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The 18th And 19th Century Industrialization Process as The Main Aspect of City Creation and Its Impact On Contemporary City Structures: The Case of Lodz

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Abstract. The article analyses the 18th and 19th century industrial towns transformation and the development in their structures. Due to science and technological advancement occurring in the industrial era, medieval and renaissance methods of city planning became inefficient. Industrialization forced great changes in urban planning and usage of natural resources in the most of the European towns. The case of Lodz – little agricultural town which changed into one of the biggest textile production centers in continental Europe over less than a century – indicates the importance of industry-related developments on its unique appearance and local identity at present. Lodz was transforming from craftsman town into the metropolitan area with the use of semi-rural layout from the early stage of industrialization. As a result, the city developed into a mixture of public spaces with strict planning law of iron-grid pattern surrounded with independent production centers as well as suburban residential structures without unified urban plan. As a result, a large European city emerged. Its urban structure was subject of further extensions and transformations, especially in the second half of the 20th century. The most important were the changes in usage of public spaces and the emergence of new means of transport. Due to these transformations streets had to be widened, causing demolition of buildings, which resulted in destroying the compact urban structure. Another reason of the city deterioration was economic problems connected with political issues. In 1962 Lodz was one of the biggest manufacturing center where 58,8% of employment was recorded in the textile industry which shows how that part of economy was connected with city. Some thirty years later at the early stage of post-communist transformation the textile production decline and a lack of new investments led to regression. The city created by industry underwent a metamorphosis. The factory closures badly affected not only the local economy but also traditional urban structure, and as a result caused the loss of identity and destroyed emotional links of local society with the city. The main aspect of article is to discuss how spatial organization of the industrial city, its urban structure and its way of functioning affected urban planning after the deindustrialization process, and how these factors shape the existing as well future city structures.

1. Introduction

Contemporary cities are complexes based on heritage left from our ancestors, developed and created over the centuries of evolving their structures. The changes that took place during the industrial revolution and modernist design methods, created after the Second World War had the greatest influence on the appearance of modern cities. Until the 18th century cities in Europe were mainly created in long-lasting transformation of their structures. Flexible and compact spaces, connected with each other, allowed cities to adapt into changing economical and external factors which lead to create a composite city urban spaces. Technological advancement and industrialization process in the 18th century forced changes of urban planning in the most of the European cities. During the time of industrial era, medieval and renaissance strategies of town-building started to be inefficient. This led into expansion of urban areas and development of new forms of their usage. Historical old towns were mainly considered as



basis for urbanisation of new areas around them representing new concepts of space arrangement and usage of natural resources. An example of city of Lodz which in the 17th century was a little agricultural city that changed into one of the biggest textile manufacturers in continental Europe in the 19th century, shows how dramatic changes occurred over that period.

The study main objective is to present some phenomena occurring in industrial cities and their deindustrialization process. Presented analysis is a basis to city development in order to prevent the creation of problematic spaces. The analysis of these factors is an important aspect in order to understand the changes taking place in contemporary urban structures.

2. Craft-based City

The first and the most crucial stage of city development for Lodz was initiated thanks to political and production changes in the Polish Kingdom in the first half of 19th century. After regaining autonomy, the ruling government noticed only a slight economic growth, caused by the lack of appropriate craftsmanship in the country, textiles in particular. In order to this problem, new production centers were to be established. In this process, thanks to the high demand for woollens and linens it was decided to

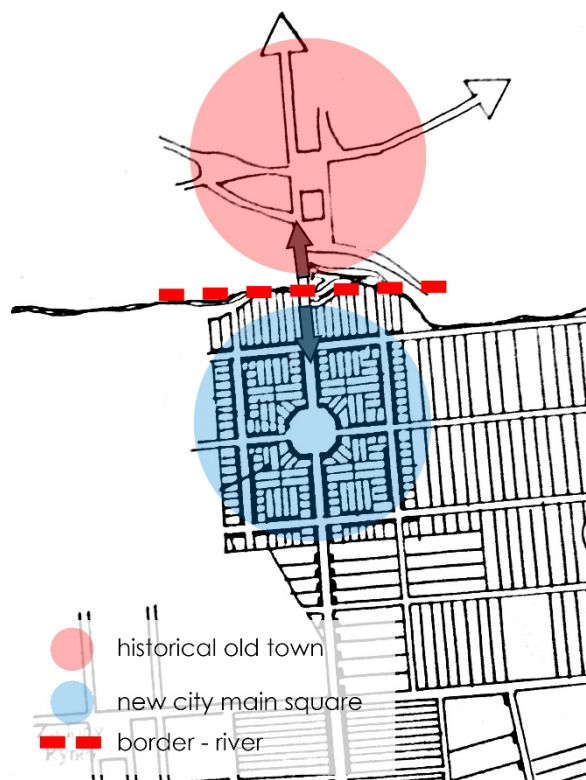


Figure 1. Natural development border between existing spaces

source of power, forced the transformation of space according to new production assumptions, leading to intensified development of the southern part of the city, along the river of Jasien. As a result, the new semi-rural settlements stretched over a distance of 4 kilometers, with the old town as the northernmost part of Lodz.

3. Industrialization era

Thanks to good access to natural resources and localization Lodz in second half of 19th century was started to changing from agricultural town into industry based city. Rapid changes occurring in the city, become attracting investors to it new industrial center. An increasing number of factories caused a rapid development of the city stimulating its further expansion and transforming its use. The agricultural town was quickly evolving into a major textile production center in the region. One-storey, timber-built weavers' homes were quickly replaced with multi-storey, masonry tenement houses providing basic housing conditions for a constantly growing population of Lodz. Technological advancement in the 19th

century changed way of using many natural resources entirely. Watercourses being used as power source for factories, led into urbanization riverside areas, which had a significant impact on city planning. During this period, the location of industrial premises was completely uncontrolled. Their distribution, in addition to the availability of water, in large was based on the possibility of combining a several plots in order to locate the factory buildings. Manufacturers political power, growing numbers of facilities and technological advancement led to the development of factories into ever larger and more complex scales.

As an example of that kind of space there was a Karol Scheibler and Izrael Poznański factory areas. Both of the complexes were established as a group of complementary factory objects dealing with the creation of finished products from raw material to the final product. Such a way of building facilities for wealthy manufacturers was a comprehensive solution allowing to reduce the cost of producing materials, while for the city it resulted in the formation of coherent spaces, acting as one organism. Creating complex urban planning assumptions caused an unusual development of the city structure. In the case of Lodz, by these facilities worked as an independent structure, acting autonomously and self-sufficiently creating “cities inside the city”.

4. Disadvantages of too rapid development

Lodz and its unique urban structure was created by many factors occurring over a short period of two centuries of its industrial development. This, in consequence, caused many structural, spatial and social difficulties.



Figure 2. Schematics of factory buildings as a part of city structures. Contemporary city plan

One of the first problem that occurred in city transformation was an isolation of old historical township center. New settlement was created as a development of existing small agricultural town without any connection with it. Old town was isolated from new city by natural conditions (a river that can be crossed only by one street) also the new planned settlement has got their own town trading squares, and new plots were planned near the city new main axis - Piotrkowska street. What is more, due to administrative decisions the old town became a Jewish district, which strengthened its further isolation from the new city. Also the establishment of the first water mills on the river of Jasien, stimulated urbanization processes in the southern part of the town thanks to good natural resources in that area [2]. The newly developed districts were much better maintained, and many new investments resulted in faster space transformation, leading to the creation of an area with much higher property status than in the historic township area. That way of city evolution led to social and structural divisions, which caused increasing discrepancy between

the old and new town.

The industrial revolution in many European cities was a form of evolution in existing branches of the industry which developed in new technologies and using them on a larger scale adapting existing city structures. On the other hand, some cities were created by using existing historical structures as the main center of city, creating a network of independent factories connected with each other into a complex and interdependent urban organism. In the unique case of Lodz, industrialization was not a process of evolution of city structures it has become a main factor in building city from which you can say the city was founded again.

After establishing first water mills it was possible to notice that the development of industry is leading to increased growth of areas near factories. Rapid growth of industrial buildings led to creation its unique urban layout. City was built as a system of factory buildings created in the new inner city, while the old town was gradually suburbanizing. In Lodz there were no separate factory districts, as a result the whole city became an area of mixed industrial and residential use. Its unique structure and manufacturers influence in the city administration led into creation semi-autonomous units within Lodz borders. The uniqueness of the factory assumptions in the Lodz were consisted of the ideas of industrial area. A typical industrial premises was based on conception of the complementary buildings for various purposes. Production facilities were created as group of buildings designed in closed area with manufacturing, supply and storage units, while the complementing structures as shops, canteens, public buildings or residential areas were distributed with the aim to create an open public space. The whole complex was built in the same architectural style, from these same materials as the factory, creating consistent and compact urban structure. That kind of planning (entirely private) despite an open form of complementary area created assemblies which could not be assimilated with surrounding city structures due to their scale and planned spatial organization that distinguished them from the urban areas [3].

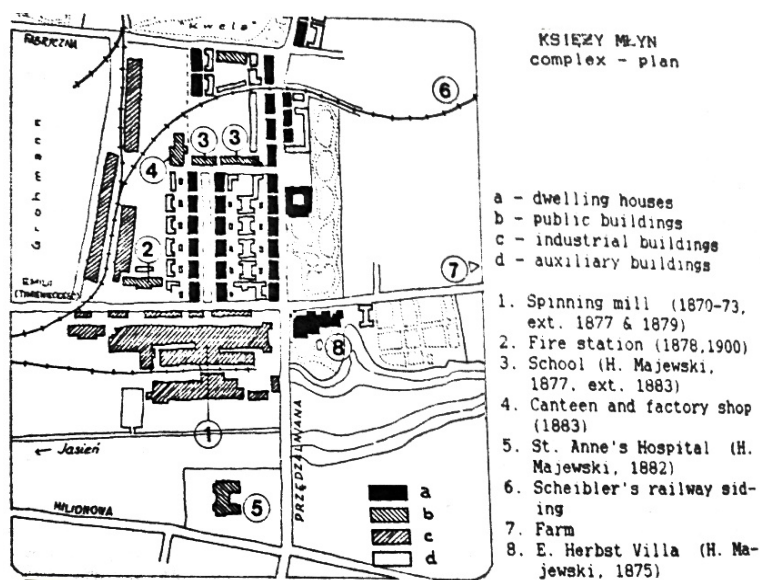


Figure 3. Karol Scheibler, factory complex – plan. Księży Młyn

city housing led to the significant spatial problems. First of them was the urban space usage.

Changes in the way of production have affected increasing population remarkably, causing the problems with uncontrolled growth of buildings. Because of already existing buildings in many places, modification of the spatial development plan of the city was not possible. As a result the that city was built on plots which were prepared for an agrarian type form of building. After time of usage the plot areas were build up. Their further division and next changes were impossible due to private ownership. Lodz as a typical commerce city was creating new buildings to maximize the income of their owners. Because of that fact, there was developed a structure of the city covered with tenement houses. These factors have resulted in compact structure of the overpopulated residential buildings, which led to numerous social problems. Due to the size of the parcels and the intensity of the buildings, there was created a system of high residential annexes surrounding the plot which formed a deep internal courtyard [4]. Thanks to this type of development, the spatial layout of the city of Lodz has created large urban quarters of an intense and compact construction, leading to the formation of dense inner-city tissue. Over that period Lodz had also problem with common public spaces and public objects. Much of the city area was private which caused problems with locating many social buildings as schools, hospitals or even commercial buildings. Many shops, workshops or even public buildings as theatres were located inside a private plot causing a creation of semi-public spaces in the private area without connection with the street. This way of dividing the city, intensity of buildings and speed of formation during the period of

industrialization are one of the reasons for many contemporary spatial and social problems in the city center, hindering changes in existing structures.

In analysis above there are city structure evolution steps. On the first look there are great differences in density, that occurred just in only 40 years (1870-1914). That kind of compact structure is main reason why modern city is so hard to rearrange and why communication in both inside and outside of the city quarters is difficult. There is also a tendency towards partial development of buildings in the middle part of plots, which is a result of the lack of accessibility of these spaces to public spaces.

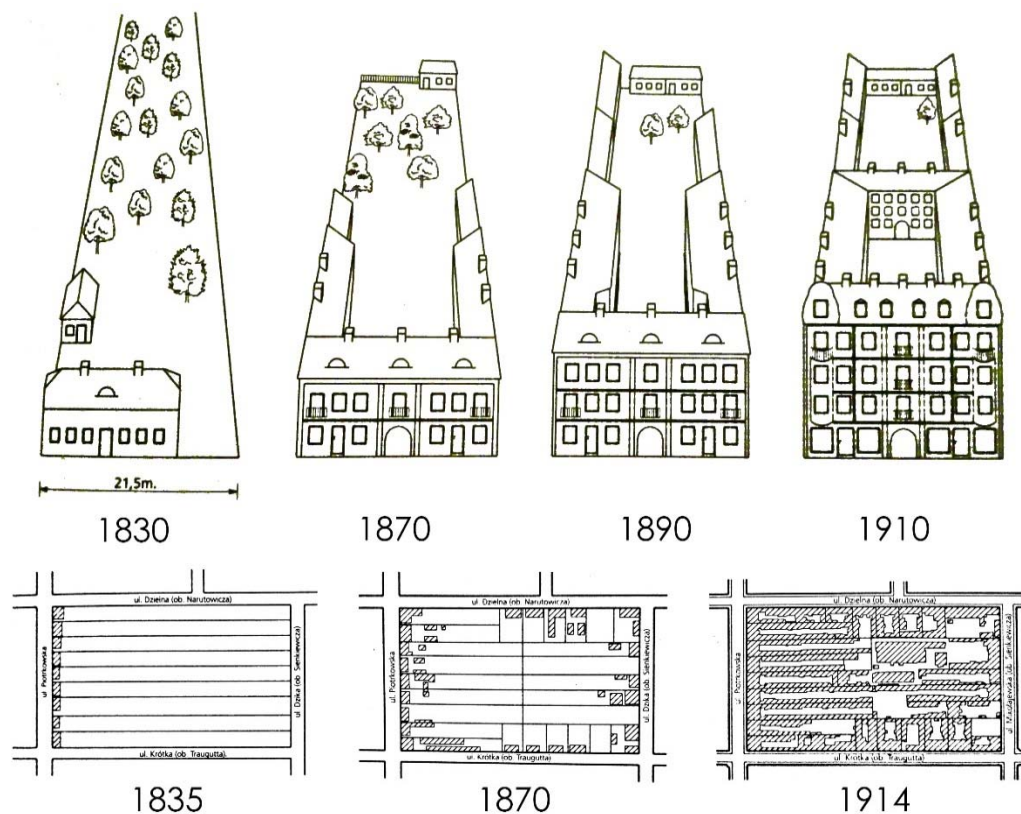


Figure 4. Development of Residential buildings from the timber-built weavers' homes into multi-storey masonry tenement houses

The constantly growing demand for employees for the new and existing, expanding factories led to the maximum intensification and overpopulation of used spaces, causing the development of the city beyond its borders. This factor led to creation of large suburban spaces without a regulated legal or planning situation. For this reason, there was established one of the biggest residential suburban areas in Europe, called Baluty. The settlement was created near the historical 17th century centre of old Lodz. Its location was mainly caused by the cheapest maintenance of building and living costs, caused by the slowest development and isolation of the part of the city. In Lodz the city was planned according to certain plans, property divisions and regulations governing the development. Meantime Baluty did not have specific space plan or building law which led to the creation of uncontrolled, chaotic structures. Buildings in such places were created in unplanned spaces, generating buildings inconsistent with the city's tissue. Lack of spatial planning in these regions led to the formation of buildings with similar parameters as in city but with a distinctly different spatial quality causing problems with living conditions and its proper functioning i.e. access to light or air quality in the area [5].

5. 20th century of changes

After World War II the situation in many cities in Europe changed dramatically. Most of them were devastated and due to rebuild processes many of historical structures in their planning were more adaptive and efficient. In case of Lodz relatively good preservation of 19th century inner city structure caused both many advantages and problems with new modern city planning solutions. The downtown compact residential area was completed with new objects in destroyed space. The building plan of

tenement houses, its proportions and density resulting from the evolution of the industrial agglomeration caused many problems while adjusting the city to the needs of the 20th century.

The main problem in the existing urban tissue was the adaptation of public spaces to new means of locomotion, their widespread dissemination and the demands of society in modern times. Poland in the post-war period was under strong influence of the Soviet Union, through town planning in that period was closely related to its policy. These factors have great influence on space creation in the city of Lodz. From its principles the city created for capitalist purposes was inconsistent of the politics of the USSR. For this reason, the structures that were created and the changes that took place at that period in many cases led to the destruction of compact historical buildings and their heritage. As an example of such way of planning was the deterioration of compact tenement houses at contemporary Zachodnia Street and the Kosciuszko boulevard.

In the pictures and plans above there are comparison between historical street structures and current condition of buildings. On the schematics on the right it is easy to see that compact, closed structure was divided. Former private property lost its front building, showing its private yard. This led to the loss of the border between the private and public parts. Changing the way of functioning many objects in one space caused their consequently deterioration and degradation of these buildings. Such actions led to many social and spatial changes in this region. Comparison of pictures on the left shows how important changes have taken place in the manner of space usage. The historic pedestrian alley, which was one of

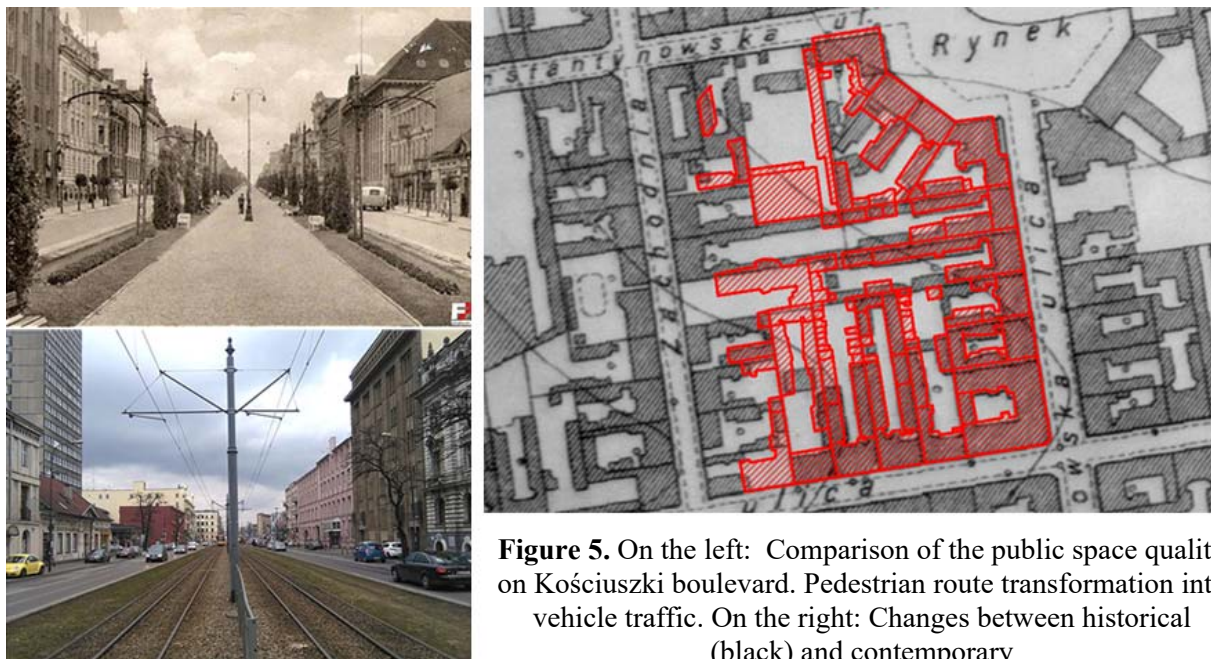


Figure 5. On the left: Comparison of the public space quality on Kosciuszki boulevard. Pedestrian route transformation into vehicle traffic. On the right: Changes between historical (black) and contemporary

(red) the most representative urban spaces in city, has turned into one of the main arteries of vehicular traffic, thus destroying its character. In addition, the development of multi-lane streets in a cooperative urban space has led to dividing the city fragment into two independent sectors.

Another of the greatest disadvantages of cities based on only one branch of industry is their problems and external factors inhibiting the development in specific field of economy. Main problems with regression of the city were economic problems, connected with political issues. In 1962 Lodz was one of the biggest manufacturing center, where 58,8% of employment was recorded in the textile industry [6]. That data shows how that part of economy was connected with city. Some thirty years later at the early stage of post-communist transformation the textile production declined and lack of new investments led to regression. The city created by industry underwent a metamorphosis. Many of the existing facilities was closed. The traffic-generating spaces that were the driving force behind the development of the entire city were closed leaving behind vast areas isolated from urban structures. Closure and aversion to objects associated with the economic problems of their inhabitants led to their gradual break-up. Many objects were treated as unnecessary leading to their demolition, changing the spatial arrangements. Situation created after these actions led to difficult changes in society. The multicultural community identifying itself with industrial heritage lost its connection with it and rejected

the work of their ancestors. That factor led to the creation of a society that does not identify with the spaces in which they live thus intensifying social problems [7].

6. Conclusions

All analyses in text show that too rapid development of some aspect of the city could be leading to it insufficient planning and growth. Also many of cities founded and developed in industrial revolution era have frequent disadvantages and some of their modern structural problems occurring in city, are the result of changes and decisions made before. That also shows that every city got its unique structure and evolution process. Conclusions presented here can be only a help for building case of other cities as a reference of some aspects needed in fully understanding its way of functioning. It also shows some of reasons why history based cities are hard to adapt or why structures based on only one branch of industry are inefficient in long term planning. The case of Lodz, shows why contemporary city and modern society, their instantly advancing technology and fast changing demographic or economic reasons, need more adaptable structure that can be transformed in a fairly short time.

References:

- [1] O. Flatt, *Description of the city of Lodz (Opis miasta Łodzi)*, WIST, pp. 12-46, ISBN 978-83-62867-00-4, Lodz 2011 (in Polish)
- [2] J. Salm, J. Wesołowski, *Lodz Guide (Łódź-Przewodzik)*, Zarząd Miasta Łodzi, pp. 34-39, Lodz 1992 (in Polish)
- [3] K. Stefański, *How industrial Lodz was build – architecture and urban planning of city 1821-1914 (Jak Zbudowano Łódź Przemysłową – Architektura I Urbanistyka Miasta w Latach 1821 – 1914)*, ROŚiOŚK, pp. 97-106, ISBN 83-86334-53-3, Lodz 2001 (in Polish)
- [4] A. Olejniczak, *#City (#Miasto)*, Biuro Architekta Miasta, pp. 6-37
- [5] ISBN 978-83-945099-1-0, Lodz 2017 (in Polish)
- [6] K. Stefański, *Lodz – the Birth of the City (Łódź – Narodziny miasta)*, Kusiński, pp. 322-328, ISBN 978-83-946566-0-7, Lodz 2016 (in Polish)
- [7] FJN, *Lodz in the 20 years of the People's Republic of Poland (Łódź w 20 – leciu PRL)*, pp. 101-112, Lodz 1964 (in Polish)
- [8] B. M. Walczak, "The Importance of Industrial Heritage for Cultural Landscape of Lodz and its Local Identity" in e. Wittbrodt, W. Affelt (eds.), *International Conference Heritage of Technology – Gdańsk Outlook 4 Proceedings*, Gdansk 2005