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Spatial management of contractors. An analysis of the industrial sites of the *Louis De Waele* enterprise in Brussels (1867-1988)

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ABSTRACT: Due to the recent attention paid to general contractors, business historical insights have revived within construction history. To obtain a better understanding of the role these contractors played in shaping the built environment, the historical analysis also has to focus on their spatial conduct. Confronting different business historical sources enables an evaluation of the spatial management of a Brussels contracting firm, the *Louis De Waele* enterprise, active since 1867 until today. It started as a small family enterprise and evolved into one of the most important Belgian contracting firms by 1900. The firm combined general contracting with a spatially more demanding woodworking activity until 1945. Its spatial management was highly influenced by external factors, especially the general construction activity. The insights make clear that analysing a contractor's spatial management forms a valuable perspective for business historical research into construction enterprises.

1 INTRODUCTION

Whereas business historical insights formed a fundamental point of departure for the first generation of construction historians (Hinchcliffe 1985), they receded into the background later on. Today however, due to the new attention for the practices of general contractors (Bertels et al. 2016; Dobbels et al. 2016), business historical insights are back in the forefront of construction history. As a contribution to this upsurge, the research scope can be expanded to the spatial aspects of their business activities (Scranton and Fridenson 2013, 227-231), in accordance with the spatial turn in historical research. Within the spatial turn, space is as important as time in the unfolding of human affairs (Warf and Arias 2009). Analysing the spatial conduct of actors in the construction industry can thus contribute to our understanding of their evolving importance within society. Like other entrepreneurs, contractors not only managed their business on a financial level, but on a spatial level as well. This research focuses on the spatial management of the *Louis De Waele* enterprise, a general contracting firm founded in 1867 by the brothers Jean and Louis De Waele. The analysis extends until 1988, when the firm left its site in Sint-Jans-Molenbeek (Brussels).

This company forms a representative business historical case for the evolution from a small local family

enterprise into a large, still existing player on the national construction market. It is therefore interesting to analyse the well-documented evolution of its spatial management by confronting many different business historical sources. First of all, company archives, containing accounts and pictures, are important sources. Public administrative sources such as fiscal registers, nuisance investigation reports and building permits offer additional insights, especially for the initial years of the firm, since company archives are entirely absent for this period (1867-1888). Wall (2014) showed how the construction industry during more recent periods can be studied through oral history. Inspired by this, an interview was conducted with the firm's concierges, active since 1979.

Before analysing how these sources enable us to trace the spatial management of the firm, a distinction has to be made between two scales of spatial management, for which the firm had to take different considerations into account. On the small scale, it consists of infrastructural management, namely the spatial organisation of business processes on the industrial site. On the large scale, it consists of locational management: where did the enterprise settle and why? Explicit motivations for locational management decisions are rarely mentioned in company archives, but economic-geographical insights can offer an explanatory framework. The 'least cost theory', introduced

by Alfred Weber in 1909, is tested on this case study. The theory presumes a primordial importance of minimizing transportation costs in locational decision-making (Weber 1909). Firms executing weight-losing industrial processes settle as near as possible to their suppliers, or at least to the main supply transport channel. In woodworking firms for instance, heavy tree logs are transported into the factory by suppliers, and lighter parquet boards, window frames, etc. are transported from the factory to the clients. Transportation costs to deliver the supplies are therefore higher than those to deliver the finished products. Weight-gaining industries on the other hand settle closer to the consuming market. Contracting is weight-gaining, because the building process on the construction site results in an immobile structure. This paper will investigate how Louis De Waele spatially managed to combine both activities, despite their opposite locational needs. Although the least cost theory is more than a century old, recent literature confirms the importance of transportation costs for companies' locational management (De Caigny 2003, 555).

2 HISTORICAL OVERVIEW

The brothers Jean De Waele (1840-1902) and Louis De Waele (1843-1900) were born in Ghent as sons of joiner Eugène De Waele (GPA, *births*). They moved to Brussels where they were trained in the workshops of various joiners and masons. In 1867, they established their own business in a rented workshop in the *Quai aux Pierres de Taille 2* in Brussels (BCA, *patentes*, 4, 1867). They combined woodworking and general contracting activities as *entrepreneurs-menuisiers* (BCA, *almanachs*, 1870). This was not unusual: many general contractors started as 'regular' contractors – specialized in one aspect of construction, such as masonry or carpentry – and combined this with general contracting (executing and coordinating entire construction projects) by themselves or by cooperating with subcontractors. In 1870, they

moved to a terrain of their own in the *Rue de l'Intendant 29-33* in Sint-Jans-Molenbeek. Although exact business figures are not available, the increasing amount of major construction works indicates that the company grew steadily during the next two decades, for instance with their 1884 reconstruction of the Nation's Palace in Brussels (*La Chronique*, 14/06/1885).

In 1889, by then only named after 'Louis De Waele', the enterprise relocated to a larger terrain along the *Boulevard Leopold II 44-46* in Sint-Jans-Molenbeek. The end of the nineteenth and the beginning of the twentieth century was a time of expansive growth for the company. Brussels experienced an unprecedented urban development. This caused a strong increase of the overall construction activity, of which De Waele could successfully profit by building numerous houses and furnishing them with exquisite woodwork and parquetry.

After Louis' death in 1900, his sons took over and converted the firm into a joint-stock company (*société anonyme*) in 1902. In this period, the firm was one of the first Belgian concessioners of Hennebique's reinforced concrete (Van de Voorde 2011). They carried out numerous big private and public projects, such as the *Entrepôt Royal* on the industrial site of *Tour & Taxis* (1903-1907). By 1907, the company employed approximately 450 labourers in their factory and 500 on their construction sites. This was quite exceptional: according to the Belgian industry census of 1910, only 45 out of 28,705 building firms in Belgium employed more than 100 workers.

The woodworking and contracting divisions co-existed within the enterprise until 1946 when they were split up in 'Parquetteries Louis De Waele' and the general contracting firm 'Entreprises Louis De Waele S.A.' (Dobbels 2017). The latter increasingly worked with subcontractors, which consequently reduced the number of its own labourers. At the same time, its activities focused more on property development. In 1988, the firm left the industrial site in the *Boulevard Leopold II* in Sint-Jans-Molenbeek. The firm was sold to a French real estate investment group in 2008.

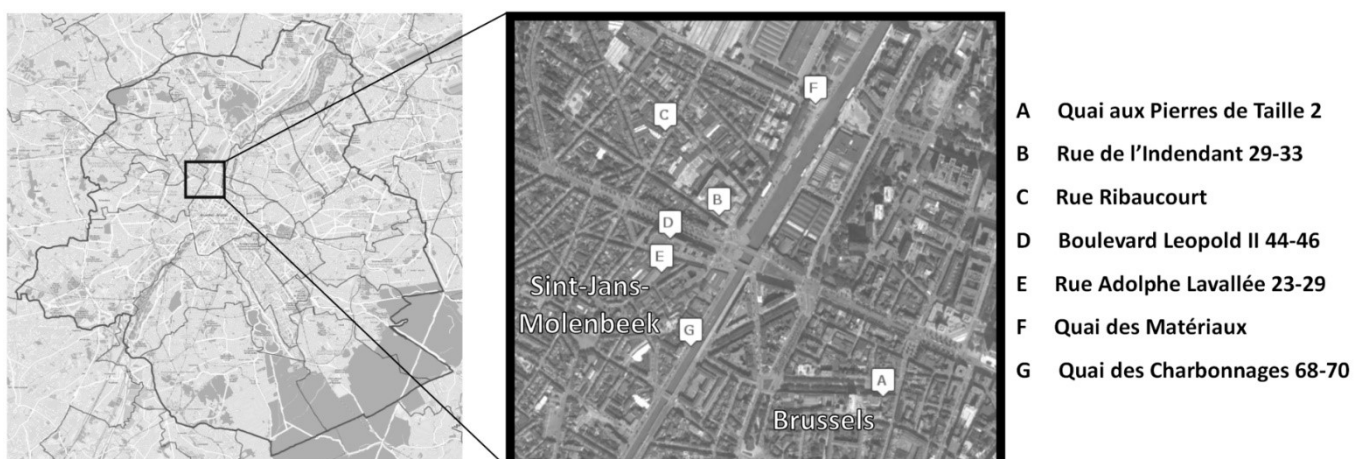


Figure 1. Louis De Waele's settlements in Brussels and Sint-Jans-Molenbeek, situated in the pre-industrial port (A) and close to the Canal (B-G), indicating the importance of supply transportation costs in locational decision-making.

3 SPATIAL MANAGEMENT

3.1 Roots of the firm in the city centre (1867-70)

Brussels' industrial development in the nineteenth century mainly took place in the western suburb of Sint-Jans-Molenbeek, near the Canal (1832) that connected Brussels with Charleroi and Antwerp. However, in 1867 Jean and Louis De Waele still settled in the pre-industrial port in the city centre. As beginning entrepreneurs, they had to start off by merely renting an available business space. They found this near the *Bassin de l'Entrepot* in the *Quai aux Pierres de Taille*, a location where they could still depend on an easy supply of construction materials.



Figure 2. Quai aux Pierres de Taille, Brussels, ca. 1860. Detail from Popp, Philip Christian. 1842-79. *Atlas cadastral de Belgique. Plan parcellaire de la ville de Bruxelles, 1re section*.

The business started in a rented workshop in the back of a residence where Jean and Louis De Waele both lived (figure 2). The workshop was also used by a coal merchant (BCA, *patentes*, 4, 1869). It had a surface of around 130 m² (BcadA, 207, Br. 12 ex 4).

When the workshop was sold in 1870, the new owner transformed it into a residential dwelling (BCA, TP 19145), compelling Jean and Louis De Waele to leave. Nevertheless, the initial growth of the firm – they already had ten employees (BCA, *patentes*, 4, 1870) – had not only made the workshop too

confined, it had also produced the necessary financial confidence to invest in infrastructure of their own.

3.2 Expansion in the Rue de l'Intendant (1870-89)

In 1870, the firm relocated to Sint-Jans-Molenbeek. In this municipality in the Brussels' Canal zone, a new district on previously rural land accounted for important pull factors. It provided the enterprise with more space and expansion possibilities. Moreover, transportation costs for supplies could be reduced considerably by the proximity of the broad Canal and its direct connection with the newly paved *Rue de l'Intendant*, providing better transport opportunities than the narrow docks and streets in the city centre.

Jean and Louis De Waele acquired three adjacent parcels in the *Rue de l'Intendant* with a total area of approximately 1250 m². It contained a residence on the street side (figure 3: A), a warehouse (B), a workshop (C) and two horse stables with saddlery (D).

The 1870s and 1880s were years of steady growth for the enterprise, paired with a gradual improvement and expansion of its infrastructure in several ways (BcadA, 207, Molenbeek 1; BSA, *éta. dang.*, B874). First of all, the fixed technical equipment was regularly adapted to the increased production. Whereas the majority of Belgian contractors continued to build by traditional methods until the First World War (Buyst 1992, 175), De Waele already installed a steam boiler and engine (H) to mechanize production in 1871. Several spatial measures were required to use a steam engine, such as building a high chimney, securing the safety of the labourers and the living conditions of the neighbours. Meant to activate the mechanical wood-sawing, the engine had a capacity of 8 horsepower (hp). In the following years, several consecutive, heavier steam boilers and engines were activated, with a final engine of 25 hp. The new engines also activated other woodworking equipment, apart

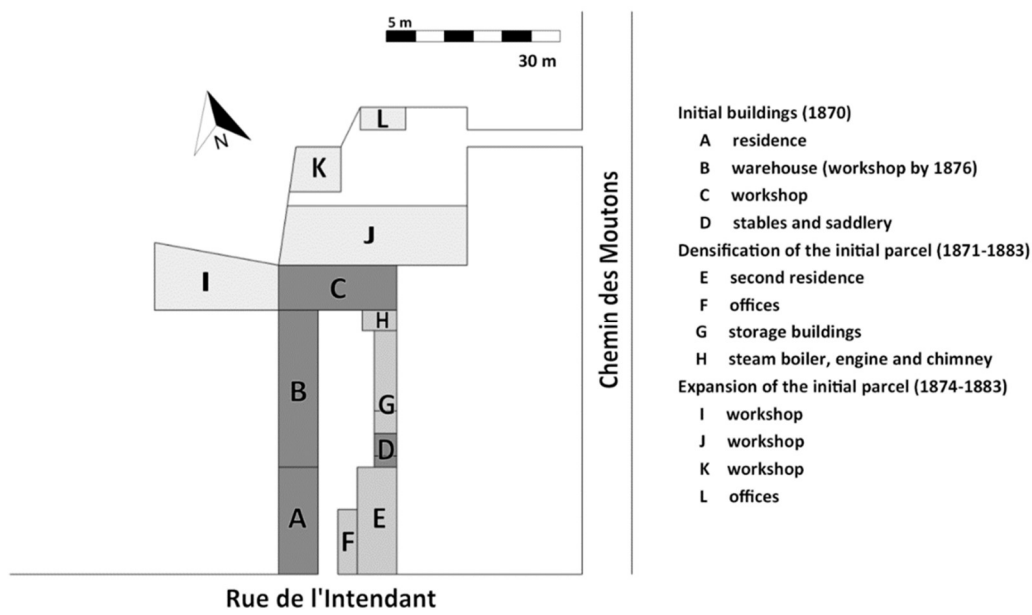


Figure 3. Evolution of the company infrastructure in the *Rue de l'Intendant*, 1870-1889 (based on BSA, *éta. dang.*, B874).

from the sawing machine. The nuisance investigations within a radius of 100 m never caused complaints from households nearby. This can be explained by the firm's early settlement in the area. New residents were aware of the firm's presence, so they deliberately chose to live near a factory.

Next to that, the courtyard was gradually occupied by storage buildings (G) and the aforementioned steam boiler with chimney (H). Also a second residence (E) was built in 1876. Offices (F) were placed between both residences, next to a small remaining passageway.

Furthermore, the industrial site organically grew within the building block, following opportunities to expand on surrounding parcels. Between 1874 and 1883, Jean and Louis De Waele acquired several adjacent terrains on which they constructed industrial buildings (I-L), consisting of workshops and offices. The site was now disclosed to the public road via a new passageway that led to the *Chemin des Moutons*.

Finally, spatial extension was executed on non-adjacent terrains as well. In the *Rue Ribaucourt*, on less than 400 m distance, a warehouse was constructed in 1873 on a terrain bought from the Brussels béguinage.

3.3 Relocation to the Boulevard Leopold II (1889)

By 1889, the company was bursting at the seams at *Rue de l'Intendant*, making another relocation necessary. Less than half a km away, a large parcel of approx. 6400 m² on previously rural land was acquired. It was situated along a new, prestigious avenue in Sint-Jans-Molenbeek, the *Boulevard Leopold II*.

In the late nineteenth century, most of Brussels' wealthy citizens settled in the southeastern suburbs on the other side of the city. It caused a boom in construction activity in this area, from which Louis De Waele intensively profited, despite the considerable

distance to the factory. This was sometimes problematic, since the enterprise did not dispose of storage facilities in this area (BCA, *propriétés comm.* 331). In 1889, Louis De Waele nevertheless still opted to remain in Sint-Jans-Molenbeek. Several considerations could have played a role. Transportation costs were once more highly important. The Canal was still not far-off, and the broad boulevard reduced costs even further. Via this avenue and its continuations all over the city, supplies could fluently reach the factory, and construction materials and equipment could easily be transported to the construction sites. Furthermore, real estate prices were decisive. The terrain in the *Boulevard Leopold II* cost around 10 francs per m², whereas the price for building plots of a comparable size on the wealthy southeastern side of the city, in Elsene and Sint-Gillis, was around 17 francs per m² in 1889 (*Guide de l'expert en immeubles* 1889). Next to that, agglomeration forces are likely to have caused a clustering of dependent industries in Sint-Jans-Molenbeek. Around 1902 for instance, Louis De Waele frequently cooperated with another contractor, Ruelens, located in the *Boulevard Leopold II* as well (LDW CA, *Comptes*). Finally, the firm was already widely known to be settled in Sint-Jans-Molenbeek. Its visibility and reputation would only be stimulated by moving to the nearby and prestigious boulevard.

Between 1888 and 1890, several buildings were constructed on the new industrial site (figure 4: A, B, C). As De Waele needed to showcase his own buildings along the *Boulevard Leopold II*, they were designed by some of the most prominent architects at the time. Emile Janlet (1839-1919) designed the director's house (B) in a typical Flemish Renaissance Revival style, intended as a display of the firm's skills and fashion-consciousness. The factory building (A) was designed by Henri Beyaert (1823-1894). Having frequently collaborated before, the firm had estab-

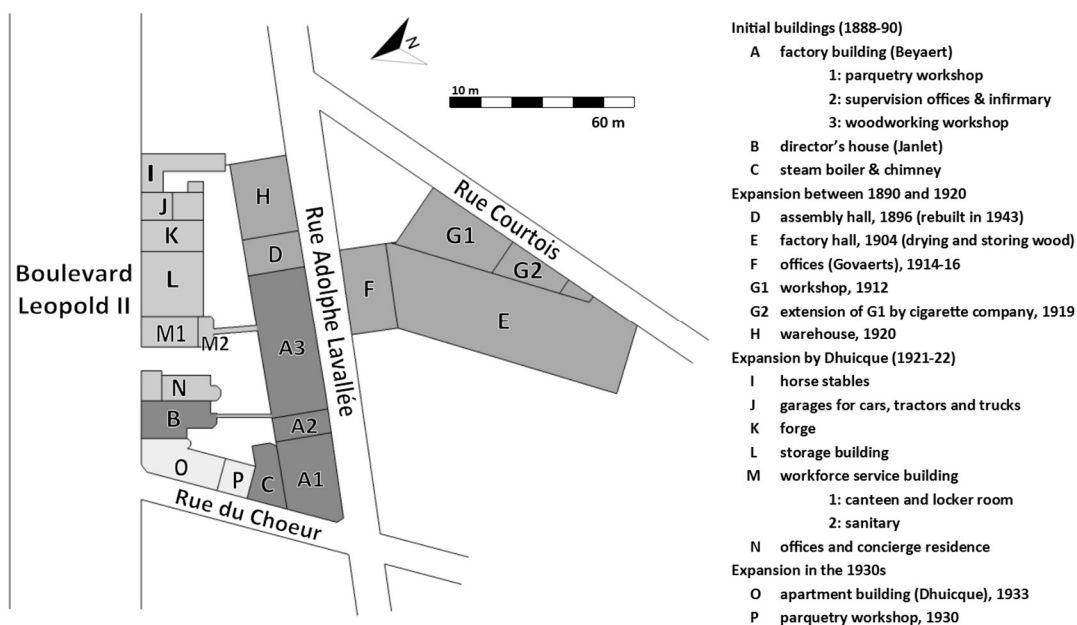


Figure 4. Evolution of the company infrastructure in the *Boulevard Leopold II*, situation ca. 1935.

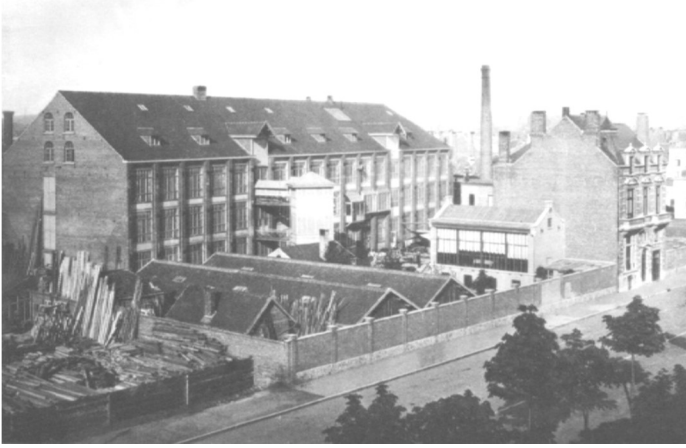


Figure 5. The industrial site in the *Boulevard Leopold II* (1894), with the factory by Beyaert (A), the director's house by Janlet (B) and temporary warehouses (from: *l'Industrie Belge*, BCA).



Figure 6. Traditional joinery in the workshop on the first floor of the Louis De Waele factory building (A3), designed by Henri Beyaert in 1888 (photo ca. 1900, CBRS CA).

lished a strong professional relationship with these architects. Particularly when working in the popular Revivalist styles, traditional skills and techniques were highly valued, especially in interior woodworking. De Waele could deploy these on a large scale in ambitious construction projects, which made the firm a preferential partner for prominent architects.

These professional relationships enabled Louis De Waele to build himself an advanced factory in 1888-89. Beyaert implemented some well-thought remunerative features in his design. Moreover, as a general contractor, the firm had access to modern techniques and knowledge in factory-building. This brought the contracting firm on the forefront of industrial architecture by the end of the nineteenth century.

The factory building (A) by Beyaert had three floors, each containing two halls. An iron instead of a timber framed construction was used for fire safety reasons, also allowing a flexible plan layout. Three steam engines of 205 hp in total activated around 100 woodworking machines and electrical lighting. This was highly advanced in a time before public electricity distribution was provided. It allowed for an extension of the working day and additionally favoured the flexible lay-out of the workspace (Amhoff 2016). The industrial process of wood-sawing, needing heavy machinery, took place on the ground floor. The sawn wood was brought upwards to the woodworking (A3) and parquetry (A1) workshops on the first and second floor. Afterwards, the finished products were brought down to the assembly and dispatch hall. Transport between the workshops was arranged by rails and elevators. Between the two halls on each floor, supervision offices (A2) were located, so a close watch could be kept on the labourers. Large windows let in a lot of natural light, favouring a qualitative production. Attention was paid not only to the speed and quality of production, but also to the labourers' physical well-being. Sanitary installations were placed within a separate staircase tower, connected to each floor with footbridges. An infirmary (A2) was situated on the ground floor (BCA, *L'industrie belge*).

3.4 *Infrastructural investments and the general construction activity (1890-1945)*

After the construction of the factory (A), the enterprise continued to expand its industrial infrastructure. These investments strikingly reflect the general increase in the Belgian construction activity between 1890 and 1904. Storing and drying timber demanded a lot of space, for which several warehouses were erected during these years on the terrain. The warehouses were connected via railways to the factory (A). They could however not fill the storage needs for a long time. The increasing activities required vastly more space. The firm saw an opportunity in an empty lot of approximately 2800 m² on the other side of the *Rue Lavallée*. Around 1904, a large factory hall (E) was constructed on this terrain, where vast amounts of timber could be dried and stored (BcadA, 207, Molenbeek 1). After 1904, the Belgian construction activity stagnated until 1914 (Buyst 1992). The firm apparently did not suffer much from this. In 1910, they built another warehouse on a terrain of approximately 3150 m², rented from the port authority of Brussels. It was situated on the *Quai des Matériaux* alongside the Canal, only half a km away from the factory. It was equipped with an electrical sawmill to further diminish transportation costs (BCA, TP 16348). Furthermore, the company erected an office building (F) in the *Rue Lavallée* in 1914. It was again designed by a leading Brussels' architect, Léon Govaerts (1860-1930). It contained offices for the management, accountants and clerks. The director's house (B), which was quickly after 1890 transformed into an office building, had clearly become too limited for the firm's expanded activities. A footbridge was designed over the *Rue Lavallée* into the factory (A), facilitating the supervision of the workforce. Due to strict regulations however, it was not realized.

Construction activity plummeted because of the First World War, probably causing financial difficulties for the firm, since in 1919 the factory hall (E),

warehouse (G) and new offices (F) were sold to the Vittoria Egyptian Cigarette Company from Rotterdam. The nation's reconstruction after the war however caused a sudden upsurge in construction activity. The enterprise was able to buy the complex (E-F-G) back in 1920 and subsequently leased it again to the cigarette company. Even more illustrative for the post-war boom in construction activity and the consequent financial optimism by Louis De Waele, was the sizeable infrastructural expansion that took place in 1921-22 (MMA, TP 12363 & 12629). The warehouses were removed to make place for a brand new industrial complex, containing six buildings with a variety of functions (figure 4: I-N).

They were designed by yet another prominent architect, Eugène Dhucque (1877-1955). His concept was in line with the most recent insights in industrial architecture. By the 1920s, factory buildings were no longer a mere shell for production, but were increasingly recognized as essential elements of the technological manufacturing process (Uhl 2016). Specifically the principles of the scientific management theory were clearly reflected in the company infrastructure. This theory was heavily influenced by pre-war Taylorist principles, stating that the workplace had to be redesigned to maximize workers' productivity. In the construction industry, Taylorist mass-production led to a standardized production in the contractor's own factory (Wall 2013, 20). This brought about cost reductions and quality improvements in comparison to the work on the construction site (Buyst 1992, 177). Taylorism was however widely perceived as reducing the worker to a mere cog in the machine. They became more influential after a post-World War I 'humanizing' update, affected by the industrial psychology movement. Now under the name of 'scientific management', also the physical and mental well-being of the workforce was taken into account. In Belgium, entrepreneurs implemented scientific management principles during the Interwar period to compensate for the steadily rising cost of labour, caused by the introduction of the eight-hour day in 1921 (Heyman 1928) and a steep post-war inflation (Scholliers 1990). According to Geerkens (2004, 115), the importance of scientific management in Belgium was still relatively small during the first half of the 1920s. Therefore, the clearly recognisable application in 1921 of many of these principles in the De Waele factory confirms the contractor's position on the forefront of industrial architectural practice.

The relation between scientific management and industrial architecture has been demonstrated for British factories by Loader and Skinner (1991). Moritz Kahn from the Truscon concrete company and architect Thomas Wallis built several 'model factories' from 1916 on. They were constructed in reinforced concrete (for fire safety reasons and flexible expansion possibilities), were provided with a lot of daylight (typically called 'daylight factories'), had a

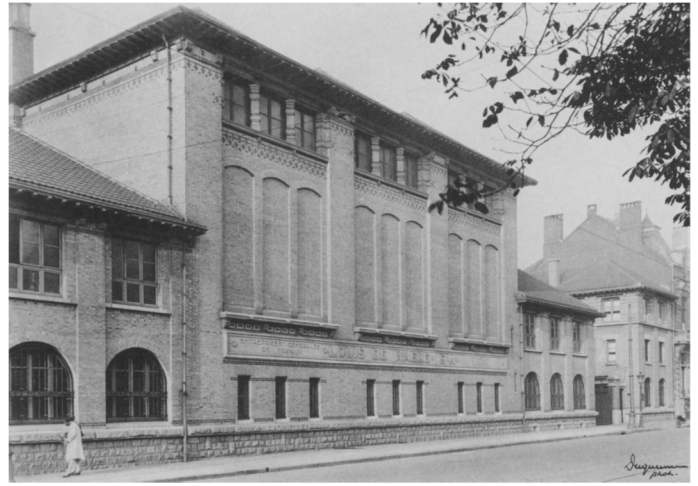


Figure 7. From left to right: the forge, the storage building, the service building and the office building by Eugène Dhucque, 1921-22 (l'Emulation, 1927b).

carefully thought-out internal plan of operations (to avoid congestions and crossings of circulation paths), and an attractive architectural appearance (for its advertising value and stimulating effect on employees). Many of these characteristics were also present in De Waele's factory buildings of 1921-22.

Concerning improvements in business-economic efficiency, the new buildings were fit in the existing infrastructure. Connections between old and new buildings via footbridges ensured non-conflicting streams of labourers, management and materials. The office building (B) was expanded (N) and was connected with the factory (A) via a footbridge, allowing the management to inspect production. A double footbridge was realized between the factory (A) and the workforce service building (M). Elevators and railways within the new buildings additionally ensured the efficiency. Facilities for old and new means of transport guaranteed that the firm could convey materials at low costs, both on a local scale (with horse-drawn carriages, I) and further away (with trucks, J).

Concerning investments in the well-being of the workforce, the design was very advanced as well. To achieve an agreeable environment, there was a specific attention for architectural aesthetics, both in the exterior and interior. Heating, ventilation and sanitary provisions were well considered and large windows and electrical lighting facilitated a well-lit work environment. Fire safety was accounted for, by using concrete and by the footbridges that provided evacuation possibilities. Other provisions for the workforce, all within the service building (M), consisted of bicycle parking, lockers and a canteen. Especially the canteen emphasized the moralising goal of industrial architecture according to Dhucque (1927). These investments were nonetheless made from a paternalistic 'social engineering' vision on the labourers' work.

After a stagnation in the general construction activity between 1923 and 1927, an increase took place again in 1928 (Buyst 1992). It motivated the firm to settle anew in its complex on the other side of the *Rue*

Lavallée (E-F-G). In 1929 they installed two opposite gates across the *Rue Lavallée* (in A and F) to ensure a fluent stream of materials from the warehouse (E) to the factory (A) (MMA, TP 16297). The crisis of the 1930s however brought the company in financial trouble. Especially the demand for the luxurious woodworking and parquet must have strongly declined. From 1931 on, the firm found additional sources of revenue in leasing the vacant space on their industrial site to other companies. Moreover, in 1933 a 7-floor apartment building (O, also designed by Dhuicque) was constructed to earn revenue from residential tenants as well (BcadA, 207, Molenbeek 1).

3.5 *The relationship with the neighbourhood*

Whereas the enterprise never received complaints from its neighbours in the *Rue de l'Intendant*, it was on worse terms with the local community in the *Boulevard Leopold II*. During the first years, the firm repeatedly experienced burglary (MMA, TP 3005). The anxiety was however reciprocal. Mostly during the Interwar years, neighbours frequently complained to the municipal authority about black smoke coming out of the factory chimney, causing greasy soot deposits everywhere. This mostly happened during crisis years, when the firm had to resort to low quality carbon or possibly even timber waste as combustible (MMA, *comm. et incomm.* 13117). Other complaints were directed against an excessive noise of machines at night and were nursed by a fear of fire hazard. This was not unjustified, since in 1926 a small fire broke out. It could be put out quickly due to a good fire safety policy, prescribed by the government, preventing a possible disaster (MMA, *comm. et incomm.* 10879). The local authority repeatedly underwrote the grievances, obliging the firm to take measures to eliminate the nuisances for the anxious residents.

3.6 *Spatial management after World War II*

In 1946 the parquetry branch was dissociated in a separate enterprise, which considerably down-scaled its activities, thus requiring less space than before. Many industrial buildings became obsolete. One by one, they were transformed into office buildings, starting with the stables in 1941 (MMA, TP 21711). Subsequently, the offices were leased to other firms. By the 1980s, twelve different companies were situated on the site (De Greef, interview 2017).

Before World War II, there was an aspiration to spatially concentrate the company infrastructure – if not all on the same or adjacent parcels, then at least as close as possible – in order to restrain transportation costs within the production process and to facilitate the exchange of information. After the war this gradually changed due to improvements in transportation and communication. Only the company's offices remained in the *Boulevard Leopold II* (N, B, O,

P). Workshops and warehouses of the contracting firm on the other hand moved to dispersed locations. The concrete reinforcement workshop was relocated in 1959 to the *Quai des Charbonnages* in Sint-Jans-Molenbeek (BSA, building permits, A658-3410) and the depot for construction equipment to the *Rue de Birmingham* in Anderlecht, approximately 3 km away. As transportation costs for the nationally operating contracting firm could be minimized by settling near the highways, all workshop and storage facilities eventually relocated to a terrain in the northern suburb of Machelen, near the interchange of the Brussels ring road with the E19 towards Antwerp.

Ultimately the administrative functions also left the *Boulevard Leopold II* in 1988. At the end of the 1980s, the enterprise saw a major financial opportunity – possibly instigated by financial difficulties – in selling their real estate and realizing a new large construction project on it for the Belgian French community government (De Greef, interview 2017).

4 CONCLUSION

The Louis De Waele enterprise managed to combine a weight-losing woodworking and a weight-gaining contracting activity from 1867 until 1945, despite their fundamentally different spatial needs, both in locational and infrastructural terms. In accordance with Weber's least cost theory, the firm's locational decisions mostly aimed at diminishing timber transportation costs – furthermore influenced by expansion opportunities due to urban developments, by real estate prices and by behaviourist motives. Spatial management of woodworking was also dominant on the small scale because of its higher need for space, requiring extensive infrastructure for storing, drying and labelling timber. Contracting on the other hand mainly took place on the construction sites. This equipment had to be mobile and temporary workshops were erected on the spot. Consequently, there was no significant need of factory-type assembling processes for a contractor (Buyst 1992), so these spatial needs could conform easier to the more demanding spatial needs of woodworking, enabling the firm to successfully combine both activities, at least until 1945.

The opposition between developing long-term spatial strategies and responding to sudden spatial opportunities forms a recurring contrast, especially on the small scale. The steady growth of the enterprise was reflected in the growing freedom it could claim in strategically shaping its own infrastructure. A deliberately planned infrastructural constellation was designed by both Beyaert and Dhuicque. Their factories demonstrate the position of the general contractor on the forefront of industrial architectural practice. Business-economic efficiency was combined with an attention for the well-being of the workforce, influenced in the case of Dhuicque by the principles of

scientific management. These well thought spatial constellations nevertheless gradually diluted in later years, due to adaptations to evolving business needs.

Many spatial decisions were influenced, if not forced, by external factors. Urban development drove the firm towards Sint-Jans-Molenbeek in the nineteenth century, and drove it out again in the twentieth century. The neighbourhood managed to influence government prescriptions on the firm's infrastructural management. But most of all, the spatial management was influenced by the general construction activity. In times of high activity, the firm continuously expanded. During crisis years, it disposed of obsolete infrastructure. The internal company evolution however also influenced its spatial management. The exceptional growth before World War I enabled the firm to fulfill a trendsetting role in the industry by adopting many technological innovations in an early stage.

The research shows that analysing a firm's spatial management proves to be a valuable perspective for business historical research, including the research into construction companies. It forms an important contribution to our understanding of the evolving role they played in shaping the built environment.

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