*Mannesmann in Great Britain 1888 - 1936: an Investment Dependent on Politics and the Market**

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Business history, already in the nineteenth century, abounds in examples of industrial enterprises founded with the assistance of investments of foreign capital. In some cases, the existence of these investments was reflected in the name of the company. It was, however, almost unheard of for a company, at the time of its founding, to build and operate production sites in two or more different countries simultaneously. Of course, there were examples of tight sales- and supply-integration, but it generally took years, and often decades, before an industrial enterprise was prepared to venture a direct foreign investment in order to produce abroad. A company's early years were devoted to consolidation, to the acquisition of experience, and to the accumulation of capital for future investments. Furthermore, in the case of most industrial enterprises, there at first existed no particular call to invest abroad: these enterprises had been founded with the satisfaction of domestic demand in view, and the portion of production exceeding this demand could then be sold abroad, for which the company could always avail itself of the services provided by domestic commercial enterprises. On the other hand, direct investment abroad required knowledge not only of the prevailing market conditions, but also of the particular political circumstances in the foreign country concerned; finally, it presupposed a knowledge of the language of the foreign country in question. For the most part, enterprises took upon themselves the risks involved in direct investment abroad only when compelled to do so by external factors — for example, when threatened with the loss of successfully acquired markets due to tariffs or other trade restrictions. [1]

Mannesmann was in this respect, as in others, an unusual case. The company was founded in 1890 as the *Deutsch-Österreichische*

* I would like to thank David Franklin and Frank Nellissen for their assistance in producing this translation; I am indebted to Nora Fischer for the fair copy.

1 Cf. Frank Nellissen's dissertation, *Evolutionspfade der internationalen Unternehmenstätigkeit aus wirtschaftshistorischer Sicht - Das Mannesmann Engagement in Brasilien* (in printing).

Mannesmannröhren-Werke AG. Mannesmann's initial capital, by virtue of which the fledging enterprise already numbered among the ten largest companies in Germany, was divided primarily among Germans and Austrians. Its plants, where seamless steel pipes were rolled according to the Mannesmann technique, were located, among other places, in Komotau, Bohemia, which at that time belonged to the Habsburg Empire. A second plant was situated in the Saarland, near the French border — it might even have been built on the other side of the border; in any case, in the light of the possibilities afforded by the French market, this was an option which Mannesmann seriously considered. [2] However, in the end, the city of Bous in the Saarland was chosen, not least because the Saarland, home to many mines and iron and steel works, was itself a very promising market, besides also offering convenient access to Lothringen, at that time still part of the German Reich, to Luxembourg and Belgium, regions also heavily involved in the coal and steel industry, and, finally, to France as well. These advantages, together with the already familiar common language and law which location in Germany afforded, ultimately outweighed those that a site in France had to offer. [3]

As the plant in Bous was intended to supply demand in western Europe, so the site at Komotau was selected with the potential of the southern European market in mind. This choice was facilitated by the intimate knowledge of this market possessed by two Remscheider commercial enterprises, which had, for many years, supplied the Habsburg Empire stretching from Vienna far into the Balkans with products from the *Bergische Industrie* of Remscheid and Solingen. The Mannesmann family was related to the owners of one of these two enterprises, both of which owned part of the capital of the Komotauer company. [4]

In addition, there were also the German language, common to Austria and Germany, and their shared business law: the *Allgemeine Deutsche Handelsgesetzbuch*, which was adopted by the *Deutsche Bund* in the early 1860s, and established a common basis for all commercial activities — at least until 1907, when Austria, with the passing of its own body of commercial law, became foreign territory in this respect as well. [5] Another Mannesmann pipe plant was founded abroad in Great Britain, the home of industrial development and also, in view of its currently extensive colonial possessions,

[2] Cf. Horst A. Wessel, *Kontinuität im Wandel, 100 Jahre Mannesmann 1890 - 1990*, (Düsseldorf 1990), p. 13 ff; as well as Horst A. Wessel, *The First Hundred Years of Mannesmann Technology*, 1987.

[3] *Ibid.*, p. 37 f.

[4] *Ibid.*, p. 42 f.

[5] Cf. Lutz Hatzfeld, "Hansemann wollte ein Archiv. Eine handelsrechtliche Anekdote zum 200. Geburtstag eines rheinischen Unternehmers", *Archiv und Wirtschaft* 23 (1990), p. 143 ff.

the centre of the most important sales market in the world. Like the three other Mannesmann-owned enterprises abroad, this company, with its headquarters and plant in Landore, South Wales, already existed prior to the founding of the *Deutsch-Österreichische Mannesmannröhren-Werke AG*. It was, however, the only one of the four not to be brought into the new company at that time, being only years later purchased and incorporated into the enterprise.[6]

Without doubt the Mannesmann family grasped the tremendous advantages which the location of a company producing in Great Britain afforded; certainly, the Mannesmanns made the most of such advantage with great enthusiasm. The road along which the Mannesmanns were travelling had earlier been paved by the Siemens family, which had for many years been entrepreneurially active in Great Britain. In 1883 in recognition of his achievements on behalf of economic and technical progress in Great Britain, Wilhem Siemens, a Siemens brother of the pioneer generation, was elevated by Queen Victoria to the hereditary nobility, and thence went by the name of "Sir William".[7]

Werner Siemens became acquainted with the Mannesmann technique in 1887; from the very start, he was filled with enthusiasm over this "revolution in rolling technology". He immediately informed his brothers, Friedrich and Wilhelm Siemens, who at that time were seeking a method for using the regenerative firing technique, invented by Friedrich, for the economical production of quality steel from pig iron with a high scrap-metal content. Werner Siemens was convinced that, with the help of the Mannesmann technique, "steel would in the future rule the world completely".[8] After a visit to Remscheid, where the invention had originally been made in the file factory run by Reinhard Mannesmann Senior, Friedrich Siemens was equally excited and decided immediately to participate in the founding of the companies in the Saarland and Austria. In addition, negotiations were begun over a contract, its object the licensing of the Mannesmann-rights for Great Britain and Ireland.[9]

[6] Horst A. Wessel, *Kontinuität im Wandel*, p. 40 f., 110 ff.

[7] Cf. Wilfried Feldenkirchen, *Werner von Siemens. Erfinder und internationaler Unternehmer*, (München 1992); Conrad Matschofl, *Werner Siemens. Ein kurzgefaßtes Lebensbild nebst einer Auswahl seiner Briefe*, 2 Vol., (Berlin 1916); Georg Siemens, *Geschichte des Hauses Siemens*, I Vol. 1847 - 1903, (Munchen 1947); Sigfrid von Weiher, *Die Entwicklung der englischen Siemens-Werke und des Siemens-berseegeschäfts in der zweiten Hälfte des 19. Jahrhunderts* (= Schriften zur Wirtschafts- und Sozialgeschichte, Vol. 38), (Berlin 1990) (= Diss. Freiburg, Breisgau 1959); Horst A. Wessel, *Emil Guilleaume und Siemens Brothers in London*, (Köln 1982).

[8] Siemens-Archive; Reproduction under M. 33.000 in Mannesmann-Archive; cf. also Mannesmann-Archive; R 6.0401.

[9] Mannesmann-Archive, M 15.600, contract from 2/21/1888; M 60.005.

Landore was selected as the site for the plant not so much on account of its favourable geographical location — near to the coast, and on the Midland and Great Western railway lines — but because the plants of the Landore Siemens Steel Company were situated nearby. In the summer of 1887 the contract was signed, and the construction of the Mannesmann pipe plant began immediately. According to the contract, the Siemens family was to advance to Mannesmann the sum of £ 10,000; additionally, Mannesmann was to receive one free share for every share issued in exchange for cash, by which measure the Mannesmann family retained its hold on half of the new company's shares. January 1888 saw the founding of the Mannesmann Tube Co. Ltd. with a capital of £ 300,000. Its commercial direction was entrusted to J. G. Gordon, an English nephew of the Siemens family, and its technical direction to Carl Mannesmann. [10]

How confident the Mannesmanns were that they had made sufficient progress with the new Mannesmann technique, despite all the difficulties they had experienced in converting successful experimental results into real industrial practice, is shown by their acceptance, already in October of 1888, of a large order from Chile: 57 English miles of high-pressure pipe to be delivered by the end of the following March. [11] Although a number of engineers and foremen were transferred to Landore from the already operating plants in Remscheid and Komotau, with the inventors themselves, Reinhard and Max, also, at times, intervening, operation never moved beyond the trial phase. Just as they had failed in Continental Europe, the attempts in Great Britain to produce a market-ready, thin-walled pipe by means of a slant rolling mill alone proved unsatisfactory, entirely apart from the costs involved in the production of such an artifact. There were flaws inherent in the technique itself, independent of the production conditions peculiar to Landore. [12]

With the invention, in 1890, of the reciprocating rolling process, all problems that had so far stood in the way of the efficient production of seamless steel pipes seemed finally to be solved. [13] This step forward brought with it powerful new financial backers, ready to invest further capital, and so it was decided to merge all of the Mannesmann pipe works into one enterprise. However, after having endured years of high-capital expenditure without returns, the Siemens family believed they were now close to success, and so declined to incorporate the Landore enterprise, of which they had a

[10] *Ibid.* and M 15.625 as well as M 68.151.

[11] *Ibid.*, M 30.014, p. 22.

[12] Horst A. Wessel, *Kontinuität im Wandel*, p. 55 ff.; Rudolf Bungeroth, *50 Jahre Mannesmannröhren* 1884 - 1934, (Berlin 1934), p. 131.

[13] Horst A. Wessel, Zwei berühmte Walzverfahren für nahtlose Stahlrohre wurden 1891 patentiert, in: Report. Zeitschrift für Kunden und Geschäftsfreunde der MRW AG, C 17 (1991).

majority share, into the new company. Consequently, the continental plants founded the *Deutsch-Österreichische Mannesmannröhren-Werke AG*, while the Siemens and Mannesmann families together continued to conduct the Mannesmann Tube Company in Landore as an independent enterprise. [14]

Naturally, there was from the beginning close cooperation between the two enterprises, especially in order to overcome production bottlenecks in the British plant due to technical shortcomings and inadequate mechanical facilities. After the first pilger mill was installed in 1891 and put into operation, thin-walled pipes of 1 3/4 to 2 inches outer diameter were rolled, and then further processed by the cold-drawing machine into bicycle-tubes and boiler-pipes. [15]

The economical, stable, and precision-sized Mannesmann tube revolutionized, among other things, the design and construction of bicycles. Their price fell to about one tenth of their original cost and turned a luxury- and sports-vehicle into a means of transport for the masses. Equally great was the demand for Mannesmann bicycle-tubes, for which the concept "precision pipe" was created and rapidly gained wide currency. In February 1892, there were orders for bicycle-tubes extending to a total length of approximately 107 km. By the end of May of that same year, the aggregate length had increased to around 140 km, this at a production capacity at about 24 km per month. Two thirds of these orders had been placed by North American companies, which at that time were experiencing a veritable "bicycle boom".[16]

In comparison with the continental plants, Landore always lagged behind. While the plants in Remscheid, Komotau, and Bous were equipped for the mechanical feeding of cavity blocks, in Landore this task was carried out by hand until 1895. This method was not only more labour-intensive — due to the exceedingly strenuous nature of the work, several different teams had to be employed, but also more expensive: the production costs in the Welsh plant, for example, were about 2.7 times as high as those for the plant at Komotau. Additionally, there were also problems in Great Britain involving the supply of tube piping. The requirements placed by the Mannesmann technique on the quality of steel tube piping were entirely new, even for the experienced British steel industry. [17] Contrary to all expectations, the Landore enterprise proved unable to surmount the difficulties that troubled it. Loss upon loss was recorded, which, due to the Mannesmann family's lack of liquid resources, had to be borne by the Siemens, who in turn increased their percentage of the business at the expense of the Mannesmann share. Again and again, the alternative of closing the plant was considered. On 21 July, 1893, Carl

[14] Horst A. Wessel, *Kontinuität im Wandel*, p. 53 f.
[15] Mannesmann-Archive M 16.601 and M 16.602.
[16] *Ibid.*, catalogue for bicycle tubes.
[17] R. Bungeroth, *50 Jahre*, p. 131 f.

Heinrich von Siemens wrote to the Siemens representative and future general manager at Landore: "Let's shut the dump down, if the pipe business won't go anywhere. Otherwise, we'll only keep throwing good money after the bad, until all the sources are exhausted, and finally the business collapses." [18]

As of the end of 1893, Landore was again recording large and steadily increasing orders for bicycletubes, though admittedly not always at adequate prices. As a result, the warehouse stock of pipes was swiftly depleted. At the end of 1894, the total amount of current orders had grown to almost 244 km, which corresponded to ten months' production at Landore. Furthermore, the company finally managed to get itself on the list of suppliers to the British Admiralty. That this could have been achieved by a company founded by Germans and operating according to a German-invented technique demonstrates the superiority of the Mannesmann pipes. The British Admiralty had correctly realized that these substantially reduced the danger of pipe ruptures and steam-boiler explosions, occurrences all-too-common in that day and age. With the stamp of quality conferred upon it as a supplier to the British Admiralty, Mannesmann simultaneously acquired the right to deliver to private shipyards as well. [19]

Already in 1893, the production plant in Landore had been supplemented by the addition of a pilger mill with two roll stands for pipes with diameters of 2 ½ to 4 inches, and another mill with one stand for pipes with diameters of 4 ½ to 5 ½ inches. In 1895, all the pilger mills were equipped with mechanical feeders, and the large pilger mill completely rebuilt; it was fitted out with two new stands, making a total of four, and now processed pipes from 6 to 8 inches in diameter. As it was often quite difficult to procure the round bar steel needed for the small pilger mills, the old 3-stand rail rolling mill of the Landore/Siemens Steel Company was equipped with new round passes, and the requisite quantities of round bar steel were rolled by hand from heavy round ingots. [20]

In early 1895, the influx of orders had reached such a capacity that Landore could no longer fill them on its own. By the middle of the same year, orders had attained an aggregate amount of almost 760 km, which, despite an increasing monthly production output, would still have taken the plant more than eight months at full capacity to fill. Since the delivery deadlines precluded such a pace, and large new orders were already coming in, approximately 100 km were sub-contracted out to the continental Mannesmann pipe plants. For the first time, the Mannesmann Tube Company finished the business year with a profit, albeit a small one, if one excludes the depreciation of buildings and plants. [21]

[18] Mannesmann-Archive M 30.014, p. 57.
[19] *Ibid.*, p. 75.
[20] R. Bungeroth, *50 Jahre*, p. 132.
[21] Mannesmann-Archive M 15.602 and M 15.603.

Despite all these investments, the turn-around in the company's fortunes was not achieved: for this situation the company's management, and in particular its technical direction was to blame. Until the middle of 1892, the technical director had been Carl Mannesmann, brother of the inventors. He was replaced by the engineer, Julius Pfau, who had come to Mannesmann from Sulzer, the Swiss machine factory, and assumed, in 1887, direction of the Remscheid plant, and later that of the Bous plant. He had visited Landore repeatedly, and had participated in the testing of the rolling mills there. He was, therefore, intimately familiar with the conditions in the British Mannesmann plant when he assumed direction of it in 1892. Unfortunately, health complications forced him, at the end of the next year, to abandon the island and return to the Continent, where he once more became technical director of the Bous plant. [22]

Back in Landore, the Swiss, Karl Stiefel, who had headed Landore's construction office since 1890, did not receive the position his fellow countryman, Pfau, had vacated. Stiefel possessed all the prerequisites, and the commercial director recommended his promotion. However, in consideration of the contemporary debate concerning an alleged foreign infiltration of the economy, which had by that time become quite heated in Britain and elsewhere, the job was ultimately given to an Englishman. A few months later, Stiefel — in spite of contractual obligations — left Landore and established , for the North American "Bicycle King" Henry Lozier, the Elwood Weldless Tube Co., whose products were to provide Mannesmann with stiff competition, not only in North America, but eventually on the Continent as well. [23]

Neither Pfau's successor in Landore, nor the commercial director there, knew the first thing about either the production or the sale of Mannesmann pipes; in addition, they made serious errors in their calculations of retail prices. Contrary to customary business procedure, they granted North American bicycle producers considerable credit without demanding any kind of surety, arrangements which led for the most part to losses for Landore. Though lacking technical expertise, the plant director imagined it feasible to produce Mannesmann pipes five pounds per ton cheaper than had been done in the past, bringing them beneath the market price for welded pipes. According to his conception of things, Landore's capacity for achievement was so enormous that he would be able to turn it into the greatest factory of its kind in the world. He sealed his fate as plant director when he accepted a large order from the British postal service for conically-rolled telegraph poles, star products of the Remscheid and Komotau plants. Not only were the poles sold at a price which barely covered the cost of materials, but for every pole to come out of production intact, four others left it mangled and unuseable;

[22] *Ibid.* M 15.603.

[23] *Ibid.* M 11.050, The minutes of the meeting of supervisory board of 5/14/1900; M 60.006, R 4.2010 and R 4.2014.

finally, the deadline for delivery was not met, so that along with the loss of prestige and confidence the company incurred a hefty fine as well. [24]

The new plant director was chosen in early 1898 after consultation with the board of directors of the *Deutsch-Österreichische Mannesmannröhren-Werke AG*, and subsequently prepared to take up of his duties by visiting the plants at Komotau and Bous. Standing in the way of a successful revitalization of the business, however, were politics and the market. For one thing, the British Admiralty banned the use of foreign steel in building steam boilers for their ships. Up until then, Landore, along with the other British pipe plants, had used Swedish steel on account of the high quality of the semi-finished and end-products, and had secured for itself an adequate long-term supply. After the Admiralty's decision, the price of Swedish steel fell by almost 40 percent. As a result of this, Mannesmann Tube suffered heavy losses, which its own means were not sufficient to cover. In addition, the workers of the Welsh coal mines, and part of the work force at the Landore plant as well, went on strike. [25]

On the other hand, with the collapse of the American bicycle boom, orders for bicycle tubes had already drastically subsided. By the middle of 1898, almost 30 km of bicycle tubes lay unbought in stock at Mannesmann Tube, which on top of that had already ordered even greater masses of tubes from continental plants. Landore's debt to the *Deutsch-Österreichiche Mannesmannröhren-Werke* ran to nearly £ 17,000. In November of that year, Landore opted for its own voluntary liquidation. [26]

If the plant, its patented equipment, and the British market — on the island as well as overseas — were not to be left to the competition, the *Deutsch-Österreichische Mannesmannröhren-Werke AG* would have to take control of the British enterprise, in spite of its own limited financial flexibility — the company was at that time undergoing a difficult period of reorganization. [27] The board of directors believed the risk manageable, and the supervisory board declared itself unanimously in favour of the acquisition, because it lay "in the interest of the company". After lengthy negotiations, a price of £ 185,000, was agreed upon. [28]

The takeover followed in June 1899. The initial capital of the British

[24] R. Bungeroth, *50 Jahre*, p. 132.

[25] Mannesmann-Archive M 11.072, letters from the chief of the supervisory board to the chief executive officer at 28 Feb. and 29 March, as well as *vice versa*, of 2 March, 10 March and 26 March 1898; cf. also M 30.014, p. 83 f.

[26] M 15.600 and M 15.603.

[27] Cf. Horst A. Wessel, Finanzierungsprobleme in der Gründungs- und Aufbauphase der Deutsch-Österreichischen Mannesmannröhren-Werke AG. 1890 - 1907, in: Dietmar Petzina, *Zur Geschichte der Unternehmensfinanzierung* (= Schriften des Vereins für Socialpolitik, NF 196), (Berlin 1990), p. 119 ff.

[28] See note 26.

Mannesmann Tube Comp. Ltd., as the firm was now called, was set at £ 340,000, of which provisionally only £ 287,725 was raised. Furthermore, in order to enhance liquidity, £ 100,000, made up of 4 ½ percent fixed interest stock was issued. [29] The board of directors and the operations commission responsible for technical coordination assumed that Landore's past difficulties had been due primarily to management errors made in the commercial sphere. For this reason, an experienced company secretary from the headquarters in Düsseldorf was appointed as commercial director, while technical direction was at first left in English hands. Düsseldorf standards were introduced into commercial management, which not only facilitated more reliable calculation and controls, but also exploited the advantages afforded by modern office equipment; for example, an adding machine of the brand "Brunswiga", which now has its home in the museum collection of the Mannesmann-Archive, was transferred from Düsseldorf to Landore. Additionally, in 1902, as circumstances failed to improve according to expectations, a German plant director was called in £ 10,455 more of ordinary share capital was raised in as well. [30]

Now a work schedule was set and a development plan drawn up, according to which the plant would be modernized and its productivity enhanced. Already by 1904, the production of steel cylinders had improved to such an extent that Landore gradually came to supply almost all of Great Britain`s demand, including that of the naval authorities. Between then and 1908 production and sales tripled. As the demand for socket pipes increased beyond expectation, additional production and storage capabilities were added. The production capacity for socket pipes and pipe fittings rose to 1,000 tons per month. When the German plant director took up his position at Landore, the plant produced about 5,000 tons per month with a total force of 939 workers; by the outbreak of the first World War, output had risen to 31,000 tons, and the workforce to 1,500 workers, indicating an increase of nearly four-fold in worker productivity. [31]

On 1 January 1913, the plant director in Landore left his position to his successor, another German engineer, in order to begin construction of a new plant in Newport, east of Landore at the mouth of the River Severn. Here, in recognition of the purchasing habits of British customers, the new plant was to produce pipes with mid- and large-sized diametres of up to 15 inches, which had previously been supplied by continental plants. [32]

At the outbreak of the war, the office building and wages office in Newport were almost structurally complete; but, with the internment of the

[29] *Ibid.* M 15.600.

[30] *Ibid.* M 11.050, the minutes of the meeting of the supervisory board of 25 July and 23 Nov. 1898 and of 8 May 1899; cf. also M 11.002 at 5 August 1897 and 18 July 1899.

[31] R. Bungeroth, *50 Jahre*, p. 132.

[32] *Ibid.*, p. 135.

German management, construction work ground to a halt. In 1916, the entire company was seized by the British government as enemy property and sold to a British consortium, the proceeds being placed in a compensation fund. During wartime, the Landore plant worked for the War Ministry, producing shells for munitions, steam-boilers and steel cylinders for the navy, and compartments for the army's airships. In early 1917, construction of the Newport plant was resumed, and at such a rapid pace that, just one year later, it was ready to go into pipe production. At first, the plant produced war materials, and then, after the armistice, pipes destined for more peaceful applications, with diameters from 7 ½ up to 15 ¾ inches. 1921 saw the introduction of welded-pipe construction, measuring from 14 to 72 inches.

In 1921, the British coal and steel company, Baldwins Ltd., whose main plants and mines lay likewise in South Wales, took over the former Mannesmann plants in Landore and Newport, for which Baldwins had already been an important supplier of semi-fine steel products, and which continued to trade under the name of the Mannesmann Tube Co. Soon after the takeover, a round bar steel mill, built only in 1909, was closed down and scrapped. For the pipe plants, this had two disadvantages; first, that another large warehouse for semi-finished products had to be provided, and, secondly, that the ovens of the pipe rolling mills could no longer be charged with warm material. These new factors both hindered pipe production and made it more expensive.

To replace the scrapped rolling mill, a Stiefel rolling mill, or piercing mill, was erected. Developed by Charles Stiefel, Landore's former chief engineer, this was a substantially improved Swedish mill, which operated with a modified Mannesmann skew rolling-mill as a blooming mill. This piercing mill was supposed to replace all pilger mills producing pipes of up to 5 inches in diameter. The new rolling mill went into operation in November 1924 but, despite vigorous technical support from North American specialists, never progressed beyond trial runs. [33]

Conscious of the importance of the British market, Mannesmann tried to gain a foothold there once again after the war. At first, however, they were unable to move beyond an exclusive representation by Leonard Hall, Ltd., reestablishing friendly relations with the plants in Landore and Newport only in the mid-1920s. In September of 1926 Mannesmann acquired a share in the company's capital, which was to grow to 93 percent. In accordance with the demands of the British government, Britons formed majorities on the board of directors and supervisory boards; the management of the company also lay in British hands. However, the plant directors in both Landore and Newport were replaced by German specialists. [34]

After meticulous examination, the piercing mill in Landore closed down

[33] *Ibid.*, p. 133 and 136 f.

[34] Mannesmann-Archive M 15.613, M 15.614 and M 15.617.

as unserviceable. In November 1929, a pilger rolling mill took its place, producing pipes with outer diameters of 2 to 4 ½ inches at the rate of 120 tons per day. Up until 1930, the cold rolling mill was modernized. In the mid-1930s the plant housed two one-stand and one two-stand pilger mills for pipes of diameters of 2 to 8 inches, as well as all the accompanying operations, such as the cold-drawing plants with a monthly output of around 400 tons, the pole drawing plant, the socket-pipe department, and the tube bending plant. [35]

After Mannesmann took over, the Newport plant underwent far-reaching modifications in its rolling mill and in its production of tubes, socket-pipes, and poles. Many new machines were installed and the ovens modified for gas-firing, which involved considerable financial expenditure. [36]

In spite of everything, the hoped-for financial success was achieved only to a disappointingly small extent. Production was plagued by a recurrent lack of quality semi-finished products, which the neighbouring steel works of Baldwins could not supply, and which, when procured elsewhere, was so expensive and inflated production costs to such an extent that it rendered successful competition exceedingly difficult, if not impossible. [37] In order to retain the advantages afforded by pipe production in Great Britain, Mannesmann set its sites on securing the requisite supply of semi-finished products through an extension of the iron and steel works in Duisburg-Huckingen, but this initiative succumbed beneath the opposition of Britain's heavy industry.

When in the mid-1930s, with the goal of making the pipe plants independent, Mannesmann attempted to obtain free foreign currency for the construction of a steel plant of its own in Great Britain, the national socialist government in Germany forbade such a course of action. New plants abroad did not mesh well with the political and economic designs of the national socialists, who were on the contrary much more oriented towards the selling of foreign property, in order to eliminate the German economy's dependency on foreign currency and strengthen the efforts toward autarky. Those in charge at Mannesmann felt operations in Great Britain subjected to an ever-increasing pressure. Under these circumstances, which seemed to augur badly for the future, the board of directors in Düsseldorf decided that their company in Great Britain, lost during the war and then re-acquired after the end of the war, in which Mannesmann had invested so much human and financial capital, was finally to be sold. In 1936 it was acquired by Stewards and Lloyds. [38]

[35] *Ibid.* M 15.621; cf. R. Bungeroth, *50 Jahre*, pp. 133 and 135.
[36] *Ibid.* M 15.622.
[37] Mannesmann-Archive M 15.610, M 15.611, M 15.618, M 15.619, M 15.620, M 15.623.
[38] *Ibid.* M 15.612; cf. also Wilhelm Zangen, *Aus meinem Leben*, (Düsseldorf) 1968, p. 99.

In 1927, the trading company Leonard Hall Ltd., London, had been taken over by Mannesmann, and continued to operate under the name Premier Steel Tube Company Ltd.; the rights to the name "Mannesmann Pipes" had been lost as a consequence of the war. Immediately after the sale of British Mannesmann Tube in 1936, the Premier Steel Tube Company changed its name to the Mannesmann Trading Company, which acted from then on, until the Second World War, as exclusive representative of the interests of the Mannesmann companies in the British Empire. [39]

In summary, the following points merit emphasis:

- The production of seamless steel pipes according to the Mannesmann technique migrated to England with remarkable rapidity.

- During industrialization in the nineteenth century, this technique was one of the few innovations that stimulated technology transfer along a north-south axis, travelling from Germany to Great Britain.

- Direct investment had in its favour the market opportunities afforded a company producing in Great Britain, but nevertheless required special preconditions for its realization — in the case at hand, Mannesmann's close financial relationship with the Siemens family, who had already been active in Great Britain for years.

- The development of the company, and in particular the structure of the production schedule and the further extension of production plants, were conditioned by the demands of the markets in Britain, in the British possessions overseas, and in North America.

- The influence of politics is particularly clear in the case of the measures taken by the British Admiralty: positive, with the placing of the enterprise on their list of suppliers; negative, with the ban on all steel except British in their steam-boilers.

- Expropriation during the war, and the circumstances in both Britain and German forced its eventual sale about a decade after the re-acquisition of the company, forced its eventual sale and thereby led to the end of industrial direct investment abroad, show that politics is, in many cases, stronger than the market.

[39] Horst A. Wessel, *Kontinuität im Wandel*, p. 238.