Urban industries and the production of space: a typomorphological analysis of the mixed urban fabric around the historical national road Jetsesteenweg in Brussels, Belgium

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Abstract. *From the second half of the twentieth century, industries have moved from locations in urban areas to the monofunctional fringe due to zoning policies and rising real estate prices. More recently, high unemployment rates, lengthy commuting journeys and economic dependability have re-oriented the urban planning agenda towards the qualitative retrofit of small-scale production in vital inner-city areas. However, this reveals that designers seem to have 'forgotten' how to spatially integrate industries in the city. As large industrial sites have remained in the mixed urban fabric of Brussels, it serves as a useful research object to explore this knowledge gap. This paper aims to retrace the role played by small-scale industries in the morphogenetic and typomorphological development of the city's historically-important national roads. Hence, historical reconstruction and functional mapping are combined to unravel types of the industrial mix at different scales and through time. Through process typological analyses of the city's mixed urban fabric, this research explores what can be learned from the logics underlying the path-dependency of urban industries.*

Keywords: typomorphology, urban industry, Brussels-Capital region, national roads

Introduction

A large share of productive activities has disappeared from inner-city areas as a result of zoning policies and increasing real estate pressure on urban land from the mid-twentieth century. Jobs and artisanal knowledge have been relegated to monotonous enclaves at the urban fringe. Whereas European cities were once rich sites of production, they now mostly host consumption. In response, urbanists, architects, and policymakers have sought the inversion of this process through the qualitative reintegration of productive enterprises in mixed-use urban areas. A radical shift has recently been proposed from the post-industrial towards a 'productive' model for the city as debates among academic researchers and policy-makers are increasingly inspired by the necessity of local employment by urban industries (Borret, 2015; De Boeck *et al.*, 2017; Ferm and Jones, 2017).

Studies on the metabolism, economic circularity and design of industries seek to provide the 'productive city' paradigm with a scientific backbone (De Boeck *et al*., 2017; Ferm and Jones, 2017; Moritz *et al.*, 2012). Despite this attention, however, early pilot projects and research-by-design studies reveal the complexity of the challenge for urban designers to spatially organize and convince markets of the potential co-existence of dwelling and working (Ferm and Jones, 2017). As Vermeersch (2016, p. 54) states, 'designers seem to have forgotten how to spatially (re) integrate productive activities in urban areas', thus the need for typomorphological and historical research on the urban and architectural level is evident. Industrial buildings are still omnipresent in the mixed urban fabric of Brussels but have not yet been systematically researched. Moreover, the long-term industrial emergence and anchorage in urban areas remain understudied. Consequently, accurate descriptions of the spatial conditions for persisting industries and reasons for their moving are lacking.

Prior research on the geography of urban industries has been engaged with mapping present-day and historical corporate activities in the Brussels-Capital Region (Degraeve and Vandyck, 2018; Vandyck *et al.*, 2019; Vandyck and Degraeve, 2019). This body of research concluded that significantly more industrial activity accumulated in certain areas, such as the Canal Zone, Maalbeek valley and historical roads to the city. Cognisant that the first two zones have been studied thoroughly, this paper aims to investigate the typology of historical national roads as former and present-day locations of urban production. These national roads are historical inter-urban routes that were either built or designated as national stone roads (*steenwegen*) under Austrian rule in the eighteenth century and which respectively follow the shortest straight line or the existing meandering path between two cities. This paper examines the latter category on the basis of a prototypical case study of the Jetsesteenweg in the Brussels-Capital Region, which has traditionally been one of the most vital entry roads to the city of Brussels. It was the only road northward at the west bank of the river Senne and led to several villages including Jette, Wemmel, Merchtem and Dendermonde, which gave their names to the road: Merchemsesteenweg, Wemmelsesteenweg and the Jetsesteenweg. The historical concentration of industrial activities marked the urban form along the route.

Research goals and theoretical framework

There is a considerable knowledge gap between the sustainable ambition to retrofit industries in urban areas and the typomorphological understanding of this complex spatial issue in historical perspective. This paper, therefore, aims to re-establish a forgotten link with the productive past of Brussels by learning from its remaining built stock along these historical axes. As opposed to the general relocation of industrial activity from inner-city areas towards the fringe, recent studies have highlighted the persistent presence of some industrial premises in the Brussels-Capital Region (Degraeve and Vandyck, 2018; Vandyck *et al.*, 2019; Vandyck and Degraeve,

2019). Hence these buildings and the mixed urban fabric they constitute are taken as the conceptual starting-point in constructing a knowledge base of the production of physical space by industries.

The objective of this typomorphological research is to identify logics in the architecture and embeddedness of industrial buildings through analysing their formation process and current state. In doing so, we attempt to understand how productivity has traditionally been anchored at various scales in the anatomy of national roads, and how the production of physical space by urban manufacturing, in turn, structures contemporary mixed urban form as a morphological frame. What are the conditions this path dependency creates for the presence or absence of urban productivity today, and can we identify cycles in the presence of industries in relation to typomorphology and explore their interdependence?

This links with the Italian process typological theory, which is fundamentally based on understanding the urban fabric through the story of its constituting elements. As argued by Muratori, the forms of historical structures are influenced by the context of the time in which they were conceived (Cataldi *et al.*, 2002). Hence their logical reconstruction can unveil the political, socio-economic and cultural contexts that lay imprinted in the urban form (Argan, 1963; Grassi, 1967; Moneo, 1978). Consequently, typomorphological studies are engaged with interpreting the underlying tendencies in the temporal and spatial proliferation of a typology.

Recurring logics, inherent in the series of artefacts that constitute a type, can be conceived as manifestations of a specific context, albeit economic, political or cultural (Conzen, 1969, p. 6). The dynamic nature of this context continuously evokes adaptations of basic building types and the emergence of new ones (Caniggia and Maffei, 1979; Whitehand, 2000). Reconstructing the trajectory of these typological series can, in hindsight, reveal 'morphological periods' and important moments of socio-cultural and political-economic change (Conzen, 1969, p. 7). This is useful for tracing how, why and where the symbiosis of dwelling and industrial activities developed and eventually dissipated.

Nonetheless, when projecting the typomorphological discourse to the matter of industrially-mixed urban form, a hiatus appears in state-of-the-art empirical research, as it has largely been occupied with functionally-determined types. Törmä (2017, p. 5) rightfully argued that only a few researchers, like Muratori, have explored the interesting field of hybrid buildings and their changeability in time. Davis (2012), however, dissects the hybrid typology of the merchant's house in the light of different cultural and functional interpretations, as does his recent work with Froy on London's railway arches (Froy and Davis, 2017).

Research methodology

The research is primarily based on the use of historical-geographical sources to reconstruct the historical morphogenetic process of the mixed urban fabric (see also (Kropf, 2017; Whitehand, 2000). Historical cadastral maps, aerial imagery and development plans formed the basis on which these analyses were drafted in four consecutive 'snapshots' with an interval of approximately 40 years: 1891, 1930, 1969 and 2016. Simultaneously, these 'snapshots' were compared with the historical mapping of industrial enterprises at corresponding dates. This latter analysis was performed by means of digitising the industry and trade almanacs (*l'Almanach du Commerce et de l'Industrie à Belgique*) that contain the professions and addresses of all entrepreneurial inhabitants on a provincial level. Due to their comprehensive nature, these address books enabled all consecutive building functions and industrial activities at the 'snapshot' years to be traced.

After identifying and mapping the productive premises, they were subjected to an in-depth analysis of their architectural features, urban embedding and successive uses. The Caniggian research method was followed in order to deconstruct the complex urban fragment into elements, structures and organisms, to bring order to the knowledge of the built

environment (Caniggia and Maffei, 1979; Moudon, 1994). Accordingly, the urban form is studied at the level of its constituent building blocks, industrial plots and productive buildings through specific case studies. Building permits, aerial images and cadastral maps were consulted and compared with on-site investigations and semi-structured interviews with current owners to update information on the state of each building.

Since the research pursues a high level of detail, it was decided to narrow down the empirical basis to a case study of one representative national road, which still accommodates a significant proportion of industry. The methodical and content-related insights can nevertheless be scaled up and contribute to the more general debate.

Morphogenesis and functional mapping

Historical context

When Brussels became a political epicentre and its economy boomed, demographic growth exceeded the capacity of the historical urban fabric within the city walls. Consequently, the surrounding villages rapidly developed alongside the existing networks of national roads such as Waversesteenweg, Gentsesteenweg and Jetsesteenweg that connected Brussels with its hinterland and other cities (Figure 1). In the first half of the eighteenth century, the Austrian regime had ordered the construction of those paved roads (*steenweg*) to connect the Flemish cities (De Meulder *et al.*, 2002, p. 30). Whereas most national roads were planned by the Austrian regime as the shortest, and therefore straight, connection between two towns, others (like the Jetsesteenweg) were the upgrading of existing, organically-shaped routes. The agricultural settlements that historically characterized this Jetsesteenweg were to make room to accommodate the expanding city. However, notwithstanding the extensive urban developments, certain aspects of the villages' rural character persisted as their initial industrial activities (such as breweries and leather workshops) were specifically grafted on the legacy of former agricultural activities (Bauwelinckx *et al.*, 2011) (Figure 2).

The establishment of the Belgian kingdom in 1830 led to the capital city's economic and industrial growth. Mobility and transportation were facilitated with the construction of the Brussels-Charleroi canal, five years before the first European railway connected Brussels with Mechelen in 1835. Near the Jetsesteenweg, these trends resulted in the

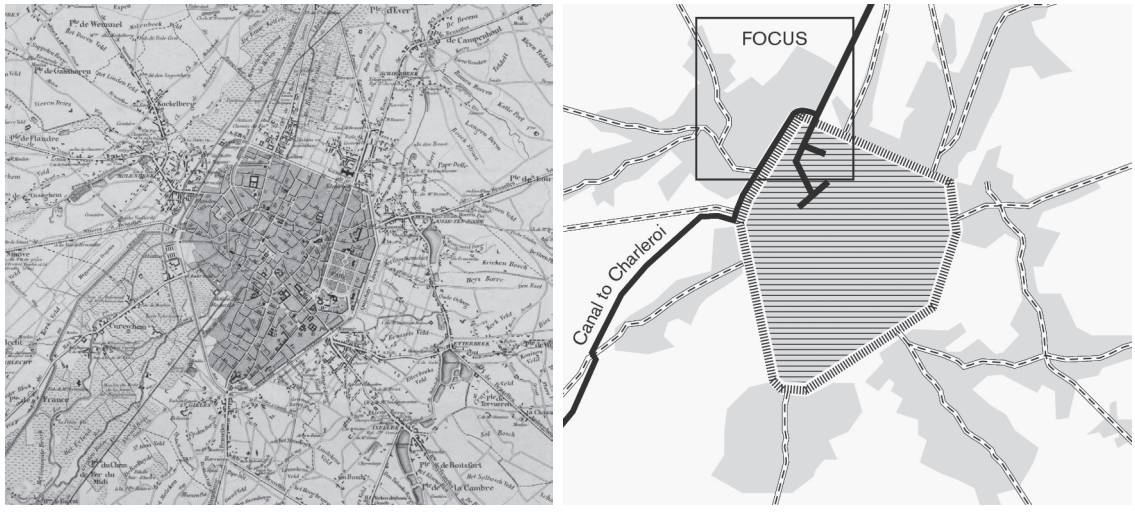


Figure 1. Left: the cartographer Delahoese's topographical map depicting the villages surrounding Brussels in around 1840 (source: © Koninklijke Bibliotheek van België). Right: Schematic interpretation of the 1840 map.

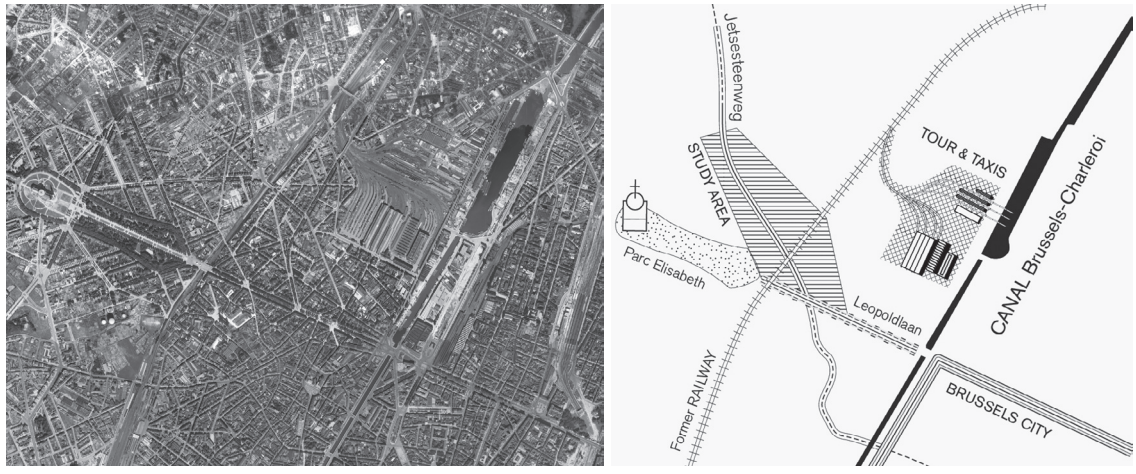


Figure 2. Left: aerial image of 1953 (source: http://bruciel.brussels/, accessed 12 April 2019). Right: schematic overview of the structuring spatial elements.

opening of the nearby Pannenhuis freight station around 1880 and the long-term planning debate concerning the construction of docks and working quarters on the west bank of the canal. In 1900 the Belgian king inaugurated the port of Brussels several hundred metres westwards, and the new urban development was strongly characterized by a wave of industrial activity (De Beule, 2017). As a result, the city's most important public warehouse ,'Tour & Taxis', was erected in the following decade and connected the Pannenhuis freight station with the water. In addition, movement possibilities had changed substantially around the Jetsesteenweg by that time. The Parc Elisabeth had become connected to the historic town by a wide avenue of Haussmannian grandeur. Its construction marked the advent of a rational street pattern that enabled the entire fields between the canal and the historic national road to be developed.

Hence the Jetsesteenweg was well-positioned in terms of mobility of people and goods (via road, rail and water) to attract industrial actors. Even if new roads were developed after the construction of the avenue, the old arterial road undoubtedly retained its role as a primary commercial connection, explaining why many companies chose this road to locate their activities. The omnipresence of these craftspeople and industrial enterprises played an active role in shaping the urban form through the construction of their workshops and warehouses.

Agriculture and construction at the turn of the twentieth century

The importance of the Jetsesteenweg as a historical entrance to the city of Brussels can be seen in 1891 (Figure 3) which shows that small-scale housing structures, interspersed with typical courtyard-shaped farmsteads and workshops, were aligned to the narrow national road. Apart from two metal foundries, already visible on the 1854 city map, the nineteenth-century economic activities in the street were strongly agricultural. However, as the Brussels trade almanacs did not include this profession in their listings, there is only literature to confirm this (Bauwelinckx *et al*., 2011). The other activities that were listed at the time were exclusively construction-related enterprises. Figure 3 demonstrates that these joiners, bricklayers and window installers had their small-scale workshops in the southern part of the urban fabric, near to the residential neighbourhoods and the city of Brussels.

Rapid expansion in the early twentieth century

At the start of the twentieth century, the 'road inspector' Victor Besme had conceived an

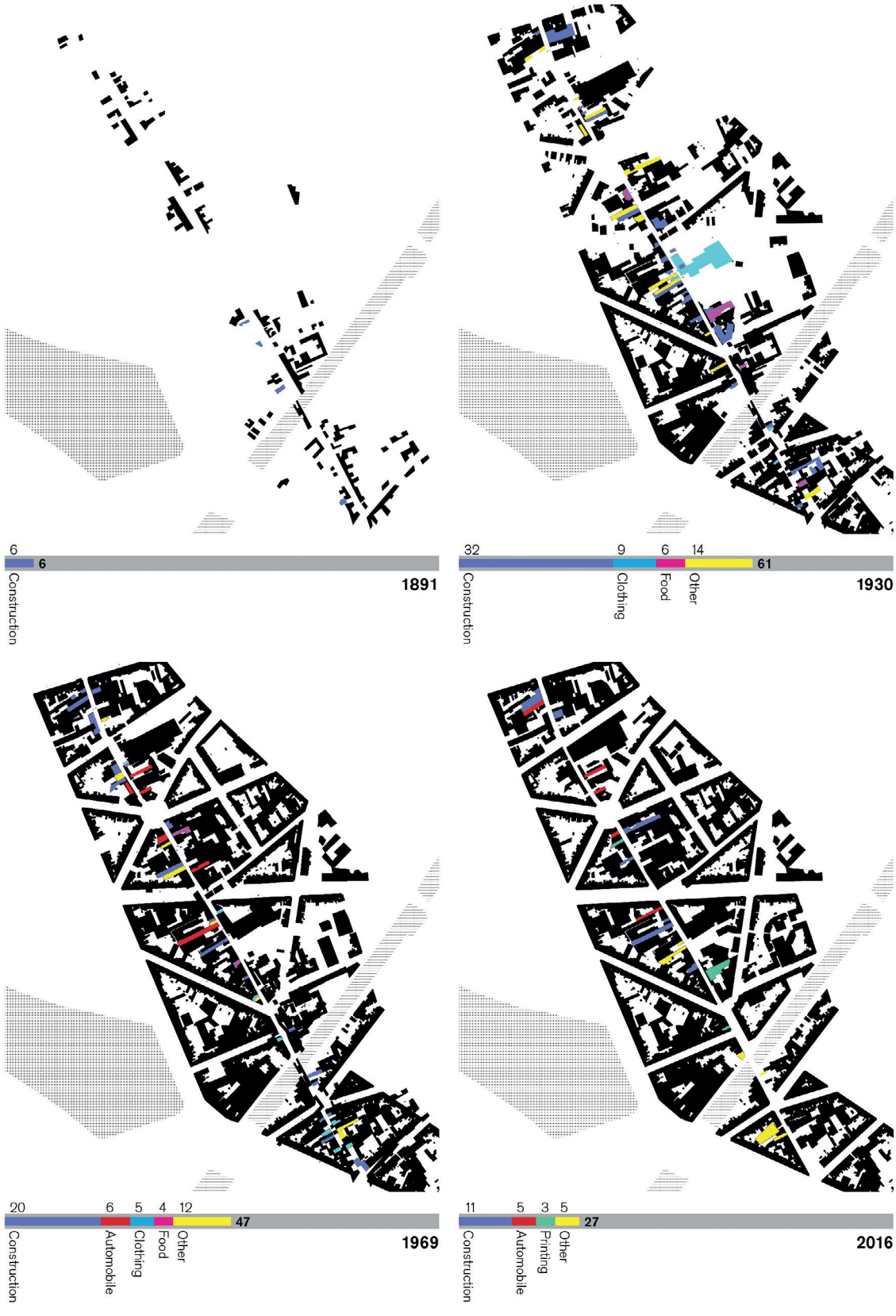


Figure 3. Morphogenesis and functional mapping of industrial activities around the historical route of the Jetsesteenweg (source: mapping based on historical address books, maps and aerial imagery).

ambitious plan to structure the rapid development of the outskirts of Brussels (De Beule, 2017, p. 46). In proximity to the Jetsesteenweg, the rectangular Parc Elisabeth – which was first conceived to accommodate the 'Palace of Industries' – instead was the site of the Koekelberg basilica. In accordance with Hausmann's thinking, all neighbouring streets were aligned to face this monumental park. The wave of infrastructural works caused by this development had fragmented the historical fabric of the Jetsesteenweg by introducing triangular-shaped building blocks with sightlines to the park. The 1930 'snapshot' (Figure 4) reveals this rapid densification over the course of 40 years. Nonetheless, parts of Besme's street plan were adapted to meet the agricultural parcel and ownership structures that characterized the historical national road. The agricultural land had been divided into deep parcels where clothing, food and construction industries were likely to settle (see Figure 3). As the mapping of the 1930s address books demonstrated, the industrial activities had, indeed, extended along the stretch of the Jetsesteenweg. These agglomeration effects echoed in the weekly Sunday market that hosted stands for craftspeople who were active on, or in the immediate surroundings of, the street (Bauwelinckx *et al*., 2011). The overview graph (Figure 3) shows that, as with the 1891 'snapshot', most enterprises were active in the construction industry. Their dominance could be attributed to the increased demand for housing that came with the city's rapid expansion and the availability of large vacant plots. Despite their overwhelming number, however, the multitude of building actors had a relatively small spatial impact when compared to the other

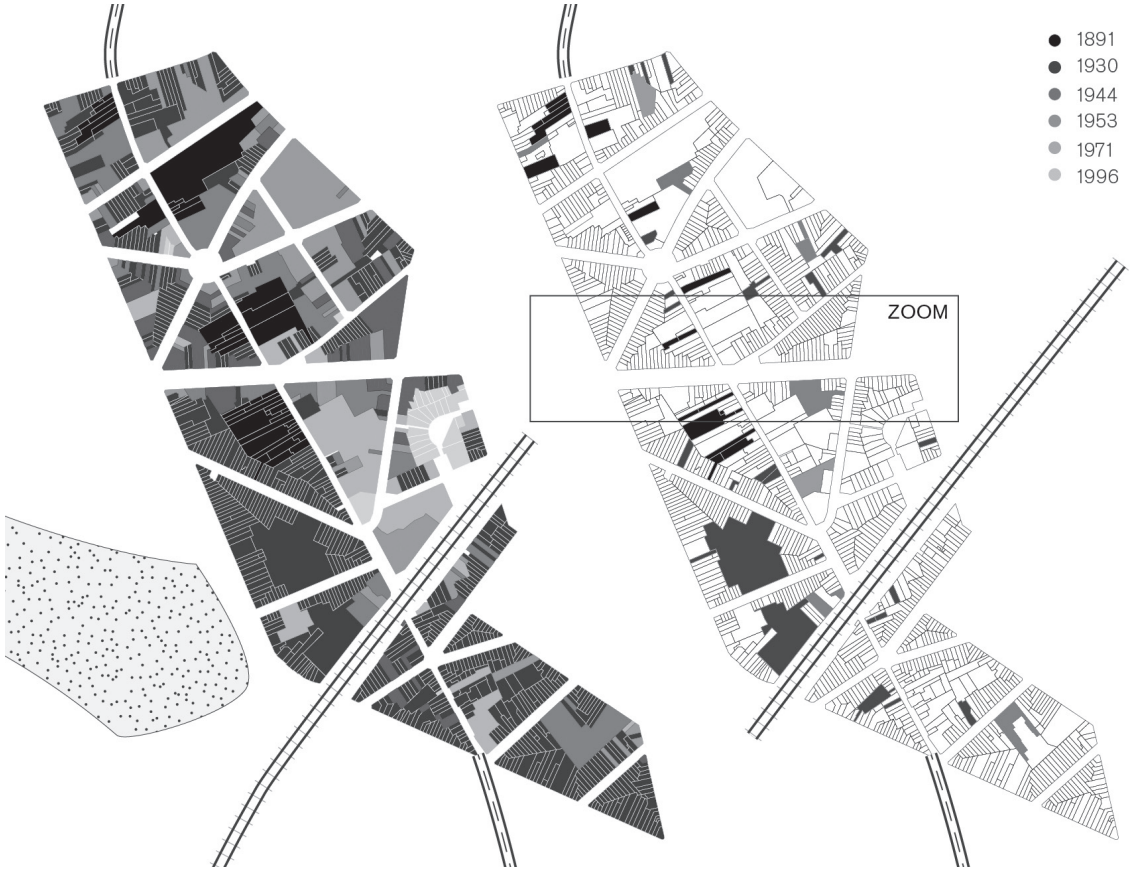


Figure 4. Left: approximate years from which the current-day parcelling structures stem, ranging from 1891 to 2016. Right: location of industrial activity in 2016. The area indicated 'zoom' is enlarged in Figure 5.

activities such as chocolate and tobacco factories, breweries and leather workshops that were still grafted onto the area's agricultural profile. Whereas these other industrial users constructed industrial sheds on wide and deep parcels to meet their extensive infrastructural needs, the construction enterprises were dispersed amidst the residential urban fabric.

Aftermath of industrial heyday

The area's morphological expansion between 1930 and 1969 is mainly concentrated in the northern part of the Jetsesteenweg that had remained vacant until the 1940s. The figure-ground map (Figure 3) shows that the degree of congestion (built ratio) of the block is substantially lower than in the older urban fabric. As typological studies have pinpointed that, much like Pandora's box, the interior of a building block could accommodate a multitude of industrial activities, the lowered built ratio suggests a general decline in the number of new small-scale industries (De Meulder and Van Acker, 2008; Degraeve and Vandyck, 2018). This observed lack of new productive spaces is repeated in the functional mapping of the trade almanacs that highlighted a general decrease in the number of active industries. Nevertheless, in conformity with the earlier 'snapshots', construction enterprises again formed the largest share of the area's industrial profile. However, the rising automobile sector, that seemed to fit the existing, deep industrial buildings, does add diversity to the range of other activities.

Persistent construction and the automobile sector

The street's urban form has not altered substantially since the early 1940s, with the exception of minor infill developments. However, despite its mixed urban fabric, the current-day activity mapping reveals a continuation of the declining number of active enterprises: about 43% of the companies have disappeared since 1969. This reduction is due to a large decrease in construction activity and the relocation of food and clothing industries towards the urban fringe. The vacated space has not been taken up by the continuous presence of car repair workshops, nor by the rise of printing services, but holds considerable opportunities for the future productive city. As will be demonstrated, the street's wide variety of building types is capable of hosting a multitude of industrial, yet compatible, functions.

Typomorphology

This paper now turns to focus on the actual location, embeddedness and architecture of productive workspaces in the Jetsesteenweg and its surrounding urban fragment. To satisfactorily accommodate new structures in the Jetsesteenweg that are compatible with its morphological character, it is necessary to consider its wider urban context. Consequently, the urban fabric surrounding this historical route is studied through a process typomorphological analysis in order to identify the precise role of industries in the production of physical space. The study area, as defined in Figure 2, is deconstructed according to its constituting elements: the urban fragment, building blocks, parcels and buildings.

Urban fragment

The deep parcels of land that once met the infrastructural needs of agricultural and early industrial activities, and still exist today, do provide a morphological frame as the backbone of today's parcel distribution and presence of urban industries, even when the Haussmannian street alignment plans of the late-nineteenth century radically introduced sight axes and grand boulevards that connected monumental places. Accordingly, the aerial image of 1930 (Figure 5) reveals the urban design idea of linking the Belgica square in the east with the monumental basilica in the Parc Elisabeth on the western side of the Jetsesteenweg. Besme's plan wiped out important fragments of the existing mixed urban fabric, so that triangular-shaped

Figure 5. Street axis connecting the Koekelberg basilica with the Belgica station around 1930 (source: http://bruciel.brussels/, accessed 12 April 2019).

building blocks produced the desired sight axes between, and towards, both monumental places. Hence the deep plots – often home to industrial activities – became islands that were circumscribed by a residual of residential development. The irregularly distributed patterns created by these triangular-shaped parcels appear to constitute favourable conditions for the reintegration of industrial activity. This observation can specifically be made on the western side of the Jetsesteenweg, where most industries are, remarkably, settled on the oldest parcels. On the east side, however, lie renewed structures in which there is apparently no place for urban entrepreneurship. Fragments on both sides of the same road thus appear to be at a different stage of their plot cycles, in which the densely-packed historical fabric is making room for the development of new residential buildings. However, interestingly, these imperfect patterns and rifts between old and new, now accommodate a significant share of today's productive activities.

Building blocks

Figure 6 emphasises how the idea of an 'industrial island' is a historical phenomenon that is found scattered throughout the urban fabric of the Jetsesteenweg. Its different forms of appearance can constitute the empirical sample for typomorphological study. Parameters such as function, size, plot distribution, compactness and accessibility help understanding and define types of hybrid forms at the scale of the building block. Accordingly, a significant distinction can be made between the building blocks that were entirely planned and others that were adapted to the existing fabric. Around the Jetsesteenweg, this latter group is strongly characterized by their pronounced orientation inherited from the route's productive past. As depicted in the 'bricolaged blocks' in Figure 6, the one side of the building blocks that faces the Jetsesteenweg is prevailing in shape, parcel distribution, width or depth. This predominant orientation even resulted in rectangular blocks where certain parcels traverse the entire block width to provide access to the industrial complexes from two parallel streets.

Furthermore, the remainder of the blocks that are not adjacent to the Jetsesteenweg demonstrate that industrial activities have also settled in the planned urban layout. Whilst the geometrically 'perfect patterns' (Figure 6) solely accommodate dwellings, the imperfections in the designed parcel distribution have

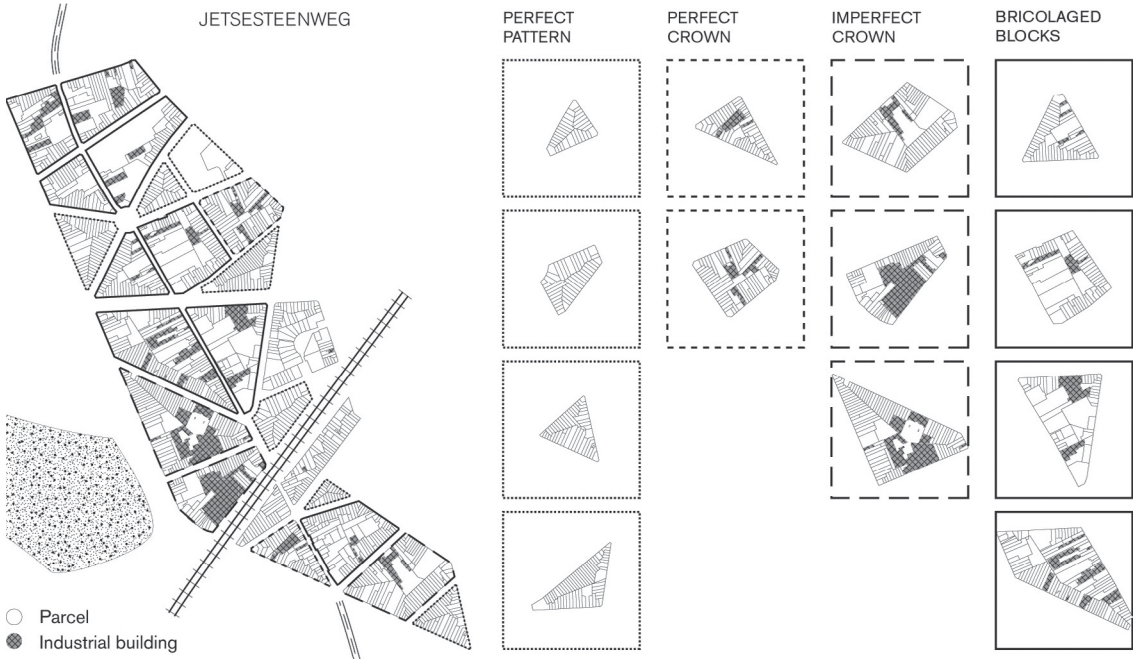


Figure 6. Overview of productive building block typologies. Whereas the 'perfect patterns' consist of geometrically distributed plots, the 'perfect crown' typology is marked by an industrial building within the block that is circumscribed by a 'crown' of housing. In the 'imperfect crown' these industrial buildings extend from the block's interior into the streetscape. The 'bricolaged blocks' bear a clear orientation as a result of the historical parcel division and ownership structure, around which new plot patterns were designed.

Figure 7. Left: elevation of a typical 'perfect crown' block, containing a car repair workshop. Right: typical 'imperfect crown' in the form of a lighting factory (source: images from Google Streetview, 2017).

often been home to industries. Two principal types of these industrial parcels can be identified according to their visual presence in the urban realm. On the one hand, the blocks with a 'perfect residential crown' (a complete circle of residential plots) consist of an industrial complex that is hidden from the streetscape within the extent of the building block (Figure 7). On the other, the industrial activity within the block has outgrown its original location and, through annexations of land is now evident on street-facing façades.

Parcels

As stated earlier, the typologies of blocks shape, and are given shape by, the architecture of their constituent buildings. Whereas some monumental buildings, such as the chocolate factory, iron foundry and furniture factory, are larger in scale than their contexts in the public domain, other extensive premises are hidden behind the façades of apparently ordinary terraced houses. The former comprise static and unique monuments that structure the orientation of their surrounding fabrics, as an assemblage of types. In contrast to monuments, the assemblages of types have the dynamic capacity to adapt to changing economic and cultural contexts (Rossi, 1984). Both the bricolage building blocks and the designed plot structures show traces of how changing industrial needs are manifest spatially in the nature of the type. Their continuing compaction, demolition, construction or annexation of land can be conceived as successive stages in the development of the basic type. As a consequence of the parcelled landscape of ownership within a building block, some business premises resulted in veritable labyrinths, hidden behind stately terraced houses. Figure 8 depicts the prototypical stages in the development of the basic type in a schematic matrix. From this overview, and in line with the Caniggian theory, it becomes clear that the smallest structures form the basic type from which all other premises, with the exception of the monumental structures, have been derived. Whilst all industrial complexes consist of the elementary ensemble of a frontage house with one or more industrial structures to the rear, the different kinds of access to these latter structures illustrate the typological process. These forms of access vary from townhouses with extended doorways, to drive-through gates, semi-detached houses with driveways or even urban fallow ground.

Building: interpreting the basic type

Whilst the minimal building width fundamentally differentiates the type, its depth seems to merely depend on its positioning in the street block. In triangular street blocks, central plots are deeper than those near corners, and because of this they are able to accommodate the more spacious infrastructural needs. Yet a closer view of these townhouse-atelier ensembles demonstrates that the typological process as a general phenomenon requires understanding at the smallest scale. Therefore, the workspaces that accommodated the continuing presence of construction enterprises have been taken as case studies for in-depth research.

The industrial building that now belongs to a carpenter (Figure 9A) at the northern end of the Jetsesteenweg can be regarded as the basic typology from which most other productive buildings have been derived. The ensemble dates from 1901 and contains a gated row house at the street and a multi-storey workshop to the rear. The typical open courtyard between the house and workshop enabled goods to be lifted between the different levels of the workshop via large window openings. This rear workshop structure now accommodates a carpenter's heavy wood-cutting machinery at ground level and an atelier above for assembly of the sawn parts. Its wide façade openings still provide the same opportunities for moving the finished and assembled goods.

The second case study (Figure 9B) elaborates on the first adaptation of the building type. A covered courtyard here connects the residential front with the industrial activities at the rear. As the complex was originally constructed around 1910 for food-related activities, the courtyard was to be protected from rainwater entering where the goods were stored. Nowadays, a general contractor uses the ventilated space to park vehicles and store paint buckets and construction waste.

Whereas these two cases were solely accessible through a shared gate for dwellers and workers, the next examples have separate entrances for the industrial use at the rear and the row house in front. This modification of the basic type enabled the house to be developed into offices and dwellings sublet to other actors. The rear building of the third case (Figure 9C) is currently occupied by a

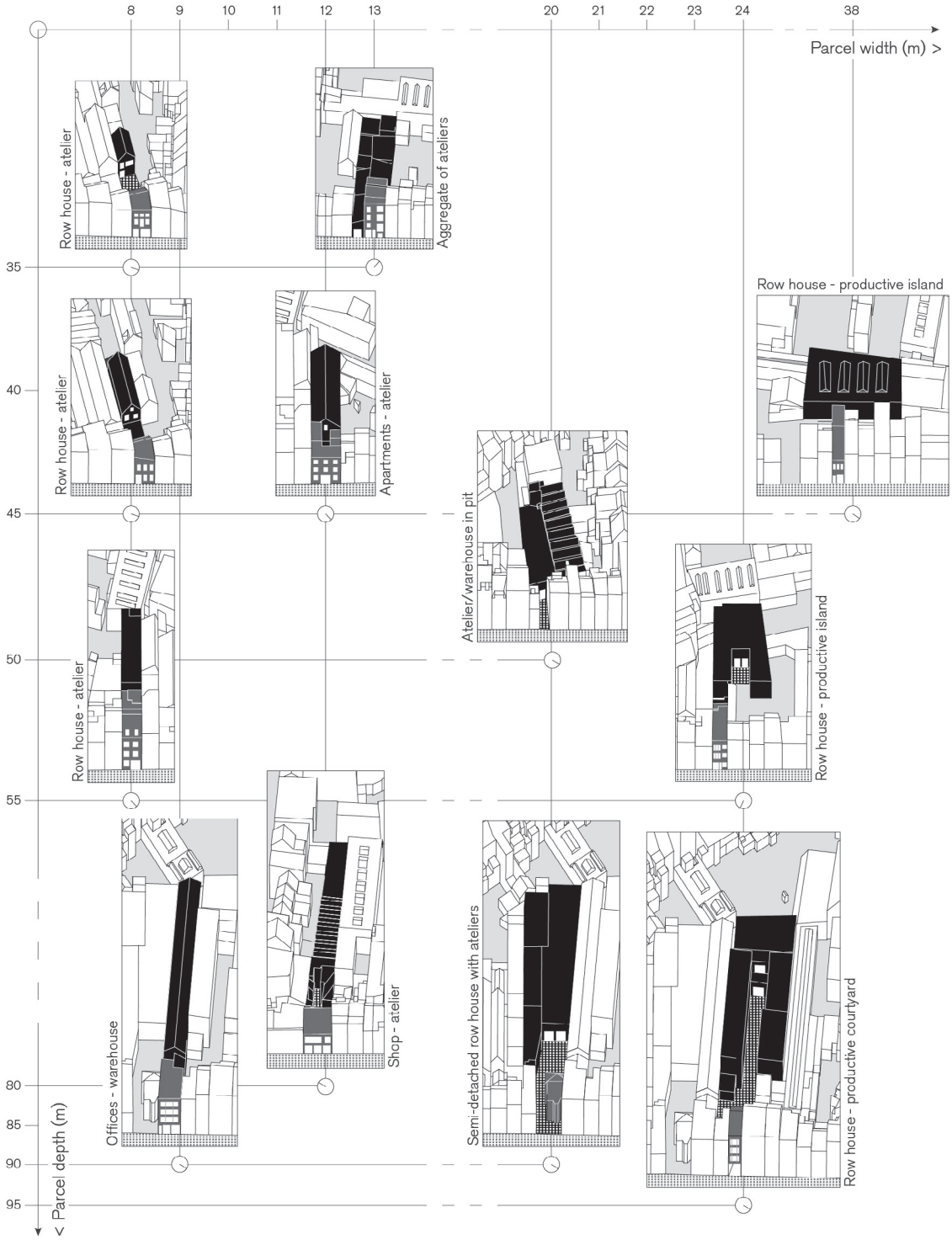
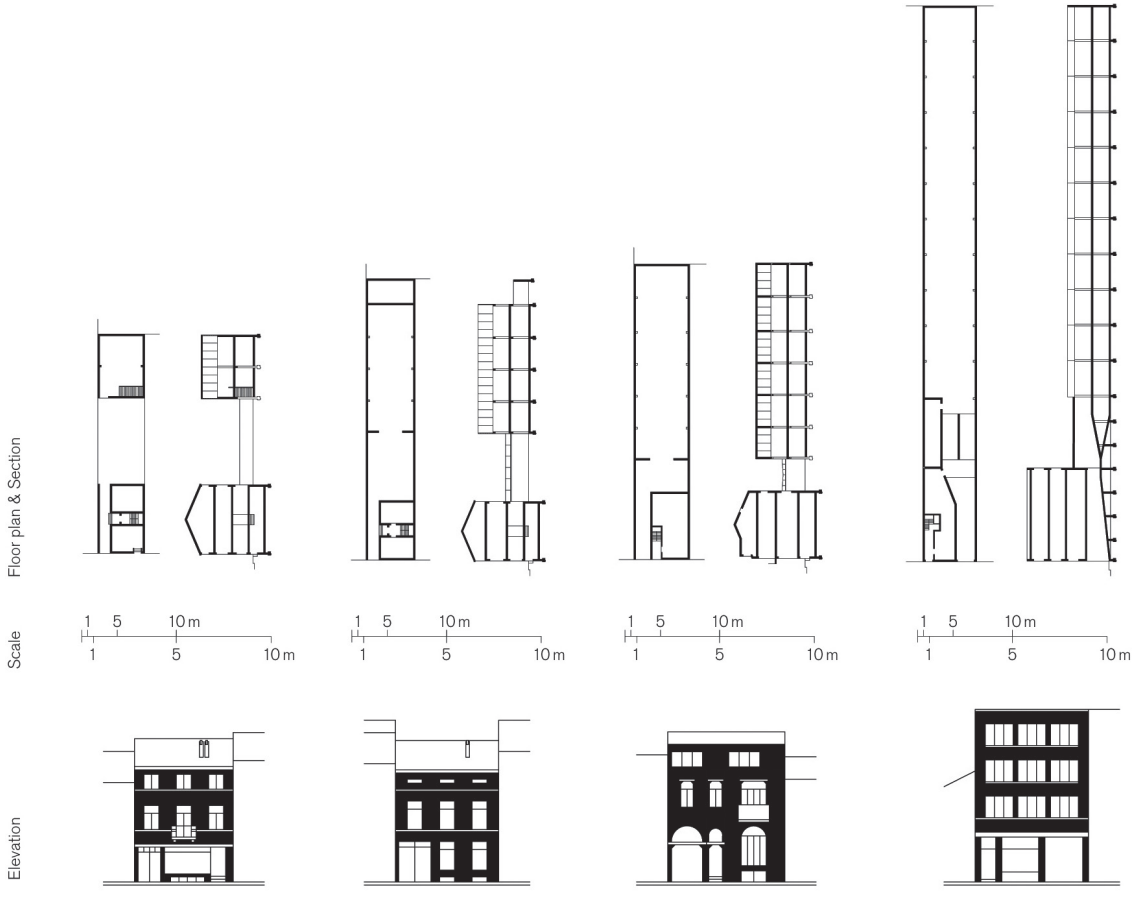


Figure 8. Basic industrial building types, ordered according to plot dimensions.

building company that has its office on the ground floor on the street frontage. The spaces above are used as apartments with separate accesses, away from the industrial activities.

A fourth element in the trajectory of the typological process was found in the premises of a larger-scale general contractor (Figure 9D). The building, constructed in the 1940s,



1900	-	-	-	-
1910	Hay merchant	-	General contractor	-
1920	Plumber	Hay merchant	General contractor	-
1930	Plumber	-	Elevator building	-
1939	Iron workshop	-	Elevator building	General contractor
1949	Iron workshop	-	Elevator building	General contractor
1960	Iron workshop	-	Elevator building	Car repair
1969	Iron workshop	Elevator building	Elevator building	Car repair
2016	Carpenter	General contractor	General contractor	General contractor

Figure 9. Overview of the architecture, historical use and location on the historical route of the case studies A–D (left – right).

was heavily inspired by the altered mobility context and increasing dependency on motor vehicles. This evolution is seen in the frontage office building and the rear multi-storey workshop. The façade was designed with tall and wide gates to enable trucks to enter deep into the rear building. This has split levels, high ceilings and long ramps to access both storeys by car, these features resonating with the building's successive uses, as both contractors and car garages have occupyied the structure since its construction.

Conclusion

In order to provide the discourse of the productive city with insights from its own past, the combined mapping of historical industrial activities with morphogenetic analyses at

multiple scales offers an appropriate method. Along the trajectory of the national road Jetsesteenweg, it was deployed to grasp how physical space and accommodated activities have mutually structured each other over time, both on the scale of the city fragment and the individual building. The research showed that the history of contemporary urban form can be seen as a source for the preservation and reintegration of urban entrepreneurship.

At the macro level, it is clear how the agricultural character of the national road systematically facilitated the development of urban industry, which flourished in the vicinity of a locale favouring mobility. Even so, the plot structure of the farmsteads lived on in the deep industrial buildings which replaced the farm buildings. This path dependence is manifest not only spatially, but also in the nature of the activities that occurred. The leather and food workshops and factories were long grafted onto the agricultural past of the stone road and the construction sector remained present throughout the period considered. Today, the oldest structures house the largest proportion of productive activities and, in later stages of the plot cycles, there is no longer a place for these leather and food workshops. Therefore, there appears a clear link between morphological indicators such as the degree of construction, parcel depth, and the current presence of industrial activity.

Furthermore, these developments cannot only be understood at the level of the individual plot, but have to be comprehended in the context of their immediate surroundings. Indeed, it was not the quasi-static cell wall of the street block, but precisely its dynamic properties within that proved to be the ideal place for inner-city production. Away from the public domain, the amorphous manifestations resulting from takeovers, expansions and renovations clearly show a determined anchoring of industry in the mixed urban fabric. These spontaneous growth processes have created a fragmented, distorted appearance of the urban fabric, in which industry thrives to this day.

On a more detailed scale, moreover, it became clear how different patterns of use lie imprinted in the typological applications. In this way, the reconstruction of the trajectory of a basic typology brought insights into the business practices, from a one-man company in a terraced house to apartment buildings with industrial uses behind. Notwithstanding these developments of the basic type, it turned out that all stages and scales to date have been occupied by manufacturing activities. It can, therefore, be concluded that both the buildings and their users in the historical urban fabric are not only inter- but also intra-functionally mixed, and this constitutes a vital breeding ground for the productive city, as opposed to monotonous enclaves at the urban fringe. Lastly, we conclude that a similar approach should be used for comparative research on other stone roads and other inner-city fragments to question and complement these findings.

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