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## Article

# The Gokteik Viaduct: A Tale of Gentlemanly Capitalists, Unseen People, and a Bridge to Nowhere

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**Abstract:** This article explores technical and socio-political factors that impacted construction of the Gokteik Viaduct railway bridge in Shan State, Burma, and the recurring failure of political powers to complete a continuous railway between Rangoon (Yangon) and Yunnan. Under rather contentious circumstances, the British government awarded an American steel company with the contract to construct what would become the world's longest railway trestle bridge at the time of its completion in 1900. As an engineering marvel of its era, the Gokteik Viaduct is in the same category as the Eiffel Tower in Paris. Until now, however, scarce research has explored the Gokteik Viaduct in terms of historicity and factors that ultimately prevented this structure from fulfilling its intended purpose of transporting trainloads of marketable goods between Burma and Yunnan. This raises an ironic question: How could engineers construct such a remarkable bridge to service a railway that was never finished? Furthermore, why does the Gokteik Viaduct largely remain unexamined in terms of its noteworthy place in the geopolitics of Southeast Asia? In answering such questions, the authors conclude that the "unseen" story of the Gokteik Viaduct is not only about engineering prowess but of a political and social environment that continues to bedevil massive infrastructure projects in Upper Burma today.

**Keywords:** Burma; railway history; public policy; British colonialism; civil engineering; political theory



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## 1. Introduction

As a tall and slender structure that spans 2260 feet and boasts a maximum superstructure height of 320 feet, the Gokteik Viaduct railway bridge is a thrilling attraction for the few tourists who travel to the Shan hills region of northern Burma. What remains underappreciated to many visitors, however, is that at the time of its opening ceremony in 1901, the Gokteik Viaduct was the longest railway trestle bridge in the world and regarded as the linchpin for connecting Kunming, China, to Burma's seaport in Rangoon. Of additional historical interest is that the bridge was fabricated in the Commonwealth of Pennsylvania, USA, and erected in a remarkably short duration of nine months ([The Pennsylvania Steel Company 1902](#)). While these particulars may seem trivial to the casual tourist, we argue that the story of this bridge has timely relevance to inform ongoing infrastructure projects such as China's "Belt and Road Initiative" and related Chinese ambitions to develop ports and gas fields in eastern Burma. Moreover, the Gokteik Viaduct is a relevant case study for anyone involved in engineering, public administration, and various forms of development work, including Chinese and Burmese officials whose ambitious plans to complete a twenty-first-century, high-speed railway by 2015 have so far failed to come to fruition. Most recently, the Burmese army's coup d'état in 2021 again dashed China's hopes of a high-speed railway to the Indian Ocean as well as other development projects throughout Burma.

It is somewhat surprising, therefore, that relatively little discussion has explored how even the most advanced planning and engineering technologies have for more than 130 years failed to construct a continuous railway to link Burma with southwestern China. Hence, this article explores the historical significance of the Gokteik Viaduct railway bridge and demonstrates through case-study narrative that technical engineering capability is not the sole factor in determining the success or failure of large infrastructure projects. Rather, we demonstrate that gross oversimplifications and blindness to socio-political realities often inhibit planning bureaucracies from fully “seeing” relevant externalities. This is hardly a new thesis, however. Among many authors who have a similar approach are James C. Scott (1998, 2009) in Southeast Asia, and Goran Hyden (1983) in East Africa. Tony Waters (2007, 2018) wrote about the catastrophic clash between modern capitalist markets and independent peasantries in Scotland, North America, Tanzania, Congo, and Burma. All emphasize the strength of remote farming societies relative to intruding modernity. We take this argument a logical step further and point out that failure to complete the railway between Burma and Yunnan is yet another example of how such modernist projects fail, despite technical capabilities and market incentives. Usually such failure is attributed to culture, or “externalities”, not failures in planning. However, we see such “externalities” as being central to the story of why the Burma-Yunnan railway has never been built, and regard technical engineering capacity and terrain (geographical friction) as important yet secondary issues.

The Gokteik Viaduct and the still non-existent Burma-Kunming railway illustrate this problem well. Perhaps the most significant externalities related to the Gokteik Viaduct were compromises made by British officers who overlooked cultural nuances of the local peoples in northern Burma. Furthermore, highlanders themselves often remain “unseen” through a tactic of not challenging modernist planners directly but instead avoiding their encroaching institutions, thereby creating a situation in which land cannot be alienated, workers cannot be subordinated to intrusive projects, tribute is minimized, market incentives become irrelevant, and the rationalized and centralized political power<sup>1</sup> needed for large infrastructure projects becomes nebulous.

Burma/Myanmar historian and political analyst Thant Myint-U similarly described the task of British officers in fulfilling the dreams of a railway by focusing on political systems that existed in Burma long before the arrival of the British colonial apparatus. Myint-U wrote, “As everywhere in the Empire, British political officers rationalized and systematized what had been a somewhat messy system of local chiefs, and office-holders” (Myint-U 2011, p. 84). British officers’ failure to appreciate “messy” systems of local ethnic groups—at least “messy” from the bureaucratic perspective—was certainly a contributing factor in Britain’s failure to complete the railway. Although the “messy” systems may have worked well for local Shan leaders who lived in close proximity to the railway line, the systems did not fit neatly within the paradigm of British rail building. Such timeless dissimilarities manifested themselves in various ways as lowland bureaucrats “saw” the highlands of Upper Burma only through the lens of what James C. Scott calls “high modernism” (Scott 1998, pp. 87–102).

As James C. Scott (1998, pp. 87–102) explained in his book *Seeing Like a State*, bureaucratic “eyesight” requires the oversimplification of complex phenomena into high-level glances. This works in much the same way that airplane passengers at 30,000 feet gaze over landscapes below. Metaphorically speaking, 30,000 feet is the altitude from which bureaucrats sitting in London, Nay Pyi Taw, or Beijing see the land and peoples whom they are charged to administer (Waters 2012, pp. 170–72). Typically, this is thought of as being a necessary simplification to maintain complex institutions like mass education, public health, market regulation, policing, military occupation, and—ultimately—political control. We argue that it can also be seen by what does *not* happen—in this case the failure to construct a railway in a region where such a project was possible from a strictly technical standpoint.

From the metaphorical 30,000 feet elevation, the Gokteik Viaduct was constructed in a remote region of colonial Burma in 1900 with the objective of extending Britain's railway access into Yunnan, irrespective of the political and social contexts. However, even after more than a century a continuous railway still does not extend from Lashio to Kunming despite previous efforts from the British Empire and recent efforts by China's Belt and Road Initiatives which indeed, in 2021, completed construction all the way to the border of Burma.<sup>2</sup> Why is this? We contend that hidden in the omissions of government documents and engineering reports pertaining to the Gokteik Viaduct are the complex political structures of local Shan and Kachin peoples who were later so carefully described in Edmund Leach [1965]'s (Leach [1965] 2008) anthropological masterpiece *Political Systems of Highland Burma*, Thant Myint-U's (2011) *Where China Meets India*, James George Scott's (1921) *Burma: A Handbook of Practical Information*, Mandy Sadan's (2013) *Being and Becoming Kachin*, and Jane Ferguson's (2021) *Repossessing Shanland*.<sup>3</sup>

The most recent example of dashed dreams for a railway between China and Burma is still perhaps in progress, as it has been for at least ten years. In the epilogue to his book *Where China Meets India*, Thant Myint-U (2011), reflecting on Chinese assertions of engineering prowess, wrote that a high-speed rail from Kunming via Mandalay and then on to the Indian Ocean port at Ramree Island in Rakhine would be completed by 2015 (Myint-U 2011, p. 319). Although a Chinese railway was recently constructed to the China-Burma border in Ruili, Yunnan, the connection into Burma remains unfinished due to the same externalities that existed in 1900. Planners acknowledge these externalities with such terminology as, "political instability and ongoing conflict in the region".<sup>4</sup>

## 2. Research Methodology

Very few secondary sources have investigated the historical significance of the Gokteik Viaduct despite its status as an engineering marvel. Therefore, we utilized a constructive process to research primary sources such as engineering publications, government records, and news articles that were published between the early years of British colonization and Burma's independence in 1948. The resulting narrative describes delusions of financial fortune, underestimations of social and physical obstacles along the route between Rangoon and southwestern China, and complex political realities that continue to hinder massive infrastructure projects in Burma today.

## 3. Governance in Highland Burma in the 19th & 20th Centuries

Prior to British conquest in the late nineteenth century, the highland peoples of both Burma and southern China were typically small polities. Some were clan-like, others were larger polities, and the largest were princedoms with incipient bureaucracies. In the case of the Shan peoples, at times they paid tribute to the Burmese in Mandalay, Chinese groups to the north, and/or the Thai kingdoms in Chiangmai and Bangkok. In the case of other groups such as the Akha, Lawa, Lue, and Wa, these groups were probably even more diverse in their political structures.

The longer distance relationships were patrimonial in the sense that distant polities offered clientage to distant patrons in exchange for protection from other distant raiders. However, control by powers from afar was weak because highland peoples remained physically distant in highland regions where friction of distance slowed the movement of goods and humans.<sup>5</sup> Some Southeast Asian scholars like Scott refer to this as a "mandala", although the precision of this concept is questioned by Sadan (2010), and other scholars who are more reluctant to make generalizations.

Britain's efforts to dominate the new colony<sup>6</sup> in Upper Burma were likely interpreted by the local peoples in terms of traditional rivalries between Burmese, Chinese, and other potential raiders (e.g., see Rippa 2022; Waters 2018). Unequal alliances rooted in patron-client relations are typically important to mounting defense against invaders in that world that Sai Aung Tun describes as "feudal". He proceeds to note that most "princes" had only a thousand or so households (Tun 2009, pp. 40–41).<sup>7</sup>

According to Baillargeon, at the time of formal annexation by the British in 1886, the diverse “Shan states”—through which the Burma-Yunnan railway line needed to pass—was not a “legible extension of Burma, but instead a collection of unique states that had diverse ethnic population, each with their own historical relationships with both the Burmese and Chinese states [empires]” (Baillargeon 2020, p. 665). By “historical relationships” Baillargeon means that the various Shan polities had traditional agreements to pay tribute either to the Burmese crown in the Pagu/Mandalay, the Chinese, or perhaps the Lanna and Thai kingdoms further to the south, depending upon who would offer them protection from attack. In other words, they were what are known as either feudal relationships in Europe or the *Sakdina* relationships in Thailand (see also Waters 2022).

Loyalties by small polities were also easily transferable depending on the relative strength of potential patrons and the relationships between individual highland leaders and lowland kings.<sup>8</sup> Speaking to this reality, in 1965, Mr. Sao Saimang Mangrai<sup>9</sup> noted that British planners were disappointed by what the British considered “inevitable chaos” in the Shan states even after the encroaching colonizers displaced the Burmese at the Shan courts. Mangrai generalized that from the British point of view, “Only chaos in the Shan States was a reality . . . practically the whole country-side was in the state of turmoil”, and there would be no “Golden Road”, as Mangrai explained, “The ‘Golden Road’ to China glittered before the trade-conscious Britishers, but even in the best of times during the British supremacy [sic] in the East, the road never carried more than a few thousand mule packs in a year” (Mangrai 1965, p. 101).

The most recent scholarship describes this diversity well. Marshall [2002] (Marshall [2002] 2012), Sadan (2013) and Ferguson (2021) all emphasize the diversity of the polities in Shan State and beyond. As anthropological writers, they also tend to each highlight “thick description” in which the detail is the point. Scott (2009) of course does not do this in *The Art of Not Being Governed*, which is about how the British colonizers saw their conquered territory, and the simplifications that this led the British to take. Ferguson lists the eighteen armies she describes holding territory at different times in northern Shan State since the end of World War II and acknowledges that there are presumably even more armies including units of the *Tatmadaw* (Ferguson 2021, p. 18). However, both Ferguson (2021) and Sadan (2010) are critical of James Scott (2009) because of what they call Scott’s tendency to lose track of the detail of the polities within Shan and Kachin states. Although Ferguson and Sadan critique Scott for generalizing, as he indeed does, it is important to note that the point of his book is to describe the generalizing tendency of British colonialism about which he offers “thick description”.

### 3.1. Multiple Polities and Railway Construction

Construction and operation of a railway assumes few restrictions on long-distance trade. This necessitates central authorities who guarantee the rights of companies to purchase and secure rights-of-way, hire laborers, import construction equipment, and most importantly to protect the project itself from disruption. After completion, there needs to be assurance that goods can actually transit long distances with predictable customs charges and protection from the seizure of cargo. In other words, a railway is threatened by the existence of multiple polities that have their own laws, customs policies, and officials. British colonialism tried to create favorable conditions for the Burma railway by ignoring local variation and forcefully implementing political categories adopted from the Indian Colonial Service.

### 3.2. From the Local Diversity of Thick Description, and the Problem of “Seeing Like a State”

Scholars who focus on Shan State (i.e., Ferguson, Tun, and Leach) have been deeply impressed by the diversity of political forms among the Shan and the plethora of other groups in the area. In their own way, Ferguson, Tun, and Leach each point out that the Shan polities were well-organized relative to geographic, historical, and political context. As anthropologists, Ferguson, Tun, and Leach skillfully described the diversity of forms



that emerged. However, the British colonial authorities were less cognizant of the diversity of forms, and instead simply sought to force whatever existed into the categories that were largely determined in colonial offices. For example, the category “prince” was used by the British for both small polities consisting of a few hundred households and other polities with tens-of-thousands or more households.

This background context brings us to the story of Britain’s aim to extend the Burma Railway to access neighboring Yunnan, which necessitated construction of a massive railway bridge across the Gokteik gorge. This endeavor, however, would prove to be at least partially contingent upon the small Shan and Kachin polities subordinating themselves to British colonists’ larger goal of accessing Yunnan’s markets via a new railway.

#### 4. Influence of the ‘Yunnan Myth’ on Railway Planning

Before 1900, the Gokteik gorge was an obstruction along an ancient trade route. Chinese merchants led long caravans of mule trains across three natural bridges formed by the Chungzoune River that flowed through the gorge (Harmer 1901, p. 191). This well-established route between southern China and Burma facilitated trade of luxury goods, including products from lead and silver mines at Bawdwin. However, trade in bulk goods such as gold and silver ore, lead, teak, and jade was not practical with pack animals. Still, the route was important to elites, and it is even believed that Marco Polo passed through the defile (Baillargeon 2018, p. 91; Fryer 1902).

By the late nineteenth century, both Britain and France were casting covetous eyes upon marketable goods produced in isolated Yunnan, which at that time could neither be exported through nearby French Indochina nor British Burma. Following the oft-repeated storyline of gold rushes throughout the nineteenth century, Yunnan was touted as having an abundance of wealth and untapped resources that, from a vantage point of world empire, could simply be taken on a first come, first served basis.<sup>10</sup> Such embellishments resulted in a popular yet misguided belief that is referred to as the “Yunnan Myth” (Walsh 1943, p. 273). The Yunnan Myth fueled competition between Britain and France, as each country sought to be the first to pillage Yunnan’s presumed wealth via rail from their respective colonies in Southeast Asia.<sup>11</sup>

The Yunnan Myth owes much of its conception to the travel writings of two British officials named Archibald Ross Colquhoun and Holt Samuel Hallett. Counted among the ranks of other “gentlemanly capitalists” who manipulated British policy in Burma, each of these men were to shape the story of the Gokteik Viaduct and railways throughout the region (Webster 2000, p. 1005; Baillargeon 2020, p. 662). In October 1885, Colquhoun published *An Anglo-Chinese Commercial Alliance*, which was written to secure political support for a railway line between Burma and Yunnan. Colquhoun argued that Britain’s then struggling economy could be righted if the Empire simply constructed railways to access new markets in Asia:

The chief cause of the depression in this country [Britain] is overproduction, competition, and hostile tariffs placed upon our goods by foreign nations. The only cure for the depression of trade is to be found in the development of our main Colonies, and in the opening of new markets. (Colquhoun 1885, p. 162)

Based on this simple premise, Colquhoun called for immediate development of new markets in eastern Asia, which he touted as being “the most promising to be seen in any part of the world” (Colquhoun 1885, p. 165). Colquhoun specifically identified British Burmah as the inevitable thoroughfare for transporting market goods from Yunnan, and he emphasized that Yunnan was “renowned for its mineral wealth” (Colquhoun 1885, p. 167). Missing, of course, was a broader perspective: Yunnan was not only about the products and trade that was “seeable” via account books and financial calculations of the mercantile colonialists. Both Yunnan and Upper Burma were also inhabited by peoples who, as James C. Scott (2009) noted, were adept at evading and frustrating attempts at state capture.<sup>12</sup> Indeed, Shan leaders were loosely tied to the Chinese Empire and were not necessarily

amenable to strong ties to either the Burmese kings in the nineteenth century or the later British colonial government (Baillargeon 2020, p. 665).

However, Colquhoun could not see the future, much less the nature of Shan politics. After presenting the first part of his argument in *An Anglo-Chinese Commercial Alliance*, Colquhoun proceeded to attack potential skeptics by reminding readers that “narrow-minded” and “shortsighted” officials had previously opposed construction of the first Burma Railway line between Rangoon and Prome (Colquhoun 1885, p. 169). Indeed, some allegedly “narrow-minded” officials had nearly prevented construction of the Prome-Rangoon railway line along the Irrawaddy River, and accessed what later proved to be profitable markets. At the time of Colquhoun’s (1885) essay, the lucrative Prome-Rangoon line was already seeing returns of approximately six percent (Colquhoun 1885, p. 169). Colquhoun cited the success of the Prome-Rangoon railway as an example of fortunes that would be negligently forfeited if Britain did not extend the Burma Railway into China. Colquhoun concluded his simplified argument before British Parliament by pleading on behalf of Britain’s mercantile interests:

No policy or project of such importance [as a railway to Yunnan] for the National welfare is now before the public, and it will be strange indeed if—in face of the present depression of trade, with mills and machinery everywhere idle, warehouses overstocked, shipping unemployed, discontent of the working classes growing in our manufacturing centres, and our population increasing—if the mercantile, manufacturing, and working classes cannot induce Government to avail itself of the opportunity now offered for vastly increasing our commerce and strengthening our position in Asia. (Colquhoun 1885, p. 173)

Colquhoun’s argument about the economic potential of new markets undoubtedly played a role in persuading market-focused officials to launch Britain into the Third Anglo-Burmese War (November 1885), annex Upper Burma in January 1886, and exile the Burmese king to British India (Baillargeon 2020, pp. 662–63).<sup>13</sup> Colquhoun and other officials applied a logic that had proven effective in terms of expanding the lowland Burmese kingdom. In Upper Burma, however, there was perhaps a different logic that had no way of appearing on the ledgers of British officials in Rangoon. This logic was inherent to the people of highlands Burma who had spent the last millennia perfecting a skill that James C. Scott described as “the art of not being governed” (Scott 2009, pp. 127–77).

## 5. The Burma Railway as an Instrument of Legibility

Britain’s objectives in financing the Burma Railway were to efficiently extract natural resources, expedite communication, strengthen Britain’s control over the colony, and generally enable colonial bureaucrats to administer lands that were inherently difficult to control and transit. These objectives were likewise at the root of Colquhoun’s successful campaigning to construct the Gokteik Viaduct and thereby extend the Burma Railway into China.

Throughout the British Empire, railway construction strengthened Britain’s grip on her colonies as formerly distant regions of remote countryside became accessible within only a few days of travel. Most importantly, railways permitted the export of bulk goods from distant areas to ports from where they could be transported throughout the British Empire. Outlying territories were thus brought into the British system of rationalized trade, regulations, law, and even religion (Wohlers 2019, p. 516).<sup>14</sup> Furthermore, steel rails themselves served as an ever-present reminder of British political and economic occupation. Attesting to this reality, in an 1886 report titled *Burmese Border Tribes and Trade Routes*, Major-General MacMahon of the British army explained the benefit that railways had in terms of exerting control over the allegedly “uncivilized congeners of the Burman race, having their habitat on all sides of our new frontiers” (MacMahon 1886, p. 394). Major-General MacMahon’s essay is insightful because it reflects the uneasy relationship between the self-proclaimed “civilized” colonial officials, and the allegedly “uncivilized congeners” (i.e., people of vague categories who lived in the pre-colonial highlands and whose variation

was “unseeable” in the censuses and ledgers of British colonialists). Reflecting his naivete regarding the “congeners”, MacMahon simply lumped highland peoples under the single ethnonym “Burman race”, presumably because the nuances of ethnicity were invisible to the invading British. When British bureaucrats and “gentlemanly capitalists” failed to “see” such intricacies, the fate of the Yunnan rail project was perhaps sealed.<sup>15</sup>

In *The Art of Not Being Governed*, James C. Scott (2009) pointed out that peoples of the pre-colonial “Zomia” highlands had politico-cultural habits that yielded uneasy relationships with lowland governments which sought to centralize state power. These relationships exacerbated difficulties in communication, trade, and governance. Many such structures pre-dated the British and had emerged largely in response to Burmese, Chinese and perhaps Siamese incursions seeking tribute. These habits and social structures were, as Scott emphasizes, “incoherent” and “invisible” to the arriving British colonizers, as they also would be to the engineers and railway planners of the Burma-Yunnan railway. Presumably the structures were also invisible to the later arriving Japanese, the subsequently independent government of U Nu (1948–1962), and the military government of Ne Win (1962–1988) (Scott 2009, p. 218).

The British found a reactive type of social organization had already emerged when they arrived in Upper Burma during the nineteenth century. This seemingly preexisting social organization made the highlanders appear insubordinate in the eyes of previous lowland Burmese kings, and it was likewise puzzling to the eyes of British bureaucrats. The British understood how lowland governments developed elaborate armies, cultural institutions, literacy, political institutions, and articulation with global markets in rich river valleys. However, the visible absence of such institutions in the highlands reinforced the colonizers’ prejudice that highland cultures were inferior or even barbaric.<sup>16</sup> Major-General MacMahon’s offhanded reference to “uncivilized congeners” on “all sides of our new frontiers” is a nearly textbook example of Scott’s (2009) thesis that lowland people are frustrated by highland “barbarians” who remain just beyond the reach of accounting books and market-based logic. Much of this was reflected in how ethnic categories were created, re-created, and disappeared in the censuses that the British took starting in 1891, which were conducted every ten years until 1941. Censuses resumed irregularly under the independent government (Ferguson 2015).

## 6. The Gokteik Viaduct as a Pawn in a Figurative Game of Chess between Britain and France

In the 1890s there was yet another reason that the British wanted to construct the Gokteik Viaduct—and construct it quickly. After the Sino-French War of 1884–1885 solidified French control of northern Vietnam (Tonkin), the French cast their eyes further northward toward Yunnan. British officials in London, Calcutta, and Rangoon were already engulfed in colonial rivalries with other European countries and worried that France would gain control of gold, silver, teak, jade, and other markets within Yunnan (Metzgar 1976, p. 185). These developments deepened the rivalry between Britain and France as each country sought to maximize financial gains from their respective colonial holdings in Southeast Asia. Responding to perceived threats to British interests, Major-General MacMahon used language of a chess game to evaluate how to checkmate other sovereign states while ignoring the people who lived in northern Burma:

The interests of both England and China demand that they should mutually establish and maintain a good understanding, so as to counteract any malign influence that may be brought to bear on either or both by the insidious advances of their great rival in the Asian question. Since-handed [sic] we easily beat the French in the little game of diplomacy lately played in India beyond the Ganges, and in alliance with China we can easily checkmate Russia in the bigger game . . . They [the Chinese] are further as fully convinced of the necessity and importance of railways and telegraphs for military as well as mercantile purpose, as only a few years ago they were persuaded to the contrary. (MacMahon 1886, pp. 406–7)



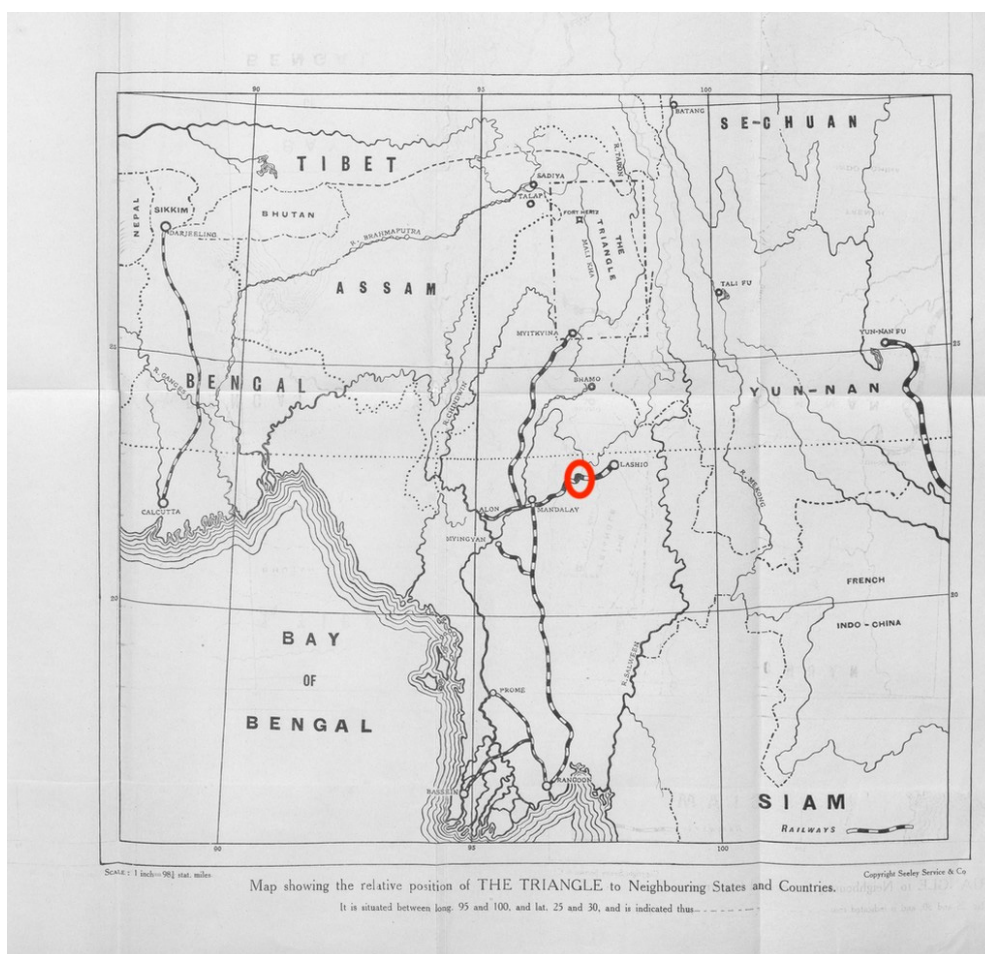
In this tumultuous context, Holt S. Hallett issued public letters that echoed Colquhoun's previous calls for Britain to construct railways to access new markets in East Asia. In a November 1889 edition of *Blackwood's Edinburgh Magazine*, Hallett emphasized the significance of such a railway to facilitate trade:

We have endeavoured to awaken, and have awakened, an intelligent interest in the subject of the importance of connecting India with China by a railway; and by exploration have proved to the satisfaction of everyone who has studied the question, that a practical route between these two great empires exists, and that along that route a railway can be constructed at a reasonable cost, which would tend greatly to enhance commerce of Great Britain and India with its Eastern neighbours—Siam and its Shan States, and the western half of China . . . When this railway is constructed, its inland terminus at Ssumao will assuredly form the nucleus of a system of Chinese railways which will spread through the western, central, and southern provinces of China . . . This line would pass through and develop the richest part of Asia, [and] foil the designs of the French, who are hoping and endeavouring to oust our trade from Southern China and Central Indochina. (Hallett 1889, pp. 647–48)

In the same article, Hallett urged British politicians to extend the Burma Railway into China, and he framed the effort as a method to check France's expanding influence in the region:

The enterprise which we propose is big with promise, not only for the present but for future generations. Our policy, political as well as commercial, should be to develop by every means in our power our intercourse and intercommunication between India and China—between British manufacturers and millions of Chinese, Siamese, and Shan customers . . . We are a nation of shopkeepers, and it is by the trade that we live. Every nerve should be strained by the manufacturer and working man to gain for British commerce the great market existing in Western China . . . it still remains to be seen whether French or British enterprise will win the much-coveted prize. (Hallett 1889, p. 659)

Such rhetoric from Hallett and other “gentlemanly capitalists” persuaded Britain to counteract France's growing influence in Asia, and both countries soon had survey teams laying out railway routes to Yunnan from their respective colonies in Southeast Asia. From Mandalay, the Burma Railway would transit the hilly terrain of Shanland and cross a natural obstruction known as the Gokteik gorge. Ironically, the task of building a railway bridge across the Gokteik gorge would prove more straightforward than the presumably simpler task of laying railway tracks from Lashio to Kunming (See Figure 1).



**Figure 1.** Colonial map showing the Burma Railway system and nearby “Yun-nan”, Siam (Thailand), and French Indochina. The red circle is the vicinity of the Gokteik Viaduct. Source: (Horton 1899).

## 7. Hallett vs. Nisbet Debate Regarding Viability of a Railway Route between Burma and Yunnan

In *Blackwood's Edinburgh Magazine*, Hallett—ever the optimistic shop-keeper—discussed the commercial benefits and technical challenges of establishing railway routes between Burma and Yunnan, and he specifically alluded to difficulties associated with constructing a railway route across the Gokteik gorge. Hallett seemingly recognized that the Gokteik gorge had for centuries limited the capacity of an ancient caravan route and by extension was key to railway completion:

The difficulties of the route, according to people who have traversed it, are said to be still greater beyond Thounzee. The great gash in the country, between 1100 and 1200 feet deep, called the Goteik [sic] defile, has to be descended by steps cut in the face of the rock for 800 feet to a natural bridge across the ravine, and, having crossed it, the precipice on the other bank has to be ascended in the same manner. (Hallett 1889, p. 657)

In such discussions, Hallett identified challenges that Britain would inevitably face—and undoubtedly overcome—but in no way did he intend to dissuade railway construction. At no point did he consider the political feasibility of the project in a mountainous area over which the British, Burmese, and Chinese had never exercised anything more than indirect control. Unlike Hallett, however, Dr. John Nisbet (1853–1914), who served as Britain's Conservator of Forests in Burma from 1895–1900, questioned the feasibility of constructing a railway within the Shan hills region, and he vehemently opposed its construction. In the January 1899 edition of the *Journal of the Society of Arts*, Nisbet bluntly warned prospectors

of commercial dangers, “[T]he British Chambers of Commerce, which have been told to look upon Yunnan as an Eldorado, must prepare themselves for the probability of disenchantment and disappointment” (Nisbet 1899, pp. 182–83).

Although Nisbet articulated well-founded objections by using economic language that was customary in British debates, colonial officials ultimately proceeded with their plans to extract Yunnan’s purported wealth via rail. In his article, Nisbet also alluded to the daunting challenges associated with constructing a railway line that would follow the traditional trade route from Maymyo to Lashio, across the Gokteik gorge, until finally reaching Yunnan (Nisbet 1899, pp. 183–84). Nisbet estimated that it would require two years to overcome the natural obstruction of the Gokteik gorge (Nisbet 1899, p. 183). Elsewhere in this article, Nisbet also discussed how the Anglo-Chinese agreement of June 1897 advanced the commercial interests of British businesses that hoped for an extension of the Burma Railway into Yunnan. To attract business investment, the colonial government in India guaranteed low interest rates for the Burma Railway to construct a line from Myohaung (near Mandalay) through Lashio and then to northern Shanland. From northern Shanland, a railway line was envisioned that would reach Yunnan at a terminus on the Yangtze River. Contradicting the naïve optimism of English businessmen, Nisbet predicted that the railway from Burma to Yunnan would fail to open profitable markets in China.

Nisbet, who was an expert on forests and natural resource economics of Burma, based his conclusion on three economic points:

- (1) the terrain of the proposed route was so rugged that railway construction was economically unviable,
- (2) bilateral trade would not come to fruition, and
- (3) claims of mineral wealth in Yunnan province were exaggerated.

Regarding these points, Nisbet warned that:

Any abnormally expensive endeavour to tap the trade of South-Western Yunnan by means of a railway will not be remunerative, for the very simple reason that this lofty plateau produces nothing in the nature of a trade capable of great expansion. It is not asserted that it is in any way impossible, as beyond our engineering skill, to construct a line to Talifu or further east to the banks of the Yangtse; but it is maintained that it will be enormously expensive to build and will not generate adequate returns, and that in any case extensions and ramifications of the railway net throughout Burma are preferable—unless commercial principles are to be subordinated to political and strategic considerations. To be profitable, or even possible, trade must be reciprocal; and there seem to be no products in Yunnan which can be utilized in exchange for goods of British manufacture to a sufficient extent to make the railway in question remunerative. (Nisbet 1899, pp. 182–83)

Officials generally snubbed Nisbet’s pessimism, however, and instead embraced the widespread aura of optimism. One representative example of naïve optimism occurred during the opening ceremony for the completed Gokteik Viaduct in June 1901. On this auspicious occasion, Sir Frederic Fryer, who served as Lieutenant-Governor of Burma between 1897 and 1903, justified construction of the Gokteik Viaduct and boasted to the ceremony’s audience that the bridge would soon facilitate trade between Mandalay and southwestern China. At the same time he subtly acknowledged that trade was being impacted by an unsettling political environment:

The Gokteik Viaduct spans a formidable obstacle on the oldest and most direct route connecting Burma to Southwestern China, a route of which we have mention as far back in ancient chronicles. It is, there is but little doubt, the same “gold and silver road” along which Marco Polo accompanied the Chinese invading armies in their march to Mandalay. In former times there was a very considerable traffic on it, but of late years the *disturbed political condition of the countries* [emphasis added] through which it passes has led to much of the trade being diverted to

other channels. It is hoped, however, that with the improved communications now being provided (and of which this Gokteik Viaduct forms so important a feature) the trade will again return to this direct line connecting Mandalay with the Chinese frontier. (Fryer 1902)

In this speech, Sir Frederic Fryer alluded to the “disturbed political condition” in neighboring China at the time of the Boxer Rebellion, and just after the Tai-Ping, without having the slightest premonition that related circumstances would fuel numerous bloody conflicts in Southeast Asia throughout much of the twentieth century. Alas, conflicts abound even today on the Burma side of the border, and no independently recognized central authority legitimately administers the China-Burma border region. Instead, there are a collection of pseudo-states that are not controlled by any central government, many of which still engage in methamphetamine trade and arms manufacturing.

### 8. How an American Company Won a British Contract to Construct a Railway Bridge in Colonial Burma

By the late nineteenth century, rail was regarded as an effective technology for asserting political control over vast territories. Britain depended heavily upon railways to control its massive colony in India, a phenomenon made possible by the Industrial Revolution and the Bessemer process which enabled mass production of steel for such products as rails, train engines, and bridges. Indeed, these developments also made it possible to construct the steel Eiffel Tower in 1889, which was then the tallest structure in the world. Aside from improved metallurgical processes, another reason for the widespread availability of steel was the business strategies of steel magnate Andrew Carnegie (1835–1919), who underpriced steel products to force competitors out of the market. Carnegie remains oddly relevant to the Gokteik Viaduct because his influence over America’s industrial economy enabled an American company to win a British contract for construction of a steel railway bridge in the hills of British Upper Burma.

Britain and the United States enjoyed a somewhat cordial relationship during the late nineteenth century. However, the deflated cost of steel in the American market threatened Britain’s industrialized economy, which suffered a catastrophic decline in sugar, linen, and silk markets in the late nineteenth century (Wilson 1901, p. 77). In that time-period steel companies in Britain simply could not compete with the artificially deflated prices of American steel. After bidding against British companies, the Pennsylvania Steel Company in Steelton, Pennsylvania was awarded the contract for the Gokteik Viaduct on 28 April 1899 based on lowest cost and shortest construction duration.

As a result of its successful bid, the Pennsylvania Steel Company would earn the distinction of constructing what would be the world’s longest railway trestle bridge at the time of its completion. In a 1901 edition of Britain’s *Fortnightly Review* magazine, however, British author H.W. Wilson insightfully reflected on the tumultuous effects that America’s steel industry had on the global steel market and complained that the Pennsylvania Steel Company underbid British companies that competed for the contract:

In the case of the Gokteik Viaduct in Burma, a structure 2260 feet long and 320 feet high, the lowest English tender was at a cost of £26 10s. a ton, the work to be erected in three years. The tender of the Pennsylvania Steel Company was for £15 a ton, the work to be erected in one year. Here, again, the difference is simply astounding . . . To explain this extraordinary difference, we must suppose one of three things—either that American works are immeasurably superior in economy of construction, cheapness of material and labour; or that English works are handicapped, as manufacturers assert, by arbitrary restrictions on contracts, which are waived in the case of American firms; or that our markets are being made a dumping ground for the American surplus products, under Mr. Carnegie’s surplus law, at unremunerative prices. (Wilson 1901, p. 82)

British steel companies were understandably irritated that an American company was awarded the contract for a prestigious bridge in British Burma, but the cost savings and



urgency of Britain's allegorical "chess game" with French and Russian encroachment into Asia effectively quieted much of the discontent within Britain.

Immediately after contract award, engineers from the Pennsylvania Steel Company set out to finalize design details, roll steel, and prepare to transport each component of the viaduct from central Pennsylvania to New York and then on to Upper Burma. In August 1899, the company transported the first one-third of the bridge's structural pieces to New York for the 10,000-mile voyage to Burma. The final shipment of unassembled bridge pieces departed New York via steamship in December 1899, and erection of the viaduct was completed in November 1900 (Wohlers 2022a, p. 1).

### 9. Use of the Gokteik Viaduct between 1901 and 1941

The railway line between the newly erected Gokteik Viaduct and the village of Lashio, which is well short of the Chinese border, was completed in 1903. After reaching Lashio, planners concluded that—just as Nisbet had warned—the railway line between Lashio and Yunnan was deemed unviable and abandoned (Thompson 1942, p. 30). Lord Curzon, who at that time was serving as Viceroy of India, then decided to terminate the line at Lashio and thereby condemned the Gokteik Viaduct to being a bridge to nowhere. Although the Gokteik viaduct had ancillary economic benefits for Lashio and villages along the railway route, the structure remains a *bridge to nowhere* in the sense that a continuous railway route to Yunnan remains unfinished, and the bridge never fulfilled its primary objective of accommodating goods from Yunnan.

Ironically, the main beneficiary of the nearly forsaken Gokteik Viaduct was a young American entrepreneur named Herbert Clark Hoover,<sup>17</sup> whose company—the Burma Corporation—would use the viaduct and unfinished railway line to export lead and silver from the nearby Bawdwin mines. Piles of extracted lead at Bawdwin had been abandoned by Chinese artisanal silver miners in earlier centuries when only refined silver products were valuable enough to be packed out via mules. However, Hoover capitalized on the Gokteik Viaduct, the unfinished railway line, and high-purity mines in Bawdwin in order to transport massive quantities of lead and silver to world markets. The first trainload of ore and previously abandoned slag from the Bawdwin mines rolled over the Gokteik Viaduct in January 1909, en route to smelters in Mandalay (Hamill 1931, p. 265).

The Gokteik Viaduct fortuitously enabled the industrious Hoover to become a multi-millionaire at a young age. In fact, Hoover's fortune in 1914 was valued at \$4,000,000<sup>18</sup>, and most of this wealth was attributed to his mining operations in Burma. It is notable that Hoover amassed so much fortune in British Burma that Britain issued him an ultimatum to either become a British citizen or sell his mining property in Bawdwin (Special to The New York Times 1928). Whereas the highlanders of Upper Burma remained largely illegible in the eyes of British bureaucrats, Hoover experienced a perhaps undesirably high level of legibility due to his accounts, London connections, and railway lease that included use of the Gokteik Viaduct. In Hoover, Britain saw an American entrepreneur profiting greatly from the failed British investment. Reporting on the success of Hoover's business endeavors in Burma, the New York Times reported in 1932:

The bulk of the Hoover fortune . . . came from his connection with the Burma Mines, Ltd., owner of ancient Chinese silver mines in Burma which had been abandoned and were discovered anew by Mr. Hoover, who correctly analyzed their possibilities. They are regarded today as the richest in the world, with a yield of lead, silver, copper, and zinc. (New York Times 1932)

Further attesting to the role that the Gokteik Viaduct had in terms of enabling the transport of valuable metals from the Bawdwin mines, it was reported that Hoover's Burma Corporation extracted more silver in twenty years than the Chinese miners did in the previous centuries (Marshall [2002] 2012, p. 142). Thant Myint-U insightfully noted that the Bawdwin mines were "big enough to supply all the lead needed by the Japanese war machine" (Myint-U 2011, p. 105).<sup>19</sup>



Such large-scale mining operations inherently depend on railway to import labor, food, and mining equipment while exporting raw silver, lead, and other products at industrial levels (Baillargeon 2018, p. 126). But even the extraction and transport of these materials did not continue for long. Mining output declined after a border incident between British military police and Chinese troops in 1934, and a decrease in global demand due to the Great Depression. Despite a brief revival later in the 1930s, the Bawdwin mines never fully recovered (Baillargeon 2018, pp. 309–15). Construction of the railway line from Lashio to Yunnan was briefly revived in 1938 only to be finally terminated when Japan invaded Burma in early 1942.

#### 10. The Gokteik Viaduct as a *Principal Strategic Objective* in the Burma Campaign (1942–1945)

Four decades after construction, the Gokteik Viaduct would serve a critical military objective of the Burma Campaign. As part of Japan's blockade of China in the Second Sino-Japanese War, the Japanese Imperial Army attacked British Burma at the end of 1941. Outlining key strategies to defend Burma from Japanese invasion, in January 1942 the British government designated the Gokteik Viaduct as one of its *Principal Strategic Objectives*, reflecting again dreams of a route to southern China rather than immediate strategic importance (Coordinator of Information-British Empire Section 1942).

In mid-March 1942, Japan commenced a military campaign to seize control of the road between Yunnan and inland Burma. As one potential artery along the supply lines to interior China, control of the Gokteik Viaduct was a significant objective for both militaries. In this context, Britain abandoned the concept of a Burma-Yunnan railway while seeking to open vehicle transport through a hastily constructed "Burma Road" which was completed in 1937–1938 during the Sino-Japanese War. Japan actually used this vehicle route to facilitate its invasion of Burma in 1941–1942, and the route was later re-captured by the Allies in 1945 and ultimately abandoned to the jungle after the war (Smith 1940).<sup>20</sup> Or rather, the road reverted to what it had been before the war, similar to how the region at large reverted to pre-modern social structures sustained by local institutions. Plans for modern infrastructure, whether roads or railways, disappeared from even the peripheries of the Chinese, British, French, American, and Thai consciousness. Still part of the local consciousness, they would not re-appear again in outsider awareness until later in the twentieth century.

In order to disrupt Japan's advance along the Yunnan-Burma Road, British Major James Michael Calvert (aka "Mad Mike") was pre-emptively tasked with mobilizing Chindit soldiers from Britain's Bush Warfare School in Maymyo (Pyin Oo Lwin) for a mission to defend the Gokteik Viaduct in May/June 1942 (Calvert 1996, p. 83). At this time Calvert was serving as the Commandant of the Bush Warfare School, which trained Chindit soldiers in demolition work and guerrilla warfare (Calvert 1996, p. 80).<sup>21</sup> Coincidentally, the mobilization of Chindits, who were predominantly a conglomerate of guerrilla fighters from Burma, India, the UK, and Africa, was regarded as an innovative strategy in the British war effort. As Britain needed to supplement its own fighting forces, "lowland" military strategists began to see the "highlanders" in terms of what they could contribute in terms of guerrilla warfare. Regardless, Calvert reportedly requested permission to destroy the Gokteik Viaduct to disrupt the Japanese advance, but this request was denied. Calvert and his Chindit troops then retreated from their position near the Gokteik gorge due to Japan's increasing presence in the area (Rooney 1990, p. 49).

The Allies shifted tactics as their fortunes in Burma deteriorated. One year into Japan's occupation of Burma, the Allies launched an aerial bombing campaign to cut Japan's supply line between Burma and Yunnan. A 3 March 1943 article in *The New York Times* reported that pilots from the Tenth United States Air Force in India had bombed the Gokteik Viaduct on 24 February to slow Japan's advancement to the Salween River (Associated Press 1943c, p. U.S. Fliers Bomb Mandalay Viaduct).

In March 1943, Calvert and his band of Chindit fighters were tasked with another covert operation to return to the Gokteik Viaduct and destroy it on 17 March 1943. Due to the strong presence of Japanese troops within the territory east of Mandalay, however, this mission was aborted before Calvert and the Chindits could arrive (Rooney 1990, p. 75). Although ground-based attacks were impossible by this time, pilots from the Tenth United States Air Force successfully bombed the viaduct from the air on 17 and 24 March (Associated Press 1943a, p. Heavy Activity in Burma). *The New York Times* reported, “Hits on the span and its approaches, ‘have effectively prevented any rail movements’ over the bridge in many weeks’ . . . damage also was caused in raids on Sunday and Monday on the Gokteik Viaduct” (Associated Press 1943d, p. U.S. Fliers in Burma Hit Foe’s Supply Line). After the March attacks, monsoon season suspended aerial bombings until September 1943.

Trailing the Allied bombing missions in March 1943, the Allied Joint War Plans Committee met in July to consider repairs to the Gokteik Viaduct and establish a railway line to Kunming that would help push Japan out of China. The Joint War Plans Committee report highlighted the potential usefulness of the Gokteik Viaduct but expressed reluctance to extend the railway beyond Lashio since that would necessarily commit crews to two years of labor. The committee’s report again revived, albeit briefly, the dream of establishing a rail connection between Burma and Kunming. This report also outlined contingency plans should the Gokteik Viaduct be retaken in a Japanese counteroffensive:

If the campaign to recapture BURMA commences in November 1944 and is completed by April 1945, then the RANGOON to KUNMING barge-truck line should be in commission to carry 80,000 tons not later than November 1945. Provided the GOKTEIK Viaduct can be repaired, the BURMA-YUNNAN railroad will be operating by November 1946. The pipelines should be in commission by spring 1946, and the LASHIO-KUNMING railroad will be delivering 60,000 tons per month from RANGOON to KUNMING by June 1948. If the GOKTEIK viaduct is destroyed, a delay of 1 to 1-1/2 years may be anticipated in the opening of the MANDALAY-LASHIO railroad. (Joint War Plans Committee 1943, p. 12)

On 9 September 1943, Allied aerial attacks were relaunched. *The New York Times* reported that American pilots used Mitchell medium bombers to detonate “bombs beneath the towering steel structure and scored three direct hits on the railroad tracks at its south approach . . . The communique said, ‘This vital link in Japanese communications for the supply of troops opposed by the Chinese forces in Yunnan had been protected from bombing for three months by monsoon storms and clouds’” (Associated Press 1943b). The September 1943 aerial attacks on the Gokteik Viaduct successfully severed one of Japan’s potential supply lines between Burma and China (See Figure 2). With this supply line cut, the United States Army shifted focus to airlifting supplies into China, and constructing the Ledo Road<sup>22</sup> between Assam, India and Kunming, China, which would cross northern Burma.

After the war, Burma gained independence and endured decades of economic struggles, isolation, and internal strife that nullified any remaining ambitions for a railway between Yunnan and northern Burma. Since independence in 1948, Upper Burma has been occupied by irregular forces of the Burmese Communist Party, Chinese Kuomintang Party, Shan revolutionary groups, Kachin liberation government, and garrisons of the Burmese army. In many ways, this reflects a political situation that is remarkably similar to that of previous decades and centuries. Loyalties have largely remained local while the wider goals of world markets and the political goals of Beijing and Nay Pyi Taw are ignored. These goals include a new railway in the region, which would give the Burmese military means to expropriate local land rights, as they are notorious for doing. Trade via rail would not be available to customs-collectors from many Kachin, Shan, Wa, and other local militias that currently control the region. In reality, pseudo-sovereign powers that occupy the region would likely bomb a railway that was constructed by the central government and defended by the Burmese army.



**Figure 2.** The Gokteik Viaduct after the end of the Burma campaign (c. 1947), with structural components missing. This photo was taken by the Burness family of Scotland as they traveled in Burma in the late 1940s. Source: ([Wohlers 2022b](#)).

## 11. Discussion and Conclusions

The Gokteik Viaduct was arguably one of the most significant engineering achievements at the beginning of the twentieth century, yet today the structure remains largely unknown outside of Burma. The bridge itself was a triumph of logistics and technical engineering skill, and it was constructed in spite of physical, political, and social constraints. In its lifetime it has survived more than a century of use, bombings during World War II, neglect during Burma's dictatorship between 1962–2010, ambitious Chinese planning after 2010, and sporadic armed conflicts that continue in the region today.

Although its historicity largely remains unrecognized, we argue that one of the timeliest lessons from the Gokteik Viaduct comes from a fact that broader global capitalism failed to grasp—and often *still* fails to grasp. The problem is not just technical but rooted in political structures which by their very nature simplify and generalize complex politics. It is quite true that various polities govern the region on their own terms and in shifting alliances according to whichever lowland centers intrude. However, these polities are also small, and most importantly opaque to high modern institutions of distant bureaucratic powers that finance large infrastructure projects. These powers cannot “see” pre-existing clan alliances, agricultural ecology, trading networks, and tributary relationships that do not fit inside the simplifying tools of bureaucratic rule. The simplifying tools are, as Scott (1999) describes in *The Art of Not Being Governed*, ledgers, birds-eye political maps, cadastral surveys, censuses, house registrations, market licensing schemes, health surveys, and a range of other institutions designed to facilitate rule at a distance.

Why do such schemes repeatedly fail in places like Burma?<sup>23</sup> Scott emphasizes that such schemes are commonly destroyed by the conventions of high-modernist planners whose complex computer software and other modern tools function in a framework of oversimplifications and short-term vision coded into these tools. Certainly this was the case for the Gokteik Viaduct, the Lashio Railway, and the still yet-to-be-built railway between Burma and Kunming. *If all the high-modern capacity of the British colonial authorities, Japanese war planners, American military planners in World War II, and Chinese planners of today is frustrated, why might this be the case?*

We suggest that part of the answer emerges from observing that, despite various forms of modern invasion, planning, scheming, and investment, the businesspeople and governments of the lowland cities inadequately account for relevant externalities that comprise social life in the “highlands”. From this perspective, even the longest railway trestle bridge in the world became simple compared to the still impossible feat of extending a railway from Lashio to Kunming through lands occupied by people who Scott says

epitomize the elusive “art of not being governed”. Such people disregard state structures such as railway rights of way, trade monopolies, labor contracting, global markets, and all the other necessities of modern systems. Bureaucrats who showed insufficient appreciation for social and political constraints, while being blinded by data-rich reports and dreams of easy wealth, would inevitably fail to achieve a functioning railway to Yunnan.

For about 150 years, the highland peoples of Upper Burma have made themselves, as Scott (1998) writes, “invisible” to the Burmese kings and later to colonial bureaucrats who sought to bring the peoples of Upper Burma under political, economic, and social sway.<sup>24</sup> The railway’s construction received little, if any, “buy-in” (to borrow a modern bureaucratic term) from the highland peoples who may have been valuable allies had political and social relationships been “played” differently (to borrow language from Major-General MacMahon’s game of political chess). This is why, perhaps, an observer as astute as Edmund Leach (Leach [1965] 2008), who wrote about the Kachin and Shan political systems, could complete an anthropological masterpiece without even mentioning either the railway or Herbert Hoover’s mining conglomerate. Leach’s informants seemingly never thought such institutions all that important. In Leach’s book, the ruling Shan Saobwas, the Kachin Gumlao, and the Kachin Gumsa seemingly did not notice the railway and were presumably unimpressed with the engineering marvel that spanned the Gokteik gorge. However, then again, the Saobwas, Gumlao, and Gumsa were similarly absent from the reports that bureaucrats and business boosters aggressively published. This is the type of “artistry” that Scott seems to refer to and that, perhaps, underpins the “ungovernability” of the bureaucratically invisible highlands.

This brings us back to James C. Scott’s book which is specifically about highland Burma, *The Art of Not Being Governed*. *The Art of Not Being Governed* is about people who are skilled at avoiding that 30,000-foot aerial gaze of engineers, accountants, and a slew of other bureaucrats who seek to tame the “unseen” highlands (Waters 2012, pp. 170–73). Scott describes *Zomia* (i.e., the highland areas through which the Burma-Kunming railway was to be built) as a region that contains people highly skilled at avoiding projects that exert centralized state control. Examining the unbuilt Lashio-Kunming railway highlights how this might have happened. Highlanders achieve this end not by challenging planners directly but by avoiding their institutions, thereby creating a situation in which land cannot be alienated, workers cannot be subordinated to intrusive projects, tribute is minimized, and the centralized political power needed for large infrastructure projects remains irrelevant.

Thus, the longest railway trestle bridge in the world—the Gokteik Viaduct—was built during roughly the same era that the Eiffel Tower held a similar status as being the tallest structure in the world. However, the Gokteik Viaduct became a strictly local phenomenon and engineering curiosity that is largely unknown outside of Burma, while the Eiffel Tower remains a globally recognized icon by people who have never even visited France. Is this rather ironic history rooted in James C. Scott’s (1998, 2009) ideas about the “see-ability” of highland Burma and the art of not being governed? We are not entirely sure since indeed, as the trendy cliché states, “correlation does not imply causation”. However, it is indeed a provocative thought. Perhaps the lesson for the region is that unless high-modernist planners come to appreciate the complexities of the “unseen” peoples, politics, and social environments within Burma, it is likely that future efforts to construct a continuous railway between southwestern China and Yangon will perpetually result in frustration.

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## Notes

- <sup>1</sup> We are referring to the type of bureaucratized power described in Max Weber's (2015) classic essays "Bureaucracy", and "Politics as Vocation".
- <sup>2</sup> See, e.g., news story: <https://thediplomat.com/2021/09/chinese-high-speed-rail-network-reaches-myanmars-border/> (accessed on 8 September 2021).
- <sup>3</sup> Such works are rarely if ever cited in the many consultancy reports regarding ceasefires, development planning, economic reports, public health policy, or other activities undertaken in this region. Rather, there is a reliance on the technical reports which highlight the strengths of foreign technical expertise at the expense of local knowledge.
- <sup>4</sup> See: <https://www.irrawaddy.com/news/burma/feasibility-study-bri-railway-link-myanmar-take-18-months.html> (accessed on 12 December 2021) and <https://thediplomat.com/2021/09/chinese-high-speed-rail-network-reaches-myanmars-border/> (accessed on 12 December 2021).
- <sup>5</sup> Effective railway transportation into inland areas means that friction of distance decreases and the global marketplace reaches into remoter areas (see Waters 2007, pp. 117–19).
- <sup>6</sup> The sources of disorder in Upper Burma must have seemed arbitrary but surmountable to British colonizers. For example, newly anointed Buddhist Shan princes appeared to be British allies, but their principedoms often proved ephemeral and conflicts over royal succession were commonplace. As for administrative challenges posed by ethnic groups, the Kachin quickly Christianized but were never able to create the principalities of the Shan. The Wa ethnic group was labelled as headhunters and barbarians, and therefore suitable primarily for *National Geographic* (see Lawitts 2018, p. 296; Myint-U 2011; Scott 1896).
- <sup>7</sup> Such disorder is reminiscent of the situation in Germany where there were dozens of principalities until those "modern" nations were consolidated in the mid-nineteenth century.
- <sup>8</sup> See description of Shan states in Tun (2009, pp. 39–44), and more generally Leach [1965] (Leach [1965] 2008) for description of Shan and Kachin leadership. Tun (2009, pp. 38–39) notes that even the fastidious British could get the administration of Shan State down to just seven units in northern Shan State, 38 in southern Shan State, and one in eastern Shan State.
- <sup>9</sup> Mr. Sao Saimang Mangrai served as a government official in Shan State shortly after Burma gained independence in 1948.
- <sup>10</sup> Addressing prospectors' lust for gold, Nisbet rhetorically asked, "As for gold, why go to Yunnan when the Wuntho gold-fields are within 12 to 20 miles of the Mu Valley Railway, and while the Paunglaung range of hills, east of the Sittang river but within easy reach of the Rangoon-Mandalay line, is known to be rich in precious metals?" (Nisbet 1899, p. 183).
- <sup>11</sup> Myths about unexploited were of course not specific to Burma, and were found in other evaluations in the nineteenth-century worlds of European colonialists, and after. Situations that were similarly disorganized from the perspective of world capitalism also led to similar myth-making. Waters (2018, pp. 77–100) compared the inability of potential colonizers to exploit both Burma and Congo. Similarly in the twentieth and twenty-first centuries, Afghanistan frustrated development planners from Great Britain, the Soviet Union, and the United States. All three brought impressive modern capacities for infrastructure, which were never realized.
- <sup>12</sup> Attesting to this fact, Major-General MacMahon described how the obstructive nature of the Shans prevented a Han emperor from entering the region: "A century before the Christian era it appears that the emperor of the Han dynasty fitted out an expedition to find its way through South-Western China to India, which was frustrated by the obstructiveness of the 'barbarians' or Shans, who then occupied Yunnan, resulting in their chastisement and expulsion from the country of the Upper Meikhong and Salween rivers to the Irawadi valley. This movement developed to such a degree that the immigrants, after a while, found themselves strong enough to overthrow the monarchy established by the Aryan settlers and founded a kingdom of their own, of which more anon" (MacMahon 1886, p. 395).
- <sup>13</sup> Webster concluded that these "gentlemanly capitalists" were able to "manipulate their commercial contacts in the provinces to present before government a formidable national coalition of business and public opinion in favour of invasion . . . the absorption of Burma into the British empire was the result of gentlemanly capitalists at work". (Webster 2000, p. 1005).
- <sup>14</sup> In the minds of the peoples of Upper Burma, construction of a railway likely would be seen as disturbing the natural environment in which guardian spirits (i.e., *Nats*) lived. The British engineers would have ignored or simply not "seen" such beliefs, which do not fit in well with high-modernist reasoning. As a result, such descriptions make their way only into ethnographic research and are rarely acknowledged in engineering and development studies.
- <sup>15</sup> This is a reference to both Scott's discussion of the invisibility of colonial peoples to the modern state in *Seeing Like a State* (Scott 1998) and *The Art of Not Being Governed* (Scott 2009). In the latter this is called "the incoherence of tribe and ethnicity" (Scott 2009, p. 238). This comment about legibility is consistent with Benedict Anderson's classic description of bureaucratic censuses (Anderson [1991] 2006, pp. 244–47), which is largely based on Southeast Asian data. Jane Ferguson (2015) has also



written an excellent critique of how bureaucratic censuses of British Burma created “ethnic” categories, typically aligned with particular territories while excluding others. The British would typically assign leadership to a “chief or prince”, and gave him the hereditary right to “rule” over a particular territory which they in turn classified according to particular language and ethnonym, such as described in Scott (2009).

- 16 Major-General MacMahon similarly wrote: “Beside the Burmese, Talaings, and Shans, who have played the historic part on the field of Indo-China, there are, says Colonel Yule, ‘a vast mass of races of inferior importance, generally terms wild or uncivilized, their civilization varying through every degree except the highest. Many of them are only inferior to the so-called civilized races whom they border in the absence of a written language, while others are head hunters in almost the lowest depths of savagery’” (MacMahon 1886, p. 394).
- 17 Hoover was the 31st President of the United States (1929–1933).
- 18 More than \$111,000,000 USD today.
- 19 The Bawdwin Mines were also revived under the recent NLD (2016–2021) government, and villagers resisted moving. This project has again become moribund, following the coup of 1 February 2021, and the continued resistance of villagers (see <https://www.irrawaddy.com/news/burma/residents-refuse-move-australia-myanmar-joint-venture-mine.html>. Accessed on 14 March 2021). In August 2021, it was reported that the Australian Company which held a 51% share was selling its stake for \$30,000,000 (see <https://www.irrawaddy.com/news/burma/australian-mining-company-sells-stake-in-myanmar-project.html>. Accessed on 3 September 2021).
- 20 The Japanese were able to build, complete and operate the Burma Railway over the mountains at Three Pagoda Pass, to the port in Burma at Thanbyuzayat in Mon State. The railway was used to supply the Japanese war effort in Burma via the port in Bangkok, Thailand. The 415-kilometer railway project through the mountains was constructed by Allied Prisoners of War, and it was considered to be both an engineering achievement and humanitarian catastrophe. The railway itself operated until 1947, after which it fell into disuse. The Thai part of the railway was revived after 1958. The Burmese portion is no longer used—but it is yet another dream project which is part of the Chinese Belt and Road Initiative of the 2010s and after.
- 21 Chindit soldiers were troops from across the British Empire who were trained at the Bush Warfare School in India and used to fight the Japanese in Burma.
- 22 Additionally, known as the “Stillwell Road”.
- 23 Additionally, consider Afghanistan, where during the late twentieth and twenty-first centuries the Russians and Americans likewise attempted to construct massive infrastructure and largely failed.
- 24 Indeed, even today many peoples in the region make themselves “invisible” to the Tatmadaw. They do this through such things as avoiding censuses, changing names, joining militias, and avoiding borders.

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