PROJECTING CAPITALISM

A History of the Internationalization of the Construction Industry

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The Imperialist Origins of the International Operations of U.S. Construction Firms

Statistics of exports from the United States to foreign countries fail to reveal the full indebtedness of American trade to American engineers and contractors. In Mexico and in South Africa, in Siam and in the Altai region, in Australia and in Peru, in Brazil and in China, the American mining engineer, railway builder, dredging contractor, the builder of bridges have left an indelible impress...1

Competing with European Firms

Whereas British construction firms internationalized their operations in advance of their industrial counterparts, the sequence was reversed in the United States. This lag was largely a function of the enormous demand for railway and infrastructure construction in the United States through the nineteenth century, which made external expansion unnecessary for contractors. Moreover, the major colonial powers—Britain, France, and Germany—made penetration of their “captive” colonial markets by U.S. firms difficult.

One of the first profit-making construction projects undertaken by U.S. entrepreneurs was the Panama Railroad. Undertaken in 1849 by William Aspinwall,2 a merchant and shipper with interests on the Pacific Coast, and New York capitalists in time to cash in on the Forty-Niners’ desire to reach California as quickly as possible, it established the stratified recruitment pattern, adopted later on a larger scale in excavating the Panama Canal, of reposing the United States as a source of engineers and skilled workers, while absorbing the unskilled from Europe and especially from the West Indies as the mainstay of its 7,000-man work force. The West Indian laborers ultimately proved to be cheaper than the thousand imported Chinese coolies, hundreds of whom allegedly committed suicide for lack of opium.3

U.S. construction contractors in the latter half of the nineteenth century built a number of single-use industrial railroads for U.S. producing firms designed to transport raw materials, such as hardwoods or manganese ore in Cuba.4 Phenomena typical of the periphery’s increasing dependence on the metropoles commonly underlay such projects. Thus, for example, the government of Peru,

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2 NYT, Jan 19, 1875, at 8, col. 3 (obituary).
4 “Railway Work in Cuba,” 33 EN 242 (1895).
seriously weakened as a result of its defeat by Chile in the saltpeter war, was constrained to enter into an agreement with Grace Bros. & Co., co-owned by William Grace, then-mayor of New York City, to settle its foreign debt. In exchange for a 66-year lease on two state-owned railroads, part of the annual guano output, and ownership of silver mines, Grace agreed to build a $10 million extension of the Oroya Railroad, begun by Meiggs in 1870, to reach "the grand objective, the famous silver mines of Cerro del Pasco, said to be the richest silver deposit in the world." In addition to building railroads in Chile, Colombia, Guatemala, Costa Rica, and Jamaica, U.S. firms also initiated but failed to complete a number of lines in Latin America during this period. Collins Brothers of Philadelphia, for example, began building the Madeira & Mamoré Railway in Brazil in 1878, but abandoned it when a quarter of its U.S. employees fell victim to sickness and accidents.

Once construction of Canadian canals and railways was underway by the mid-nineteenth century, the propinquity of the lines to the U.S. border, the interconnections of U.S. and Canadian routes, and the desire of U.S. firms both to use southern Ontario as a short-cut and to control a share of Canadian commerce all led to the participation of U.S. contractors in the building of the Welland Canal and Canadian railways such as the Grand Trunk and Great Western in the 1850s. Later, U.S. firms routinely carried out related projects in Canada in addition to erecting numerous large commercial buildings. Henry J. Kaiser, for example, began his construction business paving roads in British Columbia in 1914.

By 1880, Engineering News, a recently founded construction-engineering journal, heralded America's belated entry into imperialist competition: "The months now passing are the first flush times in which American capital is enlisted abroad." That year marked the onset of railway construction in Mexico as the "Boston capitalists who are pushing the Atchison, Topeka, & Santa Fe Rail Road system" built a line through Sonora in order to find an alternative route to the Pacific Coast in competition with the Huntington railroad interests. Construction of lines connecting the mining and agricultural regions of Mexico to the Southwest of the United States formed part of the Porfirista project of building capitalism with foreign capital. Because the vast majority of Mexican railroads had been

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13 EN 111, 361 (1885); 1 IDCH 547 (Thomas Derdak ed., 1988). On the later history of the railway and the silver mines, see Cleona Lewis, America's Stake in International Investments 237-38 (1938).

*William Curtis, "Railway Construction in Central and South America," 29 EN 616 (1893); William Curtis, "The Railroads of Central America," 10 RA 698 (1885); "Guatemalan Northern Railway," 36 EN 14 (1889); 78 Engineer 549 (1894) (James P. MacDonald of Knoxville, Tennessee secured contract to build line in Jamaica).

*The line was not finished until 1912. A. Hess, "Notes on a Costly Brazilian Railway Line," 68 EN 578 (1912).


**Mexican Railway Projects," 7 EN 321, 322 (1880).

*EN 255 (1880) (quotation); "The Mexican Railroads," 8 EN 88 (1881); Fred Powell, Railroads of Mexico 123-25 (1921); Lewis, America's Stake at 314-21; David Pletcher, Rails, Mines, and Progress: Seven American Promoters in Mexico, 1867-1911 (1958). For an overview of U.S. economic penetration of Latin America during this period, see Myra Wilkins, The Emergence of Multinational Enterprise: American Business Abroad 113-34, 149-72, 173-95 (1970).

*See Sergio de la Peña, La formación del capitalismo en México 163-86 (1977 [1975]); Steven
financed by U.S. capital, the accompanying increase in exports meant that increasingly "Mexico enters the world through the United States" rather than through Europe.14

By the turn of the century, U.S. capital investment in Mexico was estimated at a half-billion dollars, 70 per cent of which was directed to railways.15 The other leading U.S. construction-engineering journal, Engineering Record, reported that "[a]ll railroad construction in Mexico is carried on under the direction of Americans...."16 This U.S.-oriented railway network, four-fifths of the stock of which was concentrated in a few American hands, transformed the character of economic relations between the two countries. The new dependence expressed itself in the fact that, by 1910, the United States accounted for almost three-fifths of Mexican imports and three-quarters of its exports, which were largely minerals, timber, and agricultural commodities.17 The Mexican Southern Railway, for example, which was being promoted by ex-President Ulysses Grant—a vanguard of American imperialism in Mexico in the early 1880s—was to pass through Oaxaca, "full of valuable timber, with miles and miles undisturbed by the woodman's axe."18 Grant's assurance to Mexicans that such railways "would, in a brief time, make Mexico a rich and populous republic" remained unfulfilled.19

By the early 1880s, U.S. firms were building bridges in such remote locations as Brazil and Australia, shipping all the ironwork and erecting gear and crews from New York.20 As the gap in iron prices between the United States and Britain narrowed by the mid-1880s, U.S. bridge-building firms began ousting British firms in Latin America and even in the British colonies.21 By underbidding British and German competitors to secure the contract to build the largest bridge in the Southern Hemisphere in 1886, the technically challenging Hawkesbury Bridge in New South Wales, the Union Bridge Company of New York gave the European construction-engineering industry pause.22 Before the end of the century, the Phoenix Bridge Company of Pennsylvania erected numerous railway bridges in China, Korea, and Japan, while the Pennsylvania Steel Company, underbidding all its British competitors, built one in Burma.23

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21 See "The Verrugas Viaduct," 51 Engineering 460 (1891) ( erection gang sent from United States to build bridge on Oroya Railway in Peru); "American Bridges in English Colonies," 14 EN 345 (1885)
In 1899 a furor erupted—a British engineer chided the complaining businessmen: "This whining is un-English"—when the British War Ministry awarded a contract to Pencoyd Iron Works in Pennsylvania, which had already performed work in the Netherlands and Japan, to erect the bridge over the Atbara river in the Sudan for the railway that British and Indian military engineer troops, dervish prisoners of war, and indigenous fellahs subject to the corvée were building between Wadi Halfa and Khartoum. By completing the work much more quickly than could its British competitors, the U.S. firm (and the erecting gang it sent out from the United States) contributed to Britain's military reconquest of the Sudan.

In dedicating the bridge, the British commander-in-chief of the Egyptian army, Lord Kitchener, himself once a Royal Engineer, addressed the deep-seated trend that he saw as underlying this incident. The British firms' inability to supply such a large undertaking so rapidly "demonstrates that the relations between labor and capital in our country are not such as to give sufficient confidence to capitalists to induce them to run the risk of establishing great up-to-date workshops with the plant necessary to enable Great Britain to maintain her proud position as the first constructing nation of the world." A U.S. construction-engineering journal argued that although it was true that U.S. workers' wages were three times higher than their British counterparts while their productivity was four to five times greater, U.S. structural steel firms' chief advantages lay in the attention that they devoted to standardization, specialization, and organization as well as their permanent revolutionizing of the means of production.

In seeking to explain why British civil engineers suddenly preferred to do business with U.S. bridge builders, a leading British engineering trade journal concluded that British firms had not thoroughly integrated the three elements of engineering, steel manufacture, and erection:

It has been said that bridges are built by the mile in the States and cut off by the yard as wanted. This is not strictly true; but it is true that a great deal of work is done ready cut-and-tried in the offices of the best firm, and that they are always in a position to submit designs for any bridge.

Another such turn-of-the-century incident even triggered a parliamentary flap. The American Bridge Company was incorporated in 1899 to bring under the House of Morgan's unitary control twenty-five of the largest bridge-building firms (including Pencoyd Iron Works), which, however, as finished-steel companies, depended on other producers for most of their crude steel. The new amalgamation, which accounted for nine-tenths of bridge tonnage erected in the

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24"Engineer 128 (1901) (letter to editor from John Graham). "Probably no bridge contract ever gave rise to so much controversy....."
27"Lord Kitchener's Dedicatory Address," 40 ER 528 (1899).
29"The Atbara Bridge," 87 Engineer 543 (1899) (editorial). The journal also reprinted an article from the Philadelphia Record explaining that in the preceding three years the U.S. steel industry had invested in the most modern equipment. "The Secret of Our Manufacturers' Success in Foreign Markets," id. at 453.
30"PD (4th ser.) 500, 687-88 (1900).
United States, submitted the lowest bid (£135,000) to build thirty bridges on the British railway in Uganda, which required it to ship 6,000 tons of steel from New York to Mombassa. The company also sent to this location, "so remote from a skilled labor market," an erection gang consisting of a superintendent, seventeen skilled erectors, and a cook. The U.S. workers were paid twice their normal wages, which enabled some of them to buy "comfortable homes" on their return.

Under these Americans, literally, worked 150 Hindu riveters and carpenters and 150 African laborers, whose wages were less than a quarter of the Hindus'. Their vulnerable position proved too much of a temptation to American Bridge, a leader of the anti-union open-shop movement in the first decade of the twentieth century. Discovering a scope of freedom that cantankerous unions and occasionally enforced statutes precluded in the United States, the company's U.S. foremen found it "necessary almost to go back to old slave days" in their treatment of African workers. "They could be punished in no way except by the whip or by fining them," one of the firm's engineers boasted to the engineering profession: the most effective procedure was to "act as police, judge, and executioner yourself." Hand in hand with this atavistic attitude went American Bridge's disavowal of Brassey's approach to international labor: the company appreciated the "exceedingly cheap labor even if one good white man is equal to three or more Indians."

The enormous volume of bridgebuilding in the United States enabled the industry to attain a very high degree of development. The absorption of American Bridge by J. P. Morgan's newly formed U.S. Steel Corporation in 1901 strengthened this trend. Structural steel work designed by specialists and fabricated in "monster works" dedicated exclusively to it enabled U.S. firms to reduce the manufacture and erection of bridges to such simple terms that export prices "in almost inaccessible parts of the world" were not significantly higher than those of bridges erected in the United States. The British Institution of Civil Engineers heard a paper in 1902 by an engineer who had studied the Pencoyd plants in an attempt to understand the emergence of such strong U.S. competition. Among the salient differences, Henry Bridges Molesworth observed fewer union limitations on output, 24-hour a day operations, and greater scientific knowledge in the drawing room. At the U.S. Steel plant, moreover, "[e]ven comparatively new machinery, if superseded by anything better, is ruthlessly relegated to the scrapheap."
In 1902, U.S. Steel Corporation sought a new construction-related vehicle for expanding its exports. Its partner in this endeavor was George A. Fuller Company, which, when capitalized at $20 million the previous year, had become the largest construction firm ever organized in the United States. The two firms, high-ranking executives of each of which owned stock in the other, formed a trust, the U.S. Realty and Construction Company, in order to enter foreign fields, with the view of introducing steel construction in cities like London, Paris and Berlin. Although financial problems thwarted these plans, Fuller became the largest building firm in the United States with a virtual stranglehold on the construction of tall buildings in New York City, and in the 1920s succeeded in introducing steel-skeleton buildings in Japan.

The beginning of the new century witnessed yet another unmistakable manifestation of the emerging dominance of U.S. industrial capital. When the Westinghouse Electrical Manufacturing Company built the largest electrical machinery and engine factory complex in Britain near Manchester, The Times correspondent announced the appearance of a "new order," in which "British capital, British enterprise, and British engineering skill" would no longer hold sway. If the means of production housed in these $7 million facilities were not emblematic enough of the coming sea change, a U.S. firm also managed the quite uncommon feat of wresting away from British firms the contract for constructing the nine substantial buildings. The St. Louis firm of James Stewart and Company, founded in 1845 and thus one of the oldest construction firms in the United States, had specialized in grain elevator construction; it later incorporated in New Jersey in 1913, moving its headquarters to New York. In penetrating the English market, Stewart "pushed forward to completion with a rapidity probably never before attained in the construction of substantial steel and brick buildings." To the astonishment and disbelief of English employers, Stewart enforced a much faster pace of work, requiring the British workers, members of the Bricklayers' Union, to conform to the alleged U.S. norm of 1,500 to 2,500 bricks in nine and one-half hours as opposed to the customary 330 to 700 per day. Just a quarter-century earlier the economist Alfred Marshall had cited the Bricklayers as a union whose strength in large part derived from being unrestricted by foreign competition. Stewart achieved this output both by threatening to employ nonunion workers and by paying an hourly wage 15 per cent above the union rate. To sustain this level of output, Stewart described for The Times how, on another English project, the erection of a chimney at the Mersey Tunnel Power
Imperialist Origins of U.S. Construction Operations

Station at Birkenhead, he had used such innovations as double platform lifts that permitted quick transportation of the bricks up to the bricklayers while the other lift was descending.46

Although one member of the British Institution of Civil Engineers sought consolation in the fact that Americans were not always successful in competing for work in Britain,47 soon U.S. firms specializing in the export of structural steelwork were building bridges all over the world.48 Thus when the British Cleveland Bridge and Engineering Company built the world's highest railway bridge at Victoria Falls in 1904, the achievement prompted a national commercial sigh of relief: "It is a source of congratulation in these times, when we hear so much about the foreigner taking contracts that used to be secured by British firms."49 The British constructional steel manufacturing and erection industry was, moreover, hardly at the point of collapse. Its largest firms, such as Dorman, Long & Co., Ltd., which was integrated backward (into mines) and forward, remained internationally dominant for decades.50 Yet by the end of the nineteenth century, even Dorman, Long conceded that it was subject to severe competition from German and U.S. steel manufacturers.51

The Spanish-American War and the Construction of the Panama Canal

The United States had since the early 1880s sought a role among the Great Powers in East Asia and the Pacific Basin. In Korea, for example, "a rich but backward region far from the restraints of 'civilization,'" U.S. entrepreneurs began "playing for big stakes" as they joined their rivals in "grabbing all the resources of the country they could lay their hands on."52 After U.S. financiers gained control of the richest gold mines in Asia in the 1890s, the U.S. firm of Collbran & Bostwick built the first steam railway, electric railway, waterworks, and office building in Korea.53

The advent of so-called insular imperialism, that is, the assembly of a network of naval, coaling, and cable stations through the acquisition of Guam, Hawaii, the Philippines, and Wake positioned the United States to penetrate the Chinese market.54 Yet U.S. capital initially failed in its efforts to move beyond

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48See e.g., "The Quebec Bridge," 41 ER 391 (1900) (Phoenix Bridge Co.); "The Tula and the Chone River Bridges, Mexico," 50 ER 362 (1904) (American Bridge and Phoenix Bridge).

49"The Quebec Bridge," 41 ER 391 (1900) (Phoenix Bridge Co.).

50"The Quebec Bridge," 41 ER 391 (1900) (Phoenix Bridge Co.).


52"The Quebec Bridge," 41 ER 391 (1900) (Phoenix Bridge Co.).


54"The Quebec Bridge," 41 ER 391 (1900) (Phoenix Bridge Co.).
trade with, to large-scale investment in, China. Whereas entrepreneurs from the European Great Powers and Japan recognized that it was necessary to take a long-term view of railway construction as "the chief means of internal development in China, opening the way for greater investment of foreign capital and creating a large market for manufactured goods," U.S. financial consortia in the 1890s and 1900s lost several opportunities for building railways because "American capital was not yet competitive enough to accept the more marginal terms that European capital would risk."

The establishment of a formal U.S. colonial empire in the wake of the Spanish-American War, however, soon prompted U.S. construction-engineering firms to take advantage of the coalescing imperialist global financial, military, and political apparatus to challenge British, French, and German competitors. As the leading industry trade journal, Engineering News, editorialized at the conclusion of the Spanish-American War:

The course of recent events appears to indicate that within a few years the great empire of China may offer a new field to the American engineer and merchant, and that the overthrow of Spanish misrule and medievalism in the West Indies and the "Far East" will also lead to possibilities of rapid development of American interests in these smaller fields. Development in such cases means, first of all, the introduction or extension of the railway. While the American engineer in his own country has shown his ability to build light and inexpensive railways for development purposes...he has so far had but little opportunity to exercise this ability in other countries, with the exception of Mexico. It is true that he has built railways in the West Indies, in Central and South America, and in the Hawaiian Islands, and is building one in Korea, but most of these have been short lines, built to accommodate an existing traffic from mines, or along established routes of travel, rather than to serve as lines of general development.

Almost immediately Engineering News began carrying announcements, circulated by the U.S. diplomatic corps, of opportunities to build railways in Latin America. Thus in 1900 the U.S. consul in Para, Brazil, reported that the governments of Brazil and Bolivia were offering subsidies for the construction of railways that would "open up a new and important market for American goods and open up rubber belts and cattle lands, now inaccessible." Interested contractors were asked to contact the consul. Characterizing the railways in Central America as a "Peace Agent," Engineering Record proclaimed that "[the United States is necessarily obliged to exercise a sort of protection over the countries in question...in order to guide the development of their resources...."

Symbolically the U.S. government itself inaugurated overseas activities in the new century as the Army Corps of Engineers began building fortifications in the recently acquired Philippines and Cuba. The U.S. government insured that
the infrastructural projects in the Philippines, which were designed to move that country's economy toward dependence on the United States, also benefited U.S. construction firms. Thus during the first decade of the twentieth century, American Bridge erected a highway bridge, J. G. White & Company built a railway, and Atlantic, Gulf & Pacific Company undertook $4 million worth of harbor development in the Philippines.62

In order to facilitate exploitation of Cuba's natural resources, especially its iron ore and sugar, which U.S. firms had been mining and processing since the 1880s, the U.S.-owned Cuba Company built a major railroad across Cuba during the U.S. military occupation. More than half of the 10,000 construction laborers were imported from Spain in large part because they were "more docile" than U.S. workers.63 The U.S. Army's handling of a large contract for paving and sewerage in Havana was severely criticized as providing excessive profits to Michael Dady, a private contractor, who also happened to be a high officer in the Republican Party in Brooklyn.64 It was in occupied Cuba that the newly incorporated Snare & Triest Company began its overseas work. Founded in 1902 by Frederick Snare, a former vice president of Pencoyd Iron Works, it immediately secured a contract to build a pier at Matanzas "at a time when few American companies dared venture outside the boundaries of the United States." During the next half-century, Snare, which went on to build manufacturing plants, mills, bridges, power plants, ports, and terminals throughout Latin America, "obtained a larger proportion of the heavy construction contracts [in Cuba] than any of its competitors."65 In particular, it performed most of the construction work for the American & Foreign Power Company, a dominating entity in Cuba, as well as nickel production plants for Freeport Sulphur Company.66

U.S. firms operating in Latin America had no compunctions about using state force to disrupt the untoward workings of a free labor market. In the course of building the Guayaquil & Quito Railway in the first decade of the twentieth century, James P. McDonald Company of New York entered into an agreement with the Jamaican government for a supply of 3,500 Jamaican laborers who were to be paid 50 to 60 cents for a 10-hour day. When the company took umbrage at the workers' desertion for the local sugar plantations, the Ecuadorian government "came to the rescue" by criminalizing the employment of Jamaicans by anyone other than the railway contractors.66

The largest empire-building project carried out by the United States was the construction of the Panama Canal during the decade preceding World War I, "which called together the largest number of men that were ever employed at one time on any modern or medieval peaceful enterprise."67 Unlike the private capital that built virtually all other international infrastructure projects of the period "for what could be made out of it," the U.S. government did "not stand in the"
position of a private corporation with reference to the Panama Canal. It occupied its state-entrepreneurial role most prominently in engineering the "secession" of Panama from Colombia, which reduced the cost of building the canal considerably by creating a compliant client state.

Originally considered in the mid-nineteenth century as a means of opening the American West and as a tool in contesting British claims to Central America, when finally built, the Panama Canal was motivated by military and national and international economic considerations. The canal's military character has even been used to explain its origins as a public enterprise. As naval operations in the Cuban theater of the Spanish-American War showed, the canal would enable the U.S. Navy to transfer its fleets between the East and West Coasts much more expeditiously in order to administer the budding American empire. The extension of our territory to include the Hawaiian Islands and...the Philippines has made this connection most desirable for the proper exercise of governmental functions wherever they are to be discharged. Indeed, the Isthmian Canal has been interpreted as underlying the Spanish-American War itself: control of Cuba and Puerto Rico made it possible to ward off any European efforts to interfere with U.S. domination of the new canal.

The Panama Canal also assisted U.S. intercoastal trade: "The costs of transportation had for a long time restricted the volume of trade between the eastern and western sections of the country, but the canal has made possible the greatest freedom of interchange of commodities produced in both sections." Perhaps even more importantly, the canal would facilitate U.S. capital penetration of South America, which at the turn of the century still consisted of British "commercial annexes." The Panama Canal served to satisfy the economic necessities of securing raw materials from Asia and the Pacific coast of South America and competing with European capital for the export of manufactured commodities to those same regions. High transportation costs were seen as particularly damaging to U.S. interests on the west coast of South America, to which the United States accounted for only one-tenth of exports. The cheapening of freight made possible by the new canal would induce the building of railways, without which a successful mining industry, which was dependent on heavy and expensive equipment, was not possible. But once "the railroads thoroughly open up the Andean Plateau to the American capitalist and mining engineer...the return to capital...promises to be liberal." Although U.S. manufacturers of many products were already producing at lower cost than their European competitors, the Suez Canal had brought the latter closer to Asian markets than Atlantic and Gulf port exporters. Together with Suez, the Panama Canal thus effectively shifted the

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68 Peter Hains, "The Labor Problem on the Panama Canal," 179 NAR 42, 49 (1904) (brigadier general and member of Isthmian Commission).


74 Emory Johnson et al., 1 History of Domestic and Foreign Commerce of the United States 363 (1915).

75 V. W. Stead, The Americanization of the World: The Trend of the Twentieth Century 217, 221 (1902 [1901]).

hub of international sea routes back to the Northern Hemisphere.  

The U.S. version of an Isthmian Canal got underway a quarter-century after French capital had failed. The private Compagnie Universelle du Canal Interoceánique, directed by Ferdinand de Lesseps, who had also been the guiding entrepreneurial force behind the Suez Canal, initiated construction of a sea-level canal in 1880.  

Although mortality at Panama under the French regime did not approach the 120,000 deaths that Herodotus had assigned to an unsuccessful attempt by an oriental despotic regime to build a Suez Canal 2,500 years earlier, the deaths of perhaps as many as 30,000 West Indian, European, and U.S. workers did considerably exceed the 10,000 Chinese, Chileans, and Peruvians who had died building the Oroya Railway in the Peruvian Andes in the 1870s under Henry Meiggs, who "was not sufficiently careful of the health of his workmen."

The majority of Panama Canal laborers were recruited from Jamaica, Martinique, and Colombia. So plentiful was the supply that Engineering News alerted its readers that from Jamaica "it would seem that negroes may be had ad libitum (a wink for contractors in Southern climes)."

Although Lesseps's Canal Company furnished the laborers and housing and often the machinery as well, "all but a fraction of the labor force worked for the contractors." This apparent fractionation of the work force was magnified when the French prime contractor, Couvreux, Hersent et Compagnie, withdrew in 1882 in favor of a multitude of subcontractors. Couvreux had also built the Suez Canal, introducing there the first excavating machines, which it then developed further in projects at Vienna and Antwerp in the 1860s and 1870s. Among the dredging and excavation companies receiving the bulk of the contracts at Panama were several Dutch, French, Swiss, Swedish, English, and Colombian firms. In particular the San Francisco firm of Huene, Slaven, & Company, later known as the American Contracting and Dredging Company, which had the world's largest excavation equipment specially built for its sections of the canal, secured huge profits—"[t]he profits of these dredges at Panama have been fabulously great; so great that we do not like to put them on record in cold print"—before the entire undertaking collapsed.

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"Possibly anticipating the emergence of an American Palmerston, one of the leading British construction-engineering journals cautioned de Lesseps that even if he could show the United States "that the canal would be a paying concern when once completed, and if all the world were under one master this might be sufficient to get the capital to do it with...[nevertheless] there are many masters, and their interests are not exactly the same." "The Panama Canal," 48 Engineer 150 (1879) (editorial).

"Herodotus, Historiae, 2.158, James Breasted, A History of Egypt 487-88 (1905)." See also Karl Marx, 1 Das Kapital: Kritik der politischen Ökonomie 315-16 (1867).


"9 EN 167 (1882).

"McCullough, The Path Between the Seas at 159. According to Charles Jameson, "Notes on the Panama Canal," 16 EN 202 (1886), 60 per cent of the workers were "negroes" from Jamaica and Martinique and 20 per cent from Colombia.

"10 Les Travaux du canal de Panama," 4 GC 1, 3 (1883); "The Panama Canal Finances and Contracts," 10 EN 365 (1883); Max de Nansouty, "Travaux du Canal de Panama: Les Excavateurs," 13 GC 131-35 (1888); McCullough, The Path Between the Seas at 170, 148-51.

"11 "The Panama Canal," 13 EN 168 (1885) (listing the firms and the value of their contracts).

"See "Nicaragua and Panama," 20 EN 31, 32 (1888) (editorial) (quotation); "The 'Hercules Dredgers' for the Panama Canal," 10 EN 49 (1883); "Canal de Panama: Dragues du type américain 'l'Hercule'...

"See "The Panama Canal," 15 EN 88 (1886) (explaining how contracts permitted contractors..."
Despite the use of the most advanced dredging and excavation machinery ever deployed, the mistaken choice of a sea-level rather than a lock canal and financial failures in the 1880s ultimately led to termination of the French project, thus enabling the U.S. government to undertake and complete the monumental work. Against the background of the scandals surrounding the French project, Engineering News applauded the intervention of the state: "We have escaped the danger this great work might be turned over to a syndicate of capitalists to handle as they pleased, which means in such a manner as would yield them the largest profit on the sale of securities and the work of construction." To be sure, the journal was also constrained to acknowledge that there were in any event no contractors large enough to bid for the whole contract and to give sufficient financial guarantees.

The U.S. governmental construction organization deployed even more powerful excavation machinery than had the French—including steam shovels, unloaders, spreaders, and trackshifters. They all contributed to the creation of Lake Gatun, which inundated twenty-five villages and dispossessed thousands of meagerly indemnified inhabitants. This unprecedented capital-intensity notwithstanding, the project at its peak in 1913 still absorbed the labor of 45,000 workers. The West Indies furnished the largest contingent. Indeed, virtually the whole adult male population of Barbados deemed physically acceptable by the U.S. recruiters worked at some point in Panama. The suggestion that Blacks from the U.S. South be employed was rejected by southern congressmen, who objected to the untoward consequences that such a drain would have on their employing constituents' source of cheap labor.

In mustering the possible sources of labor, canal construction supervisors substituted racist-genetic rhetoric for Marx's political-economic and cultural account of the differential intensity and productivity of labor between workers from advanced capitalist and not-yet capitalized societies. Avoiding direct comparison, they argued, for example, that West Indians were constitutionally incapable of the performance of what would be considered a day's work in the United States. The best that railroad contractors have ever been able to get out of colored day laborers in the tropics is one third of what the average white man will accomplish in the Temperate Zone....

European observers parroted these sentiments. Thus Eugen Tincauzer, a...
Prussian state engineer who was one of the non-American members of a board of consulting engineers appointed by President Theodore Roosevelt to advise the Isthmian Canal Commission, justified the racial wage differential on the ground that "so long as the Negro still has a dollar in his pocket he won't work"; higher wages would therefore only lead to greater absenteeism. An English engineer combined paternalistic contempt for the "naturally lazy" West Indian workers with patronizing contempt for their upstart masters: "The American foremen and overseers...are under the fallacious impression that showers of abuse, or acts of violence, will command obedience and stimulate the energy of their gang. They quite fail to understand that under two centuries of British rule the West Indian negro has been subjected to kindness and strict justice, under protection of unbiased law courts."

To be sure, by the end of the project, these very supervisors acknowledged that West Indian workers had become as productive as their European counterparts—if only because the latter's output deteriorated as a result of their prolonged stay. As measured by the rigid racially segmented division of labor and wage structure, which placed all white Americans among the higher-paid skilled and all nonwhite non-U.S. citizens among the low-paid unskilled workers, this refusal to accommodate prejudice to experience proved to be a valuable cost-cutting device. By the same token, employment of Spanish workers also helped to reduce state expenditures on the Panama Canal because while "worth relatively three times as much" as West Indians, they were paid only twice as much.

**World War I and the U.S. Breakthrough to Capital Exporting Status**

England's pioneers in all cases were the engineers and their co-workers, the contractors. ... We now have the material basis, surplus funds, for foreign expansion.94

The eruption of European capitalist rivalries in World War I coincided with and overshadowed the opening of the Panama Canal.99 A turning point in many respects, the war (which enabled U.S. Army Engineers to carry out building projects in Europe for the first time),100 definitively shifted the focal point of world capital accumulation to the United States. "With all the other industrial countries of the world busy destroying one another"101 and withdrawing their capital from their far-flung enterprises, especially in Latin America, internationally oriented American capitalists decided to seize the unique but long-awaited opportunity to project U.S. capital overseas.102 In November 1915 a group led by Frank Vanderlip, the president of National City Bank, and including the most important industrial and financial capitals in the United States founded (and capitalized at $50 million) the American International Corporation. The New York Times immediately hailed it as "by far the most ambitious attempt that has ever
been made to put the United States among the ranking nations in world commerce and finance." Promoters and directors included representatives of the House of Morgan, Standard Oil, Chase Bank, National City Bank, Anaconda, Armour, McCormick, International Nickel, General Electric, American Telephone & Telegraph, and Grace.

American International was established, inter alia, to promote the construction of infrastructure abroad. Until that time, the United States had "figured little in construction work in South America, Russia, or the East. That was because we ourselves were borrowers of capital." The two major exceptions were Stone & Webster Engineering Corporation and J. G. White Engineering Corporation. Before embarking on overseas projects, both firms had gained significant experience financing electric light and power companies in the United States. Stone & Webster, which began as consulting engineers in 1889, soon branched out into construction. During the depression that began in 1893, bankers planning to buy up unprofitable electric utilities co-opted Stone & Webster, which had already been managing and supervising public utilities. The firm's capacity for raising capital for utilities secured it an advantageous position in obtaining contracts for construction. At first Stone & Webster marketed clients' securities for a service commission; later it evolved into an underwriter and investment banker. This domestic financial strength enabled Stone & Webster to work in a similar manner overseas.

Operating on a much smaller scale, J. G. White & Co., Inc., which started out in electric power construction engineering, also combined management of utilities with investment securities dealing and bond distribution. By 1913, J. G. White Engineering already maintained offices in London, Para (Brazil), Buenos Aires, and Santiago for its work in designing and constructing hydroelectric and electric light and power projects, and electric railways.

World War I quickly transformed the configuration of international capital flows. As the president of American International, Charles Stone, an owner of Stone & Webster, explained to U.S. construction firms, with the growth in U.S. manufacturing exports, "surplus capital" would have to seek "employment abroad...in world-development work."

The development of a country is essentially an engineering task—the building of railroads, of ports, of municipal works, of public utilities. England's mechanical and engineering superiority in the early part of the last century, combined with her wealth, fitted her admirably for such development work. Great firms sprang up that carried British engineering genius to every part of the world—and where England's engineers went and invested English gold, English trade followed.

103 "Raise $50,000,000 for World Trade," NYT, Nov. 23, 1915, at 1, col. 1. See also 72 ER 745 (1915) (editorial) ("the greatest single step taken by American business to cope with the problems of international trade"); Harold Cleveland & Thomas Huertas, Citibank 1812-1970, at 91-94 (1985).


105 "Raise $50,000,000 for World Trade" at 6, col. 6.


Imperialist Origins of U.S. Construction Operations

Today such great firms as S. Pearson & Son, Ltd., engineers and contractors both, continue to serve as the pioneers for English trade expansion, for trade follows investment, and these firms build English investment money into public works, utility systems and industries.

Powerful German engineering and construction companies, such as Philip [sic] Holzmann Aktiengesellschaft, have developed, too, and their work forms the basis of greater German trade.

One obstacle to the propulsion of U.S. construction capital onto the world market was peculiar to the mode of financing public works in Europe and South America. In Latin America such projects were 'let only to contractors who are prepared to accept payment in bonds that do not have a ready market.... Only one American firm, Wm. R. Grace & Company, ever carried out this system on the large scale and with the financial resources that European houses have found profitable.' In Brazil, for example, most railway construction in the beginning of the twentieth century was financed by French, German, and English bankers who held Brazilian government bonds and had an understanding that their representatives would be given the contracts for the construction. Consequently, 'The success of American contracting firms will depend...upon their ability to interest American capital in the Brazilian field in other lines' such as founding a bank.

John Aird's work on the Aswan Dam at the turn of the century furnished another example of the kind of financing that had become necessary in international construction yet remained inaccessible to U.S. firms. Aird's contract provided that the £2 million were to be paid in sixty semi-annual installments not to begin until the work was completed. The Egyptian government issued bonds payable over thirty years, which the wealthy British financier Ernest Cassel, who was heavily invested in Egypt, took over, thus permitting the contractor to be paid in cash on the usual monthly certificates.

Overcoming these kinds of financial obstacles was the avowed purpose of American International. By enabling construction firms to dispose of the bonds taken in payment for their work, American International was designed to make it possible for them to compete on the world market. Within months of its establishment, in 'one of largest contracts ever placed with an American firm' in South America, American International provided the financing for Ulen Construction Company to build waterworks and sewerage systems in several cities in Uruguay.

Several of American International's founders had long cultivated an intense interest in investment in and trade with China. A subsidiary of American

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109 Stone, "Engineer's Relation to Foreign Expansion" at 6.
112 Maurice Fitzmaurice, "The Nile Reservoir, Assuan," 152 MIPE 71, 77 (1903), DNB 1912-1921, at 97, 98 (1927) (s.v. "Cassel").
113 "Will Help American Contractors in Handling Work in Foreign Fields," 73 ER 93 (1916) (interview with Willard Straight, vice president of American International). On American International's later development (it was merged with Adams Express in 1969), see Cleveland & Huertas, Citibank at 368 n.25.
114 "American $5,500,000 Contract for Work in Uruguay," 75 EN 858 (1916); "International Corporation Will Finance Uruguayan Work," 73 ER 496 (1916).
International, Siems-Carey Canal and Railway Company, promptly secured a contract to rebuild the world’s oldest and longest canal, the Grand Canal in China. Although this project eventually came to nought, the British engineering-construction industry quickly noticed that its U.S. competitors had begun to use credit to overcome what it had theretofore been its greatest competitive obstacle—insistence on immediate payment in dollars.117

In the aftermath of the devastation of World War I, governments in Europe, especially France, after initial resistance, awarded some contracts to U.S. firms for reconstruction.118 To the ultimate disappointment of U.S. contractors, however, domestic firms performed the vast majority of the work.119 Elsewhere in Europe, however, U.S. firms did gain a foothold. The Foundation Company, for example, which was founded in 1902 and maintained branch offices or performed work in Peru, Chile, Bolivia, Argentina, and Colombia, incorporated a separate entity, Foundation Company (Foreign), in 1925 to carry on projects in the rest of the world including France, Spain, Italy, and Japan.120 It built the library of the university in Louvain, Belgium, in addition to performing drainage work in Greece and subway excavation in England. Other companies built grain elevators in Bulgaria and government buildings in Turkey.121

In a move of greater long-term significance, U.S. industrial companies operating overseas began to entrust non-infrastructure projects to U.S. building firms.122 Thus in 1920 Standard Oil contracted with the Austin Company of Cleveland to build several standard factory units for distribution centers in Turkey, Bulgaria, and Greece.123 Austin, which had been incorporated in 1904, pioneered the standardized steel-frame factory building in the United States in the course of constructing a large number of electric lamp factories in the years before World War I. In addition to exporting prefabricated structures to Europe and South Africa, Austin also undertook the reconstruction of Belgian glass plants destroyed during World War I.124 A decade later U.S. Corn Products Refining Company selected H. K. Ferguson to build its factory in Korea.125 By the late 1920s, with the onset of Stalin’s gargantuan accelerated industrialization program, U.S. construction-engineering firms such as Badger, Lummus, Foster-Wheeler, J. G.

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118 See "Are We Wanted in France and Belgium?" 82 ENR 2 (1919) (editorial); "Are American Engineers and Contractors Wanted in France?" id. at 31; "$200,000,000 French Contract to American Firm," id. at 1231 (Vulcan Steel Products Co. co-opted MacArthur Bros. and McClintic-Marshall Co. to perform construction work with French workers).


121 "Foreign Work Being Done by New York Contractors," 88 ENR 672 (1922); "Foreign Contracts Awarded to American Contractors," 93 ENR 650 (1924); "Foreign Contracts Awarded to American Concerns," 95 ENR 897 (1925).

122 The plant that Ford built in Argentina in 1919 was designed by Albert Kahn, the leading U.S. industrial design firm, but construction itself was supervised by a Ford employee, R.R. Brown, although it is unclear whether the work was done by force account. Myra Wilkins & Frank Hill, American Business Abroad: Ford on Six Continents 93-94 (1964).

123 "Lets Contracts for Buildings in the Levant," 84 ENR 299 (1920) (Standard Oil’s own erecting force was also involved).


White, and Kellogg began competing with European and especially German firms for contracts to build roads, hydroelectric dams (including Dnieprostroy), and industrial facilities in the Soviet Union; during the 1930s, Soviet industrialization provided crucial demand for Western firms and employment for thousands of unemployed engineers and construction workers seeking refuge from the worldwide depression.126 The best known of these projects were the construction by Austin (and Ford Motor) of an automobile factory at Nizhni Novgorod and McKee Corporation’s construction of the world’s largest steel complex at Magnitogorsk.

U.S. construction firms even managed to penetrate the Japanese construction market. Using technology developed in the United States, Stone & Webster, for example, built a hydroelectric plant in Japan in 1920.128 In the same year the Japanese government invited the George A. Fuller Company to organize a branch in Japan to build and to instruct Japanese contractors and engineers in U.S. methods. The George A. Fuller Company of the Orient, Ltd. began work on four steel-frame office buildings, including two in Tokyo for the Tokyo Steampship Company and the Japan Oil Company. Importing the machinery and materials from the United States, the firm employed a skeletal staff of U.S. skilled workers and supervisors together with Japanese laborers.129 No sooner had these buildings been erected than the monumental earthquake of 1923 put them to a severe test, which they passed structurally.130 The early 1920s also saw Mitsui hire James B. Stewart & Company to build a bank and other office buildings in Tokyo, while Foundation was awarded a contract for $82 million to build an underground electric railway in Tokyo, and Westinghouse built railway electrification facilities.131 Other U.S. firms built bridges in Japan in the 1920s.132

While the U.S. Navy Civil Engineer Corps was occupied with a far flung empire extending from Haiti to Guam and the Army Engineers were building roads in Cuba,133 U.S. construction firms began to profit from the infrastructural

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128 “U.S. Firm to Build Hydro-Electric Plant in Japan,” 84 ENR 299 (1920).

129 “U.S. Contractor to Erect Office Buildings in Tokio,” 84 ENR 597-98 (1920); “Constructing Modern Office Buildings in Japan,” 89 ENR 476-78 (1922).

130 “Structural Lessons Learned from Survey of Steel-Frame Buildings After Japan’s Earthquake,” 91 ENR 728 (1923). In the aftermath of the earthquake, the Japanese-American Engineers’ and Contractors’ Corp. was organized to participate in the reconstruction. “Organize Big Company to Reconstruct Tokyo,” 92 ENR 135 (1924).

131 “Foreign Projects Awarded to American Contractors,” 93 ENR 650 (1924).


133 See e.g., P. Searles, “Difficulties of Construction Work on the Island of Guam,” 97 ENR 106 (1926); “Activities of Navy Civil Engineering Corps Tabulated for Fiscal Year,” 101 ENR 586 (1928); “The Great
projects in South America that U.S. finance capital was making possible. Vanderlip, the chairman of American International, promoted bank credit for Latin America as a means of ousting European capital. In 1920, Foundation secured a $50 million contract for construction of waterworks and sewerage systems in Peru. The 1920s also saw R. W. Hebard & Company of New York build highways in Colombia and Panama and a railway and roads in El Salvador, while Turner Construction Company performed worked for the Standard Oil Company of New Jersey in Cuba. Winston Bros. Company built a railway in Colombia, and Simmons Construction Corporation of Charlotte, North Carolina secured a large road contract in Costa Rica. Raymond International, a firm that had secured contracts in Canada, Mexico, Chile, and Argentina beginning in 1907, owed its strong market position to its having patented the cast-in-place concrete pile—that is, driving hollow steel shells to the required depth and then filling them with concrete to avoid the damage otherwise associated with pile driving. By the 1920s it was performing port and other work throughout Latin America as well as in the Philippines, Sumatra, China, and Japan, where it built an electric station at Yokohama.

Other firms performed road work in Peru as well as a variety of work in Canada and the Caribbean. They built warehouses, docks, piers, and yacht clubs in Cuba, hotels in Nassau owned by U.S. companies, the U.S. embassy in Brazil, and modern steel office buildings in Buenos Aires. In Mexico, too, U.S. firms continued to build railways (for the Southern Pacific) and pave roads during the 1920s, although even the largest U.S. firms were often underbids by Mexican competitors.

In addition to such activities performed by construction firms, U.S. multinational firms engaged in the private corporate counterpart to the departmental system of railway construction adopted by colonial governments. In South America, mining and power companies carried on major construction projects by force account, while the Firestone Rubber Company built a power dam and its own highways on its huge rubber plantations in Liberia and from it to the coast.

During the international "obesely lucrative...orgy of lending" after

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Road Improvements in Cuba," 57 ER 240 (1908).

133See 90 ENR 805 (1923).
138"Foreign Work Being Done by New York Contractors," 88 ENR 672, 1083 (1922); "Foreign Work Being Done by New York Contractors," 89 ENR 634 (1922); "N.Y. Firm Gets $35,000,000 South American Contract," 92 ENR 952 (1924) (George E. Nolan Co.).
139"Foreign Contracts Awarded to American Contractors," 93 ENR 650 (1924); "Foreign Contracts Awarded to American Contractors," 95 ENR 897 (1925); "Large Contract for Highways Reported Let in Mexico," 110 ENR 510 (1933) (Warren Brothers and Foundation submitted higher bids).
large U.S. construction firms, in association with U.S. banks, further implemented the program outlined by American International in financing overseas public works projects. As originally foreseen: "In some cases the projects may have to be suggested, and the people of the country educated up to an appreciation of the expediency of undertaking them." Although the construction firms charged exorbitant prices and reaped enormous profits, the crash and depression at the end of the decade revealed the risks inherent in this internationalizing strategy. Ulen & Co., which was founded in 1922 by American International, Stone & Webster, and Ulen Contracting Company to carry out work in South America, proceeded in this manner to manage the building of tramways, gas and waterworks, and ports in Athens, Warsaw, and Latin America. It derived its profits primarily from fees and bonds. Bolivian government bonds financed Ulen's construction of a state-owned railway in the 1920s. Chile secured $200 million in loans from U.S. banks for infrastructure projects such as waterworks, railways, and ports, which Ulen, Foundation, and Warren Brothers Company carried out. The riskiness of Third World operations during the Great Depression was demonstrated by the fact that Ulen declared bankruptcy between 1939 and 1941.

Warren Brothers, the largest highway construction firm in the United States, was another internationally oriented U.S. building firm during this period that was originally launched on a patent—for paving material—in 1900 after several decades in the coal tar and oil business. Warren, which both manufactured "bitulithic" pavement and owned several foreign subsidiaries including ones in Argentina, Chile, Guatemala, Europe, and Australia, performed road and paving work throughout Latin America. During the late 1920s and 1930s, it also did paving in Spain and Poland.

In 1927, Warren secured a contract for $75 million to pave 481 miles of the 700-mile Central Highway in Cuba, assertedly the longest paved road ever put under contract until that time. The remaining 211 miles were awarded to the Compañía Cubana de Contratistas, which gave the Cuban president, General Gerardo Machado, and his friends "a magnificent opportunity...to enrich themselves." The highway, which the firm advertised as The Largest Highway Contract in History, was touted as enabling American tourists to indulge their
pastime of "driving through the country in their own cars" which they were wont to ship ahead.\(^\text{152}\)

On its section Warren Brothers employed 5,000 workers. Unlike the standard pattern for overseas construction projects, the contract negotiated by the Cuban government limited the role of foreign workers: three-quarters of the workers were required to be Cuban. Warren reported that only a small number of skilled Americans worked on the highway. In order to take advantage of Henry Kaiser's highway equipment, Warren also sublet a $20 million section to Kaiser Paving Company, of which it was majority owner and with which it had both competed and cooperated on projects in Canada. Kaiser had, until this time, been well known in the West, but had not been "even remotely in the 'big time.'" The Central Highway—Kaiser Paving's share of which was triple the firm's total volume of business during its previous 14-year existence—became a "turning point" for Kaiser: it was his last large road project before advancing to more complex types of heavy construction. The year after Kaiser's firm completed its section of the highway, it included Warren in the company that Kaiser and Warren Bechtel formed to participate in building Boulder Dam.\(^\text{155}\)

The *Carretera Central* was recognized at the time as an extravagant public works program "which would have been a luxury in the wealthiest country"; on a per capita basis, its cost would have been the equivalent of a $3.5 billion highway in the United States.\(^\text{154}\) Although the highway was persiflaged at the time as being ballyhooed into "Pharaonic" proportions,\(^\text{155}\) later socialist and anti-socialist authors agree that the incorporation of several rich agricultural zones into the national market depended on the completion of the highway.\(^\text{156}\)

Because the Cuban government had manifestly overextended itself in light of its reduced revenues in the latter half of the 1920s, a question arises as to why Warren Brothers, which protested to the U.S. government in 1929 when rumors of impending action against the dictator Machado were circulating,\(^\text{157}\) and the Chase National Bank, which was closely aligned with Machado, employed his son-in-law as manager of its Cuban branch,\(^\text{158}\) and financed construction through a complicated series of loan transactions, entered into this deal. U.S. firms saw a guarantee of security in Cuba in the neocolonialist financial, trade, customs, and military control that the United States had assembled there.\(^\text{159}\) These controls included the "right to intervene" that the United States had arrogated to itself and imposed on Cuba in the form of the Platt Amendment, the large accumulation of U.S. investments, and Machado's probusiness attitude. After Machado's
terroristic rule led to his ouster in 1933, a successor government suspended payments, causing Warren Brothers to file for bankruptcy, from which the firm emerged in 1942 after having settled with the Cuban government.

Major integrated U.S. bridgebuilders such as John A. Roebling & Sons and American Bridge carried on work throughout Latin America in the 1930s. Frederick Snare Corporation built a deep-water port at Cartagena, Colombia, while Ulen constructed a dam in Chile. And once the United States began co-financing the Pan-American Highway in the 1930s, U.S. road and bridge builders secured significant contracts in Latin America supervised by the U.S. Bureau of Public Roads.

By the time of World War II, then, U.S. construction firms had developed a considerable volume of overseas operations. This new international orientation was symbolized by the creation in 1928 of what was "perhaps the largest construction firm in the world." United Engineers and Constructors, Inc., the result of the merger of Public Service Production Company (Newark), United Gas Improvement Contracting Company (Philadelphia), Day & Zimmerman Engineering & Construction Company (Philadelphia), and Dwight P. Robinson & Company (New York), was expressly "formed to operate in any part of the world" in every type of construction-engineering. The firm's construction of the Buenos Aires subway in 1931 was merely one among its many overseas projects.

In spite of the macro-political-economic importance of this whole range of intensified internationalization in the wake of World War I, overseas projects nevertheless accounted for "but a small percentage of the average annual volume" of aggregate U.S. construction. By the same token, however, these projects also expanded export markets for U.S. producers of steam shovels, grading equipment, steel rails, pipes, and rolling stock. Among the most proleptic of

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Cuba at 383-87, 390-91, 395.

For a characterization of Machado's dictatorship and of the political forces that led to his expulsion, see Jürgen Heil, Kurze Geschichte des kubanischen Volkes 220-76 (1976).


See e.g., Charles Jones, "The San Rafael Bridge in San Domingo," 112 ENR 249 (1934); "Plan Unique Over South American River," 129 ENR 605 (1942); "Open Largest Central American Suspension Bridge," id. at 74. Roebling did not perform work outside the United States until the 1930s. Hamilton Schuyler, The Roeblings: A Century of Engineers. Bridge-Builders and Industrialists (1931).

1 6 4 M a t h a m G r a n d i e r , M a t h a m G r a n d i e r 5 6 2 (1922); R. Cady, "New Deep-Water Port at Cartagena, Colombia," 115 ENR 710 (1935); "Will Build Dam in Chile," NYT, Jan. 1, 1930, at 52, col. 8.


1 6 7 "Companies Merge to Build Utilities," NYT, Jan. 17, 1928, at 37, col. 2.

1 6 8 "Companies Merge to Build Utilities," NYT, Jan. 17, 1928, at 37, col. 2.


1 7 0 H. Bookholtz & C. Judkins, The Construction Industry 50 (Bureau of Foreign & Domestic Commerce, Market Research Ser. No. 10 1, 1936). The Census of Construction reported that the value of work done by U.S. contractors in outlying possessions and foreign countries in 1929 amounted to only $24 million—compared with a domestic volume of $1 billion. As a result of the way the data were collected, however, "the foreign business here reported is only fragmentary, and does not in any sense represent the total amount of business done by American contractors abroad." U.S. Bureau of the Census, Fifteenth Census of the United States: 1930 Construction Industry 62, tab. 4 at 85-87 (1933).

1 7 1 Lewis, America's Stake at 379.
these projects for the course of internationalization was the construction in the 1920s and 1930s by the M.W. Kellogg Company of twenty newly introduced high-pressure thermal cracking process units for the production of motor gasoline in eleven Latin American, European, and Asian countries.171