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Contrasting Styles of Foreign Investment

A Comparison of the Entrepreneurship, Technology and Finance of German and Canadian Enterprises in Barcelona Electrification

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Two different "styles" of foreign direct investment that emerged in the global economy at the end of the nineteenth century combined to electrify Barcelona before WWI. German electrical equipment manufacturers, in association with specialized investment bankers, began the process of electrification in the 1890s and 1900s by setting up subsidiary operating companies in Barcelona as captive customers for their equipment. After 1911a different style of foreign direct investment, originating from Canada, deploying different technological, financial and business strategies, created an integrated, regional, hydroelectric monopoly in the region. This paper compares the achievements and the failures of the two styles, German "Unternehmergeschäft" and Canadian "Venture Capitalism."

DES STYLES OPPOSÉS D'INVESTISSEMENT ÉTRANGER : UNE COMPARAISON DES PRATIQUES ENTREPRENEURIALS TECHNOLOGIQUES ET FINANCIÈRES DES FIRMES ALLEMANDES ET CANADIENNES DANS L'ÉLECTRIFICATION DE BARCELONE

*Avant la première guerre mondiale, à Barcelone, se sont combinés deux « styles » différents d'investissement étranger parmi ceux qui ont émergé dans l'économie globale à la fin du XIXe siècle. Des industriels allemands du secteur de l'électrotechnique, en association avec des banquiers d'investissement spécialisés, commencèrent le processus d'électrification dans les années 1890 et 1900 en constituant des compagnies filiales opérationnelles, qui fournissaient des équipements à des clients captifs. Après 1911, un style différent d'investissement étranger direct, originaire du Canada et déployant différentes stratégies technologiques, financières et d'affaires, créa un monopole hydroélectrique régional intégré. Cet article compare les réalisations et les échecs des deux styles, d'une part l'*Unternehmergeschäft*, de l'autre le* venture capitalism *canadien.*

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INTRODUCTION

Economic historians have traditionally distinguished between several different *forms* of foreign investment, the best known being the distinction between portfolio investment that involved passive participation without ownership or control, and direct investment that carried with it control.[1] In this paper we would like to develop a further distinction, what we will call the *style* of foreign investment.[2] Foreign investment behaves in different ways and serves different purposes in specific settings. It can take on a different character depending upon the situation, the evolution of technology, the entrepreneurship that mobilizes capital in one country for investment in another, and willingness of international financial markets to entertain different kinds of risks. In this paper we will use the case of the electrification of Barcelona between the 1880's and 1914 to illustrate this point.

Two distinct waves of foreign investment built and reorganized the electric industry in Barcelona during this period, the first emanating from Germany and the second from Canada. The *form* of investment in both cases was the same, namely foreign direct investment. But the *style* differed greatly. In the first instance foreign investment organized, equipped and managed several companies; in the latter case it built an integrated system. The first wave was directed by manufacturers of electrical equipment seeking foreign markets, the second by an international engineering and financial syndicate attempting to duplicate in Spain their successful system-building experience in Canada, Brazil, and Mexico. Some of the difference in style can be attributed to timing, the technical evolution of the electric industry, and the institutional affiliations of the key players, as will become clearer in the sections of this paper devoted to each specific phase of Barcelona's electrification. However, there is more to the story than structural determinism. In different parts of the capitalist world distinct patterns of business behavior emerged in response to the emerging challenges of a new business. Capitalism is an adaptive system. Different styles of foreign investment emerged in local markets led by innovators, suited to specific situations, and sustained by the information acquired through experience by investors in those markets. The sequence of challenges present in Barcelona brought forth two different styles of investment and types of organizations.

For purposes of clarity we are tempted to identify these two distinct styles of foreign investment specific to Barcelona as German and Canadian but, like tobacco and alcohol, this packaging must bear a warning. As long as these national attributions are interpreted as a labels or shorthand descriptions, they will be useful. However, the association of different styles of foreign investment with different countries should not be pressed too far. In the first case several other national sources of foreign investment followed the German example. Moreover

1. The conceptual distinction between the two types of investment can be readily made. The practical differentiation based upon the answer to the question how much investment is required to exercise control, is rather more difficult to determine. See for a discussion Mira Wilkins, draft mss Chapter 4, "Multinational Enterprise and International Finance," p. 3-4.

2. We obviously owe an intellectual debt here to a familiar distinction Thomas Hughes made with respect to culturally influenced configurations of technology, see Thomas Hughes, *Networks of Power*, Baltimore, 1983.

the Germans got by with considerable help from their Swiss, Belgian, French and Italian partners. Secondly the Canadian activity was not as deeply rooted in Canadian economy as a strict reading of the label might suggest. Canada provided convenient legal domicile, accommodating corporate law, and to a certain extent entrepreneurship, but it was not a supplier of technology, management, or a majority of the capital. The Canadians were also led by an American and in large part financed by the British and Belgians. Thirdly, both phases of development involved international capital mixed together in different proportions and forms. German investors participated heavily in the Canadian phase, but they did so in a new guise. They exchanged control of several competing companies for securities of various sorts in an integrated monopoly. Like a chameleon, foreign investors changed their spots to adapt to the emerging business environment. The most important characteristic of capitalism is not its national coloring but rather its international nature. The Barcelona electric utilities story captures very nicely this capacity of capitalism to reconfigure itself combining national elements in different ways to solve business problems. We will therefore continue to use the words German and Canadian as identifiers, but with the caution that these words should not be interpreted literally.

Barcelona is a good place to observe the different styles of foreign investment close up. The city may not have been a "typical" example of the history of electrification– what city was? Nevertheless Barcelona shared the experience of many other cities in the world, which were electrified, and in other ways economically modernized by foreign direct investment during the first phase of globalization at the end of the 19th and the beginning of the 20th centuries. What we have to say about Barcelona could be said, mutatis mutandis, about Rio de Janeiro, Sao Paulo, Buenos Aires, Mexico City, Genoa, Naples, Seville and a host of other cities in southern Europe and around the world.

The paper begins with a brief discussion of the first phase of electrification in Barcelona directed primarily by German equipment manufacturers. A second section explores the contrasting Canadian style of foreign investment practiced in the city after 1911 aimed at building a free-standing, integrated, operating company. The information in these two sections comes from business records and other archival materials located in Germany, Switzerland, France, Britain, the United States and Canada and supplements the work of Spanish economic historians with better access to local sources.[1] A concluding section compares the structural characteristics of the two styles and highlights the different environmental, financial, and organizational conditions that gave rise to them. The two styles were well adapted to the quite different business problems and opportunities presented by the Barcelona electricity market as it evolved over two decades at the turn of the last century. In neither case, however, did the two techniques "work out" as satisfactorily as their promoters expected.

1. Gregorio Núñez, "Las empresas eléctricas: crisis de crecimiento en un contexto de crisis politica," in G.S. Recio and J.T. Fernández (eds), *Los Empresarios de Franco*, Barcelona, 2003, p. 121-144; Albert Carreras, "La gran empresa durante el primer franquismo: un momento fundamental en la historia del capitalismo español," in *ibid.*, p. 47-66; H. Capel and J.I. Muro, "La Compañia Barcelonesa de Electricidad [1894-1912]", in H. Capel (ed.), *Las tres chimeneas*, vol. 1, Barcelona, 1994.

THE GERMAN STYLE: TECHNOLOGY DIFFUSION, START UPS AND UNTERNEHMERGESCHÄFT

It is well known that the electricity business did not emerge whole, like a new product suddenly coming to market. The separate elements evolved, and it took some time for the pieces to be conceived of as a system and connected. During the early years of experimentation and competition between different forms of electricity (roughly the 1880's and 1890's), the barriers to entry were relatively low both for those businesses manufacturing the equipment and for those who wished to own and operate an electric plant to illuminate a factory, store, hotel, or the streets of a city. The equipment was not particularly complicated; it could be hooked up readily to already operating steam power sources. Nor did it require extensive engineering. Existing service industries, such as gas companies and tramways, when they adopted the new technology, also became electric companies. Thus the electricity business emerged characterized by many, small scale, isolated, geographically restricted, aspiring entrants.

Electrical technology was diffused beyond its points of origin with amazing speed by the animal spirits of capitalism, the universal demand for light and mobility, and the enterprise of equipment manufacturing companies. Inventors and equipment suppliers brought the various parts of the eventual system to market first in the United States, Germany, France and Great Britain. Theatrical demonstrations of illumination and electric traction broadcast the business possibilities and whipped up popular demand for improved services. A provincial yearning to catch up with metropolitan amenities and fashion rapidly enlarged the market. Local capital, where it could, seized the novel business while opportunistic promoters familiar with the success in metropolitan centers started up new businesses in urban centers lacking in the entrepreneurship, capital, knowledge and connections. As early as the 1880's foreign direct investment played an important role both at the centre of the emerging technology –creating international joint ventures amongst equipment makers– and on the periphery throughout the Americas, Europe and Asia by promoting new ventures that broadened the market for service and equipment.[1]

The initial phase of the electricity business in Barcelona perfectly reflects this general history of distributed, quasi-competitive structures resting upon a web of international information and capital flows. As early as 1881 local capitalists acquired a small electric plant, set up some arc lamps around the *Paseo de Colom*, and entered the electricity business as *Sociedad Española de Electricidad* (SEE). Some years later, in 1896, two Barcelona gas companies organized a jointly owned electric utility, the *Central Catalana de Electricidad*. Thus Barcelona businessmen brought the novelty and flickering unreliability of electric service to the local market but they could not by themselves negotiate the transition as the business scaled up, moved into centralized systems requiring larger quantities of capital a greater technical knowledge. Foreign capital enters the Barcelona picture at the point of transition from a novelty to a utility, from isolated service to organization around a central generating station, and the need to begin wiring the city on a much broader scale. For example British capitalists refinanced SEE in 1889 in return for 50% of the equity, but even then the faltering company lacked the resources to provide street lighting to the satisfaction of the municipal government or to serve more than about 120 commercial customers.

The United States and Germany quickly emerged as the leading electrical equipment manufacturers. In both countries increasing scale, larger volumes of output, fierce competition, technological convergence and steeply rising capital requirements led to a fairly rapid consolidation in the equipment manufacturing industry. Industrial concentration reduced the number of producers to two or three key companies in both countries, in the United States the *General Electric* merger [1892] and *Westinghouse*, and in Germany the *Siemens and Halske* group on the one hand and *Allgemeine Elektrizitäts-Gesellschaft* (AEG) on the other. The German companies, with their smaller local market, became by far the most aggressive exporters of electrical equipment compared to their US counterparts. They did so in part through a very forward policy of creating companies in foreign markets to purchase their equipment and services. During the 1890's both Siemens and AEG became quite active promoting new electric ventures in European and South American cities. Financing new ventures to consume equipment of course greatly increased the capital requirements of operation, which brought the German electric equipment manufacturers into close alliance with German banks as partners in these promotions. AEG for example depended heavily upon the Deutsche Bank, its initial financier. A linguistic neologism, "Unternehmergeschäft," (translation: creating their own market by starting new businesses) was coined to describe this process whereby companies expanded their markets by organizing, financing, equipping and managing new ventures themselves. As the volume of business expanded in the mid 1890's, the German electric manufacturers and their bank partners created special joint venture banks dedicated to the finance and oversight of this rapidly growing, capital intensive network of domestic and overseas electric utilities. In 1895 AEG along with 9 banking partners (3 general German banks, 2 Swiss, 1 French and 1 Italian bank, and 2 private German banks) created the Bank für elektrische Unternehmungen (known by its acronym Elektrobank). A year later Siemens organized a counterpart, the Schweizerische Gesellschaft für elektrische Industrie (Indelec).[1] For tax and reasons pertaining to more relaxed corporate law these utilities' finance and holding companies were domiciled in Switzerland. A third German supplier, Union Elektrizitäts-Gesellschaft which had been founded in 1892 by the American Thomson-Houston Electric Company and by the Berlin machine building firm Ludwig Loewe & Co., organized its bank in Belgium, the Société financière de transports et d'entreprises industrielles (Sofina) in 1898 supported by a similar multination constellation of financial partners. When AEG acquired Union Elektrizitäts-Gesellschaft in 1902 Sofina entered the AEG orbit. Technical

1. For early US investment and licensing arrangements overseas see Mira Wilkins, *The Emergence of Multinational Enterprise: American Business Abroad from the Colonial Era to 1914*, Cambridge, 1970, p. 52-59, and for German investment in the United States electric equipment industry see Mira Wilkins, *The History of Foreign Investment in the United States to 1914*, Cambridge, 1989, p. 433-442. On the exchange and mingling of technologies from different countries see T. Hughes, *Networks of Power*, Baltimore, 1983, p. 47-200. More generally for a view of the international process of electrification see Trédé (ed.), *Électricité et Électrification dans le monde*, Paris, 1990.

1. Two other smaller equipment suppliers, Schuckert in Germany and Brown Boveri in Switzerland created their own banking co-ventures in the latter 1890's, Continentale Gesellschaft fur Elektrische Unternehmungen, and Motor. Gesellschaft für angewandte Elektrizität (Motor) respectively. In the United States General Electric followed a similar strategy somewhat later organizing the Electric Securities Corporation in 1904 and the Electric Bond and Share Company the following year.

excellence, manufacturing prowess, and aggressive marketing combined with special purpose financing made Germany the largest electric equipment manufacturing country in the world before WWI and in particular the largest equipment exporter.[1]

It is worth briefly reviewing these well-known phenomena of business history because these were the vehicles –enterprising German equipment manufacturers and Unternehmergeschäft banks connected to a web of European financial institutions– that effectively electrified Barcelona. Through the same process many cities in Germany, Italy, Switzerland, France, Russia, Portugal, Denmark and in South America were also energized.[2]

The major German electrical equipment manufacturers became seriously interested in the Barcelona market in 1889 when Siemens and Halske established a subsidiary in the city in order to bid on the municipal street lighting contract. This effort failed. However, AEG's different strategy did lead to a breakthrough five years later, in 1894. In concert with a group of German, French and Spanish financial institutions, AEG bought out SEE and reorganized it as *Compañia Barcelonesa de Electricidad*.[3] From that point onward the *Compania Barcelonesa* developed as a satellite of an electrical equipment manufactuer. German mangers were sent to run the company; AEG's engineers redesigned the system around a new power plant located close to the harbour. By contract the company was required to purchase its equipment and services from its German parent company, AEG. The board of directors, with enough local notables up front for domestic coloration, contained representatives of the French and German banks, and Emil Rathenau the president of AEG. The two electric main companies, *Compañia Barcelonesa* and the gas company affiliate, *Central Catalana*, negotiated an agreement to divide up the city between them, notionally carving out separate markets for each firm. To provide additional finance to complete the project

1. Peter Hertner, "Financial strategies and adaptation to foreign markets: the German electrotechnical industry and its multinational activities: 1890's to 1939," in A. Teichova, M. Lévy-Leboyer and H. Nussbaum (eds), *Multinational Enterprise in Historical Perspective*, Cambridge, 1986, p. 145-159; Peter Hertner, "German Multinational Enterprise before 1914", in Peter Hertner and Geoffrey Jones (eds), *Multinationals: Theory and History*, Aldershot, 1986, p. 113-134; Peter Hertner, "German Banks abroad before 1914", in Geoffrey Jones (ed.), *Banks as Multinationals*, London, 1990, p. 99-119; Peter Hertner, "Global Enterprise Before the Second World War: The Example of the Electro-Technical Industry", in T. Szmrecsányi and R. Maranhão (eds), *Historia de Empresas e Desenvolvimento Econômico*, Sao Paulo, 1996, p. 105-116; Peter Hertner, "Technologie et capitaux allemands dans l'industrie électrotechnique française avant la Première Guerre mondiale: un premier bilan", in M. Merger and D. Barjot (eds), *Les Entreprises et leurs réseaux: hommes, capitaux, techniques et pouvoirs, XIX^e-XX^e siècles*, Paris, 1998, p. 499-521; Luciano Segreto, Financing the Electric Industry Worldwide: Strategy and Structure of the Swiss Electric Holding Companies, 1895-1945", *Business and Economic History*, 23, 1994, p. 162-175; Luciano Segreto, "Du 'Made in Germany' au 'Made in Switzerland': Les sociétés financières suisses pour l'industrie électrique dans l'entre-deux-guerres", in M. Trédé (ed.), *Électricité et Électrification dans le monde*, *op. cit.*, p. 347-367; Lucian Segreto, "Le rôle des investissements suisses dans l'industrie électrique francaise jusqu'à la Deuxième Guerre mondiale", in M. Trédé-Boulmer (ed.), *Le financement de l'industrie électrique, 1880-1980*, Paris, 1994, p. 199-216, and Albert Broder, "Banking and the Electrotechnical Industry in Western Europe", in R. Cameron and V.I. Bovykin (eds), *International Banking, 1870-1914*, New York, 1991, p. 468-484.

2. For a list of electric tramways organized by Belgian companies alone see Luciano Segreto, "Elettricità ed economia in Europa", in Giorgio Mori (ed.), *Storia dell'industria elettrica in Italia*, Roma/Bari, 1992, vol. 1, p. 727-728.

3. AEG and Deutsche Bank subscribed 70% of the initial capital of 4 million pesetas, Société lyonnaise des eaux et de l'éclairage 25%, and the remaining 5% was taken up by Barcelona banks.

Elektrobank joined the financial group in 1896.[1] As the capital requirements grew in later years, Elektrobank sent its own technical-administrative delegate to Barcelona to watch over the investment.[2] Construction difficulties, delays in delivering equipment, and bureaucratic problems with the local authorities delayed progress, but by stages between 1897 and 1899 AEG and its banking partners brought modern, reliable electric service for municipal, commercial, industrial and residential consumers to Barcelona. Similar German-led but multinational technical-financial consortia were at work simultaneously electrifying Madrid, Valencia, Bilbao, and Seville in Spain as well as Genoa and a handful of other Italian cities.[3] The Barcelona venture was a part of a broad business strategy of German exports and investments.

At the same time German equipment manufacturers exploited other opportunities to electrify Barcelona and sell electrical equipment. In 1897-8 AEG bought two Barcelona tramways, merged them into one company, the *Compañia General de Tranvias de Barcelona a Sans*, and began the process of electrifying its service in 1901. AEG's electric tramway readily arranged a contract for power with AEG's electric utility, which had mutual advantages. The tramway acquired electricity more cheaply than it could supply itself, and the electric utility became more efficient by balancing its load factor, adding a large daytime industrial power user to complement the nighttime peak demand for illumination. To finance the reconstruction and electrification AEG drew upon its Belgian affiliate, Sofina, as well as a consortium of German and Belgian banks.[4] Meanwhile at least six other tramway companies continued to operate in the region, several of them foreign owned. Sofina became the vehicle AEG used to acquire several of these other companies as the opportunities presented themselves after which they were drawn into the AEG web of equipment orders, but not electricity supply. By 1911 Sofina and AEG between them controlled the majority of the tramway system in the city. AEG, in explaining its complex transactions with Sofina to the German Foreign Ministry in 1909, pointed out that the consolidation and in particular the takeover of a previously British tramway by a Belgian company effectively diverted all equipment orders to its German facilities.[5]

The evolution of the electric utilities in Barcelona during the first decade of the twentieth century presented the operators with several business challenges;

1. Marco Doria and Peter Hertner, "Urban growth and the Creation of integrated systems of electrification: the cases of Genoa and Barcelona, 1894-1914", in Andrea Giuntini, Peter Hertner and Gregorio Núñez (eds), *Urban growth on two continents in the 19th and 20th centuries. Technology, networks, finance and public regulation*, Granada, 2004, p. 217-248, and particularly p. 231-232, 237-238; H. Capel and J.I. Muro, *op. cit.*

2. By the time *Compañia Barceloñesa* became a fully operating utility in 1900 its capital structure consisted of 5 million pesetas in common stock, 7.5 million gold francs of 5% bonds, and 5 million pesetas in 5% preferred shares, the last of which were completely subscribed by Elektrobank.

3. Gabriel Tortella, *The Development of Modern Spain*, Cambridge, 2000, p. 216-219; M. Doria and P. Hertner, "Urban growth and the Creation of integrated systems of electrification: the cases of Genoa and Barcelona, 1894-1914", in A. Giuntini *et al.*, *Urban growth on two continents in the 19th and 20th centuries. Technology, networks, finance and public regulation*, *op. cit.*, passim.

4. M. Doria and P. Hertner, "Urban growth and the Creation of integrated systems of electrification: the cases of Genoa and Barcelona, 1894-1914", in A. Giuntini *et al.*, *Urban growth on two continents in the 19th and 20th centuries. Technology, networks, finance and public regulation*, *op cit.*, p. 234-235.

5. *Ibid.*, p. 235.

namely high costs of operation and competition. The inability to resolve these challenges satisfactorily meant that all companies functioned at less than optimal efficiency and therefore with diminished profitability seen in a comparative context. The parent companies with operating properties in many markets could see these comparative differences in efficiency and profitability more clearly than anyone. All of the companies' dynamos were powered by steam generated from imported British coal. The coal could be readily delivered to the harbor generating stations, but a deteriorating exchange rate situation between the peseta and the pound substantially increased energy costs and created ongoing uncertainty. Construction cost over-runs combined with higher coal expenses forced the company to raise more capital than expected, which in turn distributed the lower profits over a much more extensive capital base of bonds, preferred shares and stock than originally anticipated. Secondly, price competition between the several sub-scale generating and distributing companies ate into profit margins. Moreover, as a result of the partial Sofina consolidation of the tram system, the tramway supplied much of its own electricity from power stations it acquired which in turn limited the amount of power the electric utility could sell to the tramway. For example, between 1908 and 1910 the *Compañia Barcelonesa*, which controlled about 70% of the market, sold about 20% of its electricity for domestic lighting, 11% for electric traction, and about 69% for industrial power.[1] Competition between the two electric utilities obviously benefited high volume industrial power users, but high prices and geographical fragmentation of the market probably inhibited the spread of domestic service. Imported coal, exchange rate instability and competition led to sub-par performance. The AEG company made money, but not as much as might have been expected given experience elsewhere. Then in 1910 the locally controlled, *Central Catalana*, served notice of its intention to break out of this high-cost/competitive bind by acquiring waterpower concessions with a view to shifting to lower cost hydro-electric energy delivered to the city via long distance transmission lines.

Foreign direct investment German style modernized electric service in Barcelona between 1889 and 1910 creating in the process a new market for AEG electrical equipment. After Siemens made a significant investment in the company around 1908, this opened up opportunities for the Siemens electrical equipment subsidiary located in Barcelona. Both major German equipment manufacturers thus shared different aspects of the Barcelona equipment market and participation in the ownership of the key utilities through their special purpose investment banks. Unternehmergeschäft served the goal of exporting high technology equipment and services. In the competitive Barcelona situation, however, it had not however proved to be an effective tool for consolidating the market, creating production efficiencies, and maximizing the financial performance of the firms. And after two decades of hard work and minimal returns a new and proven technology in the hands of a competitor threatened to further destabilize the market. It is at this point that the key foreign players, in particular the German, Swiss and Belgian bankers, began to think of other ways of improving the financial performance of their Barcelona properties. Enter foreign direct investment Canadian style.

1. *Ibid.*, p. 238-240.

THE CANADIAN STYLE: HYDROELECTRICITY, CONSOLIDATION AND FINANCIAL ENGINEERING

Over time the interests of the manufactures and the banks began to diverge slightly. Manufacturers had no long-term interest in the time-consuming and capital-intensive business of utility management. For manufacturers money tied up in utilities was to a certain extent stranded debt that added to their capital requirements. Yet they wanted to maintain some ownership stake in order to continue to sell equipment to going concerns. Bankers were primarily interested in maximizing the rate of return on their investments and, when financial markets had been properly cultivated, by selling securities –and in some cases control– to realize capital gains and turn their capital for promising new ventures. For them the interests of the manufacturers were secondary. Barcelona in 1911 represented one of those moments when German manufacturers and international bankers had to evaluate where their best interests lay.

Sometime in 1911 the Deutsche Bank and Elektrobank began negotiations with the Canadian syndicate led by Dr. F. S. Pearson, the brilliant but mercurial American electrical engineer.[1] Pearson may also have been attracted to the Spanish opportunity by British engineers familiar with the situation and some Catalan businessmen peddling waterpower concessions. His scouting mission to investigate the possibilities of a new entry hydroelectric enterprise may have challenged the German bankers to reconsider their Barcelona investments. German bankers already had considerable experience dealing with the Pearson group in Latin America and had acquired considerable respect for its track record. In the course of building large scale, integrated hydroelectric utilities in Sao Paulo, Rio de Janeiro and Mexico City, the Pearson group, through friendly negotiations, had bought out smaller German owned properties at considerable profit to their former owners.[2] Various German banks held significant portfolios of securities of these successor firms. Moreover, as an engineer Pearson was unrivalled in the areas of high-head hydraulic generation, long distance transmission, and flow diversion to maximize the hydroelectric potential of river systems.[3] Pearson, for example, had learned his trade engineering hydroelectric stations at Niagara Falls. In Brazil he conceived a grand scheme of reversing rivers to force them to fall from greater heights. In Mexico too he had re-engineered remote river system to extract the maximum amount of hydroelectric energy for transmission to a distant metropolitan market. Pearson possessed the engineering knowledge to see the hidden possibilities of the Barcelona electricity market. His syndicate, which emerged based upon a network of Toronto and Montreal entrepreneurs

1. *The Electrical Review*, December 15, 1911, quoted in Doria and Hertner, p. 240, note 88, reported that the threat of a price war inclined the owners of the Barceloñesa company to sell out. For their part the Pearson group offered a handsome premium for the stock, said to be in the range of 140%.

2. H.V. Nelles, "Financing the Development of Foreign-Owned Electrical Systems in the Americas, 1890-1929", *Business and Economic History On-Line*, Vol. 1, 2003, p. 6-7.

3. See the *Dictionary of Canadian Biography*, Vol. 14, p. 830-833 for Duncan McDowell's excellent short biography of Frederick Stark Pearson. See also his book *The Light*, Toronto, 1988, chapter 1-5 for his Brazilian ventures. For a heroic treatment focusing on his engineering accomplishments see also the two articles by Gil Cook, "An Extreme Power Engineer: The Accomplishments of Fred Stark Pearson", in *IEEE Power and Engineering Magazine*, November-December 2003 and January-February, 2004.

and financial institutions, but managed since 1908 from London by the Canadian capitalists James Dunn, had a proven record of financing, promoting and bringing to market very large scale, capital-intensive utilities companies.[1] Pearson at the time was struggling to get a Texas land and irrigation company up and running without adequate rain. Dunn was dabbling with an oil shale proposition in Canada. Both men needed a big new promotion to make the market forget their unsuccessful attempt to take over the Rock Island Railroad, the damaging effect of the Mexican Revolution on their Mexico properties.

Pearson spent October 1911 in Spain with a team of engineers, sizing up the Barcelona utilities market, evaluating the hydro-electric potential of the Spanish mountains, and interviewing various Spanish politicians and businessmen regarding hydraulic concessions. His perspective differed from the German utilities promoters who preceded him and had vested interests in particular companies. He took a comprehensive look at the electric supply, transmission, distribution and marketing situation with a view to developing a super-company capable of serving the entire region at much higher levels of efficiency and profitability. Pearson personally inspected waterpower sites in northern Spain on the Ebro and Pallareasa rivers and came away enthused with the possibilities. On October 3rd Pearson in Barcelona cabled Dunn in London:

> Very well satisfied entire situation here except will be considerable delay settling concession with Government as many formal matters to be adjusted before concession will be granted. Have had an interview with Premier Minister Development. Stop. Very satisfactory.[2]

The delays with government probably had to do with the regulations preventing foreigners from owning Spanish waterpowers. It would take some time to work around that obstacle. Pearson also estimated that it would take about £2,500,000 to acquire the necessary businesses and concessions.

Nevertheless things did move with astonishing speed. By the end of the month Pearson and Dunn had organized the Barcelona Traction, Light and Power Company in Canada with authority to issue $25 million Canadian in stock and £5,000,000 in bonds. This new company would acquire existing tramway and electric companies, rebuild and extend them, and re-energize the city with hydroelectricity produced at huge new facilities to be constructed in the Pyrenees. While in Spain Pearson had bought a number of waterpower sites from the Catalan businessman Emilio Riu that would provide the necessary hydro-electricity. But he immediately envisioned an extensive series of dams, reservoirs, diversions and real estate ventures that would greatly enhance the output of these waterpowers and their irrigation potential. Pearson then visited Berlin, probably sometime in November, to negotiate the purchase of the AEG-Elektrobank-Deutsche Bank *Barceloñesa* company as the keystone distribution arm for his new integrated utility. Carlos E. Montañés, one of his principal collaborators,

1. For a detailed discussion of Pearson, the enterprises promoted by his group, and other Canadian activity in this field see C. Armstrong and H.V. Nelles, *Southern Exposure: Canadian Promoters in Latin America and the Caribbean, 1896-1930*, Toronto, 1988.

2. National Archives of Canada, MG 30 B 38, Sir James Dunn Papers, Vol. 33, Telegram, Pearson to Dunn, September 30, 1911; Vol. 34 Telegram, Pearson to Dunn, October 3, 1911. [Hereafter Dunn Papers.]

has left us a vivid and somewhat glorifying description of Pearson's meeting with Emil Rathenau at AEG's Berlin headquarters.[1]

By the end of the year the Canadian syndicate had strategically transformed the Barcelona utility market. It had acquired the main electricity company and the remote waterpower concessions necessary to re-supply it with low cost hydroelectricity. Moreover, the company proposed to develop hydroelectricity on such a scale as to serve the entire region of Catalonia through a network of subsidiaries, some to be acquired, some to be built. Its ambition extended beyond electricity. The promoters aimed also to take over the tramways eventually,[2] as well as build an electric railway to extend the suburbs of the growing city creating in Barcelona an integrated utilities monopoly similar to those they had previously created in Brazil and Mexico. The Canadian foreign direct investment style aimed at effective control of the urban and regional market within one large, integrated corporate system by acquiring some of the key operating companies, transforming their technological base with new hydroelectric generation and long distance transmission facilities. By proposing to extend service over a much wider area, lowering prices, and negotiating contracts for future delivery with large users, Pearson then justified rapid expansion and heavy investment on the basis of the rapidly growing demand.

Before proceeding further we must pause briefly to explain the typical *modus operandi* of the Canadian entrepreneurs. To a certain extent the Canadian businessmen pursued a financial strategy every bit as bold and daring, some might say as reckless, as Pearson's electrical engineering. And Pearson, it must be said, was one of those rare engineers who fully understood and participated in the financial circus of company promotion Canadian style. First of all Canadian entrepreneurs understood the revolutionary effect hydroelectricity had upon the cost structure of electric utilities. By greatly increasing the scale of production and lowering operating costs, electric utilities could serve a much larger market, at lower prices and still make healthy profits. Indeed, properly managed a utility needed only a small fraction of its income to cover operating expenses. The rest could go toward extensions, upgrades, rate reductions, debt service, and ultimately dividends on the common stock. Of course the capital costs of the new hydroelectric installations, long distance transmission and extended distribution facilities increased dramatically. The Canadian entrepreneurs did not see that as a problem, but rather an opportunity for they were first and foremost financiers, investment bankers, bond salesmen and company promoters. The more debt the better as it meant higher commissions and more good "stuff" (as they colloquially referred to the stocks and bands they created) to spread around. The new economics of production meant that these companies could readily serve the mountains of debt piled upon them and still perform adequately for the shareholders.

1. Bartos Roig Amat, *Orígines de la Barcelona Traction (Conversaciones con Carlos E. Montañés)*, Pamplona, 1970, p. 261-262.

2. By mid-November Dunn had formed a syndicate to begin to acquire Barcelona Tramways shares, a company controlled by Sofina in Belgium. Dunn's European partner, Lowenstein, was closely associated with Sofina. These affairs were not being conducted between arms length businessmen, but rather amongst a close coterie of investment bankers and market operators who knew each other intimately and were intricately tied up in each other's affairs. Despite these back room dealings the tramways were not included in the original purchase, though they would be incorporated later.

The second key element in the financial engineering of a Canadian style promotion was its somewhat unusual capital structure. Pearson and his colleagues strove to acquire the necessary properties, build their new facilities and get their re-energized and expanded utilities up and running financed entirely by a heavily discounted bond issue or a series of bond issues. The common stock was distributed in varying proportions to the underwriting syndicate as a bonus, held back by the promoters as a control block, and sometimes distributed to local notables for services rendered or as obligations to be drawn upon when political circumstances required. The securities of the new company were then collectively controlled by the underwriting syndicate for a specified period –usually two years– after which they would be sold into the market by the syndicate manager, the profits being pro-rated according to ownership shares. Properly managed these promotions were extremely attractive to insiders. In the first place bond underwritings could be financed by financial institutions and paid on installments. Secondly once operating and properly publicized the company's bonds could be readily sold at a substantial premium once the market had been made. Thirdly, the syndicate managers stove to manipulate their markets –which were very narrow at the beginning– in the absence of any securities regulation to give encouraging price signals to third party buyers. The highly leveraged capital structure of the firm meant that the future earning potential of the firm valorized the common stock. Canadian corporate law permitted these practices, regulation was lax or non-existent, and Canadian domicile provided a patina of respectability associated with supposed British financial rectitude. Stolid, boring Canada provided excellent cover for some quite audacious venture capitalism.

The promoters would round up a syndicate of reliable individuals and institutions, many of whom had participated in earlier deals. Success depended upon acting in concert; free agents who would sell at a whiff of misfortune or tempted by rapidly appreciating securities prices, threatened the entire venture. The syndicate managers sought to co-ordinate their buying and selling to create a steady rise in price which would attract outside investors who would buy to hold, effectively taking their newly acquired stock off the market. The valorization of the stock meant major capital gains for insiders who had received it as a bonus with the bonds. For insiders, then, the rate of return on an investment in one of these companies consisted of 1) appreciation in the bonds from the time of purchase to the presentation to the market once the company was operating; 2) underwriting commissions; 3) appreciation in the value of the common stock, 4) market operations based on insiders trading, less the costs of financing the investment. In a well-managed promotion these combined net profits could be considerable and of course these securities need not be completely liquidated to realize the gains. Once valorized these securities could be pledged as collateral for new promotions. For insiders these successful Canadian company promotions, such as Sao Paulo and to a lesser degree Rio and Mexico, produced splendid returns which made subsequent Pearson ventures much sought after.[1]

1. These financial techniques are documented in C. Armstrong and H.V. Nelles, *Southern Exposure (op. cit.)*, and in C. Armstrong and H.V. Nelles, "La empressa corporativa en el sector de servicios públicos: el desempeño de las compañíes canadienses en Mexico y en Brasil, 1896-1930", in Carlos Marichal (ed.), *Las inversions extranjeras en América Latin, 1850-1930*, Mexico, 1995, p. 125-144.

A trans-Atlantic network of potential underwriting participants eagerly awaited a new Pearson promotion and on first glance the Barcelona deal looked to be the best thing Pearson had ever turned his hand to. Of course the willing participants included not only Canadian investors familiar with opportunities as a result of earlier promotions but also British investment bankers and investment trusts introduced them to these sorts of high risk high yield operations by Canadian experience or associates, and the Swiss, German and especially the Belgian special purpose electric utility investment banks with whom Pearson had done business in the past. Beyond lay a vast realm of what the promoters referred to as "real investors" eager to snap up the stock and bonds of these seemingly sound, secure, steadily earning utilities companies once the market had been properly prepared with press notices and earnings statements to receive them.

While Pearson set about planning the Catalan electric utilities business on a new hydro-electric foundation in November and December, the Barcelona Traction underwriting was managed by three principals: E.R. Wood, an investment banker, handled the Canadian portion; James Dunn, an expatriate Canadian financier in London, took charge of the British allocation and, to a certain extent, directed the entire operation, and Alfred Lowenstein, a Belgian investment banker associated with the Sofina group, syndicated the continental tranche. As Dunn explained the deal to Thomas Aitken of the Bank of Scotland (who had agreed to finance the activities of the British participants) the £4,000,000 of bonds, to be priced to the underwriters at 90 with a bonus of 50% fully paid up shares, would be divided in three packages: £1,200,000 for Canada, £1,300,000 for Britain and £1,500,000 for the continent. A syndicate would control the Canadian and British bonds for 2 years; the continental portion would be issued to the public immediately but the continental manager (Lowenstein) undertook to maintain the price above 90. Dunn reserved the right to transfer bonds from the British pool to the continent depending upon the relative demand.[1]

The Barcelona underwriting proved popular, indeed perhaps too popular. Dunn's British allocation was oversubscribed. He even sold his own share and had to appeal to Wood in Canada for anything left over there he might take for himself. Wood had sold out as well. Moreover Dunn's French associates complained they had not been included in the continental offering. Lowenstein claimed his share too had been over committed and he had nothing to spare. Dunn had to console his French friends with small scraps from his own portion. The French and British principals in a small international utility acquired in the transaction demanded a participation in the syndicate on better terms than everyone else. Dunn, in high dudgeon, refused. In general the underwriting went smoothly and quickly, with only the normal tensions and suspicions of an international flotation. The happy problem for the promoters was that more investment bankers wanted in on the deal than the syndicate managers would or could satisfy.[2]

1. Dunn Papers, Vol. 35, Louis Fleischmann (L. Messel & Co.) to Dunn, November 24, 1911; Letterbooks, 262, Dunn to Alfred Lowenstein, November 27, 1911, p. 16-18; *ibid.*, Dunn to Thos. Aitken, Bank of Scotland, November 27, 1911, p. 19-20. Arnold Spitzer, a Paris investment banker, worked with Lowenstein on this underwriting.

2. See C. Armstrong and H.V. Nelles (*Southern Exposure*, *op. cit.*, p. 163-168) for a fuller explanation of the underwriting techniques and the tensions associated with this flotation.

By the end of the year AEG's electric utility in Barcelona had passed into "Canadian" hands.[1] The German consul in Barcelona reported in December that "the North American engineer Pearson" had been investigating the local utilities situation and had bough a number of waterpower sites in the Pyrenees from Emilio Riu. By chance this consul had been resident in Rio de Janeiro in 1905 when this Canadian syndicate took over the Siemens & Halske tramway as part of a major utilities consolidation. From a national point of view the German diplomat found the rumored takeover of AEG's Barcelonesa company "particularly regrettable" and hoped that the head office in Germany would not go through with the deal. A few days later German trade officials questioned the president of AEG, Emil Rathenau, about this pending sale. In an extraordinary, evasive response near the end of the month, Rathenau disclaimed any responsibility. The deal, he said, was probably by then a *fait accompli* and nothing could be done. In any event the Canadians had not bought the entire firm, only a controlling interest in the company. AEG could do nothing, he claimed: "Our part of these shares is, relatively speaking, so small that we are absolutely powerless in front of the decisions of the major shareholders who are situated mostly abroad and who consider their participation just from a profit point of view." He regretted the transfer of control to a "transatlantic property" more than anyone else because the new management would likely look to the United States for its engineering and electrical equipment.[2]

Rathenau was being disingenuous. He may himself have participated in the Berlin discussions with Pearson; certainly he knew about them and approved them. This extraordinary self-serving letter suggests perhaps that Rathenau believed that government officials did not fully understand the relationship between AEG and its banks. Elektrobank in particular was his creation and through them he was the major shareholder in the *Barceloñesa* company. But his letter provides evidence too of the widening gulf between bankers' interests and manufacturers' interests, even though Rathenau was cast in both roles in this instance. It is perhaps possible too that the Deutsche Bank pressed for this outcome over mild AEG objections. In any event AEG, the Deutsche Bank, Elektrobank and the others were prepared to sell their under-performing Spanish utility because they were just as eager to acquire cash for other ventures and securities in the new Pearson venture as all of the other eager European underwriters. The Deutsche Bank not only sold its shares in Barceloñesa, it immediately loaned the proceeds back to the new company accepting shares as security. It effectively financed the purchase of its former own investment.

1. According to Dunn the Deutsche Bank accepted a combination of cash and 18,000 shares of common stock which it agreed to take on the condition Dunn would buy back the shares at $40 at any time during the first year, Dunn Papers, Letterbook, 267, Dunn to Lowenstein reminding him of the risk he had taken, December 8, 1912, p. 69-70.

2. Bundesarchiv Berlin, R901/2235, fol. 20-21: Emil Rathenau to Auswärtiges Amt, December 29, 1911, quoted in M. Doria and P. Hertner, "Urban growth and the Creation of integrated systems of electrification: the cases of Genoa and Barcelona, 1894-1914", in A. Giuntini *et al.*, *Urban growth on two continents in the 19th and 20th centuries. Technology, networks, finance and public regulation*, *op. cit.*, p. 240. The German authorities did not fully believe Rathenau, asking him to appear in person to account for the transaction. On this second occasion Rathenau once again insisted upon the "foreign" nature of the Unternehmergeschäft banks. Secondly he noted that the price offered for Barceloñesa by the Americans was so high "that in the interest of the shareholders a sale could not be refused", *Ibid.*, fol: 22-23, handwritten report of a German diplomat in the file.

For the next two years more than 250 engineers under Pearson's direction and an army of more then 9,000 workmen swarmed over Catalonia surveying new transmission lines, building massive diversion dams, tunnels and power canals high in the mountains, and snaking penstocks down the slopes to the powerhouses in the valleys below. Pearson's grand scheme called for seven major dams, and a network of reservoirs, power canals and headworks leading to three hydroelectric generating stations. All of this had to be constructed simultaneously, Pearson insisted, rather than in stages to capture economies of scale and to storm the market with cheap electricity.[1] The German consul noted, "In Catalonia there has been a genuine invasion by North American capital" at a time, he reported in some dismay, that the vaults of Catalan banks were full of unused millions that timid local bankers might have invested had they been more enterprising.[2] By contrast US trade officials in their reports home boasted of the scale and technical prowess of the work ("the greatest work of its kind in existence", "a monument to American skill and enterprise"), emphasizing that while the capital might be British and French "the brains of this vast undertaking are nearly entirely American." As Rathenau feared, the electrotechnical equipment not longer came from Germany. Pearson drew upon the companies with which had had worked in the past, most of whom were US based. Generators and switchboards came from General Electric; Westinghouse built the transformers. Turbines for the power stations came from Escher Wyss in Switzerland. The transmission towers that carried the lines hundreds of kilometers across Catalonia came from the United States.[3]

As the Pearson group forged ahead with its monumental hydroelectric project it also restructured the utilities industry of the entire region. To provide markets for all of this new power Pearson bought up a host of small local electric utilities and tramways, wiring them into his system. [See Pearson's Report in Appendix B for a complete list.] But it is interesting to note the properties he did not snap up. At about the same time as Pearson launched the Barcelona Traction promotion, Siemens & Halske, its Swiss financial holding Indelec and the French Compagnie Générale d'Éléctricité, attempted to break into the Barcelona electricity market with a new hydroelectric company of their own, Energia Eléctrica de Cataluña. It proposed construction of a hydro-electric station on the Flamisell River in the Pyrenees north of the Pearson development.[4] Pearson indignantly refused to consider this operation a legitimate rival despite its strong

1. The project is described in several contemporary accounts: J.C. Stevens, "Serros Power Development" and "The Seros Hydroelectric Development", in *Engineering News*, September 3, September 10, 1914, p. 473-478, 536-539; H.F. Parshall, "Hydro-electric installations of the Barcelona Traction, Light and Power Company", *Proceedings of the Institution of Civil Engineers*, London, 1922, quoted in Gil Cooke, "An Extreme Power Engineer: The Accomplishments of Fred Stark Pearson", p. 80.

2. Bundesarchiv Berlin, R901/2231, fol. 182-185, General Consul at Barcelona to Auswärtiges Amt, June 8, 1912, quoted in M. Doria and P. Hertner, "Urban growth and the Creation of integrated systems of electrification: the cases of Genoa and Barcelona, 1894-1914", in A. Giuntini *et al.*, *Urban growth on two continents in the 19th and 20th centuries. Technology, networks, finance and public regulation*, *op. cit.*, p. 241-242.

3. M. Doria and P. Hertner, "Urban growth and the Creation of integrated systems of electrification: the cases of Genoa and Barcelona, 1894-1914", in A. Giuntini *et al.*, *Urban growth on two continents in the 19th and 20th centuries. Technology, networks, finance and public regulation*, *op. cit.*, p. 234-244.

4. *Ibid.*, p. 245-246.

backing. As an engineer and as competitor he dismissed the Siemens subsidiary out of hand in a cable to his London partner Dunn in November 1911:

> Do not consider this group any importance. Think Frankfurther [code for Siemens] notice bluff to frighten us induce us to buy their power which situated high in Pyrenees practically impossible access in winter country entirely snowed up now Stop Our engineer Hyde reports area watershed in his opinion makes it impossible to develop any large power there and doubts if they have 10,000 horse power under good conditions probably not 2,000 in winter months.[1]

Thus for the time being the Pearson group ignored the Siemens' initiative, viewing it as a feint intended mainly to force an expensive buyout.

Curiously Pearson also refused to purchase the largest potential power user and the most firmly established company in his territory, the Sofina-owned Les Tramways de Barcelona. Why he did so, notwithstanding the fact that his company advertised itself as a street railway in its name (Barcelona Traction, Light and Power), remains something of a mystery. Early on Pearson kept his distance from the tramway considering it a worn out, overpriced property. He thought he would do better financially negotiating a power supply contract with the tramway.[2] He also sensed there was more profit to be made serving the burgeoning suburbs rather than the old city. Moreover he had a scheme to circumvent the tramway and make more money for his company in the process following a strategy he had learned from his friend William Mackenzie in Canada. In Montreal Mackenzie's Canadian Northern Railway had found access to the business core of the city had been blocked along the riverfront in the south by two well- established railways. Rather than pick his way into the city through their networks, Mackenzie drove a tunnel into the heart of the city from the north, under Mount Royal. In one dramatic coup he had a downtown terminus and an electric railway that opened up vast suburban tracts to the north from which the railway earned a fortune both from its real estate ventures and its commuter traffic. Pearson and Dunn envisioned the same success in Barcelona.[3] Thus instead of buying up the tramway in the cramped old part of the city, they too tunneled a mile through a mountain to open up new suburban development in the abundant land beyond, where Pearson believed future urban growth would be focussed. There is a possibility too that Pearson and Dunn wanted to keep the Tramway transaction separate, as they had, for example in Mexico City. Later they could make another company promotion based upon the integration of the tram system into their corporate empire. Certainly there are hints of this in Dunn's apparent attempt in 1911 to organize a syndicate to buy up Tramways shares. It is possible too that Sofina either did not want to sell, or that Dannie Heineman asked too high a price even by Pearson's free-spending standards. At any rate in 1911 Pearson thought he did not need the tramway to make a success of his Barcelona Traction promotion.

Had Pearson been able to bring his system into production on time and on budget, Barcelona Traction might have been a great financial success for the promoters. But this being a typical Pearson operation, there was no budget or timetable; the scheme and the financial requirements expanded without explanation even

1. Dunn Papers, Letterbook 262, Dunn to Lowenstein, quoting Pearson's telegram, November 27, 1911, p. 16-18.
2. Dunn Papers, Letterbook 262, Dunn to Lowenstein, March 19, 1912 and March 22, 1912, p. 295, 321.
3. Dunn Papers, Letterbook 262, Dunn to Pearson, March 18, 1912, p. 293.

to the principals.[1] Inevitably construction delays, some caused by Government bureaucracy, and cost overruns plagued the project. Pearson's insistence upon building the entire Seros and Erbro hydroelectric developments all at once rather than in sequence raised the initial costs enormously.

Under these and other strains during 1913 the Barcelona underwriting began to unravel from within. Ugly rumors circulated that Pearson was profiteering from the construction. His strategy of refusing to buy the tramway and the Siemens company failed. The Tramway did not limp along as imagined by the newcomers. Rather it went from strength to strength. Its stock soared in 1912. Eventually it had to be bought out in 1913 at which time Barcelona Traction had to pay a hefty premium over the 1910 price. Pearson's tactical miscalculation had proven costly to the company. But it must be said that the Sofina interests and their associates who sold the tramway in 1913 were also probably part of the underwriting syndicate who took on the issue of 1st Mortgage bonds and preferred shares that had to be issued, among other things, to finance this purchase, see below.

The Siemens & Halske hydroelectric promotion also continued to haunt the new enterprise. The company went ahead with its works, conscious of the fact that eventually Barcelona Traction would have to come to terms. The longer it waited the higher the price.[2] Eventually in 1913 Barcelona Traction relented (probably because it needed financing from these circles) and bought a 49% interest in the Indelec/Compagnie Générale d'Éléctricité enterprise, Energia Eléctrica de Cataluña. This expensive acquisition further dented the Barcelona Traction treasury.[3]

More damaging yet to the fragile finances of the operation were Lowenstein's lingering suspicions that Pearson through his extravagant engineering was in effect bleeding off extra profits for himself and his demand that independent engineers review the project.[4] It took all of Pearson's and Dunn's diplomatic skill and a tour of the construction site guided by "the Doctor" to satisfy Lowenstein of the good faith and of the soundness of the undertaking.[5]

1. Dunn to E.R. Wood, March 23, 1913, Private and Confidential, Letterbook, 264, p. 310-314 for example: "This enlarged programme came to me as an unpleasant surprise as until my return to England last December I was not aware this fresh amount of money would be necessary…".
2. In 1912 the chief manager of the Deutsche Bank had predicted: "…j'ai peu de doute qu'ils finiront par se vendre au groupe Pearson…" Crédit agricole, Paris. Archives Historiques. Fonds Crédit lyonnais, DEEF 25238: Arthur von Gwinner to Eugène Lefèvre, May 15, 1912.
3. M. Doria and P. Hertner, "Urban growth and the Creation of integrated systems of electrification: the cases of Genoa and Barcelona, 1894-1914", in A. Giuntini *et al.*, *Urban growth on two continents in the 19th and 20th centuries. Technology, networks, finance and public regulation*, *op. cit.*, p. 246 for the details.
4. The Pearson Engineering Company, according to Dunn, took a standard 10% of the project cost as commission see Dunn Papers., Letterbook 264, Dunn to Pearson, April 3, 1913, p. 383; *ibid.*, Vol. 46, Pearson to Dunn, August 3, 1913, Pearson to Lowenstein, August 3, 1913. For a long letter detailing Lowenstein's grievances against Pearson and Dunn see Dunn Papers, Vol. 50, Lowenstein to Dunn, December 5, 1913, Private, and Dunn's reply, *ibid.*, Letterbook 267, Dunn to Lowenstein, December 8, 1913, p. 69-70. This is misdated in the original 1912.
5. Dunn Papers, Letterbook, 265, Dunn to Lowenstein, August 5, 1913, Private and Confidential, p. 343-345; Vol. 47, Lowenstein to Dunn, September 6, 1913; Vol. 48, Lowenstein to Dunn, from Biarritz October 12, 1913 reporting he has returned from Barcelona favorably impressed. He believed that some money might have been saved but otherwise he was very pleased with saw: "…one could reproach the Doctor for having undertaken so many different works at the same moment, because it would probably have been wiser to develop first one hydro-electric power and only afterwards commence the second one, to do the Sarria business at a much later date and to acquire, on the contrary, much earlier the operation of the Tramways de Barcelona, but for the expenditure incurred in connection with the Barcelonesa, for instance, one cannot make any reproaches to him because it was caused as a result of the intervention of Azaria".

Scandal further complicated matters. In the autumn of 1913 a group of French financiers, who hoped to sell their small waterpower to Barcelona Traction and who wanted a portion of the underwriting on better terms than insiders received, threatened to blackmail the company. These French interests had complained to Dunn that the Pearson group had allied itself too closely with a network of Jewish financiers in Brussels and Paris, effectively freezing out other French capitalists.[1] If the promoters failed to open their underwriting syndicate to other French investment bankers on exceptional terms, the dissidents threatened to expose the entire venture as a fraud. Pearson, Dunn and Lowenstein refused. In an unusual turn of events the French financiers made good on their threat, planting a sensational story filled with thinly veiled anti-semitic references in the newspaper *L'Humanité* allegedly exposing the high risk financial practices of the Canadian promotion: "It has been necessary to go as far as Canada to find legislation which permits the formation of a Company with 125 million," the editorial charged, "of which not a single share has been subscribed in cash and the founders and promoters of which have themselves taken without scruples Frs. 125,000,000 of shares."[2] In this way financiers could divert French savings into "more or less illusory" foreign enterprises.

All of this put financial pressure on the firm at a critical juncture. In 1913 global markets turned downward, and in the general retreat of speculative securities bear raiders on the continent attacked the Pearson group of companies with particular fury. The Mexican Revolution damaged the properties and the overseas reputations of the Mexican utilities and the Mexico North Western Railway. Then the failure of Pearson's Texas land company exposed Barcelona Traction and other Pearson properties to attack on the bourses. In these unfavorable circumstances Barcelona Traction nevertheless had to raise additional money to complete its ambitious engineering works, buy the tramway and the competing power company at inflated prices, and provide working capital. The initial £4,000,000 bond issue had been used up in 1912. By early 1913 a further £3,500,00 in 1st Mortgage Bonds had to be issued. In a detailed memorandum justifying the additional expenditures Pearson held out the glimmering prospect of more than a million pounds Sterling in annual earnings available for distribution to the syndicate only 5 years away to entice his reluctant financial backers.[3] According to Pearson's account, the initial £4,000,000 bond issue yielded only £2,618,300 to finance construction after the deducting the 10% discount, the £620,000 in commissions, and the £365,000 to acquire the Barcelonesa Company. By his reckoning the company needed an additional £4,900,000 to complete its works. According to Pearson's long range financial strategy, once the company was fully up and running, he proposed to repay the Barcelona Traction holding company for its advances and redeem its debt by selling bonds of the underlying operating companies to Spanish investors. In the final stages, then, Spanish capital would be brought in to replace foreign debt, but not, of course, foreign control.

Lowenstein and his associates agreed to take the entire issue of the new £3,500,000 1st Mortgage bonds but insisted upon a stock bonus of 30%. As there was none left in the treasury this had to be taken from Pearson's private holding.[1] When even that additional capital proved insufficient a batch of 7% preferred shares had to be issued in June, convertible into common stock, to finance emergency loans. This was very expensive money. The costs of raising this additional capital squeezed most of the promoters' profits out of the venture as far as Dunn and Pearson were concerned, and transferred the benefit to the continental underwriters of the bonds.

The recession of 1913 exaggerated strains within the underwriting syndicate. As Pearson predicted at the first hint of a market downturn common stock from Canada flooded onto the London market and had to be mopped up by the British syndicate to maintain prices. Dunn bristled at rumors that Lowenstein in Brussels was selling while he was busy buying. Lowenstein pleaded innocence and complained that Dunn was not doing enough. These market operations, necessary to maintain the illusion of price stability, tied up enormous quantities of capital when it was needed elsewhere. Then in the middle of these frantic trading endeavors, Dunn's partner C. L. Fischer simply vanished, leaving substantial debts to be covered to avoid a general default of the financial house. Not surprisingly well-founded rumors about Barcelona Traction's financial difficulties overshadowed the delivery of the first Seros hydroelectricity at the end of 1913. In reporting what otherwise might have been a celebratory event the British consul in Barcelona noted sardonically "...the company is undoubtedly in some financial straits, chiefly owing to having overpaid for their original purchases."[2]

The Pearson group counterattacked with a major public relations effort to support their increasingly desperate search for additional capital. A group of British journalists visited Spain at company expense to report glowingly on the progress of the works. The *Financial Times* was paid to run a series of articles about the company.[3] But the promoters could do little during a general market

1. Dunn Papers, Vol. 46, Rod. Demmé to Dunn, Personal, August 4, 1913; Letterbook 265, Dunn to Demmé, August 8, 1913, p. 383-384.

2. Translation of an editorial from *L'Humanité* exposing the financial practices of the Barcelona Traction promotion, Dunn Papers, Vol. 48, enclosed with H. Wauters, (Stallaerts & Lowenstein, Brussels) to Dunn, October 17, 1913. The syndicate defended itself by exposing the blackmail and by arguing that many successful Canadian companies had been financed with no par value shares. This latter claim lost much of its force when E.R. Wood, the Canadian financier in the best position to know these things, refused to sign the statement of defense. Dunn Papers, Vol. 50, Alfred Lowenstein to Malcolm Hubbard, December 1, 1913; Hubbard to Lowenstein, December 3, 1913; Lowenstein to Hubbard, December 5, 1913. The exposure was apparently intended to get Barcelona Traction to buy control of Compañia de los Caminos de Hiero, Saltos y Minas, owner of some waterfalls.

3. F.S. Pearson's memorandum on the financing of the Barcelona Traction construction and acquisitions, 1913, Dunn Papers, Vol. 42, with Pearson to Dunn, February 14, 1913. This document spells out all of the companies acquired, the prices paid and earnings.

1. Dunn Papers, Letterbook 264, Dunn to E.R. Wood, February 18, 1913, p. 132. Dunn explained the situation as follows. Of the initial $25,000,000 in common shares $20,000,000 had been allocated as bonus with the first bond issue. Pearson had kept the remaining $5,000,000 for himself as the promoter's share. An additional $2,000,000 over and above the $25,000,000 seems to have been issued to the Tramway shareholders following an expansion of the company's capital in April, 1913. Pearson had to withdraw $3,500,000 from their share to provide the 30% bonus for Lowenstein's £3,500,000 1st Mortgage bonds, leaving him only $1,250,000, which Dunn insisted "involves a great sacrifice to him." The benefit of the increased expenditures needed to finance the new acquisitions would accrue to the original shareholders Dunn pointed out.

2. PRO, FO 185/1163, "Memorandum on hydro-electric schemes in Catalonia and Valencia", Charles Ramsden, December 24, 1913 quoted in M. Doria and P. Hertner, "Urban growth and the Creation of integrated systems of electrification: the cases of Genoa and Barcelona, 1894-1914", in A. Giuntini *et al.*, *Urban growth on two continents in the 19th and 20th centuries. Technology, networks, finance and public regulation*, *op. cit.*, p. 242.

3. Dunn Papers, Letterbook 268, Dunn to F.S. Pearson, Mar. 30, 1914, p. 230-231; *ibid.*, Letterbook 268, Dunn to F.S. Pearson, May 6, 1914, p. 428.

retreat to turn the tide for Barcelona Traction. Lowenstein from Brussels blamed everything on Pearson's policy of indifference to cultivating market opinion and wild expansion without consultation in the belief the money could be found later: "Combien de fois n'ai-je pas aussi donné des avis de prudence au Docteur en ce qui concerne sa politique d'emprunts, et sa façon de faire plus 'grand' que les capitaux dont il disposait. En realité, tous les ennuis que nous avons maintenant résultent de cette politique."[1]

Pearson, Dunn and Lowenstein struggled during the spring of 1913 to arrange emergency loans to finish construction. They frantically reorganized the capital structure of the company to create more securities, which, in any event, the market would not take. The promoters' hopes of breaking into the French capital market in a big way had been dashed, first by the exposé, then by the unfavorable general market conditions, and lastly by Pearson's inability to produce the solid financial information major investors required.[2] As the company slid towards insolvency during the spring of 1914 insiders contemplated replacing Pearson as president with Dannie Heineman of Sofina who was at that point "really controlling the company."[3]

The historical archives of Société Générale, one of the largest French banks, reveal that Stallaerts & Loewenstein in Brussels were frantically trying to put up a syndicate for 10,000 Barcelona Traction shares in July 1914. Société Générale participated for 1,000 shares but, when asked, flatly refused to go beyond this number.[4] A week before, a Société Générale employee had stated in a note that the promoters could not maintain the Barcelona Traction share price against heavy speculation: "[...] Mr Loewenstein & Cie. en ont acheté 6.000 cette semaine mais néanmoins les cours ont fléchi jusqu'à 95 frcs après avoir atteint 220 frcs en 1912 et 140 frcs à 180 frcs en 1913. Les bruits les plus invraisemblables se sont repandus." Loewenstein had therefore founded the syndicate with a volume of 10,000 shares mentioned above. Being cautious bankers Société Générale then wrote down the value of the 2,590 Barcelona Traction shares in its portfolio to 1 Frcs each in their books.[5]

The underwriters efforts to raise money in a difficult market to finance the completion of Pearson's great scheme were, of course, completely overwhelmed by the outbreak of World War I. Financial markets closed down; governments halted international fund transfers. A defeated F.S. Pearson had to shut down construction with the high Pyrenees hydroelectric works not yet completed. At the end of 1914 the company collapsed into the hands of a receiver acting for the bondholders.[6] The promoters had finally lost control of their company.

Pearson still flitted about between New York, London and Brussels trying to refloat the enterprise; the unemployed workmen of Catalonia begged for his

1. Dunn Papers, Vol. 57, Lowenstein to Dunn, July 6, 1914.
2. See for example Dunn Papers, Vol. 53, Lowenstein to Dunn, February 20, 1914 claiming Pearson's failure to deliver timely information was preventing refinancing. Lowenstein complained Doctor Pearson had not furnished documents and technical reports he had promised at fixed intervals, nor had he indicated how he would used the additional £920,000 he wanted his partners to raise.
3. Dunn Papers, Vol. 58, Dunn to Arnold Spitzer, Confidential, July 20, 1914.
4. Société générale, Paris. Archives historiques, B 3270: Lettres échangées entre Stallaerts & Loewenstein and Société générale on 14 and 15 July 1914.
5. *Ibid.*, handwritten note of 8 July 1914.
6. Dunn Papers, Vol 60, Notice of Appointment of Receiver for Barcelona Traction, Light and Power Company, December 30, 1914.

return according to his daughter who visited the site, but a World War was an even more difficult time to refinance a company than a general recession, especially when the new money was expected to come from France and Germany.[1] On one of these trans-Atlantic trips F.S. Pearson and his wife lost their lives in the sinking of the *Lusitania* on May 7, 1915. Notwithstanding Pearson's remarkable career as an engineer and financier, a reckoning for his estate later revealed that he died bankrupt.

CONCLUSION

The Great War rudely interrupted completion of the Barcelona Traction hydroelectric scheme. But as we have seen even before that the company had begun to collapse, crushed by the burden of debt it had been made to bear. In receivership during the War the company was able to serve its customers from its thermal stations and some of its hydroelectric stations, but it could not operate at peak efficiency. It was not until 1922, by then under Sofina control, that the company, having completed Pearson's design, brought the entire 137,000 horsepower on line. Thereafter Barcelona Traction produced enough electricity to power the industrialization of Catalonia. Barcelona Traction, as conceived by F.S. Pearson, provided the spine of the Catalonia electricity grid into the 1950's as well as transportation, lighting and electric power service to the city of Barcelona.

Pearson's engineering had been sound, even brilliant. His massive hydraulic works extracted the maximum amount of power from Pyrenees' waterpowers and provided cheap energy for years to come once completed. However the financial and organizational aspect of the business presented a sharply different picture. In this conclusion we will forego the opportunity to moralize and turn instead to a comparative examination of outcomes.

The different phases of electrification in Barcelona between 1889 and 1914 presented two contrasting styles of foreign investment, the former that might be styled "German Unternehmergeschäft" and the latter, for the sake of convenience, "Canadian Venture Capitalism." At the outset we should observe that these were two styles of investment rather than stages in the development of foreign investment. Canadians had been doing these things for more than a decade by the time they arrived in Barcelona. The German style of linking manufacturing companies to investment banks would be applied by General Electric on into the 1930s. We need also to be cautious in drawing conclusions on the basis of the Barcelona case alone, and upon the evidence we have. Including Brazil and Mexico with Barcelona would change the picture. Nor do we have comparable evidence in the two cases. The Canadian operations are relatively transparent to us as a result of the surviving correspondence between the principles that allows us to see inside the venture. For the German investments we lack similar correspondence and do not know what credence to put on published financial data. We can see the Canadian style from the inside out; most of what we know about German practices

1. Natalie Pearson's 1915 letter quoted in Gil Cooke, "An Extreme Power Engineer: The Accomplishments of Fred Stark Pearson", p. 79.

involves looking from the outside in. And we must be cautious in making hard judgments about "shady" financial dealings in a historical situation in which markets and regulators had to learn and inscribe the "rules" based upon practice and performance. It is true that most of the techniques used by the Barcelona Traction promoters (insider trading, market collusion and manipulation, withholding information, publishing misleading information, high leverage, bonus stock) are now either illegal or highly frowned upon. But we should keep in mind the narrowness of the markets, the fact that professionals were playing with and against each other, and that in this high-stakes gamble the principals lost.

Each foreign direct investment style had definite strengths as well as weakness we would like to highlight by way of conclusion. The Unternehmergeschäft style very effectively supported the export of German high technology manufactured goods. As these were the largest, and most technologically sophisticated electroctechnical manufacters in the world this style of foreign investment thus worked to the advantage of public welfare by diffusing rapidly a beneficial public good, light, power, rapid transit. And as we have noted at several points US equipment manufacturers, most notably General Electric, would adopt this strategy in modified form to support their domestic and foreign sales. The weakness of the system seems to lie in its focus upon the interests of manufacturers and secondarily bankers over other strategic, technical and market considerations. This was a process driven by manufacturers. It led to proliferation, and worked well to add units of production. But it did not work quite as effectively when the time came to make a major technological shift or to combine the many small units of production.[1] The quantum increase in capitalization involved in the Canadian style facilitated integration and consolidation.

By contrast the Canadian venture capitalist style was driven by engineering and financial market concerns. Pearson imagined the most efficient system, whatever it might cost and whatever equipment it might take, and left it to financiers to find a way to raise the necessary funds. The Canadian venture capitalist style favored system-building and financial advantage to the principals over all other considerations. It lacked the financial and managerial constraints needed, however, to keep the projects on budget. Pearson acted as an independent agent, making decisions and expecting his colleagues to not only agree, but to raise the unexpectedly large amounts of new money required. Pearson would argue that a opportunities evolved and it was important to have a business plan that took advantage of every technical, geographical and competitive opportunity. If, for example, Pearson had been able to deliver cheap hydro-electricity to Barcelona in 1913 with the first £4 million this would have been a quite different story. But the project grew as it unfolded. Temptations, distractions and acquisitions got in the way. Pearson's design meant the whole project was heavily front-end-loaded: it could only be brought on-line when all of the works had been completed. We should be careful too not to confuse the style with the skill with which the style was executed. Barcelona showed F.S. Pearson at his best and

1. Emil Rathenau's extremely cautious approach to hydroelectricity is well illustrated in a letter of 4 December 1903 to Samuel Kocherthaler who was then directing one of AEG's financial holding companies, *Gesellschaft für elektrische Unternehmungen:* "[...] I just observe that hydro power is risky. We employ it only when we are forced to, and I believe we should, for the moment, remain satisfied at Barcelona with the existing [steam, P.H. and V.N.] plant" (Deutsches Technikmuseum Berlin, AEG Archives, A 1065).

his worst, as a world leader in hydraulic and electrical engineering, and as the business partner from hell.

The German style worked well in a financial market of established institutions. Manufactures could talk to their bankers and build associated institutions build upon long standing relationships. The Canadian style worked when it broadened the market, brought in new money from previously untapped sources, and expanded the scope of financial markets. The French press and the parquet bridled at the notion of fully paid up stock for which nothing had been paid. Indeed Barcelona Traction represented a stock watering promotion par excellence, providing much fodder for critics of capitalism. The Canadian venture capitalist system took no par value stock –a concept that had just begun to be accepted– to an extreme. In these highly leveraged operations the owners of the common stock received the benefit in the form of capital gains of the growth prospects and the profitability of the company. It was the tremendous attractiveness of these gains of course that created the eager underwriting syndicates in the first place, and drew the attention of a much wider pool of investors who wanted a piece of the action. This style of capitalism raised the much larger sums required for the quantum jump in scale and scope demanded by an efficient hydroelectric utility. For the stock to maintain its values as established by the underwriting syndicate on broader markets, the promoters would have to build a company capable of maintaining those values. But if the stock was held initially by the bondholders as bonus, then those who had shouldered the debt also reaped the gains and, of course, the losses. But the value of the common stock could fall to 0 –as it did in the case of Barcelona– before the underwriting syndicate began to experience net losses. The bonus stock disguised and when successful compensated investors for the substantial risks involved in the undertaking. In any event the 1913 stock market collapse and then receivership during WWI wrung most of the water out of this promotion.

Contemporary critics made much of the fact that the new entrant paid too much for its acquisitions, and this is undoubtedly true. For their part the Canadian capitalists understood the economics of a hydroelectric company rather better and knew that at scale it could be made to service a very large debt and still remain profitable. The Barcelona failure probably owned more to the inability to bring its electricity to market in a timely fashion. But it is worth noting who held up the Barcelona Traction Company; whose tactics forced it to buy at a premium, and who benefited from the sale? The answer to these questions, of course, is the Unternehmergeschäft bankers in German, Switzerland and Belgium who had launched the electrification of Barcelona. To a certain degree selling at an advantage to the Canadian syndicate represented trading one form of securities for another as far as the bankers were concerned. They were primarily concerned with extracting the maximum advantage for their institutions from each transaction. It is then perhaps entirely appropriate that when the Company collapsed in 1914 it reverted to the ownership and control of the German, Belgian and Swiss Unternehmergeschäft banks who had started the electrification of Barcelona in the first place.

We end by suggesting that not too much emphasis should be placed upon national distinctions in the disposition of capital. Before 1914 something like a global capitalist financial system was evolving in which different elements from different countries were mixed and adapted according to different circumstances. Looking at the Barcelona situation from a high altitude one might conclude that

German bankers adopted a Canadian vehicle to recapitalize and reorganize the utilities of Barcelona on a regional scale and on a new engineering foundation. Such lofty conclusions would, however, miss the wonderfully tangled and ironic human comedy that produced the unfinished masterpiece of emerging international capitalism, the Barcelona Traction, Light and Power Company.

Economic Culture and its Transfer

Americanization and European Enterprise, 1900-2005

Harm G. Schröter*

Americanization is the transfer of values in the economy from the USA. Europe experienced three waves: in the 1920s, during the boom-phase 1949-1973, and since 1985. By using Americanization as a cultural concept, we cannot only describe the waves but explain why they occurred: The Europeans were eager to learn how to improve their economy and firms during phases in which the USA excelled not only in the economic field but in others (politics, military strength, etc.). Thus we understand how and why rationalization swept over Europe as a wave in the 1920s, and why the US-film industry became superior. Why during the boom European countries set up business schools and interdicted cartels, why firms changed their systems of government, production and distribution; and finally why since about 1985 Europeans embarked on privatization, deregulation, revolutionized their financial services. The trend was to become less co-operative and more competitive in all aspects.

CULTURE ÉCONOMIQUE ET TRANSFERTS CULTURES :
L'AMERICANISATION ET L'ENTREPRISE EUROPEENNE 1900-2005

L'américanisation consiste en un transfert de valeurs dans l'économie depuis les États-Unis. L'Europe en a expérimenté trois vagues : dans les années 1920, durant la phase de boom de 1949 à 1973 et depuis 1985. En considérant l'américanisation comme un concept culturel, nous ne pouvons pas seulement décrire ces vagues, mais aussi expliquer pourquoi elles sont survenues. Les Européens étaient impatients d'apprendre comment rendre meilleures leur économie et leurs firmes durant ces phases où les États-Unis excellaient non seulement dans le champ de l'économie, mais aussi dans d'autres (politique, force militaire, etc.). Ainsi nous pouvons comprendre comment et pourquoi la rationalisation balaie l'Europe dans les années 1920, et pourquoi l'industrie américaine du film l'emporte, pourquoi, durant la phase de boom, les pays européens créent des business schools et interdisent les cartels, pourquoi les firmes changent leurs systèmes de gouvernement de production et distribution, et, en fin de compte, pourquoi depuis 1985 les Européens se sont embarqués dans la privatisation, la dérégulation, révolutionnant leurs services financiers. La tendance était de devenir moins coopératif et plus compétitif à tout point de vue.

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