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Beginning in the late 1860s, U.S. engineering firms won lucrative contracts to erect bridges, viaducts, and railways around the globe.¹ The Phoenix Bridge Company, the leading bridge fabrication and erection firm in North America by the 1890s, built steel bridges and viaducts in Guatemala, Nicaragua, Peru, Costa Rica, Cuba, Mexico, Brazil, Canada, Russia, China, and Japan between 1869 and 1885.² These far-flung projects set in motion the movement of goods, people, and expertise across the world. For each project, gangs of American engineers travelled overseas to supervise the erection of Phoenix's prefabricated designs and to manage the imported and local labor put at their disposal. These engineers shared their experience around the world in new forums of international cooperation such as conferences and technical journals and incorporated it into a global, professional identity.³ Joining a much larger network of American travelers, businessmen, expatriates, conservationists, and missionaries laboring in the Americas, Asia, and Africa, the U.S. engineering diaspora connected the United States to empires across the world.⁴

This species of transimperial connection and exchange was particularly noticeable in the British imperial world and is key to the writing of a new history of American empire. Through a series of transimperial projects, U.S. capitalist and industrial expansion became enmeshed in the proliferating networks of communication, investment, commerce, and migration that characterized British imperialism.⁵ From settler colonies to protectorates and condominiums, American contractors helped Britain consolidate its grip on imperial power, building strategically vital railway bridges for its armed forces and accelerating the

integration of interior regions with major ports and centers of extraction. In 1899, one of Phoenix's major rivals, the Pennsylvania Steel Company, underbid British competitors to build the Gokteik viaduct in Upper Burma for £100,000, connecting important mineral fields near the town of Lashio with Mandalay, the chief city of Upper Burma under British rule.⁶ The Burma Railway Company also placed large orders with Pennsylvania Steel, and the Maryland Steel Company for locomotives, rails, and ties.⁷ In the same year, British armed forces in the Sudan contracted the Pencoyd Iron Works of Philadelphia, to build the Atbara Bridge over the confluence of the Atbara and Blue Nile rivers. At a cost of £6,500 and a construction time of six weeks, the bridge enabled the supply and organization of British and Egyptian troops then advancing against the Mahdist State near Khartoum, 177 miles to the southwest.⁸ In Britain's white settler dominions, American firms built bridges and viaducts along the Intercolonial Railway and Grand Trunk Railways in Canada; the Nairne Viaducts in Adelaide, South Australia; and the Nowra and Hawkesbury River Bridges in New South Wales, Australia.⁹ "Money is being poured out like water in order to secure the market for British manufacturers," complained one British observer, "and lo! The American steps in and carries off the contracts for building these bridges without having incurred a penny of expense or an atom of responsibility in opening up the country."¹⁰

American corporations – many of which had risen to greatness by developing and exploiting recently incorporated areas of the U.S. West – played major roles in advancing the British empire of industrial extraction.¹¹ Ten miles East of Cape Town, Cecil Rhodes' British South Africa Company (BSAC) employed the Californian William Russell Quinan to design and build the Cape Explosive Works to supply dynamite for the Rand's gold mines; similarly American mining engineers were employed in large numbers by the BSAC, De Beers Consolidated Mines, and Bewick, Moreing & Co. to transform the mineral industries of Southern Africa, Rhodesia, and Australia.¹² North of the Atbara Bridge in the Anglo-

Egyptian Sudan, the American financier Leigh Hunt directed the Sudan Plantations Syndicate, an experimental farming project funded by Wernher, Beit & Co. that employed Tuskegee graduates to cultivate cotton, tomatoes, and alfalfa.¹³ “Whether or not we are to have a political imperialism,” wrote one American observer of these collaborations, “we already have an industrial imperialism.”¹⁴

Taking these projects as its starting point, this chapter proposes a framework of global connectivity defined by transimperial interaction as one solution to navigating the tensions between imperial and global history.¹⁵ Empires were organized in multiple ways through degrees of entanglement with global migration patterns, commodity chains and capital flows, and the communications infrastructure and non-state institutions that made this exchange possible. Non-state actors may have noted official boundaries, but they were not contained by them: they moved regularly between empires to supervise industrial sub-contracting, participate in colonial wars, and gather and spread knowledge. These overlaid patterns of consumption and production, exchange and collaboration are central to the transimperial character of global connectivity.

Taking center stage here are the networks of globe-crossing American engineers and experts who transferred ideas, expertise, and technology between empires and who disseminated news of the lucrative industrial opportunities offered by British Empire to audiences at home. “Out in the broad world at large,” wrote one American commentator, imperial Britons and Americans “understand each other, join hands, and work shoulder to shoulder ... in a silent alliance.”¹⁶ Migrations of this sort linked U.S. corporations both mentally and materially with a world fundamentally reshaped by British and European imperialism. Although it was commonplace for empires to outsource some industrial tasks, send observers to learn from other empires, and exchange personnel for particular projects, for many Britons, this form of American expansion was a deeply parasitic phenomenon.¹⁷

Recognizing the work done by U.S. corporations in European colonies places the dynamic, transimperial flow of strategies of rule between and across empires at the center of analysis, while also drawing attention to the non-state actors and institutions involved in these exchanges and to the exercise of power.¹⁸ Historians seeking to globalize the U.S. past require a sharper, more precise analytical vocabulary to discuss global connectivity in the nineteenth century. Labelling all connections “transnational” attenuates our analysis by distorting the nature of global connectivity; the term “transimperial” makes visible the powerful imperial formations that figured prominently in the border-crossing relationships of a world of empires. This term owes clear debts to earlier transnational scholarship, but I am not proposing a contextual thickening of key moments in the development of the U.S. empire-state, as envisaged by earlier theorists of transnationalism.¹⁹ Instead, I see transimperial contacts as the vantage point for perceiving the interwoven relationships between national, imperial, and global scales of analysis. This conceptual framing offers one solution for historians seeking to avoid the restrictions of metropole-periphery binaries and the potentially flattening terminology of globalization.²⁰

Historians of transimperial connections can draw on the new methodological breadth of research focusing on the practice, and politics, of imperial comparison.²¹ This scholarship captures one of the central dynamics of imperial power: its control over the collection and subsequent organization of knowledge in hierarchical terms. On the one hand, shared or comparable concepts of race, science, and civilization lent credibility to the idea that empires faced universal problems to which interchangeable solutions could be applied. These assumptions underpinned the creation of horizontal circuits of imperial experts dedicated to observing the administrative structures, labor policies, and medical and sanitary reforms of other empires.²² On the other hand, in the realm of inter-imperial competition, imperial comparisons legitimized claims to exceptional status among other empires.²³ In the context of

U.S. imperial historiography, the direct comparisons between the U.S. and British empires made by imperialists in the United States have long been recognized, as has the utility of the politics of imperial comparison in justifying the transition from Spanish to U.S. rule in the Philippines, Cuba, and Puerto Rico.²⁴

The central achievement of scholarship examining the politics of imperial comparison is its posing of familiar questions about U.S. imperialism from a wider angle. Yet, this approach does little to “re-engineer” the questions themselves.²⁵ For this reason, the geographic center of this chapter moves to Eastern Africa – a part of the world unacknowledged in the traditional historiography of U.S. imperialism and a region widely understood as being peripheral to the United States’ geopolitical interests in the age of European “High Imperialism.”²⁶ Stepping outside the traditional geographic and historiographical boundaries of U.S. imperialism, this chapter examines the Uganda Protectorate’s subcontracting of the American Bridge Company (ABC) to erect twenty-seven railway viaducts on the Uganda Railway. The centerpiece of Britain’s project to develop the economy of East Africa, this railway offers an opportunity to view the interwoven imperial networks that characterized Anglo-American transimperial connections. By focusing on a region of the world where American power was not the primary transformative force, historians can begin to reframe the questions we ask of the nature and geography of U.S. imperialism.

Through the ABC, U.S. engineers became substantively involved in British efforts to assert power through the seizure of land and coercion of labor in East Africa. The intent here is not to annex the Uganda Protectorate as an outpost of the American Empire, but to emphasize the centrality of transimperial collaboration to the processes of turn of the twentieth century imperialism – and in turn to highlight the delimiting nature of national-imperial frameworks on U.S. imperial historiography. In the Uganda Protectorate, U.S.

capitalist expansion, the regional dynamics of Indian sub-imperialism in the Indian Ocean world, and the global circulations of goods, experts, and labor management strategies all converged at the railhead.²⁷

Building the Ugandan Railway

On April 12, 1894, the Imperial British East Africa Company transferred its territorial rights to the Kingdom of Buganda to the British government and the Uganda Protectorate was formally declared. The Salisbury government moved quickly to develop the colony's infrastructure so as to advance commerce in the region. The key to this was a proposed railway linking the coast with the interior. Political, economic, and strategic priorities were entwined in the rationale of the proposed 582-mile Uganda Railway from Mombasa to Lake Victoria. To its promoters, a railway from the shores of the Indian Ocean to the shores of Lake Victoria was "the obvious method of attacking all of East Africa," and overcoming the limits of a harsh physical environment for travel and commerce.²⁸

Imperial strategists also envisaged the line as a key element of British imperial defense of the Nile Valley. In their calculations, the railway would secure control of the Nile's headwaters and forestall French attempts to claim eastern Sudan, thereby easing anxiety over the security of Egypt and India. Not far south of the line lay the border with German East Africa, a territory roughly the size of contemporary Tanzania, Rwanda, and Burundi combined. While the border had been stabilized by Lord Salisbury and Leo von Caprivi in the Heligoland-Zanzibar Treaty of 1890, the German East Africa Company remained Britain's preeminent commercial rival in the region. "The Germans are pushing on their line from Tanga," warned London's *Fortnightly Review*, "with the ostensible aim of reaching the Victoria Lake, it is surely high time we defend our own interests."²⁹ Among the

most vocal supporters of the line were lobbyists from the British and Foreign Anti-Slavery Society who believed it would also be the most effective means of suppressing the inland slave trade.³⁰

Connectivity was therefore central to the railway's objectives. For many missionaries, merchants, and imperial commentators, Africa was defined by disconnection. They believed that railway technology would fundamentally reconfigure East Africa's place in the world, unlocking the continent's agricultural potential by providing access to the interior where vast cotton, rubber, coffee, sugar, sansevieria (for ropes), wheat, ground-nut, chili, and simsim plantations could be cultivated. Upon completion, the line reduced freight rates to forty-eight shillings per ton, compared to £100 to £300 per ton when head-loaded.³¹ To radical-minded MPs, such as Henry Labouchere who dubbed the project a "lunatic line", and Fabian intellectuals during the late-Victorian period, the line dangerously imperiled the Treasury's financial integrity and was a waste of taxpayer's money.³² British imperial historians have similarly concluded that the over-budget and over-schedule line "did little, and at great cost" to advance its stated objectives.³³

The Uganda Railway presented a series of formidable engineering challenges. To connect the Indian Ocean and Lake Victoria, the tracks had to cross large parts of the Great Rift Valley. Bordered by steep escarpments to the east and west, the valley's floor is broken by volcanos, lakes, and the Taru desert -- an area of waterless scrub that stretched deep inland from around the fiftieth mile of track. The first supply of fresh water the line would reach beyond the Taru was the Tsavo River, 132 miles from Mombasa. Where the brush was thin, the British engineers found the tracklaying easy and could lay 5,200 feet of line in a single day. But once the town of Nakuru, west of Nairobi, had been cleared, the route led sharply up the western side of the Rift valley onto the Mau Escarpment. Beyond this the terrain fell rapidly, through a difficult country of small valleys and riverbeds.

British engineers built temporary switchbacks to climb the steepest gradients and erected wooden viaducts over some ravines, but in 1901 consulting engineer, Alexander M. Rendel had the Foreign Office advertise in London for steel viaducts to bridge the steep slopes. Historians of empire and technology have shown that consulting engineers like Rendel belonged to informal professional networks through which they exchanged information, advertised contracts, and promoted, planned, and designed imperial projects.³⁴ The networks that crisscrossed professional society in imperial London also extended farther afield. The London correspondents of American professional periodicals, such as the *Engineering Record*, *Dun's Review*, and *Iron Age*, advertised colonial projects to American firms. This was the most likely avenue through which the eventual contractor, the American Bridge Company (ABC), heard of the contract. In all, ten British and three American firms submitted proposals to the Crown Agent. ABC outbid its closest rivals the Pennsylvania Steel Company and the Phoenix Bridge Company on both time and cost, securing the contract with the lowest bid of £135,000 and a construction time of thirty-two weeks.³⁵

ABC's bid was ambitious, as the project required the transportation of 7,000 tons of steel and a thirty ton travelling crane from New York to Mombasa.³⁶ Eight of the twenty-seven viaducts were on the approach to the Mau Summit, a fault scarp standing 10,000 feet above sea level. A further nineteen descended the Mau escarpment to the railway's terminus on the shores of Lake Victoria.³⁷ As a measure of the terrain's treacherous character, the viaducts were to be built 8,300 feet above sea level, along just seventy-two miles of track. The highest was 102 feet tall, 560 feet long, and had nineteen spans; the longest was 881 feet and twenty-nine spans.³⁸



Map 1. The Uganda Railway. The engineers of the American Bridge Company constructed viaducts along the part of the line beginning at the Mau Summit just below the equator at 36° longitude. The border with German East Africa runs from the mouth of the Uмба to a point east of Lake Victoria at 1°s. At a point roughly halfway between the Indian Ocean and Lake Victoria, George Whitehouse chose Nairobi as the logical location to place a rail depot and maintenance workshops – helped by its access to fresh water. Source: Mombasa-Victoria (Uganda) Railway and Busoga Railway (1916), British Library.

Each viaduct was built “knocked down” in Manayunk, north-western Philadelphia, at the mills of the Pencoyd Iron Works before being shipped via steamer to Mombasa in the winter of 1901-1902. To make sense of this huge flat-pack, the parts for each viaduct were

painted a different color, which were then matched and bolted together. Accompanying the pre-fabricated bridges was an erection gang of twenty-one Pennsylvanian laborers that included sixteen skilled fabricators; a foreman (N.P. Jarrett of Selinsgrove, Pennsylvania); a timekeeper (Charles N. Gemberling of Philadelphia); Edward Taylor, a restaurateur from Selinsgrove who served as head cook; a clerk; and as superintendent twenty-four-year old engineer named Archibald Byron Lueder, a Cornell Graduate from Wilkes-Barre, Pennsylvania – all at twice their usual wages.³⁹

On arrival in December 1901, the group travelled from Mombasa to Nairobi and from there to a base camp at the foot of the Mau Escarpment where construction would begin. Within three days, the steel travelling crane with seventy-foot booms was swung out over the first ravine, to lift the great girders and bents into place. The first viaduct was assembled in less than a week.⁴⁰ After the initial success, work slowed. The thirty-ton traveler inched along the railway on just four sixteen-inch wheels and the locomotives moving the steel bents derailed several times on route to the construction site.⁴¹ Each time the team moved to a new viaduct, camp was broken down by an army of porters who then transported it on foot to the next erection site. The American engineers, meanwhile, advanced via train. They were obliged to live in tents while they waited for the porters to arrive, which left them exposed to the extreme night-time cold of such high altitudes, leading in turn to frequent illness.⁴² “At this rate 1 year is required to complete contract,” the deputy chief engineer R. Anderson, telegraphed home to London, “Advise putting pressure on Americans.”⁴³

If the speed of the American work was one concern, the quality was even more pressing. Although the American press declared that “American men, American methods, and American machinery” had “achieved [a] notable victory” over “our British cousins,” the reality was more prosaic.⁴⁴ The work of the American engineers came under close scrutiny from the project’s Chief Engineer, Sir George Whitehouse, who found many aspects of it

deficient. “What riveting has been done was very unsatisfactory,” he noted in one report which found that only one quarter of the rivet holes had been filled. “This, in viaducts which are over 80 & 90 feet high, is, I consider, dangerous,” Whitehouse noted drily to his superiors in London.⁴⁵ On viaduct BB (Figure 1), a 500 foot long bridge of nineteen spans, Anderson noted that some rivets were loose and could be “shoved ... out with his finger.”⁴⁶ With the contract behind schedule, Whitehouse and Anderson pressed the Railway Committee to refuse payment to the Americans.⁴⁷ Nevertheless, the Americans were paid, and on March 3, 1903, after just over a year’s work, the line was opened to the lake terminus.



Figure 1. American-built viaduct BB along the Mau escarpment, the longest of the viaducts installed by the ABC in Uganda. Source: Source: Frederick W. Emmett, “American Bridges on the Uganda Railway,” *Engineering*, August 21, 1903, 249.

“A Wedge of India”: Indian Sub-Imperialism and U.S. expansion

In one sense, this outpost of the American engineering diaspora was emblematic of surging U.S. commercial expansion. Like mission stations, the railhead was an island of American commerce.⁴⁸ American-made industrial equipment such as compressors, pneumatic riveting hammers, and hoisting engines, in addition to American-produced canned goods,

seeds, and vegetables were all imported into the colony.⁴⁹ Half a million feet of southern pine lumber was used to floor the bridges.⁵⁰ Thirty-six locomotives from Baldwin's Philadelphia workshops sped along its rails, while all of the rolling stock was equipped with American-engineered Westinghouse brakes. According to one observer, the entire project "indicates that the expansion of the British Empire and the opening of new markets tend to promote American industrial interests."⁵¹

In East Africa, senior officials in the protectorate government encouraged the settlement of non-British personnel, especially Indians, to settle and develop the colony.⁵² American expansion occurred in the web of interregional networks that made up the Indian sub-imperial system spanning the port cities of the Indian Ocean rim from Zanzibar to Singapore, from Durban to Basra and Penang. As Britain extended control into the interior of East Africa, it further drew on and advanced this system. Sir Harry Johnston, special commissioner sent to rationalize colonial administration in the Protectorate, mixed imperial security concerns with a strategy for racial uplift among both Indian migrants and black Africans. Control over East Africa and the Nile's headwaters, Johnston stressed to the Salisbury Government in 1901, "is necessitated by our regard for the political future of India." Johnston advised that "Indian trade, enterprise, and emigration require a suitable outlet," noting that "East Africa is, and should be, from that point of view an America of the Hindu."⁵³ The line then, amounted to "the driving of a wedge of India two miles broad right across East Africa."⁵⁴

Against this backdrop of encouraging non-white settlement in the region, European imperialists began to view tropical climates as unsuited to European exertion. In the view of Uganda's rulers, white settlers would inhabit parts of the British East Africa protectorate, but not the interior along the line of the railway, since, in the words of Sir James Hume Sadler the commissioner following Johnston, "I do not consider that Uganda will ever be a white man's

country in the sense that South Africa is and other parts of East Africa will prove to be. The climate is not conducive to European colonization.”⁵⁵ Indian migrants, British officials hoped, would cultivate the interior and initiate a process of racial improvement among the indigenous populations of East Africa by, Johnston imagined, “carrying the Indian Penal Code, the Indian postal system, Indian coinage, Indian clothing, right across these wastes ... tenanted hitherto by native savages or wild beasts.”⁵⁶

To that end, an enormous labor force of Indian Sikhs and Muslims were imported from the Punjab into Mombasa when construction on the line commenced in 1896. Between 1896 and 1902, a total of 31,983 Indian laborers were engaged for service by the railway, overseen by just 107 European technicians.⁵⁷ Locally engaged African laborers, driven into the labor market by hut taxes imposed in 1900, varying in number from 1,500 to 2,500 were also employed on the line for such tasks as clearing brush and levelling ground before the arrival of the Indian workers laying the track (Figure 2) – though in total Africans made up less than 20 percent of the mostly Indian labor force.⁵⁸



Figure 2. African and Indian laborers levelling ground before the arrival of track.

These workers not only battled dense, tangled roots and shallow stream courses, but the bites of chiggers and the tsetse fly, which spread “sleeping sickness” (African trypanosomiasis), a parasitic disease that results in fevers, headaches, and joint pains before causing neurological problems whose symptoms include confusion and trouble sleeping. Source: A.W. Read Collection, Weston Library, Bodleian Libraries, University of Oxford.

Indian recruitment ended in 1901 as track-laying reached completion, but the Protectorate’s Asian community proved invaluable in the lower rungs of the colonial administration, in local commerce, and on the railway as technical and service staff. As a result, the ABC inherited a number of migrant laborers. Lueder and the ABC used gangs of Indian workers as riveters on wages between twelve and forty-five rupees four to fifteen

dollars) a month with food; alongside these squads the ABC used several hundred black Africans as menial workers.



Figure 3. When construction began in 1896, the Uganda railway required enormous amounts of labor: 6,000 Indians, including 4,800 Punjabi Muslims; and 17,400 male and female Swahili-speakers, comprising 14,600 free persons, 2,650 slaves, and 150 prisoners. By 1921, Asian migrants to East Africa amounted to 54,400.⁵⁹ Source: A.W. Read Collection, Weston Library, Bodleian Libraries, University of Oxford.

The same labor circuits also converged on the Pennsylvania Steel Company's project in the Shan Hills of Burma. In Burma, the migration of Tamil and Telegu unskilled laborers from South India swelled rapidly as the colony became one of the world's largest rice

producers. Rice fields, paddy processing industries, timber yards, mineral oil refineries, and the railways were the chief sources of employment for these free and unfree migrants.⁶⁰ By 1901, Indian migrants constituted some 5.4 percent of the Burmese population and were concentrated largely in Lower Burma.⁶¹ The Burma Railways Company contracted Indian laborers to work on the Gokteik viaduct where they were overseen by thirty-five Americans from Pennsylvania Steel. Close to 500 Indian riveters pieced together more than 230,000 individual pieces of steelwork at \$17 per month.⁶² John C. Turk, in Burma as the chief engineer for Pennsylvania Steel, animalized the Indian workers as having “the same respect for their European overseers that sheep have for a collie.” The American workmen, he concluded, was equal to “at least four natives.”⁶³

Having been pulled into this web of Indian labor migration, the ABC’s engineers in Uganda posed as cosmopolitan race experts to imperial Britons and U.S. audiences alike.⁶⁴ “I had much to learn about handling, organizing, and providing for this exceedingly raw and barbarous material,” Lueder reported on his return to the United States.⁶⁵ Much to his frustration, and overlooking that the majority of laborers on the railway were contracted, Lueder found that “the coolie had a way of organizing himself as an individual striker and refusing to work.”⁶⁶ Lueder wrote approvingly that it had been necessary “to go back to old slave days” and to “act as police, judge, and executioner yourself.”⁶⁷ The punishment for striking – and the U.S.-managed side of the project was beset by strikes – was twenty-five lashes with a rhinoceros hide cane.⁶⁸

Yet the American engineers were not as adept as they portrayed themselves to U.S. audiences in technical journals and middle class magazines such as *World’s Work*. In March 1902, the chief engineer for the whole project, Sir George Whitehouse, wrote to the Railway Committee that “the Company have had considerable difficulty in working the Indian labour” and found that “practically all the Indian rivetters had struck work.”⁶⁹ The Americans,

Whitehouse wrote home again in June, “had no experienced supervision on their staff to look after the men that they engaged locally” and “many months were lost” as a result.⁷⁰

Coercive power over labor was systemic to both industrial management at home and to imperial capitalist expansion overseas. As American engineers adapted labor regimes between industrial contexts, they paid special attention to the management of non-white workers and developed a professional identity that centered on a self-proclaimed ability to manage native labor worldwide. Establishing ratios of productivity and profitability and designating competency at skilled and unskilled tasks between white and non-white workers were hallmarks of the identity of the transnational American engineer. The corporations employing elite engineers were tied to a variety of forms of unfree labor— be it the control of non-white laborers in the American West, the segregation of African-Americans, or the coercion of laborers in the Philippines and colonial contexts outside the United States.⁷¹ From these experience, and others besides, elite engineers staked claims to possessing unique knowledge of non-white capacity.⁷² ABC engineers were preoccupied by recruiting, managing, and disciplining laborers, with Lueder measuring the efficiency of Indian riveters at a ratio of “one American [to] five of the African or coolies.”⁷³ Americans found like-minded military and civilian engineers on British industrial-imperial projects who were similarly committed to the fiction that the “Anglo-Saxon race” embodied the practices of wise management. It wasn’t simply the case that empires provided an outlet for these activities, but key characteristics of professionalism were defined, and their prestige enhanced, through empire itself.⁷⁴

Amalgamation and Empire

Focusing on the Ugandan railway in this way also highlights new dimensions to the complex interconnections between empire-building and the expansion of American industrial capitalism. As Julie Greene has written, “U.S. imperialism and capitalism were profoundly intertwined,” but the empire did not simply supply the needs of U.S. corporations.⁷⁵ In the search for opportunity overseas, U.S. corporate capitalism found expansionist opportunities in collaborations with European empires and, in turn, sustained a global system of shared colonial labor management. In the case of ABC two innovations are of particular note. First, in 1899, in the midst of the spree of trust creation known as the “great merger movement,” American Bridge became an industry wide holding company when J.P. Morgan consolidated twenty-nine of the largest steel fabricators and constructors in the United States into one corporate structure. The new amalgamation accounted for 90 percent of the bridge tonnage erected in the United States.⁷⁶ This was growth by acquisition, not innovation. In 1901, ABC’s absorption into the newly formed U.S. Steel Corporation, encompassing 138 companies, strengthened this trend.⁷⁷ This marked a radical change in the competitive structure of American industry, prompting increased efficiency and technological innovation, that in turn incentivized economies of speed (in the case of steel it was cheaper to convert molten pig iron into steel, roll and shape it while still hot than it was to reheat it), meaning these new giants were able to break into foreign markets, and undersell foreign competitors, even at the expense of short-run losses.⁷⁸

Additional changes in the U.S. economy prepared the ground for the overseas expansion of U.S. steel. At the turn of the twentieth century, steel was used with increasing frequency in the construction industries, which boosted the production of large, standardized structural shapes to cater to the enormous volume of bridge building in the United States. Philadelphia’s Pencoyd Iron Works was one of the few firms rolling such shapes, and in 1899 it was one of the firms absorbed into ABC. Falling international freight rates, combined with

low-priced natural resources, an abundance of unskilled labor, and expertise acquired managing the massive economies of scale required for imposing corporate will over the natural environment of the American West were the keys to ABC's success.⁷⁹ Stated simply: mass-produced structural steel work enabled U.S. firms to reduce the manufacture of bridges to such simple terms that export prices - even to Britain's East African colonies - were not significantly higher than those of bridges erected in the United States.⁸⁰

Both Britons and Americans conceived of the mobility at the center of this story as "invasion."⁸¹ Of the British literature examining the so-called "American invasion", the shrewdest observers pointed out that it was U.S. corporations, not simply products, that dominated in almost every new industry. "The result of the formation of the trust has been to enable the Americans to produce at lower cost than ever before," wrote the Scots-Canadian journalist William McKenzie in his widely read and widely quoted work, *The American Invaders*.⁸² "American bridge competition is typical of the whole," he wrote, having "reduced the work to an exact science" with the result that "American bridges ... are cheaper, simpler, better designed, and can be much more rapidly constructed."⁸³

The language of invasion was in some ways an effort to extract a national story from the international entanglement at the center of capitalism's expansion. Yet the success of the American contract was as much attributable to the great engineers' lock-out between 1897 and 1898 – a thirty-week strike, involving some 25,000 engineers who slowed down the work of 702 firms that paralyzed Britain's heavy machine business – as the quick march of commercial invasion.⁸⁴ But, combined with the technical innovations prompted by corporate consolidations, it does reveal the capacity of American industry to fulfill global demands with great speed. A backlog in production kept British firms occupied, leading to long delivery times, and provided the opportunity for ABC to enter the marketplace. For the same reason thirty-six of the seventy locomotives deployed on Ugandan Railway were supplied by the

Baldwin Locomotive Works between 1899 and 1900.⁸⁵ Despite vigorous debate in the British press and among British colonial officials, the U.S. engines were deemed “better suited for rough work during construction.”⁸⁶ Transimperial connections, then, were as much about the relations between metropolitan economies as about peripheral entanglements. Similarly, the national was not undermined by transimperial connections but heightened by them, as the language of invasion reveals.

Conclusion

Britain’s grip on imperial power was consolidated by the co-option and contracting of U.S. industrial capacity and technological innovation. As the British sociologist Benjamin Kidd argued at the Royal Colonial Institute, it was “undoubtedly a fact, from the nature of our trade and the character of our fiscal system, that we even offer peculiar facilities” to the expansion of American firms. This left Britain “peculiarly open,” Kidd continued, to “being drawn deeply into the organization of trade and production now proceeding outwards from the United States.”⁸⁷ American firms exploited the overseas opportunities offered by the British Empire’s globe-spanning commercial infrastructure – without any of the expense of building and maintaining it. As one American observer surmised: “The United States can co-operate only with Great Britain in its material interests beyond its border. The expansion of England and its opening out of the world’s ports to commerce is *ipso facto* the expansion of American commerce without the cost of blood and substance to the United States.”⁸⁸

But the United States was less an upstart than it was an accomplice. By managing lucrative industrial contracts in the British imperial world, expansionist American corporations coproduced projects of imperial rule and their employees posed as the partners of British imperialists in the process of colonization. This expansion had not occurred

because of a grand strategic design, but through transimperial connections. By the turn of the twentieth century, US capitalism was enmeshed in transimperial patterns of migration, trade, capital, and industry central to the operation of imperial power around the world.⁸⁹ American corporations were both beneficiaries of the globalizing effects of transimperial connection and expert assemblers of the infrastructure that enabled traffic of various kinds to move easily across imperial boundaries. It was through these deep-laid transimperial relationships that the modern world system emerged.

Steve: This is going to be a central essay in the volume. Your research and analysis are revelatory. This is such original and important work. To those such as Greene who have pointed out that empire and capital have been intertwined, you say yes, but then you trace that story far beyond the study of a specific imperial formation. Some of your main finds: How even though some people in Britain regarded U.S. firms as leeches and threats, Britain relied on U.S. corporations to expand its empire, how U.S. corporations extended their reach through contracting with European empires (including to places not previously understood as being in the orbit of U.S. imperialism in this time period), how U.S. engineers worked to position themselves as imperial partners rather than lesser employees such as border-crossing South Asian workers, and how these transimperial relationships did more than just advance U.S. and British power (independent of each other) – they also helped create the modern world system, with its transimperial solidarities. Wow. I did some line editing to try to streamline some sentences and clarify some points. My two main questions are whether you think that continental expansion helped produce U.S. industrial might and engineering expertise and whether there are settler colonial origins to U.S. engineers’ conviction that they had expert racial knowledge to evaluate non-white productive capacity. If yes, adding a sentence on each topic would provide even more texture to this already multilayered essay.

¹ “American Contracting in Brazil,” *Engineering News* 9 (1882): 241; “American Bridges in Mexico,” *Engineering Record*, August 31, 1901, 196-97.

² This list was compiled from the *Album of Designs of The Phoenix Bridge Company* (Philadelphia: J.B. Lippincott & Co., 1885), 7-10; “American Bridges in Japan,” *Engineering Record*, December 23, 1899, 700.

³ Ian Tyrrell, *Crisis of the Wasteful Nation: Empire and Conservation in Theodore Roosevelt's America* (Chicago: University of Chicago Press, 2015), 26.

⁴ See for example, Ian Tyrrell, "Woman, Missions, and Empire: New Approaches to American Cultural Expansion," in *Competing Kingdoms: Women, Mission, Nation, and the American Protestant Empire, 1812-1960*, ed. Barbara Reeves-Ellington et al. (Durham, N.C.: 2010), 61; Ian Tyrrell, *Reforming the World: The Creation of America's Moral Empire* (Princeton: Princeton University Press, 2010), 80, 236-37; Emily Conroy-Krutz, *Christian Imperialism: Converting the World in the Early American Republic* (Ithaca: Cornell University Press, 2015).

⁵ Gary Magee and Andrew Thompson, *Empire and Globalisation: Networks of People, Goods and Capital in the British World, c.1850-1914* (Cambridge: Cambridge University Press, 2010); John Darwin, *The Empire Project: the Rise and Fall of the British World-System, 1830-1970* (Cambridge: Cambridge University Press, 2009).

⁶ *From Steelton to Mandalay* (Steelton, PA: Pennsylvania Steel Company, 1902); Paul Kramer, "Empires, Exceptions, and Anglo-Saxons: Race and Rule Between the British and United States Empires, 1880-1910," *Journal of American History* 88 (2002): 1327-30.

⁷ Stuart Sweeney, *Financing India's Imperial Railways, 1875-1914* (London: Pickering & Chatto, 2011), 28.

⁸ "Opening of the Atbara Bridge," *Illustrated London News*, September 2, 1899, 310. For the role of the Atbara Bridge in Kitchener's campaign against the Mahdist State see: M.W. Daly, *Empire on the Nile: the Anglo-Egyptian Sudan, 1898-1934* (Cambridge: Cambridge University Press, 1986), 202. Also operating across imperial boundaries, an Italian firm sunk the concrete piers in the powerful stream and eddying swells where the rivers met.

⁹ "American Bridges in English Colonies," *Engineering News*, November 28, 1885, 345; Walter Cook, "Erection of the Nairne Viaducts, near Adelaide, South Australia," *Minutes of*

the Proceedings of the Institution of Civil Engineers (1903): 185-87; “American bridge building in the antipodes,” *Engineering News*, January 14, 1882, 15

¹⁰ William T. Stead, *The Americanization of the World, or, the Trend of the Twentieth Century* (London: Horace Markley, 1902), 362.

¹¹ John Darwin, *Unfinished Empire: The Global Expansion of Britain* (London: Penguin, 2012), 178-88; Martin Thomas and Andrew Thompson, “Empire and Globalisation: from ‘High Imperialism’ to Decolonisation,” *The International History Review* 36 (2014): 145.

¹² Stephen Tuffnell, “Engineering Inter-Imperialism: American Miners and the Transformation of Global Mining,” *Journal of Global History* 10 (2015): 53-76; Jessica Teisch, *Engineering Nature: Water, Development & the Global Spread of American Environmental Expertise* (Chapel Hill, N.C.: University of North Carolina Press, 2011).

¹³ This was also true of the German Empire, see: Andrew Zimmerman, *Alabama in Africa: Booker T. Washington, the German Empire, and the Globalization of the New South* (Princeton: Princeton University Press, 2010).

¹⁴ Arthur Judson Brown, “The Opened World,” *American Monthly Review of Reviews* (October 1904): 461.

¹⁵ For landmark studies in these discussions see: Simon Potter and Jonathan Saha, “Global History, Imperial History and Connected Histories of Empire,” *Journal of Colonialism and Colonial History* 16 (2015): accessed November 27, 2016, doi:10.1353/cch.2015.0009; Martin Thomas and Andrew Thompson, “Empire and Globalisation: from ‘High Imperialism’ to Decolonisation,” *International History Review* 36 (2014): 142-170; Gareth Curless, Stacey Hynd, Temilola Alanamu, and Katherine Roscoe, “Networks in Imperial History,” *Journal of World History* 26 (2015): 705-32.

¹⁶ William Elliot Griffis, “America in the Far East II. The Anglo-Saxon in the Tropics,” *Outlook* (December 1898): 907.

¹⁷ Tuffnell, "Engineering Inter-Imperialism," 58-62; Stead, *Americanization of the World*, 361.

¹⁸ Julian Go, "Introduction: Global Perspectives on the U.S. Colonial State in the Philippines," in *The American Colonial State in the Philippines: Global Perspectives*, ed. Julian Go and Anne L. Foster (Durham, N.C.: Duke University Press, 2003), 21.

¹⁹ Thomas Bender, *Nation Among Nations: America's Place in World History* (New York: Hill and Wang, 2006).

²⁰ Potter and Saha, "Connected Histories of Empire;" Lynn Hunt, *Writing History in the Global Era* (New York: W.W. Norton and Company, 2014).

²¹ Alex Middleton, "French Algeria in British Imperial Thought, 1830-70," *Journal of Colonialism and Colonial History* 16 (2015): accessed November 27, 2016, doi:10.1353/cch.2015.0012.

²² See the chapter by Anne Foster in this volume; Laura Briggs, *Reproducing Empire: Race, Sex, Science, and U.S. Imperialism in Puerto Rico* (Berkeley: University of California Press, 2002), 33-38; Warwick Anderson, *Colonial Pathologies: American Tropical Medicine, Race, and Hygiene in the Philippines* (Durham, N.C.: Duke University Press, 2006), 99; Natalie J. Ring, *The Problem South: Region, Empire, and the New Liberal State, 1880-1930* (Athens, GA: University of Georgia Press, 2012), 209-11.

²³ Laura Ann Stoler, "Considerations on Imperial Comparisons," in *Empire Speaks Out: Languages of Rationalization and Self-Description in the Russian Empire*, ed. Il'ia Gerasimov et al. (Boston, MA: Brill, 2009), 44-5. Volker Barth and Roland Cvetkovski, "Encounters of Empires: Methodological Approaches," in *Imperial Co-operation and Transfer, 1870-1930: Empires and Encounters*, ed. Barth and Cvetkovski (London: Bloomsbury Academic, 2015), 9.

²⁴ Josep M. Fradera, "Reading Imperial Transitions: Spanish Contraction, British Expansion, and American Irruption," in *Colonial Crucible: Empire in the Making of the Modern American State*, ed. Alfred W. McCoy and Francisco A. Scarano (Madison: The University of Wisconsin Press, 2009), 34-63; Andrew Priest, "Thinking about Empire: The Administration of Ulysses S. Grant, Spanish Colonialism and the Ten Years' War with Cuba," *Journal of American Studies* 48 (2014): 541-58; Priest, "Imperial Exchange: American Views of the British Empire during the Civil War and Reconstruction," *Journal of Colonialism and Colonial History* 16, (2015): accessed November, 27, 2016, doi:10.1353/cch.2015.0015.

²⁵ Paul Kramer, "Power and Connection: Imperial Histories of the United States in the World," *American Historical Review* 116 (2011): 1365, n.50.

²⁶ David M. Pletcher, *The Diplomacy of Trade and Investment: American Economic Expansion in the Hemisphere, 1865-1900* (Columbia, MO: University of Missouri Press, 2009); Emily S. Rosenberg, *Financial Missionaries to the World: The Politics and Culture of Dollar Diplomacy, 1900-1930* (Cambridge, MA: Harvard University Press, 1999); Cyrus Veese, *A World Safe for Capitalism: Dollar Diplomacy and America's Rise to Global Power* (New York: Columbia University Press, 2002). As Paul Kramer has argued elsewhere, the category of informal empire has delimited the geography and conception of state power in U.S. imperial historiography, see: Kramer, "Power and Connection," 1374-75.

²⁷ Potter and Saha, "Connected Histories of Empire."

²⁸ H.G. Prout, "The Economic Conquest of Africa," *Engineering Magazine* (February 1900): 668.

²⁹ George S. Mackenzie, "Uganda and the East African Protectorates," *Fortnightly Review* (December 1894): 884; "Securing Uganda," *The Chamber of Commerce Journal* (June, 1895): 97-8.

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- ³⁰ “The Uganda Protectorate,” *The Chamber of Commerce Journal* (April, 1894): 4-5. Richard Huzzey, *Freedom Burning: Anti-Slavery and Empire in Victorian Britain* (Ithaca, N.Y.: Cornell University Press, 2012), 195-96.
- ³¹ Jan S. Hogendron, “Economic Initiative and African Cash Farming,” in *Colonialism in Africa, 1870-1960* 5 vols., ed. L.H. Gann and Peter Duigan (Cambridge: Cambridge University Press, 1969-1974), IV.313.
- ³² L.H. Gann and Peter Duigan, *The Rulers of British Africa, 1870-1914* (Stanford: Stanford University Press, 1978), 29, 279.
- ³³ Thomas Metcalf, *Imperial Connections: India in the Indian Ocean Arena, 1860-1920* (Berkeley: University of California Press, 2007), 203.
- ³⁴ Casper Andersen, *British Engineers and Africa, 1875-1914* (London: Pickering & Chatto), 57-86.
- ³⁵ *Africa No.1, Return of the Names of the British and American Firms who tendered for the supply of certain bridges for the Uganda Railway and the Amounts of the Various Tenders* (London: H.M. Stationary Office, 1901).
- ³⁶ Marc Linder, *Projecting Capitalism: A History of the Internationalization of the Construction Industry* (Westport, CT: Greenwood Press, 1994), 99.
- ³⁷ Henry Gunston, “The Planning and Construction of the Uganda Railway,” *Transactions of the Newcomen Society* 74 (2004): 64.
- ³⁸ *Ibid.*, 47; *Africa No.11. Final Report of the Uganda Railway Committee* (London: H.M. Stationary Office, 1904), 18.
- ³⁹ “American Bridge Building in Equatorial Africa,” *Engineering Record*, September 3, 1904, 310-11.
- ⁴⁰ “The Uganda Exploit,” *Boston Evening Transcript*, July 3, 1903; “Erection of the Uganda Railway Viaducts,” *Engineering Record*, August 2, 1902, 105.

⁴¹ George Whitehouse to Uganda Railway Committee (hereafter: URC), September 16, 1902, CO537/78, The National Archives, Kew, London (hereafter: TNA).

⁴² *Ibid.*

⁴³ R. Anderson to Whitehouse, April 10, 1902, CO537/77, TNA.

⁴⁴ Joseph M. Rogers, "The American Invasion of Uganda, *The American monthly Review of Reviews* (July 1903): 44.

⁴⁵ Whitehouse to URC, March 17, 1902, CO537/77, TNA.

⁴⁶ Whitehouse to URC, June 28, 1902; Anderson to Whitehouse, June 14, 1902, CO537/78, TNA.

⁴⁷ Whitehouse to URC, 11 June 1902, CO587/78, TNA.

⁴⁸ *Dun's Review*, January 4, 1902, 34; *Dun's Review*, January 11, 1902, 15.

⁴⁹ Joseph M. Rogers, "The American Invasion of Uganda," *The American Monthly Review of Reviews* (July 1903): 49.

⁵⁰ A.B. Lueder, "Building American Bridges in Mid-Africa," *World's Work* (June 1903): 3661.

⁵¹ "Foreign Industrial News," *Modern Machinery*, January 1, 1901, 12; Rogers, "American Invasion of Uganda," 44.

⁵² Metcalf, *Imperial Connections*, 166-87.

⁵³ *Report by Her Majesty's Special Commissioner on the Protectorate of Uganda* (London: H.M. Stationary Office, 1901), 7.

⁵⁴ Quoted in: Roland Oliver, *Sir Harry Johnston & the Scramble for Africa* (London: Chatto & Windus, 1957), 293.

⁵⁵ *General Report on the Uganda Protectorate for the Year Ending March 31, 1904* (London: H.M. Stationary Office, 1904), 28.

⁵⁶ Quoted in: Oliver, *Harry Johnston*, 293.

⁵⁷ Metcalf, *Imperial Connections*, 200.

⁵⁸ *Ibid*; Colin Newbury, "Historical Aspects of Manpower and Migration," in *Colonialism in Africa*, ed. Gann and Duigan, IV.525.

⁵⁹ Dirk Hoerder, "Migrations and Belongings," in *A World Connecting, 1870-1945*, ed. Emily S. Rosenberg (Cambridge, MA: Belknap, 2012), 543.

⁶⁰ Amarjit Kaur, "Indian Labour, Labour Standards, and Workers' Health in Burma and Malaya," *Modern Asian Studies* 40 (2006): 430.

⁶¹ *Ibid.*, 431.

⁶² *Steelton to Mandalay*.

⁶³ J.C. Turk, "Building an American Bridge in Burma," *World's Work* (September 1901): 1165.

⁶⁴ David Roediger and Esch, *The Production of Difference: Race and the Management of Labor in U.S. History* (New York: Oxford University Press, 2012).

⁶⁵ "The Uganda Exploit," *Boston Evening Transcript*, July 3, 1903.

⁶⁶ Lueder, "Building American Bridges in Mid-Africa," 3664.

⁶⁷ A.B. Lueder, "Experience in the Erection of American Viaducts on the Uganda Railway," *Engineering News*, April 14, 1904, 346.

⁶⁸ Lueder, "Building American Bridges in Mid-Africa," 3664.

⁶⁹ Whitehouse to URC, March 17, 1902, CO537/77, TNA.

⁷⁰ Whitehouse to URC, June 11, 1902, & September 16, 1902, CO537/78, TNA.

⁷¹ Michael Adas, *Dominance by Design: Technological Imperatives and America's Civilizing Mission* (Cambridge, MA: Belknap, 2006), 129-182; Roediger and Esch, *Production of Difference*, 11; Tuffnell, "Engineering Inter-Imperialism," 62-67; Marilyn Lake and Henry Reynolds, *Drawing the Global Colour Line: White Men's Countries and the International Challenge of Racial Equality* (Cambridge: Cambridge University Press, 2008).

⁷² See also: David R. Roediger and Elizabeth D. Esch, *The Production of Difference: Race and the Management of Labor in U.S. History* (New York: Oxford University Press, 2012), 98-135.

⁷³ “Uganda Exploit.”

⁷⁴ Magee and Thompson, *Empire and Globalisation*, 137.

⁷⁵ Julie Greene, “The Wages of Empire: Capitalism, Expansion, and Working-Class Formation,” in *Making the Empire Work: Labor & United States Imperialism* ed. Daniel Bender et al. (New York: New York University Press, 2015) 38.

⁷⁶ Linder, *Projecting Capitalism*, 98.

⁷⁷ Walter LaFeber, *The New Cambridge History of American Foreign Relations. Volume 2. The Search for Opportunity, 1865-1913* (Cambridge: Cambridge University Press, 2013), 176.

⁷⁸ Naomi R. Lamoreaux, *Great Merger Movement in American Business* (Cambridge: Cambridge University Press, 1985), 32-3; William H. Becker, *The Dynamic of Business-Government Relations: Industry and Exports, 1893-1921* (Chicago: University of Chicago Press, 1982), 1.

⁷⁹ Historians are yet to fully examine the connection between the extension of corporate control over the American West and subsequent expansion overseas. Mining historians have mapped some of the transnational relationships essential to the capitalist transformation of the west, see, for example: David Igler, “The Industrial Far West: Region and Nation in the Late Nineteenth Century,” *Pacific Historical Review* 69, no.2 (2000): 159-92; and Samuel Truett, *Fugitive Landscapes: The Forgotten History of the U.S.-Mexico Borderlands* (New Haven: Yale University Press).

⁸⁰ Linder, *Projecting Capitalism*, 99; “Presidential Address Before the Institution of Civil Engineers,” *Engineering News*, November 30, 1899, 355.

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- ⁸¹ Sebastian Conrad, *Globalisation and the Nation in Imperial Germany* (Cambridge: Cambridge University Press, 2010), 395.
- ⁸² Frederick A. McKenzie, *The American Invaders* (London: Grant Richards, 1902), 70.
- ⁸³ *Ibid.*, 75-6. See also the extensive analysis of Andrew Williamson in *British Trade and Foreign Competition* (London, 1894), 226-241.
- ⁸⁴ Frederick W. Emmett, "Physical and Economic Features of the Uganda Railway," *Engineering Magazine* (June 1901): 559; McKenzie, *American Invaders*, 74; B.P. Cronin, *Technology Industrial Conflict, and the Development of Technical Education in 19th-Century England* (Aldershot: Ashgate, 2001), 134, 145; "The British Defense of American Engineering," *Engineering Record*, 15 June 1901, 565-66.
- ⁸⁵ Gunston, "Planning and Construction," 57; *Africa No.11. Final Report of the Uganda Railway Committee*, 24. At the same time, 45 were bought by the colonial government in East India, *Iron Age*, April 20, 1899, 13.
- ⁸⁶ *Africa No.11. Final Report of the Uganda Railway Committee*, 24.
- ⁸⁷ Benjamin Kidd, "The State in Relation to Trade," *Proceedings of the Royal Colonial Institute* Vol.34, 1902-1903 (London: Royal Colonial Institute, 1903): 260.
- ⁸⁸ Charles Waldstein, *The Expansion of Western Ideals and the World's Peace* (New York and London: Bodley Head, 1899), 185-86.
- ⁸⁹ Paul Kramer, "Embedding Capital: Political-Economic History, the United States, and the World," *Journal of the Gilded Age and Progressive Era* 15 (2016), 331-62.