PROJECTING CAPITALISM

A History of the Internationalization of the Construction Industry

Marc Linder

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Non-British Competition

When competition of all against all replaced the domination of the world market by a single Power, conceptions of international economic morality necessarily became chaotic.¹

A Comparative Historiographical Interlude

British firms by no means monopolized the construction of colonial or imperialist infrastructure projects in the nineteenth century, although their preeminence and cosmopolitan character was demonstrated by the fact that even the French government selected Peto & Betts to build the first railway in colonial Algeria in 1859-1860, a short section between Algiers and Blida, which primarily served military purposes.² At the beginning of the twentieth century, too, as a function of the virtual ubiquity of British capital, British construction firms were selected to build railways associated with British-dominated mining operations in the Belgian and Portuguese African colonies.³

Nevertheless, French and German construction firms competed with British firms for international railway, bridge, harbor, and canal building orders. Gustave Eiffel's French construction-engineering firm, for example, built bridges between 1867 and 1889 in Portugal, Russia, Greece, Egypt, Indochina, and South America.⁴ More suggestive of the state of international industrial competition was the railway and bridge construction that integrated French and German steel firms performed as adjuncts to their manufacturing operations. Thus beginning in the 1850s, the French firm Schneider built railway bridges in Italy, Portugal, and Spain; later it carried out this type of work in Africa and South America as well.³ Similarly, Krupp secured the concession to build a railway in Venezuela in the 1890s, which

¹Edward Carr, The Twenty Years' Crisis, 1919-1939: An Introduction to the Study of International Relations 82 (1964 [1939]).
²See "Algerian Railways," 7 Engineer 337 (1859); Times, Apr. 9, 1860, at 7, col. 2; BRM for 1864, at 359 (16th ed. 1864); [Henry Peto], Sir Morton Peto: A Memorial Sketch 23 (1893); Charles-André Julien, Histoire de l'Algérie contemporaine: La Conquête et les débuts de la colonisation (1827-1871), at 421-22 (1964). By 1874, however, the French firm Batignolles began building railways in Algeria and then in Tunisia in particular in connection with the exploitation of phosphates and ore. Société de Construction des Batignolles, L'Oeuvre d'un siècle 1846-1946, at 47-48 (1952).
⁵"Messrs. Schneider and Co.'s Works at Creusot: Ship and Bridge-Building Department, Chalon-sur-Saône," 66 Engineering 417, 476-77, 511-13 (1898).
was characterized as "without doubt one of the greatest monuments of German enterprise abroad...probably the greatest." 6

The most outstanding example of an integrated construction firm closely linked to its nation-state's foreign policy was the French firm, La Société de Construction des Batignolles. A forward-integrated producer of locomotives and steel, Batignolles built so many railways in the French colonies in Africa that it shaped their overall evolution and prided itself on its "contribution à la mise en valeur de l'Empire Colonial Français." 7 Founded in 1846 as Ernest Gouin et Cie with financial support from the Rothschilds and others, the firm quickly expanded from locomotives to metal bridges, shipbuilding, and finally in 1862 to railway construction in Spain, Italy, and elsewhere. After the Franco-Prussian War, the renamed Société de Construction des Batignolles, in seeking to diversify its markets, decided to focus on central Europe in order to counter German influence in the Balkans as part of the French government's overall political-financial strategy on behalf of French capital. By 1885, railway construction was no longer a matter of finding markets for Batignolles as a locomotive manufacturer, but for a firm that had become so diversified that it had outgrown domestic expansion and required the world market for large-scale projects. During the next three decades, in addition to railways and ports in Romania, Greece, Bulgaria, and the eastern Mediterranean, Batignolles also built a bridge in Russia as part of the anti-German alliance. 8

Although the independent international constructors had declined since Brassey's day, the large British firms retained more of the character of those pioneers than their European counterparts. In spite of the considerable volume of domestic and colonial harbor and industrial works that he carried on behalf of the British government, the most outstanding example of such entrepreneurial autonomy was Weetman Pearson, who, like many prominent British contractors, was a member of the House of Commons. 9 Between 1895 and 1907 Pearson's firm built the Grand Canal to drain Mexico City—for which he specially ordered in England the largest dredgers ever built—Veracruz harbor, and the Tehuantepec Railway linking the Atlantic and Pacific Oceans in Mexico. The railway marked a turning point in Pearson's operations: for the first time he invested his own capital, becoming the Mexican government's partner. The line was almost immediately made obsolete as an interoceanic route by the opening of the Panama Canal—but not before Pearson made a profit on it. 10

These projects in the Western Hemisphere catapulted Pearson into the front ranks of Britain's large imperial contractors along with Lucas & Aird and Sir John Jackson Ltd. The international intensity of Pearson's operations can be gauged by the fact that of the 66 projects valued at £42.5 million that his firm undertook during the three decades between 1884 (when Pearson moved his headquarters to London and began operating nationally) and World War I, 31, accounting for 62 per cent of the value of his firm's contracts, were located outside of the United Kingdom. 11 During the 1890s about half of Pearson's volume was performed in

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7 Société de Construction des Batignolles, L'Oeuvre at 77 (quotation); Baltzer, Kolonialbahnen at 181, 188, 202; Chronicles of a Contractor at 171; Lionel Wiener, Les Chemins de fer coloniaux de l'Afrique 21-22 (1930).

8 Société de Construction des Batignolles, L'Oeuvre at 23-47, 55-64.

9 Brassey was the chief exception although his sons became members of Parliament. For a typical contemporary celebration of Pearson, see T. O'Connor, "Lord Cowdray: A Study in Personality," 51 NPMR 353 (1913).


11 Calculated according to Spender, Weetman Pearson at 287-90. These figures include projects that
Pearson’s position was immeasurably enriched by oil holdings in Mexico, which he in large part owed to the more than one million acres in drilling concessions granted him by President Porfirio Diaz and part of which he sold to Royal Dutch Shell at the end of World War I.13 Diaz’s preference for Pearson was in part grounded in his desire to use a British firm to counterbalance U.S. influence in Mexico.14 As he did elsewhere in Latin America, Pearson, vertically integrating forwards, built for his own account some of the Mexican gasworks, electrical light and power plants, and tramways that were in his control by World War I.15 These operations not only led one historian to speculate that Pearson “probably garnered larger profits from Mexico than any other man, either during or since the Spanish Conquest,” but prompted the U.S. government in 1913 to induce the government in Colombia to put an end to Pearson’s efforts to gain control over the oil resources in that country as well.16 By the time of his death in 1927, Pearson (who had been Lord Cowdray since 1910) had reorganized his enterprise, leading to the termination of the construction firm and a shift to oil, airlines, financial services, and publishing.17

Unlike such relatively independent British constructors, German construction firms were rarely more than mere agents of German industrial and especially finance capital, which played a historically unique role in facilitating industrial capital accumulation in the pre-World War I era.18 The political-economically most influential German international constructional undertaking during that period epitomized the gap between the positions of British and German capital. By the 1880s, German capital, which had until then been excluded from forging a colonial empire, fixed its attention on the exploitability of the peasants and raw materials of Anatolia and the availability of export markets in the Near East. Under the leadership of the Deutsche Bank, which was just beginning to fulfill its historic role of “providing strongholds for German foreign trade in the distant world,”19 heavy industry and the military persuaded the Ottoman sultan, whose principal activities consisted in levying troops and taxes, that construction of a railway from Constantinople to Baghdad and the Persian Gulf would also shore up his fragile semi-colonial regime.20 Yet the German construction firm—the largest at the

15 William Fuller, “Dam Building and Bullet Dodging in Mexico,” 67 EN 1002 (1912) (construction of dam for power plant in Chihuahua); Middlemas, Master Builders at 220.
17 Pearson, for example, took over Lazard Frères. Spender, Weetman Pearson at 248-49. Desmond Young, Member for Mexico: A Biography of Weetman Pearson, First Viscount Cowdray (1966), is shamelessly derivative of Spender’s biography.
20 See Edward Earle, Turkey, the Great Powers, and the Baghdad Railway: A Study in Imperialism (1923); Lohar Rathmann, Berlin-Bagdad: Die imperialistische Nahostpolitik des kaiserlichen Deutschlands 23-33.
beginning and end of the twentieth century—that built the Turkish railways occupies no niche in popular consciousness.

These divergent structures are also reflected in English and German historiography. Economic and even social historians of the internationalizing impact of British capital generally pay considerable attention to the role of the English railway contractors abroad and have produced several monographs and semi-popular books devoted exclusively to them.\(^{21}\) Historians of Bismarckian and Wilhelmine Germany, however, even East German historians, who were otherwise disinclined to permit any aspect of German imperialism to escape their scathing scrutiny, either ignore the contribution of German railway construction firms to the building of the “infamous Baghdad Railway” or mention it only cursorily.\(^{22}\) Pre-World War I German oriental imperialism may have celebrated its romantic pioneers, but contemporary public opinion paid even less attention to commercial builders than to the bankers and armaments manufacturers who drove the economic apparatus of penetrating Turkey.\(^{23}\)

Consequently, the following appreciation by Eric Hobsbawm, the leading English Marxist social historian of the nineteenth century, of the feats of British contractors in creating the material prerequisites for a world market, though penned in the tradition of Marx and Engels' account of the world-historical achievements of a bourgeoisie that drives permanent global revolution,\(^{24}\) finds no counterpart in the German literature:

Neither can we fail to be moved by the hard men in top hats who organised and presided over these vast transformations of the human landscape—materials and spiritual. Thomas Brassey...was merely the most celebrated of these entrepreneurs, the list of his overseas enterprises an equivalent of the battle honours and campaign medals of generals in less enlightened days...."\(^{25}\)

With this type of quasi-romanticized history can be contrasted the much more sober account presented by Rosa Luxemburg on the eve of World War I, in which she focused on the consequences for the precapitalist producers of the formerly remote regions of the particular societal content of the technological

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\(^{23}\)George Hallgarten, 2 Der Imperialismus vor 1914: Die sozialistischen Grundlagen der Aussenpolitik europäischer Grossmächte vor dem Ersten Weltkrieg 176-77 (2d ed. 1963 [1951]).

\(^{24}\)Karl Marx & Friedrich Engels, Manifest der kommunistischen Partei, in Marx & Engels, 4 Werke 459, 463-68 (1959 [1848]).

advances in transportation that made possible the violent incorporation of those areas into the world market. To be sure, Luxemburg’s analysis cannot be separated from her environmentally naive notion, typical of German Social Democratic theory and practice in general, that the pernicious products of the capitalist mode of production could undergo an immediate transvaluation after a socialist revolution.26

Thus in 1898 Luxemburg observed that although such gigantic undertakings as the Panama Canal were “children of naked commercial and bellicose interests,” they would nevertheless “outlast their creator—the capitalist economy” and “show what colossal forces of production slumber in the womb of our society and what an upswing progress and culture will experience once they have gotten rid of the fetters of capitalist interest.”27 How a socialist Panama Canal would differ from the one built by “the Yankees” she did not reveal to the proletarian readers of the Sächsische Arbeiter-Zeitung in Dresden. But the quasi-eschatological implications were clear: canals and railways, by mobilizing colonial armies, tended to foment conflicts between the European powers; by promoting trade and capitalist development, they also accelerated the collapse of capitalism. Consequently, “[t]he great means of transportation ultimately can have only a destructive impact on the bourgeois world and everything it creates. But for general cultural progress they are of enormous and lasting value.”28

Luxemburg’s analysis of the functions of late nineteenth-century and early twentieth-century railway and canal building for the global accumulation of capital formed a part of her attempted proof that the incorporation of precapitalist societies into the world market serves to stave off realization crises—until the absorption of all such societies leads to the ultimate collapse of capitalism. The fruitfulness of her concrete dissection of such projects as the Suez Canal or the Baghdad Railway does not, however, hinge on the soundness or plausibility of that larger theory.2

Her account ran along the following lines.30 The imperialist phase of capital accumulation or the phase of world market competition of capital included the industrialization and capitalist emancipation of the previous hinterlands of capital. Among its chief methods of operation were foreign loans and railways. The development of the world railway network approximately mirrored the geographic penetration of capital: it grew most quickly in the 1840s in Europe, in the 1850s in the United States, in the 1860s in Asia, in the 1870s and 1880s in Australia, and in the 1890s in Africa.31

In the international sphere, the realization of surplus value required only the

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27 Rosa Luxemburg, “Wasserwerke des Kapitalismus,” in idem, 1:1 GW 286, 287-88 (1907 [1898]).
29 Rosa Luxemburg, Die Akkumulation des Kapitals: Ein Beitrag zur ökonomischen Erklärung des Imperialismus, in idem, 6 GW 336-60 (1923 [1913]).
30 Id. at 336-37. The diffusion of railways depended in part on the nature of the commodities to be exchanged on the world market. In British colonies such as Australia, New Zealand, and South Africa, railways failed to foster inland penetration significantly before 1870 because the economies depended on livestock with a walking capacity, whereas India and Canada, for example, exported jute, indigo, tea, rice, cotton, timber, and grain, most of which were exposed to competition from European and U.S. producers, whom they could undersell only if they managed to reduce transport costs from the interior. Only when Australia, New Zealand, and South Africa began to center their export economies on wheat, dairy products, and gold and diamonds, did inland penetration by railways become vital. See L. Knowles, The Economic Development of the British Overseas Empire 13 (1924).
general diffusion of commodity production, whereas its capitalization required the progressive ousting of simple commodity production by capital production. The utilization of international capital for the expansion of the world railway network mirrored this shift. Railway building and loans from the 1830s to the 1860s "served chiefly the ousting of the natural economy and the diffusion of the commodity economy. ... On the other hand railway construction in Asia for about the last twenty years as well as in Africa serves almost exclusively imperialist policy, the economic monopolization and subjugation of the hinterlands." German railway undertakings in the Near East and German and English railways in Africa exemplified the latter phenomenon.32

Luxemburg took as her crisis-theoretical point of departure the fact that even if the capital, means of production, and labor power were all available in England, the lack of demand for railways and canals there explained why all these inputs were sent to noncapitalist areas.33 The question then became: Who ultimately paid for the external loans that financed the construction of this infrastructure in the precapitalist countries and who realized the surplus value of the enterprises founded with them? In order to provide concrete answers, Luxemburg examined the cases of Egypt and Turkey. Her analysis emphasized aspects that those who celebrate world progress through world trade have tended to ignore.34

For the construction of the Suez Canal the Egyptian government obligated itself to provide gratis 20,000 fellahs and 40 per cent of the total share capital of Læssep's company, which eventually became a public debt that the peasantry paid through taxes and special tributes. At the time of the American Civil War, when England was suffering from a shortage of cotton, the Egyptian viceroy confiscated land for cotton plantations on which he also used fellahs and thus came to require the fellahs whom he had assigned to the Compagnie Universelle du Canal Maritime de Suez. In a not entirely other-regarding speech, one member of the British Parliament observed that the withdrawal of 70,000 to 80,000 men from their regular village labors "must seriously interfere with the production of the most advantageous occupation for labor—for instance the production of cotton."35 The viceroy Ismail extracted from the same fellahs the 38 million francs that Egypt was required to pay, pursuant to Napoleon III's arbitration, to indemnify the Suez Company for withdrawing their labor. The fellahs made the entire operation profitable for the viceroy and European capital by virtue of the land that was expropriated from them, their forced labor, and the money that was extracted from them through taxation and in part in kind.36 Even though the limits of forced labor power for capital production became evident, the unlimited command over the mass and duration of the exploitation more than compensated for them. This process, Luxemburg argued, also brought about the destruction of the peasant economy. As in China and Morocco, so too in Egypt: militarism as the executor of capital accumulation lurked behind the international loans, railway construction, waterworks, and similar civilizing works.37

32 Luxemburg, Akkumulation at 338.
33 Id. at 344-45.
34 But see Jenks, Migration of British Capital at 294-325.
35 168 PD (3d ser.) 1148 (1862) (Layard, M.P.). The larger number of workers took into account the contingents who were continuously on their way to and from the canal. This speech was marked by self-interest inasmuch as British cotton manufacturers were vitally interested in buying Egyptian cotton and British governments were using the corvée as a basis for attacking French construction of the Suez Canal.
36 In Egypt in the 1860s and 1870s, " revenue collection became a system of tribute rather than of taxation. If the docile peasants could not pay, their possessions were confiscated." Herbert Feis, Europe the World's Banker 1870-1914, at 383 (1965 [1930]).
37 Luxemburg, Akkumulation at 345-54. The Suez Canal also caused Egypt to become a backwater of world commerce as it lost its position in the transit trade. Rondo Cameron, France and the Economic Development of Europe 1800-1914: Conquests of Peace and Seeds of War 481 (1961).
The international circulation of surplus value, according to Luxemburg, passed through different circuits in the case of the Baghdad Railway in Asiatic Turkey. Here the Turkish government gave the German railway company a state guarantee in the form of a per-kilometer sum for which it mortgaged the tithes of the provinces along the route.38 German capital thus built the railways and pressed new surplus value out of the Asians who worked on it. This surplus value together with that embodied in the German-exported means of production used in the process (raw materials and machinery) from Germany, however, had to be realized. This realization was in part effected through the commodity trade spurred by the railway itself. A brisk trade was in fact immediately triggered by railway construction in theretofore natural economies: German exports to Turkey quadrupled between 1896 and 1911.39

To the extent that the Anatolian natural economy was not commodified quickly enough, the state used compulsion to transform the in-kind income of the population into money for the purpose of realizing the invested capital together with its surplus value. Grain as a simple consumption product of the primitive peasant economy flowed from the fields directly as a commodity to the tax farmer, who then transformed it into money for the state. Thus the grain executed the accumulation of European capital before it even became a commodity. This metamorphosis took place in its brutal and naked form directly between European capital and the Asiatic peasant economy while the Turkish state was reduced to its role as political apparatus for squeezing the peasant economy on behalf of capital. The result, concluded Luxemburg, was on the one hand capital accumulation and a sphere of interest as a pretext for further political and economic expansion of German capital and, on the other, railways and commodity commerce on the basis of the disintegration, ruin, and bleeding of the peasant economy and the growing financial and political dependence of the state on European capital.40

The German Baghdad Railway

How does the microhistory of the German firm that built the Turkish railway fit into a global account such as Luxemburg's? At the end of the 1880s Germany could not yet boast of a single construction firm that could have independently carried out such a major railway project in a distant and industrially weakly developed country. Nevertheless, with financial support mobilized by the Deutsche Bank, which continued to be represented on its board of directors and to control it financially throughout the twentieth century, Philipp Holzmann & Cie. was launched onto an international career in the service of German industrial capital and the German state, transforming it from "Germany's largest German construction enterprise into a world firm."41 Until its co-optation into the

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38On the tithes, see Edwin Pears, "The Bagdad Railway," 94 ContR 570, 577 (1908); Karl Helfterich, 3 Georg von Siemens Ein Lebensbild aus Deutschlands großer Zeit 34, 71, 74 (1923). The British trade press agreed that "[t]he Turkish Government the guarantee system is working in a manner little less than disastrous." "Railways in Asiatic Turkey," 81 Engineer 558 (1896). On similar privileges extended to German and English road builders earlier in the century, see "Road Contracts in Turkey," 26 Engineer 67 (1868).
39German investment in Turkey also rose from 40 million marks in 1880 to 600 million marks by World War I. Feis, Europe the World's Banker at 319.
40Luxemburg, Akkumulation at 353-60
Ottoman enterprise, Holzmann’s cross-border activities had been limited to a few projects in countries bordering on Germany. Thus from 1876 to 1881 Holzmann built the municipal sewerage system in Linz, Austria; in the late 1870s and early 1880s it built bridges in Basel and Zurich; in 1882 it built the Amsterdam railway station; and from 1888 to 1890 it built its first railroad outside of Germany—a short narrow-gauge railway in Switzerland.42

Precisely because Germany in the 1880s still lacked “enterprises that were organized for carrying out large railway construction under difficult foreign conditions,” Georg von Siemens, the director of the Deutsche Bank and the organizational force behind German capital’s drive into Turkey, wanted to co-opt an experienced English or French firm. When his negotiations with Weetman Pearson’s firm failed to bear fruit, he entered into an agreement with Count Georges Vitali, director of a large French railway construction firm, under which Vitali built the first section of the Anatolian Railway and ordered most of the materials from German firms.43 Siemens may have been willing to cooperate with Vitali or Pearson because he wanted to induce economic and financial circles in France or England to influence their governments to make decisions favorable to the Deutsche Bank.44

Vitali, whose firms, Vitali, Charles, Picard et Cie, and Régie Générale des Chemins de Fer, had since the 1860s built railways in Italy, the Netherlands, and European Turkey,45 was constrained to fulfill a wish to which Siemens attached great importance: “In connection with the execution of the first railway line assumed by German capital, Siemens wanted to train a German construction firm for construction tasks of this kind; he therefore made it a condition that the construction firm Phillip Holzmann & Co., which was closely connected with the Deutsche Bank, be given a share of the construction.”46 To that end Holzmann and Vitali’s Régie Générale formed the Gesellschaft für den Bau der Anatolischen Bahnen. Between 1889 and 1892 it built the section from Ismid to Angora, employing largely Italian and Croatian masons and stonemasons and Turkish laborers. Under the guidance of Vitali’s firm, Holzmann was able to gain the experience it needed to build the Konia and Baghdad lines. For the section Eskişehir-Konia, which was begun in 1894, the technical supervision was exclusively Holzmann’s. All the construction material was purchased from German industry.47

Holzmann’s in-house company history described these origins of Germany’s imperialist thrust into the Near East in the following euphemistic terms:

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43Helfferich, 3 Georg von Siemens at 40 (quotation), 45-47. For a not entirely trustworthy account by George Pauling, who was apparently unaware of Holzmann’s existence, of the collapse of the negotiations with Pearson, see Chronicles of a Contractor at 101-102.


45Cameron, France and the Economic Development of Europe at 295, 299, 322.

46Helfferich, 3 Georg von Siemens at 47. The in-house centennial history of the Deutsche Bank, which devotes two tendentious chapters to the bank’s financing of the Turkish railroads, never mentions Holzmann. Seidenzahl, 100 Jahre Deutsche Bank at 63-81, 141-61.

A favorable opportunity for extensive activity abroad presented itself to the firm Philipp Holzmann & Cie. in Turkey when the government there resolved to link its largely still quite independent border provinces more closely with the capital of the Empire by means of an efficient traffic route and thereby at the same time to usher in together with a strengthening of its power a successful economic utilization of the country.48

From the end of the 1880s, when the Internationale Baugesellschaft, a firm with which Holzmann was associated, undertook the construction of the first sections of the Anatolian Railway, until World War I, Holzmann stood at the center of the construction of the Baghdad Railway, which, when finally completed (by others) in 1940, ran from the Straits of Bosporus to the Persian Gulf.49

Germany’s challenge to Britain’s hegemony in the Middle East and especially in India led to initial British resistance to the plan for the railway, which necessitated complicated arrangements for financing its construction. British commercial interests perceived the German transportation scheme as cutting off the existing British Aidin and Cassaba lines from extensions to the south and southeast and conflicting with Britain’s paramountcy in the Persian Gulf.50 Moreover, the use of the Turkish state’s customs duties to finance the railway restricted British textile exports to Turkey.51 When speculation arose that Germany would seek a coaling station along the Persian Gulf near the terminus of the Baghdad Railway, British concern about preserving its regional hegemony intensified.52 The railway further exacerbated imperialist rivalries because it was also an integral part of the Deutsche Bank’s acquisition of one-quarter ownership of the Turkish Petroleum Company, which the British seized during World War I.53

The economic, political, military, and diplomatic conflicts, contradictions, and alliances that converged in the financing, construction, and ultimate uses of the Turkish railway system were extraordinarily complex.54 The Baghdad Railway thus became, as the leading U.S. construction-engineering journal observed, a striking illustration of “the conflicting interests of European countries in developing their foreign commerce and in supporting their colonial possessions.”55 Even before the most violent form of resolution of imperialist conflicts, World War I, of which the Baghdad Railway was a “prominent side issue,” thwarted the German project and halted construction,56 the progress of the railway had been severely impeded by the war between Turkey and Italy over

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49 On Régie Générale’s demand in 1903 that the Deutsche Bank assign Holzmann’s lead role to a French firm, see Heinz Lemke, “Das Scheitern der Verhandlungen über die offizielle Beteiligung Frankreichs am Bagdadbahnunternehmen 1903,” 29 JG 227, 236 (1984). Three years later the Deutsche Bank considered reassigning the construction to a French firm in order to retain the good will of the French capital market. Hallgarten, 2 Der Imperialismus vor 1914 at 45-46.

50 “Railways Extension in Asiatic Turkey,” 78 Engineer 366 (1894) (editorial); “The German Bagdad Railway,” 88 Engineer 597 (1899) (editorial).

51 Hallgarten, 2 Der Imperialismus vor 1914 at 46-47.

52 “Railways in Asia Minor,” 89 Engineer 335 (1900) (editorial); “The Bagdad Railway,” 82 Engineer 359 (1906).

53 See e.g., Hallgarten, 1 Der Imperialismus vor 1914 at 595-610; 2 id. at 44-51, 159-64, 173-78.

54 “A European-Asiatic Railway Problem,” 86 ENR 411 (1921) (editorial).

Tripoli, which had led to the expulsion of the large contingent of Italian construction workers. Unsurprisingly, in the 1920s and 1930s, when the revolutionary Kemalist state initiated an expansion of the transport system oriented for the first time toward planned national development, it selected two Danish engineering-contracting firms in order to avoid once again giving the Great Powers "too much of a footing in the country." Against the background of this classic example of construction capital’s self-interested collaboration with German finance capital and imperialism, it is instructive to note the continuity in Holzmann’s appreciation of its historical role. In 1974, at the ceremony celebrating the firm’s 125th anniversary, the honorary chairman of its supervisory board chose to focus his address on Holzmann’s role in building the Baghdad Railway. At the time, Hermann J. Abs had been a member of the firm’s supervisory board since 1938 and its chairman for thirty years. Two decades later he was still its honorary chairman. As chairman of the Deutsche Bank and as chairman or member of the supervisory board of an extraordinary number of large German firms, Abs "was the most powerful private individual in Germany’s economic scene" since Nazi rule. In a 1974 retrospect (that Holzmann disseminates for public relations purposes) of the cooperation between the Deutsche Bank and Holzmann in "opening" Turkey as a source of raw materials and foodstuffs as well as a market for German industry, Abs, who had been convicted in absentia as a war criminal for his financial plundering in Yugoslavia during the Nazi period, assured his listeners that it was no exaggeration to characterize their work as "development aid.

Railway Construction in the German African Colonies

[It is not railways, roads, and power stations that give rise to industrial capitalism: it is the emergence of industrial capitalism that leads to the building of railways, roads, and power stations.]

German construction firms also occupied key positions in laying the groundwork for the exploitation of Germany’s formal colonies. Within the framework of Bismarck’s social-imperialist policy, Germany quickly seized a colonial empire in the 1880s in South West, East, and West Africa before it, unlike Britain and France, had commercially penetrated these territories. Driven by the search for markets and more profitable investments, which in turn was triggered by the overproduction, depression, shift from free trade to high tariffs, and need to divert attention from internal class struggle that characterized European
capitalism in the last quarter of the nineteenth century. German colonialism in Africa soon attained a stage of development that required significant improvement of the transportation system. In conformity with Germany’s status as a colonial latecomer, German advocates of African railways emphasized the need to secure privileged access to colonial production of certain raw materials, such as rubber, sisal, and especially cotton, not to participate in, but rather to reduce Germany industry’s dependence on, a world market perceived as dominated by foreign and hostile monopolies. In particular, they pointed to the cotton famine during the American Civil War that attended England’s reliance on cotton imports from the United States as a weighty reason for seeking to circumvent the world market.

In the German Reichstag debates in 1904 and 1905 devoted to the issue of state loans and guarantees for the construction of these colonial railways, both left-wing and revisionist members of the Social Democratic Party, which opposed the reactionary form of German colonial conquests if not of all colonialism, attacked state subventions of such private undertakings. Thus while the leftist Georg Ledebour argued that if the railways were profitable, the cotton capitalists should pay for them since they would be the beneficiaries, the revisionist Albert Südekum characterized the entire legislative plan as “a large capitalist maneuver” designed to shift the risk to the state.

The initiatives were, however, enacted despite the Social Democrats’ opposition. Under the leadership of the newly appointed director of Germany’s colonial office, State Secretary Bernhard Dernburg, who had been director of one of the largest German banks, the Darmstädtier Bank, Germany “made the transition from the system of monopoly colonial capitalism to rational, industrial capitalism in the colonies.” During his tenure from 1906 to 1910, Dernburg not only mobilized private capital from German banks and large enterprises for the construction of colonial railways, but also induced the Reichstag to authorize the expenditure of hundreds of millions of marks to guarantee private loans or build railways.

The first German line, from Swakopmund to Windhuk, had been built by military commandos of the railway brigade in South West Africa beginning in 1897 when ox-wagon transport was interrupted by cattle plague. In 1904 the Hereros and Hottentots, impelled by the German occupiers’ life-threatening theft of their grazing land, organized a rebellion against the colonial regime. The following year the German parliament authorized and financed construction by the Deutsche

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*See e.g., Bernhard Dernburg, *Zielpunkte des deutschen Kolonialwesens. Zwei Vortrage* 49 (1907).

*See e.g., 4 SBVR, 11th Legis., 1st Sess. 3136B (June 14, 1904); Francesca Schinzinger, *Die Kolonien und das Deutsche Reich. Die wirtschaftliche Bedeutung der deutschen Besitzungen in Oberssee 58, 65 (1984).*


*See Baltzer, *Die Kolonialbahnen at 78-80; 1 Deutsches Kolonial-Lexikon 537 (Heinrich Schnee ed., 1920); “Die Eisenbahnen Afrikas” at 1601; Gann, “Economic Development in Germany’s African Empire, 1884-1914” at 213, 241.*
Kolonial-Eisenbahn-Bau- und Betriebs-Gesellschaft of a southern line to help suppress the uprising.73

At the same time the Berlin firm of Arthur Koppel and Company, a forward-integrated manufacturer of rails and railways cars, which also maintained production facilities and offices in Europe and the United States (at Pittsburgh and Chicago),74 built the Otavi Railway in South West Africa at German government expense to connect a copper mine to the coast. When the Herero rebellion led to a shortage of labor in a thinly populated area, the firm then imported more than a thousand Italian workers. Their market-conforming behavior, however, proved "disappointing" to the firm,75 which was unaccustomed to the experience of isolated workers' taking advantage of a tight labor market. Turning the tables on their employers, "feeling secure from the competition of other workers, they exploited their situation" by demanding higher wages, performing less work, striking, and even suing.76 Trumpping the untoward consequences of a free labor market, the colonial government then obliged Koppel by furnishing 2,000 Hereros from concentration camps.77

Although many of the later railroads in Africa also served military-strategic purposes, they were, like colonial railways everywhere, largely designed to transport agricultural and mineral raw materials from the interior to ports for export. The monocultural focus of such railways was pushed to such an extreme in Togo that they were called the "coconut," "cocoa," and "cotton line."78 Most of these lines in Togo and Cameroon were built by firms managed by Friedrich Lenz (1846-1930). A self-taught engineer and the leading builder of light and branch railways in Germany from the 1880s to World War I, he formed Lenz & Co. GmbH in 1892. In addition to Lenz himself and S. Bleichröder, one of Germany's leading banks, Friedrich Krupp's firm, which had long sold the rails for laying on Lenz's railways, also financially participated in the founding of Lenz & Co.

The principal financial force behind Lenz, however, was one of Germany's most influential banks, the Berliner Handels-Gesellschaft, which was controlled by Carl Fürstenberg, formerly an associate of the powerful private banking house Bleichröder. The Berliner Handels-Gesellschaft, which was a pioneer in industrial financing, had corporate interlocks with such internationally leading firms as Walther Rathenau's Allgemeine Elektrizitäts-Gesellschaft. Fürstenberg, who had maintained close business relations with Demburg before the latter became state secretary in the Colonial Department of the Foreign Office, possessed wide-ranging financial interests in the German colonies as well as in railways throughout the world.79 Demburg furthered the colonial interests of Fürstenberg and the Berliner Handels-Gesellschaft by his conscious promotion of railway building in the African colonies as the mainstay of German capital export.80

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73Baltzer, Die Kolonialbahnen at 86-89; Klein, Deutschland 1897/98 bis 1917 at 179-80, Horst Drechsler, Südwestafrika unter deutscher Herrschaft (1966).
7429 EC 314 (1908) (obituary).
75"The Otavi Railway in South Africa: The Longest 24-Inch Gage Railway in the World," 58 EN 378 (1907).
77Lionel Wiener, Les Chemins de fer coloniaux de l'Afrique 410 (1930).
78See e.g., August Full, Fünfzig Jahre Togo 198 (1935); Arthur Knoll, Togo Under Imperial Germany 1884-1914: A Case Study in Colonial Rule 130 (1978).
80Dieter Schulte, "Die Monopolpolitik des Reichskolonialamts in der 'Ära Demburg' 1906-1910: Zu
In the first decade of the twentieth century, Lenz, through the subsidiaries Aktiengesellschaft für Verkehrswesen and Deutsche Kolonial-Eisenbahn-Bau und Betriebs-Gesellschaft, directed the building of almost 1,800 kilometers of lines in the German colonies, many of which the latter firm also operated (in addition to operating railroads built by others). These railways, which were ultimately financed by the German government and proved very profitable for Fürstenberg-Lenz, included the Usambara line in East Africa, the Banana (Lomé-Palime) and Cotton (Lomé-Atakpame) lines in Togo, the northern and middle lines in Cameroon, and three railways in the southern part of South West Africa. Two other German firms, the Maschinenbaugesellschaft Nuremberg and the Vereinigte Maschinenfabrik Augsburg, joined in the construction of a railroad in Togo. Beginning in 1908, the German colonial regime there made forced labor available for railway construction. Among these unfree workers the mortality rate was "terrific." By the mid-1890s the ubiquitous Deutsche Bank, together with the German East Africa Society, having recognized that the resources of the colonies could not be adequately exploited without the construction of a railway network, began developing plans for a railway from Dar es Salaam. Not until 1904, however, when the Deutsche Bank finally convinced the government to provide financial guarantees, could Holzmann, the sole construction firm member of the East African Railway Syndicate, initiate construction. In 1911 the German parliament provided an additional 52 million marks to Holzmann for the extension of the line.

The only point of contention that did arise between the colonial government and Holzmann focused on the "labor question." Competition among the government itself, the army, planters, and Holzmann for native workers apparently did not have the theoretically expected consequence of improving the terms of employment. When the colonial government therefore appointed worker commissioners to protect native workers against "exploitation by unconscientious planters and entrepreneurs," Holzmann did not consider this a step toward solution of "the labor question." In order to mobilize a labor force of 20,000 for the project in the face of an alleged scarcity of indigenous labor, the Deutsche Bank sought and received the approval of the colonial government to import several thousand Chinese coolies. Ultimately, however, Holzmann decided not to consummate this transaction because experts "feared an unpleasant influence of Chinese customs and habits on the Negroes." Discovering that local workers performed excellently as helpers to European craftsmen, Holzmann undertook the work on the Dar es Salaam railway in 1905, the completion of which facilitated the development of commercial cotton growing in East Africa. Holzmann then directed its efforts to the Tanganyika Railway.
which it worked on from 1908 until World War I, employing at the peak of operations more than 15,000 African workers When Holzmann's own engineers blew it up during World War I to deny it to British troops, they brought to its logical conclusion the European powers' African transportation policy of "deliberately cho[osing] a different gauge to discourage trade with other territories."

International Competition in Other Civil Engineering Infrastructural Projects

In spite of this considerable French and German competition, British firms enjoyed the advantage of experience of pioneering work in these fields in the British Isles and of a virtual monopoly of the market represented by the colonies. Their access to the London money market made it possible for them to offer facilities for the financing of the work which they were carrying out.... British engineers, supervisory staff, plant and materials were used; ...and the works, when completed, were largely operated by British companies or the nominees of the British banks which had financed them. Moreover, the sizable British portfolio investment in overseas railway and canal bonds favored construction of those projects by British firms. Just as the international loans that financed other infrastructural projects often provided that construction firms and suppliers of the lending nation perform the work.

The construction of the complex infrastructure of modern cities, such as gas and water pipe systems, reservoirs, sewerage, and, later, underground railways, also emerged as a significant impulse towards international expansion of building firms. Beginning in the 1850s, John Aird, an self-taught engineer who had created his own firm after working for a gas company laying mains in Britain, cashed in on the growing need throughout Europe for gas lighting and water systems for the self-preservation of the transformed urban agglomerations. The pioneering scale of the pumping stations, reservoirs, and filtration plants in England enabled Aird to specialize at a time when the Brasseys of Britain were fully occupied with railway construction: "With his special knowledge and experience, he saw an almost untouched market on the Continent." In quick succession he built waterworks in Rotterdam, Amsterdam, Copenhagen, Berlin, Hamburg, and Moscow. Although his dominant position was eroded after the crisis of 1857, his like-named son (1833-1911) extended the firm's activities to gas and waterworks in Warsaw, Palermo, Calcutta, Ottawa, Singapore, Argentina, and Brazil. By the

1920 [16]).


"See 2 Cambridge History of the British Empire. The Growth of the New Empire 1783-1870, at 788-802 (J. Rose ed., 1968 [1940]); "The Railways of Mexico," 50 Engineer 256 (1890) (British owned railways in Mexico built by British firms such as Bowes-Scott, Read, Campbell & Co.). On British investment in Latin American railways, see U.S. Bureau of Foreign and Domestic Commerce, Railways of Central America and the West Indies (Trade Promotion Ser. No. 5, 1925) (written by W. Long); idem, Railways of South America, pt. I: Argentina (Trade Promotion Ser. No. 32, 1926) (written by George Brady); idem, Railways of South America, pt. II (1927) (written by W. Long); idem, Railways of South America, pt. III: Chile (Trade Promotion Ser. No. 93, 1930). D. Platt, Foreign Finance in Continental Europe and the United States, 1815-1870: Quantities, Origins, Functions and Distribution 182 (1984), argues, without hard evidence, that the converse was not true—namely, that British investors did not necessarily finance railways built by British contractors.

"See Nikolai Bucharin, Imperialismus und Weltwirtschaft 106-107 (1969 [1929]).
turn of the century, when Aird’s firm completed the £2 million Aswan Dam in Egypt, Lucas & Aird was, together with S. Pearson & Son and Sir John Jackson, Ltd., one of the three largest English international construction firms.90

Other British contractors also built water- and gasworks in Europe and Latin America, while Charles Fox (a civil and consulting engineer who built railways in France, Switzerland, Germany, and Denmark), George Wythes (who was Brassey’s partner on railways in Spain, India, Mauritius, and Argentina), and William Cubitt also successfully competed for waterworks contracts abroad.91 In preparation for its construction work, the Manchester firm of Bellhouse & Company shipped all of the requisite iron work to Buenos Aires in the 1850s to build the gasworks there.92

In its restructuring of European-Asian trade routes, and by favoring the larger metal-hull steamships, the Suez Canal set off a worldwide boom in dock and harbor construction from Valparaiso to Singapore. This type of overseas project enabled the firm of Sir John Jackson (1851-1919), who carried out considerable works for the British Admiralty and domestically combated “the absurd pretension of the present-day trades unionism,”93 to become one of the world’s largest construction firms by the end of the century. Soon Jackson, Pearson, Holzmann, and others were engaged in worldwide competitive bidding against one another.94 Cross-border European projects were exemplified by the harbor works performed by the French firm of Couvreux and Hersent at Antwerp in the 1870s and 1880s.95 Overseas, British and European (and later U.S.) construction firms, often using mechanical navvies and specialized steam dredgers capable of crossing the Atlantic, undertook dredging, excavating, and building operations on all continents well into the post-World War I period.96 Couvreux and Hersent, for example, rebuilt the harbor at Montevideo at the beginning of the twentieth century, while Batignolles built the sewage and water systems in Santiago and the port in Recife.97

One of the more remarkable phenomena of pre-World War II international construction was the extensive European and overseas business conducted by a firm from one of Europe’s smallest countries. The Danish firm Christiani & Nielsen was founded in 1904 to build bridges, marine works, and other reinforced concrete structures according to methods that it had invented. It was not only immediately active in neighboring Sweden, where it eventually built hundreds of bridges, but

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90: “Sir John Aird,” 111 Engineer 38 (1911) (obituary); Middlemas, Master Builders at 121-26 (quotation at 124).

91: “Annual Report Session 1859-60,” in 19 MPICE 133, 151, 153; 21 MPICE 554, 557 (Cubitt built Berlin water-works); Helps, Life and Labours of Mr. Brassey at 161-66; 39 MPICE 264-66 (1875); 7 DNB 533 (1968) (s.v. “Charles Fox”); Jenks, Migration of British Capital at 185-86.


93: “The Institution of Junior Engineers,” 72 Engineering 695 (1901) (speech by Jackson). “Although the workmen in his employ numbered at times as many as 5,000 he never had labor difficulties of any great duration.” “The Late Sir John Jackson,” 108 Engineering 831 (1919).


96: During the 1890s the British engineer and contractor Walker performed £7 million worth of dock and port works in Buenos Aires for the Argentinian government. 85 Engineer 249 (1898). See also Middlemas, Master Builders at 113, 134, 157, 175, 199, 231, 244, 266, 237; George Edgar-Bonnet, Ferdinand de Lesseps. Le Diplomate. Le Créateur de Suez 462 (1951) (Dussaud brothers built ports at Algiers).

before World War I had already opened branch offices in Germany, Britain, and Russia. In Hamburg, for example, it introduced reinforced concrete quay walls in 1911, which then became the dominant type of harbor construction in northern Germany. 86

Harbor works were only one of many kinds of infrastructure projects enjoying a worldwide boom. “The last decade of the nineteenth century saw the beginning of a world-wide boom in the building of electric light and power plants, electric railways, and telephone systems, in which Americans took an important part.” In building such infrastructure in Europe, Latin America, and Asia, U.S. construction firms were subordinate to the manufacturers of the electrical equipment such as Westinghouse, General Electric, and Western Electric. 87 This relationship at times mirrored that between railway builders and the manufacturers that produced the rails and rolling stock such as Krupp.100

In regions of overlapping or contested colonial control such as Latin America, the pre-World War period witnessed “fierce” competitive struggles among European and U.S. firms over the construction of such infrastructure projects. Driven by the military and economic functions of railroads in consolidating rival colonial powers in Asia and Africa and the worldwide installation of electric power systems, the process of internationalization left its imprint on major European construction firms. On the eve of World War I, one of the largest French construction companies, La Société Générale d’Entreprises which specialized in electrification, performed half of its business overseas.101

Even at the peak of German involvement in Turkey, French companies such as Vitali’s Régie Générale, La Société de Construction des Batignolles, and Hersent held numerous contracts there for roads, ports, docks, tramways, irrigation, lighting and power plants. Société Générale d’Entreprise dans l’Empire Ottoman employed 10,000 workers by the beginning of World War I.102 When a German-owned electric company in Chile was confiscated after World War I, Weetman Pearson’s firm used the proceeds from its sale of oil wells in Mexico to buy that enterprise and to forward-integrate by building its own hydroelectric plants.103

Between 1895 and the end of World War I, the largest German firm, Holzmann, performed 36 per cent of its total of one billion marks worth of construction abroad. The fact that Holzmann shipped almost all its building materials such as cement, iron, and wood as well as machines and equipment to overseas building sites from Germany also increased that country’s exports. Although the Baghdad and East African railways, to be sure, accounted for the vast bulk of this overseas business, Holzmann during this period also worked on such geographically diverse projects as the expansion of the harbors at Tangier, St.

87Cleona Lewis, America’s Stake in International Investments 324-25 (1938).
103Middlemas, Master Builders at 244-45.
Petersburg, and Reval.104

German firms also carried on considerable construction work within Europe during this period. The Actiengesellschaft für Hoch- und Tiefbauten, which had been founded as Helfmann Brothers in 1875, gained its first international contract in 1899. This large turnkey project for the construction of reinforced concrete grain silos at the port of Genoa permitted the Italian city to compete with Marseille as a port of entry for overseas grain. Between 1907 and 1912 the firm also built a railway station in Basel for 10 million marks, one of its largest single prewar contracts.105 More extensive still were the European industrial and commercial projects of Wayss & Freytag, a firm formed in 1890 as a merger of two firms specializing in and developing their own ferro-concrete construction methods. Early on the firm built plants for heavy industry in neighboring Belgium, Luxembourg, and France. Following its construction of a spinning mill in Finland in 1902, Wayss & Freytag developed a considerable business in European Russia, including a department store and a hotel in St. Petersburg which it also operated until World War I. In addition to earthquake-proof apartment houses in Italy and Mediterranean harbor works, the firm also built silos in Argentina in 1909, leading to the establishment of a branch there.106 Two other German firms, Grün & Bilfinger and Julius Berger, also performed considerable harbor, excavation, and road work in the German colonies in East, West, and South West Africa in the years before World War I.107

Not surprisingly, British-built urban infrastructure tended to be found in British-built colonial cities.108 Yet even in countries dominated by British capital, French and German firms succeeded in asserting themselves. At the turn of the century, for example, French entrepreneurs built the water supply system in Valparaiso, Chile and a German firm built the electric tramway in Cairo, while in Argentina, beginning in 1906 the Deutsch-Überseeische Elektricitäts-Gesellschaft, which was an industry leader in South America formed by the Allgemeine Elektricitäts-Gesellschaft and the Deutsche Bank, contracted with Philipp Holzmann & Cie. to build its electrical plant in Buenos Aires—a project that required the importation from Germany of all the materials and equipment. Ultimately German firms monopolized the lighting and power industry in Buenos Aires.109 World War I marked a caesura in the internationalization of construction.

104Hugo Ritter, "Holzmann in Marokko und Ägypten," in Philipp Holzmann Aktiengesellschaft at 299; Meyer-Heinrich, "Einleitung" in id. at 247; Meyer-Heinrich, "Die Entwicklung des Gesamtunternehmens" at 129, 131; for inconsistent data suggesting an alternative share of 30 per cent, see id. at 91, 128.


108The same was true of French colonial cities. See e.g. 82 Engineer 417 (1879) (French firm builds electric tramway in Algiers).

It not only interrupted many private ventures by withdrawing capital for armaments and blocking access to belligerents, but also destroyed an immense volume of infrastructure and private buildings in Europe and the Near East. The war also forged a matrix of new conditions of national competition. The British construction-engineering industry, hard pressed by German and American firms before 1914, uttered a collective "Thank Heaven" that the war had made it impossible for the British government to "sell[] the prestige of the British engineering industry" by letting contracts to foreign firms that allegedly took work at a loss precisely in order to invade the British market.  

In South America, "antagonistic opposition" by the "vested interests" of British and U.S. firms persuaded governments to abandon German firms. 

Even during the early months of World War I, the British construction-engineering industry began looking forward to a postwar restoration of British supremacy. In the Near East, for example, and especially in Turkey, where German firms "had practically ousted British engineering," "German competition will be compulsorily eliminated...." With France prostrate, British and U.S. "[c]ontractors will be at a premium, and they will have the time of their lives...carrying on the enormous number of contracts" for reconstructing the Middle East. 

Yet German firms returned to the world market after the war. Launched by the aforementioned public port and canal projects for the Argentinian state, Holzmann, drawing as always on the financial support of the Deutsche Bank, had founded the Compañía General de Obras Publicas (Geopé) in 1913. During the following three decades, until the Peronist government seized Geopé in 1945, it carried out a great volume of construction in Argentina (and Uruguay) in the areas of public waterworks, dams, roads, subways, hydroelectric and other power plants, public and private commercial buildings, and production facilities (including a rayon factory for DuPont). By 1930, Geopé had become the largest construction firm in South America, employing more than 5,000 persons. Holzmann also founded companies in Chile (1915), Peru (1925), and Brazil (1927), where the governments, supported by international loans, organized civil works projects to build bridges, roads, ports, waterworks, power plants, and buildings. Much of the work, especially in Peru, was spawned by the building of the Pan-American Highway. By the 1920s, Holzmann, like the British firms, had to bid in competition against U.S. firms in Latin America. Wayss & Freytag also reentered the South American market, creating subsidiaries in Argentina, Brazil, and Uruguay, which operated until their expropriation during World War II. The Danish firm Christiani & Nielsen also established a subsidiary in Brazil in 1922, five years after it had built a paper mill there, where it then embarked on a career of almost continuous construction of marine works. 

During the period between the two world wars international construction also resumed in Asia, Africa, and Europe. In the aftermath of World War I,
German construction firms such as Hochtief, Holzmann, and Wayss & Freytag were at first heavily committed to extensive port, canal, and dam projects in France carried out within the framework of the Versailles reparations agreements. Hochtief became involved in reparations construction as a result of the firm’s takeover by Hugo Stinnes in 1921, who had created Europe’s largest industrial empire during the early years of the Weimar Republic. Stinnes had acquired Hochtief at least in part to use it for work on the French Mosel Canal and as a very lucrative conduit for directing business to other industrial firms he owned. Hochtief was not, however, confined to such reparations projects. Beginning in the 1920s it not only built a part of the Trans-Iranian Railway but joined a consortium building infrastructure in the Soviet Union. Julius Berger, too, became active in the Soviet Union, taking up the reconstruction of the Petrograd harbor facilities in 1922.

Soon Holzmann was also at work on ports at Suez and in the Azores, railways in Turkey and Iran, and commercial and industrial buildings in Yugoslavia and Greece. Berger began its involvement in the Trans-Iranian Railway in 1923, while Grü & Bilfinger carried out highway, tunnel, and dam projects in Uruguay, Argentina, and Brazil in the 1920s. By 1925 Wayss & Freytag employed one-third of its 7,400 employees abroad. In the 1930s its international orders increased as it used compressed air methods to carry out harbor works in Riga, Dublin, Amsterdam, and Rotterdam. A multinational consortium consisting of Batignolles, Schneider, Hersent, and Belgian and Danish firms built the Polish deep-water port at Gdynia in the 1920s and 1930s, which the Polish government wanted in order not to be dependent on the port at Danzig, which was under international control.

With the gradual exhaustion of large discrete public works projects in the advanced industrial countries and the spread of the requisite construction technology, competition for the remaining projects in the underdeveloped areas intensified. In the wake of the world depression of the 1930s, these rivalries assumed national political forms as English, French, German, Scandinavian, and U.S. firms individually and jointly competed for railway, irrigation, bridge, port, highway, and building contracts in Turkey, Iran, Iraq, India, China, and other countries. As with the Baghdad Railway and other nineteenth-century railroads, in Iran and elsewhere the chief purpose of the railway was ultimately to intensify the government’s military, political, and economic control, which even beforehand was strong enough to force “those least able to afford it” to pay for the construction through regressive taxes. In spite of the availability of this

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117 Weidmann, Hochtief at 50; Meyer-Heinrich, “Die Entwicklung des Gesamtunternehmens” at 234-37; Ritter, “Holzmann im Marokko und Ägypten at 299; Wayss & Freytag, 100 Jahre Wayss & Freytag [no pagination].
118 See Richard Lewinsohn (Morus), Die Umschichtung der europäischen Vermögen 98-99 (1926); Radzio, Die Aufgabe heisst Bauen at 20-23; Charles Maier, Recasting Bourgeois Europe: Stabilization in France, Germany, and Italy in the Decade After World War I, at 62, 209-12 (1975); Hochtief 1875-1975 at 165, 169.
120 “Bilfinger & Berger” at 560.
121 Weidmann, Hochtief at 27.
122 Wayss & Freytag, 100 Jahre Wayss & Freytag [no pagination].
123 Société de Construction des Batignolles, L’Oeuvre at 74-75.
125 Nikki Keddie, Roots of Revolution: An Interpretive History of Modern Iran 99-100 (1981). On the
mechanism of internal redistribution, external bank financing remained crucial. Its critical importance in international construction was underscored by Holzmann's gradual retrenchment in Asia as a result of its loss of Deutsche Bank support after World War I.126

International orders "secured the survival" of some European construction firms during the Great Depression, many of which participated in the massive industrial and infrastructure works of the Soviet First and Second Five-Year Plan.128 Thus the 50 million mark contract that Hochtief gained for building a fifteen-kilometer section of the Albert Canal in Belgium between 1930 and 1934, which was in part financed by German reparations and designed to cheapen freight transport for the Belgian steel industry, was approximately twice the firm's normal annual turnover. During the 1930s Hochtief also built a large paper factory for a German firm in Finland,129 while the Swedish Johnson Construction Company built a 750-kilometer road in Rumania.130 An English firm, Balfour, Beatty, & Company built Bermuda's first railway during this period.131 Christiani & Nielsen, in addition to expanding its operations to Thailand, Mexico, South Africa, and Venezuela, where it built piers, concrete roads, and a railroad, also pioneered the construction of a submerged, concrete reinforced tunnel at Rotterdam.132 Other cross-border construction continued through the depression, notably major bridge-building projects in Denmark carried out by German and English firms.133 One of these firms, Dorman, Long, and its venerable competitor, Cleveland Bridge and Engineering Company, were also building bridges all over the world in the interwar period—in Siam, India, Rhodesia, and even Portuguese East Africa.134 At the onset of World War II, Dorman, celebrating its fiftieth anniversary, claimed to be "the largest constructional engineering group in Europe."135

construction of the Trans-Iranian Railway in the 1920s and 1930s by German, U.S. (Ulen and J.G. White), English (Stewart & McDonell and Costain), French (Batignolles), and Scandinavian (Kampmann, Kierulf, and Saxild) firms, see "Interests Here Share in Persian Contract," NYT, July 12, 1928, at 32, col. 2; "The Trans-Iranian Railway," 164 Engineer 675 (1937); "Iran Builds a Railroad," 121 ENR 793 (1938).

126See e.g. "Agree on Turkish Loan," NYT, Apr. 6, 1927, at 44, col. 1 (Turkish government accepts $20 million loan for railway construction in Anatolia by Ulen).

127See Cuno, "Hochbauten in der Türkei" at 269.


132See Anker Engelund, "Danes Introduce New Caisson Practice at Little Belt Bridge," 114 ENR 841 (1935) (Grön & Billinger, Fried. Krupp, and Louis Eilers active from 1928 to 1935); "Start to be Made on New Danish Bridge," 110 ENR 541 (1933); "Longest Bridge in Europe Nears Completion," 117 ENR 206 (1936) (Dorman, Long).

133See "Civil Engineering in Siam," 106 ENR 928 (1931); "Steel Arch of 1,100-ft Span to be Built in Africa," 112 ENR 522 (1934); "Long Rail Bridge Completed Over Zambesi River in Africa," 113 ENR 725 (1934); "The Zambesi Bridge," 158 Engineer 403 (1934); "Rhodesian Suspension Span Contract Let," 119 ENR 441 (1937); "Long Cantilever in India," 126 ENR 538 (1941).

134167 Engineer 650 (1939).
Penetrating the U.S. Market

In the United States, in contrast, European firms never performed any significant volume of construction work. British contractors, for example, did not follow in the wake of heavy portfolio investment by British capital, which formed the principal market for U.S. railway securities. There were a few exceptions. One was George Wythes' involvement as contractor for the Detroit and Milwaukee Railroad in the latter half of the 1850s at the behest of a connecting Canadian railway, which itself performed some of the construction work in Michigan. More prominent was the Civil War-era Atlantic & Great Western Railway, the failure of which contributed to that of Petrie, who had promoted it. But generally the massive construction of railroads in the United States gave rise to large-scale domestic construction firms operating with subcontractors—as they had in Britain—and the mass recruitment of laborers from Europe and China, while U.S. railway engineering gradually deviated from the English models.

Shortly before and after the turn of the century, however, two of Europe's biggest international construction firms engaged in a variety of very large-scale civil engineering projects in New York. The first of these unusual instances of construction work performed by a European firm in the United States before World War I, which for that very reason prompted "world-wide surprise" and considerable contemporary reporting, was the execution by Pearson's firm of tunneling in New York City. After an American contractor had failed to complete the tunnel under the Hudson River, the English engineers hired by the English capitalists who financed the project contracted with S. Pearson & Son. From 1889 to 1892 it carried out the work by adopting technology (the Greathead shield) that had been developed in Britain to tunnel under the Thames. Pearson too was compelled to abandon the Hudson tunnel when its own technology failed; leading at one point to an annual death rate of 25 per cent among the sandhogs; once the technical causes of this slaughter had been eliminated, however, the English bondholders foreclosed their mortgage.

144In 1940, the Danish firm of Christiani & Nielsen, which operated all over the world, moved its headquarters for all projects outside the Axis countries to New York, yet never performed any construction work in the United States. "Rudolph Christiani Honored on Firm's 50th Anniversary," ENR, Feb. 25, 1954, at 48.


141See Caroline MacGill et al., History of Transportation in the United States Before 1860, at 310, 313 (1917); Daniel Calhoun, The American Civil Engineer: Origins and Conflict 68-78 (1960).

142Viscount Cowdray, "143 Engineer 499 (1927).

143See "Getting English Capital," NYT, Mar. 5, 1889, at 6, col. 1; "Under the Hudson River," NYT, Dec. 18, 1889, at 10, col. 3; "Under the North River," NYT, June 4, 1891, at 3, col. 5; Charles Prelini, "The New York," S3 Engineering 367 (1907); Spender. Weetman Pearson at 52-58, Brian Cudahy, Rails Under the Mighty Hudson 9 (1975). On the shield that Greathead developed in combination with compressed air, see James Greathead, "The City and South London Railway; with
By the beginning of the new century there were "more subaqueous tunnels in the course of construction in New York and its vicinity than in the rest of the world together." In 1903 Pearson secured the contract for four tunnels under the East River for the Pennsylvania Railroad Company, which were characterized at the time as the greatest engineering undertaking in the history of the country. At the conclusion of this project in 1908, at the peak of its worldwide activities, the firm was said to have been involved in $200 million worth of construction.

The largest German construction firm, Holzmann, also became active in New York State in two of the largest civil engineering projects underway at the beginning of the century in the United States, which also attracted thousands of "alien laborers" trapped in the abusive padrone system. Although it is unclear whether Holzmann was seeking to conceal its penetration of the U.S. market, its formation of Empire Engineering Corporation in 1903 for building significant waterworks prompted no public comment. The U.S. press, while mentioning the formation of Kerbaugh Construction—the firm with which Holzmann collaborated—for the special purpose of building the Kensico Dam, does not appear to have been aware of Holzmann's involvement. Kerbaugh Empire Company, which was founded in 1911, owned all the capital stock of H.S. Kerbaugh, Inc. and Empire Engineering. The long-time representative of the Deutsche Bank in the United States, the banker Edward Dean Adams, was a director of Kerbaugh Empire until 1914. When Adams left the board, he was replaced by Otto Riese, the director of Holzmann's foreign department, who remained on the board until 1917, the year the United States declared war on Germany. Even the voluminous reported intercorporate, personal injury, and contract litigation that Empire Engineering's business spawned failed to mention Holzmann's involvement.

Holzmann's projects included multimillion-dollar contracts for sections of the New York State Barge Canal—on which Pearson's firm managed to secure only one contract, having bid too high on at least eight contracts for other sections—and dredging in the port of Buffalo. The barge canal, for which...
a referendum in 1903 had authorized the expenditure of $101 million, was designed to modernize and restructure the Erie Canal in order to facilitate freight traffic from the Great Lakes to the port of New York in competition with the railroads. But for the simultaneous construction of the Panama Canal, which overshadowed it in popular consciousness if not in magnitude, the 400-mile Barge Canal would have gained greater recognition as the enormous engineering project it was. By successfully bidding on ten separate dredging and excavating contracts totaling six to seven million dollars, Empire Engineering, which performed its excavation work on sections of the canal between Rochester and Buffalo between 1905 and September 1914, conducted one of the largest operations on the project. Holzmann’s Empire Engineering also worked on one part of the New York City Catskill water supply system—the Kensico Dam in 1911-1912—which was one of the world’s largest masonry dams and “the greatest municipal water-supply system ever undertaken.”

World War I ultimately put an end to German construction activity in the United States for many years. Nor did construction firms from countries not at war with the United States find it easier to gain access to the U.S. market. Not until 1935, for example, did the British firm Taylor Woodrow found a housing and development company on Long Island, N.Y. The war did, however, create new forms of internationalism in the construction industry as firms in the warring nations such as Holzmann and Pearson and Norton-Griffiths vied to build and destroy behind enemy lines. 1914 also witnessed another precedent: when the U.S. War Department awarded a contract to a Chinese firm to build a hospital in Hawaii, it marked the first time that the U.S. government had ever let “such a contract” to a foreign firm.
