup>48</sup> These stories of triumph, however, were offset by other stories. Stories of families unable to escape

the plantations' toil. Stories of lives lived but not in ways they could have been. Stories of hopes dashed and lives lost.

These were not simply historical remembrances. They were testimonies of the life thereafter and its uncanny resemblance to the colonial past. The stories that elders shared and the few images that survive (some of which I present here) bespeak the undeniable truth that the cinchona plantations were and remain sites of extraction, human and otherwise. Yet they are also home—places of becoming, belonging, and life with all its joys and sorrows.

The government cinchona plantations became in many ways a world unto themselves. Because they were so remote, they had little choice but to work with local materials to develop forms of sustainability. To power the factory, the plantations harnessed the hydropower of nearby streams. They planted stands of oak and other timber to fuel the factory's boilers, supply firewood for workers, and construct homes, bark go-downs, and other infrastructure. Socially, Gorkha cinchona workers were not simply a labor force. They were a community. Culturally, cinchona's workers developed their own customs, celebrations, and solidarities. They forged deep connections to cinchona and a powerful sense of belonging on the plantations. In workers' vernacular, the term "quinine" became *kulain*; the plantations (*bagan*) became *kulain bagan*. These subtle linguistic shifts signal how the makings of quinine were differently lived from above and below. Where colonial officers fretted over molecular structures, alkaloid content, and extraction rates, Gorkha workers came to know the plants, land, and chemicals in more embodied ways. They lived and worked among these things. They *became-with* cinchona and quinine. Cinchona and quinine *became-with* them. As one elder put it to me, "We work because cinchona exists. Cinchona exists because we work." None of this is to say that life on the cinchona plantations took shape in a vacuum. Nor was it rosy. Plantation life unfolded within a political economy predicated on the bending of lands, plants, chemicals, and bodies to the will of the British Empire. That said, there were worlds and lives taking shape on this medical frontier—many of which, today, have outlived quinine itself.

The colonial archive offers few glimpses of this laboring community, despite its centrality to the quinine project. What then to make of this lacuna? The archive's silence is here a tell. As was the case on Darjeeling's tea estates, much (though certainly not all) of cinchona's workforce came from the neighboring kingdoms of Nepal, Sikkim, and Bhutan. The problem was that none of these kingdoms approved of the British Empire's encroachment on their human resources. To avoid diplomatic recourse, British officials elected to keep labor a strategically unwritten part of the quinine assemblage.<sup>49</sup> Labor was a "cultural" matter, as British officers called it, one best dealt with off the books.<sup>50</sup> In this calculus of subalternity, the cinchona and tea plantations leaned on informal labor recruiters to procure workers and manage their internal affairs. The government provided wages, homes, and land to lure them to the plantations and keep them there. What the British



FIGURE 14. Cinchona work crew at Mungpoo, ca. 1910. Credit: Lantern Slide, British Library, Photo 397 (68).

would *not* provide, however, were the bona fides to legally establish workers' place and property in India in perpetuity. This lack of *documented* belonging/s would haunt Gorkhas for generations to come and become a galvanizing force of their politics on and off the plantations—most notably, in the Gorkhaland agitations and a burgeoning land rights movement that gained steam during my fieldwork (and which I examine in later chapters).

The archive's silence cast its pall over my research. Oral histories with plantation elders taught me of life in the final decades of British rule, but the early days were hard to access. People often spoke nostalgically of quinine's glory days, when the cinchona fields flourished and the factory churned out lifesaving medicine to fight the great scourge. Spoken from the dismal horizons of the present day, the nostalgia was understandable and somewhat infectious. It was also, I suspected, misleading. The lantern slides that feature throughout this chapter offer more sobering glimpses of the colonial plantation. Faded and blurry, these scenes of women, children, and men—many of them very young—laboring for the British Empire signal a harder reality than nostalgia might allow. How accurately these scenes and faces reflect life on the colonial cinchona plantations is difficult to tell. I present them here, instead, for the questions they leave open and for their unspoken intimations of all that came before.

The cinchona community may have *become-with* the fever tree. The plantations may have become home. Indian quinine may have even done some humanitarian good, as its colonial founders professed it would. But make no mistake: this was an imperial enterprise meant to increase the health, power, and, by extension, wealth of the British Empire. Freightened with those imperatives, life on the cinchona plantations necessarily bore its colonial burdens.

And there were still yet more subjects that needed “mastery” if empire's alkaloid were to realize its world-historical potential.

## CHEMICALS

Making quinine hinged on getting the alkaloid out of cinchona bark and into pharmaceutical form. Enter chemistry.<sup>51</sup> Alkaloid extraction was an evolving science throughout the nineteenth century. The French chemists Pierre-Joseph Pelletier and Jean Bienaime Caventou first isolated quinine in 1820.<sup>52</sup> Following that chemical breakthrough, European and American pharmaceutical companies focused on the manufacture of “pure” quinine sulfate. Early experiments at Mungpoo, in contrast, concentrated on a cruder, cheaper drug known as cinchona febrifuge. This mix of cinchona's four antimalarial alkaloids (quinine, quinidine, cinchonine, and cinchonidine) was not as elegant as commercial quinine, but it suited the on-the-ground realities and founding logics of the British quinine project in India.

In 1873, C. H. Wood became Bengal's first appointed quinologist and began experimenting with the materials available at Mungpoo. Wood combined sophisticated



chemical reactions with a ramshackle apparatus of old beer barrels and bamboo flow channels to devise this mixed-alkaloid cinchona febrifuge. Wood's method was "simple in the extreme," his colleagues noted.<sup>53</sup> And it was brilliant. At a cost of less than one rupee per ounce, it produced a cheap alternative to "pure" but prohibitively expensive quinine sulfate.<sup>54</sup> As "pure" quinine was beyond the reach of India's poor, the British believed they had found a way to furnish "the people of India with a cheap and efficient febrifuge at a minimum cost."<sup>55</sup> The government convened a special committee in 1877 to confirm the febrifuge's efficacy. Informal trials in Indian hospitals and among the Native military revealed it was roughly as effective as quinine sulfate. The concoction did seem to cause nausea—nothing, doctors opined, that the natives couldn't handle. Naming it Darjeeling Quinine,<sup>56</sup> they hailed the febrifuge as a breakthrough. Then head of the plantation, George King, surmised that if the colonial government could produce and distribute the febrifuge widely, "malarious fever should be robbed of three-fourths of its annual victims . . . and the poor of this land [would] be thus attached to their paternal Government by yet another bond."<sup>57</sup> So went the logic of the colonial maker.

Wood's chemistry clicked with the human and material conditions on the ground. Shortly after the government quinine factory at Mungpoo's opening in 1875, Wood commented on how quickly his workers took to the chemistry. "The only workmen employed in the factory are Nepalese coolies," he noted in 1876. "These men readily master every detail and conduct the whole thing with all the care and accuracy that is required."<sup>58</sup> The febrifuge also clicked with the cinchona varieties growing on Mungpoo's steep hillsides. The plantations were dominated by the red bark of *C. succirubra*. As compared to the yellow bark preferred by commercial quinine makers, red bark was low in quinine but high in other alkaloids. Perfect for the mixed alkaloid febrifuge. The hardy red bark varieties, moreover, thrived in Darjeeling and were amenable to simple manufacture. With the botany, land, labor, and chemistry clicking, the British had found a plant and a process capable of delivering a cheap febrifuge to the masses.<sup>59</sup>

The bark-to-medicine equation soon shifted, however. In Java, the Dutch were beginning to have great success with high-quinine-yielding yellow bark varieties—specifically *C. calisaya* and a new strain called *C. ledgeriana*.<sup>60</sup> Good for quinine production but not mixed-alkaloid febrifuges, these yellow barks flowed from Java to chemists' labs across Europe and North America, fueling the commercial quinine industry and sharpening consumers' chemical sensibilities.<sup>61</sup> Mungpoo's botanists and workers were also learning the art of yellow bark cultivation. Experiments at the factory were likewise making headway on the manufacture of quinine sulfate.<sup>62</sup> The focus therefore began shifting to the production of this purer but more expensive form. Over the 1880s, Wood's once-ramshackle apparatus of beer barrels and bamboo flow channels morphed into a full-fledged quinine factory, replete with imported machinery, volatile compounds, and exacting chemistries.



FIGURE 15. Government quinine factory at Mungpoo, exterior, ca. 1910. Credit: Lantern Slide, British Library, Photo 397 (72).

Now able to produce the “pure” quinine demanded by the colonial British, the government quinine factory slowly phased out the affordable febrifuge seemingly so well suited to India’s general population.<sup>63</sup> The shifting chemistries fed back into the cinchona fields, prompting a sea change from red to yellow barks—itself indicative of empire’s true colors.

The British didn’t entirely forsake their humanitarian commitments. In the 1890s, the colonial government launched a pioneering campaign to distribute state-made quinine to Bengal’s general population. Known as the pice-package system, the program worked as follows: Quinine made at Mungpoo would be shipped to Kolkata for packaging at the Alipur Jail. Prisoners prized out five crystals of quinine sulfate, sealing the drug into packets “carrying the royal arms as a guarantee of genuineness, together with brief instructions in the vernacular.”<sup>64</sup> These single-dose packets would then be distributed to post offices, police stations (*thana*), rail stations, and dispensaries across Bengal and sold at the nominal price of one pice (equivalent to a penny). The colonial government tasked postmen—ostensibly familiar, trustworthy representatives of the government—to carry pice-packets with them as they made their rounds. Delivering medicine to the villages and proverbial doorsteps of malarial India, this became one of many means by which the British sought to make quinine part of everyday life. Rail stationmasters likewise





FIGURE 16. Government quinine factory at Mungpoo, interior, ca. 1910. Credit: Lantern Slide, British Library, Photo 397 (81).

distributed pice-packets, as did tea and indigo plantation owners, zamindars, and a variety of vending agents, as the historian Rohan Deb Roy explains in detail. “Quinine emboldened the government,” Deb Roy notes, “with an object (and an objective) with which to reach out to the interiors.”<sup>65</sup> Sold cheap and distributed widely, state-made quinine was the colonial government’s attempt to make good on its humanitarian promise. It was also, to maintain Deb Roy’s line of thought, a means of producing a particular kind of colonial power.

The pice-packet system never came close to satisfying the medical needs of India’s malarial masses. That said, it did break ground in generic drug manufacture and medical logistics. From the distant outpost of Mungpoo originated the first state-run antimalarial drug program in history—predating Italy’s better-known state quinine project of the 1900s by a decade.<sup>66</sup> The pice-packet system quickly spread from Bengal throughout India. The escalating demands put considerable strain on the fields and factory at Mungpoo.<sup>67</sup> When the pice-packet system launched in the 1890s, the Mungpoo plantation was already exhausted. Every inch

of suitable land had been planted out, and three decades of relentless cultivation had left soils and trees diminished of nutrients, energy, and alkaloids. Making matters worse, the Nilgiri frontier in southern India had recently collapsed, on account of its private planters getting pinched by exposure to the volatilities of the global quinine market. That frontier's collapse put even more stress on the strictly governmental plantations and factory of the Bengal frontier.<sup>68</sup> Clearly, the Bengal frontier needed to expand. Mungpoo was spent.<sup>69</sup> Kalimpong stood waiting.

To meet the soaring demand, the cinchona frontier crossed the Teesta River and climbed into the Kalimpong Hills with the establishment of the Munsong plantation in 1901. Situated at a slightly lower elevation than Mungpoo, Munsong's verdant hillsides and warmer weather were perfect for the high-yielding yellow barks. By 1911, more than a 1.5 million trees were in the ground—nearly all of them the yellow barks of *C. calisaya* and *C. ledgeriana*. As that first generation reached harvestable age, the new plantation outstripped Mungpoo's bark production. Munsong's bark was cheaper to produce than Mungpoo's (1.84 vs. 2.49 annas/lb). It was stronger (4.67 percent vs 2.9 percent quinine content).<sup>70</sup> And there was more of it (341,364 vs. 158,053 lbs). Munsong quickly became the crown jewel of the British quinine project.

But Munsong was even more remote than Mungpoo. Clearing its jungles, developing the plantation's infrastructure, cultivating cinchona, and getting bark down from Munsong across the Teesta River and back up to the factory at Mungpoo required massive amounts of labor. Workers were hard to come by, however, in this remote tract nestled up against the Sikkim border. Managers reported the otherwise plentiful plantation was "considerably handicapped through the inadequacy of labor supplies."<sup>71</sup> Workers came. Workers went, periodically returning to their ancestral homelands and/or seeking work elsewhere. The workforce's fluidity (and agency) was maddening for colonial officers. They called it a "cultural condition."<sup>72</sup>

Workers did eventually settle at Munsong. Lured by wages and land, they slowly established their homesteads, villages, and lives with cinchona. The new plantation expanded as fast as its land, plants, and labor allowed. As the new plantation's bark made its way to Mungpoo, the factory went into overdrive.<sup>73</sup> Pushing these places and people to their absolute limit was, for an empire fighting malaria, a moral and mortal imperative. And so the frontier expanded again and again. Still, there was a sense that it would never be enough.

## POWER

By the end of the nineteenth century, quinine's imperial implications were clear. The alkaloid had facilitated the colonial penetration of and scramble for Africa, the capitalization of the American interiors, and the stabilization of colonial rule worldwide.<sup>74</sup> Quinine wasn't just a "tool of empire."<sup>75</sup> It was also big business. The Dutch were at the fore.<sup>76</sup> At the turn of the century, the cinchona

plantations of Dutch Java accounted for over 80 percent of the world's bark, most of it shipped and sold through tightly controlled markets in Amsterdam. As the Dutch government, planters, scientists, and pharmaceutical companies banded together to standardize the global bark supply and dictate its price, many observers recognized the birth of a burgeoning monopoly.<sup>77</sup> Others smelled a cartel.

Indian quinine—and the Bengal frontier in particular—occupied a tenuous place in this economy of medicine. Private capitalist interests dominated the global cinchona-quinine market and, because boom crops so often went bust, imbued it with significant volatility. The rise and sudden collapse of Ceylon's frontier in the 1880s is a good example. When Ceylon planters turned to cinchona in the 1870s, the glut of bark they produced a decade later (when their trees reached harvestable age) drove global prices down, pushing planter capital to another boom crop: tea.<sup>78</sup> Even India's cinchona frontier in the Nilgiri Hills was a mix of government and private plantations, leaving it exposed to market fluctuations, which ultimately spelled its demise.<sup>79</sup>

The government-dominated Bengal cinchona frontier was different. While a handful of tea planters tried their hand at cinchona cultivation, these endeavors met the same fate as the private cinchona plantations on the Nilgiri frontier. For planters looking to turn a profit, cinchona bark was neither a profitable enough nor a stable enough commodity to merit long-term cultivation.<sup>80</sup> The “noncommercial” government cinchona plantations, to the contrary, were built specifically to withstand the vicissitudes of the global quinine market. In line with its imperial qua humanitarian designs, the aim was to produce the medicine that India—and the empire—needed, irrespective of the global market.

In practice, the prospect of a noncapitalist world-historical substance proved a fallacy. Capitalist forces shaped Indian quinine at every turn. Colonial administrators constantly compared this government industry to its commercial counterparts and religiously weighed its functionality, efficiency, and merits against the private sector. Commercial quinine makers lobbied the government to ensure no competition from the cheaper, generic, state-made quinine.<sup>81</sup> Heeding capital's call for a free and fair market, the colonial government conceded to peg the open-market price of its quinine to the annual price set by Britain's largest commercial quinine maker, Howard & Sons.<sup>82</sup> Thus, despite its pretenses to being a noncommercial, humanitarian enterprise, Indian quinine proved formatively entangled in capitalist operations. Nothing, however, showed the project's imperial underpinnings more clearly than the prioritization of the health of colonial officers and soldiers over that of India's general population. Fortifying British colonial administrators and the British Indian army against malaria was always the first priority. Everyone else was a distant second. This was especially the case when quinine supplies ran short—a point made painfully clear during the First and Second World Wars (more on this momentarily).

If capital structured the makings of Indian quinine, the evolving science of malaria and pharmaceuticals was also pivotal. Colonial malariologists were gradually coming to terms with what they were up against. For centuries, medical experts had operated with only vague understandings of what malaria was (biologically) and how quinine worked to combat it. The science accelerated toward the end of the nineteenth century, however. In 1880, the French physician Charles Laveran discovered the plasmodium parasite. In 1897, Ronald Ross, a British colonial officer stationed in India, identified the female *Anopheles* mosquito as malaria's vector.<sup>83</sup> That same year, Robert Koch, one of the pioneers of modern germ theory, finally documented how quinine kills the malaria plasmodium.<sup>84</sup> Solving the malaria-quinine riddle was only half the equation, however. The malaria plasmodium's life cycle spans human beings *and* mosquitoes. Quinine does nothing to stop the mosquito side of things. To stop transmission, *Anopheles* eradication was needed. In the early twentieth century, quinine subsequently became part of a two-prong approach to malaria: quinine drug therapy would focus on the host (humans); mosquito eradication would focus on the vector (the *Anopheles* mosquito), through the use of insecticides like Paris green and the elimination, or "bonification," of the standing water and wetlands where the *Anopheles* laid her eggs.

Understanding the scope and complexity of the disease only exacerbated the British Empire's anxieties about the shortcomings of its quinine supply. Indian quinine, at this point, came nowhere close to meeting the empire's demand. Until and unless the empire could produce the quinine it needed, it would remain critically exposed to market forces—none more powerful than the Dutch. Confirming the vulnerability, in 1913, the Dutch government, planters, and manufacturers entered into an official "Quinine Agreement," leveraging their near-monopoly to become, arguably, the world's first pharmaceutical cartel.<sup>85</sup> Quinine makers across Europe and the United States had little choice but to do business with the Dutch Kina Cartel and the prices it set. So too the British colonial government. Unable to grow sufficient cinchona on Indian soil, the government imported much of its bark from Java. Unable to manufacture sufficient quinine, the British relied on commercial quinine, itself sourced through the Kina Cartel, to make up the difference. The catch-22 was lost on no one: either do business with the Dutch cartel or suffer the consequences. Until and unless the British attained quinine autonomy, they would remain critically exposed to malaria *and* the Dutch-manipulated market. That mortal quandary translated directly onto the steep slopes of the Bengal frontier, where "extension" became the order of the day.

The First World War underscored the gravity of the situation. Malaria proved one of the conflict's deadliest killers. As fighting disrupted quinine supplies in Europe and the British prioritized the health of Allied soldiers, India's reserves decreased rapidly. The colonial government turned to Java for an emergency purchase of one million pounds of raw bark, which the Kina Cartel sold at an exorbitant price. British administrators had little choice but to go through with

the purchase, conceding quinine was “more important than rupees.”<sup>86</sup> In exposing the British Empire’s dependency on Dutch barks, the war forced a reckoning. In 1917, British officials estimated that the colonial quinine project was meeting only one-third of India’s demands, let alone the requirements of the rest of the empire and the Allies. Forecasting a threefold increase in demand over the coming decade, they estimated that achieving resource autonomy would require the number of acres under actual cultivation to jump from the current 4,000 acres to over 50,000 acres.<sup>87</sup>

The cinchona frontier didn’t lend itself to sudden expansion. Suitable land was scarce. The plant itself was difficult and notoriously slow growing. Saplings took eight years before yielding ample bark. Materially, the frontier could only be but so responsive. Coming out of the war, the government was therefore keen to find new cinchona frontiers. Burma, long considered a possibility, emerged as a leading candidate. After repeated expeditions, experiments, and failures, the British established provisional plantations in the Tavoy district of southeastern Burma. The colonial government even sent cinchona workers from Darjeeling to help get the Burmese plantations up and running.<sup>88</sup> But with little infrastructure, insufficient local labor, and way too much rain, the Burma frontier proved too extreme, too remote. By the late 1930s, its plantations were returning to jungle.

As a government pharmaceutical, Indian quinine’s niche was always tenuous. Its relation to the market required careful management. At the all-India level, the government placed strict import and export controls on quinine in an effort to protect its product. Counterfeiting, piracy, adulteration, and reselling were persistent problems.<sup>89</sup> To distinguish government quinine from commercial quinine, the colonial government began tinting its quinine crystals pink—the aim being to distinguish its brand and assuage private quinine makers’ concerns about competition and confusion between commercial and generic Indian quinine.<sup>90</sup> Branding was one thing. Getting India’s populations to trust and take the drug made by its ostensibly benevolent colonial government was an altogether different challenge. Many Indians harbored deep suspicions. The government turned to vernacular pamphlets and marketing campaigns to avail India’s masses of quinine’s benefits, but the results were mixed at best.<sup>91</sup>

On the plantations, there was constant tinkering with cultivation and manufacturing methods to increase extraction rates. The factory turned out an array of cinchona-derived drugs: from the crude mixed-alkaloid febrifuge mentioned earlier and other alkaloid derivatives to the purer crystals, powders, and tablets of quinine sulfate. The chemistry improved. But the frontier was tiring, as repeated plantings exhausted the soil of nutrients. The diminishing plant energy forced more and more acreage into cultivation—a signature paradox of frontier decline. Heeding the biomedical needs of the empire, the government continued to expand the Bengal frontier in the Darjeeling-Kalimpong Hills, opening new plantations at Rongo in 1938 and Latpanchar in 1943.

These extensions came late and did little to realize the project's original goals. The twilight of colonial rule revealed that this grand experiment never had and never would meet India's and the empire's needs.<sup>92</sup> The cinchona plantations of Darjeeling and Kalimpong were no match for the great scourge, malaria. These shortcomings, of course, did nothing to lessen the pressure put on the plants, lands, and lives of which these places were comprised. They intensified it.

For quinine, the Second World War was a tipping point. With the Germans cutting off the Dutch quinine supply in Europe and the Japanese invasion of Java severing raw bark supplies from Dutch Indonesia, Allied forces placed heavy demands on India's quinine stores.<sup>93</sup> As in the First World War, mosquitoes feasted on troops in the trenches and tropics, making wartime malaria one of the conflict's deadliest forces<sup>94</sup>—and quinine one of its most important tactical defenses. Civilian supplies plummeted in India. Meanwhile, the onus of medicating the Allies increasingly fell to places like Mungpoo. Plantation elders I interviewed remembered the factory working around the clock to pump out the medicine needed to carry on with the fight. With cupboards running bare, India's states scrambled to stock their hospitals and dispensaries.<sup>95</sup> The price of commercial quinine skyrocketed, putting cheap government quinine in high demand. To combat hoarding and profiteering, the colonial state seized the quinine market, implementing strict distribution, pricing, and rationing schemes.<sup>96</sup> As the government prioritized military over civilian demands, the quinine project's imperial underpinnings were exposed in harsh light. Empire's humanitarianism had its limits.

#### A REQUIEM

From the jungles of indigenous South America to world-historical substance, quinine had come a long way. But the chemistries of power were about to shift. Two developments in the 1940s fundamentally rewrote the script. The first was the advent of synthetic antimalarials. The other was decolonization. The Second World War was a catalyst for both.

With malaria ravaging the front lines and quinine in short supply, the Allies were desperate for other means to fight the disease. They turned to synthetics.<sup>97</sup> First came Atabrine, but the dosage was tricky, the side effects were significant, and it turned the skin yellow.<sup>98</sup> Nevertheless, the US military adopted it as a quinine substitute in 1943. Next came chloroquine. Cheap, effective, and easy to administer, chloroquine looked like a magic bullet.<sup>99</sup> Then came the real killer: DDT (dichlorodiphenyltrichloroethane).<sup>100</sup> Lauded by the US Army as "one of the greatest discoveries of modern times,"<sup>101</sup> the pesticide killed mosquitoes (and many other organisms) for up to six months after a single application. DDT was quickly weaponized. By 1944, the Allies were deploying DDT



in multiple fronts of the war. As soldiers popped their Atabrine below, Allied planes flew overhead, bombing newly claimed territory with DDT, denuding enemy ground of life, making it safe for occupation. Synthetic antimalarials and insecticides became game changers in the theater of war. Civilian applications soon followed.

Synthetics changed the paradigm—and materials—through which malaria would be fought going forward. Chloroquine and DDT emerged as the post-war chemicals du jour of a newly global war on malaria, itself unfolding over the incipient terrain of the Cold War. Under the auspices of the US Rockefeller Foundation and the recently minted World Health Organization (WHO) and its allied nation-states, DDT became instrumental to the Malaria Eradication Programme of the 1950s. This chemically buoyed effort to beat back malaria at first showed promise. But it wasn't long before mosquitoes and malaria developed resistance to DDT and chloroquine. This resistance, along with DDT's accumulating toxicity, prompted the need for yet newer chemicals. The chemical and pharmaceutical industries responded by churning out a revolving door of synthetic insecticides and antimalarials, which turns to this day.<sup>102</sup> Quinine, for its part, quietly slid from view amid the otherwise bright light of this new chemical age.<sup>103</sup>

The Second World War also wrought profound *political* transformations. The British Empire emerged from the war battered and broke. India's anticolonial nationalist movement, headed by icons like Gandhi, Nehru, and Bose, remained unrelenting in its demands for independence. No longer able to suppress India's "tryst with destiny," Britain conceded India's independence on August 15, 1947. Decolonization profoundly shifted the biopolitical logics of quinine. The imperial impulse was now moot. The humanitarian imperative could be addressed through synthetic antimalarials and DDT. Nehru's government partnered with the WHO's Malaria Eradication Programme in the 1950s to renew the fight against malaria. India launched its National Malaria Control Programme in 1953 and National Malaria Eradication Programme in 1958—deploying DDT and synthetics like chloroquine liberally. Malaria cases and deaths quickly fell. In 1947, there were an estimated 75 million cases and 800,000 deaths. By 1961, there were 49,151 cases and reportedly no deaths.<sup>104</sup> On this success, Nehru's government walked back its commitment to quinine.

Quinine's value plummeted. Between 1952 and 1962, the drug's global price fell to roughly half of its price in India, all but eliminating any prospect of exporting Indian quinine. Cinchona plantations in Sri Lanka, East Africa, and Guatemala, meanwhile, began cutting their losses (and trees) and closing.<sup>105</sup> But not the cinchona plantations in Darjeeling. West Bengal, having inherited the industry from the British colonial government, tried marketing government quinine as the right drug for newly independent India's fight against malaria—"sovereign remedy No.1," as the ad campaign had it.<sup>106</sup>

**WEST BENGAL GOVT.  
QUININE**



*malaria*  
**public enemy No. 1**

*Quinine*  
**sovereign remedy No. 1**

**QUININE** manufactured in the  
**WEST BENGAL GOVT.'S**  
**QUININE FACTORY**



is of 1948 B. F. Standard and as  
pure and efficacious as quinine produced  
by well-known foreign firms, and, what is  
more important, it is cheaper than its  
imported varieties with provision for liberal  
trade discounts.

**Sold**  
in all leading stores,  
Rural Post Offices,  
co-operative societies  
&  
Union Board Offices.

**Trade Enquiries**  
**THE MANAGER,**  
**GOVT. QUININE DEPOT**  
Old Hindusthan Buildings,  
Calcutta 13.

**FIGHT AGAINST MALARIA  
IS TOP PRIORITY IN THE  
NATION'S HEALTH PROGRAMME**  
ISSUED BY THE PUBLICITY DEPT. GOVT. OF WEST BENGAL

FIGURE 17. Advertisement touting West Bengal government quinine, 1953. Credit: *Himalayan Times*, November 29, 1953.

But this was too little too late. India, like much of the world, had already entered a headlong embrace of quinine's synthetic alternatives. West Bengal consequently found itself stuck with a public sector industry whose product was rapidly losing value and whose fields and factory were ill-equipped to compete in a pharmaceutical landscape increasingly dominated by the new drugs of big pharma. In this new world order, Indian quinine lacked place and purpose. Materially, technically, and ideationally, it increasingly appeared "out of time."<sup>107</sup>

Quinine's fall from the world stage reverberated through the cinchona plantations. By the mid-1950s, the plantations were in a slump and the mounting financial losses were becoming a major concern for the West Bengal government.<sup>108</sup> Labor curtailment programs ensued, with the West Bengal



FIGURE 18. Closed government quinine factory, interior, 2017. Credit: Photo by author.

government offering severance packages to decrease its expenditures on this increasingly obsolete public sector industry. Workers who took the deal necessarily left the plantations, never to return.<sup>109</sup> But most stayed, preferring to hold on to the land and livelihoods that went along with their government employment.<sup>110</sup>

Where extending the cinchona frontier had been a colonial imperative, no new acreage was put into cinchona cultivation between 1955 and 1965. The West Bengal government instead hedged its bets by diversifying into crops like tung, ipecac, and, later, dioscorea and rubber.<sup>111</sup> The late 1960s brought a modest return to cinchona planting when political violence in Indonesia disrupted the Java bark supply and news of synthetic-resistant malaria began pushing the price of natural quinine back up. But even as the price rose and new buyers from the food and beverage industry entered the market in the 1970s and 1980s, worldwide demand for the drug continued to slide.<sup>112</sup> Darjeeling's barks meanwhile grew weaker, while their cost of production grew higher. The government cinchona plantations found themselves increasingly unable to compete in what remained of the global quinine market.

The 1977 arrival of West Bengal's Left Front government (a communist regime ideologically inclined to support workers and the public sector) afforded the cinchona plantations crucial backing in Kolkata. But this was a time of dubious optimism. Former plantation officers I interviewed recalled this as a period of glaring disconnect between the cultivation, production, and marketing sectors

of the industry. Orders were coming from Kolkata to plant cinchona, but manufacturing and sales were not evolving. Lacking the R&D to improve their product and finding little market in which to sell it, the plantations had no choice but to get rid of the excess bark by any means necessary. “We were just dumping the bark,” one Gorkha manager confessed to me, seemingly at pains to revisit those paradoxical circumstances in which the fruits of his community’s labor were left to rot. Such were the “bitter truths,” as another put it, of quinine’s demise.

If global forces precipitated quinine’s fall from the world stage and national and state-level forces structured the industry’s slow demise through the postcolonial period, the quinine assemblage also crumbled internally—most notably, in the context of a violent subnationalist movement for a separate state of Gorkhaland in the 1980s. Because the cinchona plantations were the government property of West Bengal—the mortal enemy of the Gorkhaland movement—they became a front line of the subnationalist struggle. As chapter 3 explores at length, the agitation’s violence caused lasting damage to the plantations’ plants and infrastructure. Strikes and foot-dragging undermined the hierarchies and discipline (*anushasan*) that earlier drove the plantations’ ecology. By all counts, the Gorkhaland agitations led to an erosion of work culture and productivity from which the plantations have never recovered.

Since then, the plantations have slid further into disrepair. Cinchona stands have been left to the wild—a state in which their trunks grow thick and unworkable and their bark naturally loses potency. The once-proud government quinine factory sputtered through the 1980s and 1990s and eventually closed in 2000—seemingly sounding the death knell of this once-vital industry.

West Bengal meanwhile remains unsure of what to do with the cinchona plantations and the tens of thousands of people who live there. Owing to their complexity and political volatility, the cinchona plantations have avoided the fate of other government industries like the Bharat Aluminum Company Limited (established in 1965 and privatized in 2001), Indian Drugs and Pharmaceuticals Limited (established 1969; liquidated 2021), and Air India (established 1932; nationalized 1953; privatized 2022). While these public sector industries have been privatized and/or had their resources redeployed for other government purposes, the riddle of the cinchona plantations remains unsolved. The trade unions’ resistance to privatization and the broader sensibilities of the Gorkhaland movement have made these spaces a political quagmire. With the outlook bleak and the politics volatile, West Bengal has, for now, allowed the once-vital quinine industry to seemingly die a slow death.

Crucially, though, the plantations’ final day has not yet come. Dilapidated and “out of time” these places may be, but cinchona workers continue to drag themselves to work to ensure their right to government wages, homes, and land. Quinine’s time may be passed, but for the people who remain, obsolescence is not a viable option. As the plantations deteriorate around them, the meantime is hardly

ideal. But it is what the cinchona community has to work with. And so they continue to do what is necessary to stay in these places that are their home.

#### AND THE LIFE THEREAFTER

The politician was running late. The 2022 local elections were only weeks away.<sup>113</sup> A candidate from nearby Kalimpong Town had requested an audience with Mun-song's cinchona workers. And thus it was after their shift, at about 4:00 p.m., when I happened upon a dozen men, some still dirty from their day's work in the fields, sitting around on plastic chairs beside the road overlooking the plantation. It had the look of a political meeting, so I parked my bike, grabbed a cup of tea, and introduced myself. The workers graciously welcomed me to join them as they waited for the politician's arrival. I took a seat and listened as they strategized about what they should tell the candidate they needed most on the plantation. The men spoke mostly of mundane things like pipes for bringing water from the nearby springs and materials to repair the crumbling roads of their villages. When I asked about the growing number of vacancies appearing in the workforce—an issue that people were increasingly seeing as indicative of West Bengal's abandonment of the plantations—the conversation took an existential turn.

A retired laborer, freshly dressed with a black messenger bag slung across his chest, took the lead. "It's a cycle," he told me, explaining how the *badli kam* system is supposed to work. "When someone dies or retires [moving his top hand away] we are supposed to get promoted [moving his bottom hand to replace his top hand], and then a laborer gets promoted to fill our post [using his free hand to fill in the vacancy below]. So it's a cycle. But if the cycle ends, life ends." Then, suddenly, casting his gaze and hands out over the cinchona fields, as though wiping everything away: "It all will come to a close."

The men and I nodded along in agreement with the retiree's take on the gravity of the situation. The erosion of the *badli kam* system had recently become a hot button political issue—one I was tracking closely. So I took the opportunity to convey my understanding and solidarity. "This is a terrible situation," I told the workers, solemnly, "and it's so important for you and the future."

"Yes," a man to my right responded. Then, cracking a smile, "You're like our *bubu*." Seeing a puzzled look come over my face at the mention of *bubu*, a term I didn't know, he continued, "Do you know this word, *bubu*? It's the Rai term for 'elder brother.'<sup>114</sup> You are like our brother [now using the Nepali term, *daju*, with which I was familiar]."

"Wait a second," I said, "are you *all* Rais [one of the many Himalayan ethnicities that make up the greater Gorkha community]?"

"No, no. He's a Tamang [another subgroup within the Gorkha community]!" he said, pointing to a man to our left.

"Yeah, and he's a Gurung!" a man to our right exclaimed, smiling.

Fingers began flying, as the men excitedly called out each other's ethnicity—all of them part of the greater Gorkha community.

"He's a Rai!" one called out.

"He's a Gurung!" another responded.

"He's a Limbu!"

As the workers playfully pointed out each other's ethnicity in rapid-fire fashion, it was clear that these were less statements of division—they were all Gorkhas, after all—and more expressions of their intimate familiarity with one another, as neighbors, coworkers, and friends. Call them *daju*, call them *bubu*: these "brothers" were clearly able to have a little fun with the internal pluralism that has long defined Gorkhas on and off the cinchona plantations.<sup>115</sup> And so, with fingers still flying, the banter continued.

"He's a Magar!"

"And he's also a Tamang!" another worker called out, pointing at the retiree with the messenger bag.

"Ahhh, so you are a Tamang, eh?" I said knowingly to the retiree. Then, turning to face him and folding my hands in prayer position, I offered him the proper Tamang greeting that I had learned in my earlier research on ethnic revitalization in the region. "Fyafulla," I said. And again, this time bowing with a beguiling smile, "Fyafulla!"

Everyone burst into laughter at my joke, then joined the fun of saluting our Tamang friend in the most "formal" way possible. A chorus of "fyafullas" ensued, much to his chagrin.

It was a moment of levity in an otherwise heavy conversation. Sitting there waiting for a politician that was nowhere to be seen, we spoke of many things: the neglected cinchona trees towering over us; our respective experiences of the COVID-19 pandemic; the upcoming elections; and, of course, the concerning state of affairs on the plantations. Having borne the brunt of our jokes, the Tamang retiree again took the lead. "We have huge stocks of medicine here. Huge stocks in our go-downs! But it's all expired. It's all rotting! Cinchona is supposed to be uprooted for harvest after sixteen years. But we have trees that are forty and fifty years old. Their bark has grown weak. Do you see those trees up there?" he asked me, pointing to a gnarled stand of cinchona growing across the road. "Those are probably twenty or twenty-five years old."

Other men chimed in to fill the gaps. They told me how nothing was running as it should. Not the cultivation. Not the manufacture. Not the employment. In painstaking detail, they walked me through the cultivation cycles they knew so well and the slow pattern of neglect that had brought them to the current situation.

After forty-five minutes, it was pushing 5:00 p.m., and the politician still hadn't shown. The workers were getting impatient. Several tried calling the mobile number they had been given in hopes of figuring out where the politician was and



when he might arrive. But to no avail. I needed to make another appointment down the road, so I bid my *bubus* farewell. Cycling away from our discussion—a row of workers’ homesteads-turned-homestays on one side of the road, overgrown cinchona stands on the other—it was hard not to interpret our conversation as a greater narrative of abandonment.<sup>116</sup> The plantations’ deteriorating infrastructure (pipes, roads, etc.), neglected trees, and rotting bark stores, the eroding rights of workers who live and work in these places, absent politicians: these conditions were all one and connected—an assemblage, or “ecology,” that, after years of providing life, was now coming undone. The conversation might be read as its own kind of requiem, except for the vital fact that it was all happening now, and neither the plantation nor its community was yet dead and gone. To the contrary, they were very much alive, very much present. This then was no requiem. It was a testament to the realities of the life thereafter.

. . .

The rest of this book journeys further into the time-space of quinine’s after and stays there until its end. Turning to explore the conditions, projects, and horizons of the cinchona community now—*after* quinine’s rise, *after* its fall—it’s important not to lose sight of the multiple forces that made this humble alkaloid a world-historical substance. Precisely because it rose to global prominence as an assemblage of plants, lands, people, chemicals, power, and more, India’s quinine industry has not so much died as fallen part, leaving in its wake a smattering of remains—human, material, and otherwise.<sup>117</sup>

Overgrown cinchona trees, exhausted soils, corroded machines, bark rotting on the factory floor, and quinine’s other sundry remains may read as signposts of post-colonial, postindustrial ruin—“imperial debris,” as it were.<sup>118</sup> But talk with plantation residents and explore their lives and politics, and one arrives at a somewhat different reading: one in which cinchona, land, and quinine’s other remains are not simply what a people have been left with. These things and places are what makes the cinchona community who they are.<sup>119</sup> For a people forged in the crucible of colonial becoming, these pasts are not easily shucked. Nor are they easily forsaken.

Unlike during the colonial days of old, the question today is no longer how to make a life with the myriad “things” that made quinine a world-historical substance. It is how to make a life with what remains. One hundred fifty years after the British brought the fever tree to Darjeeling, the present-day cinchona plantations constitute the grounds for a different set of struggles, a different kind of becoming. These places may appear anachronistic and worn out. But for a people otherwise left behind by empire and its medical impulses, quinine’s remains are the elements with which the present and future must be made. They are the stuff of the chapters to come.