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**Architectural Style and Decoration of
the Industrial Buildings from the Late
19th Century and the Early 20th
Century**

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Architectural Style and Decoration of the Industrial Buildings from the Late 19th Century and the Early 20th Century

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Abstract

In the late 19th century and the early 20th century the industrial architecture was one of the most dynamically developing typological types. It significantly influenced the look of the cities that were expanding in this era thanks to the industrialization. The primary condition for creating a high-quality architecture was adjusting the disposition and shape of the buildings to the manufacture process determining many parameters of the construction. The secondary condition, however a very important part of the industrial architecture, was its architectural style. Therefore we may say today without any doubt that the shape of the city was influenced not only by the formation of the factory, as the manufacturing site, but by its architecture as well. This paper deals with the elements affecting the architecture of the historical industrial zones. The most significant factors were the influence of the progress in the construction and the use of new materials. One of the most important things concerning the process of forming the industrial architecture was the experience of the investors from the previous realizations, or the choice of the architect and construction company capable of making the utility architecture the unique piece preserving in its original functional and architectural style. This paper is focused not only on these aspects, but also on many others aspects affecting the architectural style of the industrial architecture at the turn of the centuries. As an example, the city of Bratislava that developed into one of the most industrial cities in Hungarian part of former Austria-Hungary, will be used.

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Introduction

In the late 19th century and the early 20th century the industrial architecture was closing the era of the industrial civil engineering expanding particularly in the 19th century. It is the period that was ended by the manufacturing growth during World War I and by the end of which the era of electrification started, not only in the manufacturing companies but also in the cities. Most industrial buildings that brought new type of structure to the towns – the factory – have been preserved from this period.

Within the frame of the history of the manufacturing, engineering, and constructing, the industrial buildings have scientific and technical values. Thanks to the quality of the overall design, the architecture, and the form of industrial buildings, these buildings may also have distinctive aesthetic values. ‘The industrial heritage is of social value as part of the record of the lives of ordinary men and women, and as such it provides an important sense of identity. It is of technological and scientific value in the history of manufacturing, engineering, and construction and it may have considerable aesthetic value for the quality of its architecture, design or planning.’ (TICCIH 2003) It is necessary to protect the remains of this period also because of the mentioned values.

While restoring and preserving the industrial heritage sites it is important to deal also with the values of the industrial architecture such as the overall architectural style and its look in the city. Clear definition of the architectural style of the particular buildings helps in converting the complexes to new uses and in defining the style of the extensions that are very often necessary in transformation of the buildings to new functional use. The perfect knowledge of the architectural forms and the decoration of the industrial buildings can help us in preserving the industrial heritage in its authentic state of this era for the future generations.

The architecture of the particular industrial buildings was affected by various factors, that more or less determined the formation of the architectural style of these objects. By the analysis and better understanding of these factors we can get the entire picture of how the industrial architecture had been formed and which influences have been reflected in it. Thus it can be easier for us to classify it within a wide range of the architecture in the cities and determine its uniqueness. This article deals with the factors, and their importance, that affected the architecture of the industrial buildings in Bratislava in the late 19th century and the early 20th century, so in the period from which the largest number of the historical industrial buildings in the cities of Central Europe have been preserved.

Methods and materials

The information about the factories and their original architectural style is not always available. The industrial objects, that had been demolished, have

not been sufficiently documented and many factory archives were destroyed during relocation or clearing of the factories. In some cases just the written information about the former factories, or their particular buildings, has been preserved and it is not possible to determine their architectural style. Therefore this research is mainly focused on the industrial architecture preserved up to the present day.

The research of the original architectural style of the industrial buildings from the particular period is orientated not only on examining the preserved state but on historical records, the original plans and the historical photographs and postcards as well. It is particularly important to carry out research also in the archives since many industrial sites were modernised during their operation period. The modernisation of the production often required major interventions into the architecture that's why it is not possible to find the original authentic architectural style of many buildings without deep knowledge of the historical documentation. Large number of complexes has lost its original plans and designs. In this case it is legitimate to use the method of comparing the buildings of the common author or engineering company or to compare the previous realizations of the same manufacturer, investor¹. To find out the original architectural style of the building besides archival research also other methods are being used: the inspection of the existing preserved remains as well as the comparison of the present state with other objects that share common factors affecting the formation of the industrial buildings.

Factors affecting the architectural style of the industrial buildings

The factors that had been affecting the architectural style of the particular industrial zones and buildings were in each case various and different. It is therefore possible to focus only on the most important and the most common ones, that can be clearly divided into two big groups (Figure 1):

external – these factors are to a large extent strictly limited (e.g. by laws, typology...). They had to be taken into account while constructing the factory and are modifiable only to a certain extent. These include the period, location, progress in the construction, layout of the building of the building, and partially the function of the building and material.

internal – these factors are not strictly limited. They can be modified according to individual requirements. These include partially the function of the building and the material and primarily the architectural style that is influenced by the elements of the architect, construction company and the manufacturer (investor).

¹ For an example of such comparison and deduction of the influences, that had been affecting the architectural style of the factory, see (Kvardova, 2012).

Figure 1. *A window from Matador factory*



Some factors can be included to a greater or lesser degree into both categories. These two large units don't represent thorough division of all factors as there's a great number of individual factors that can be found in each and every industrial zone. This review is also important to be taken as a basic division of more complex issue. All factors are somehow linked by connections by which they influence one another. The most important ones are marked by arrows in the table.

Period

The Industrial Revolution brought the transition from the hand production methods to manufacturing production that significantly influenced the appearance of the particular manufacturing buildings. The construction of the big factory complexes raised the question of the choice of the architectural style of the manufacturing objects with regard to the new function of these objects that had not appeared in the cities before. The industrial architecture passed from the traditional forms coming out from the models of secular even rural architecture to the forms representing the industrial buildings as large production objects suitable for the machines.

The reason why the historical architectural forms were still used even in the late 19th century can be credited to the tradition that was later on substituted by the newly formed styles and even later by the formation of functionalism. In the late 19th century and the early 20th century the austere concrete constructions without any specific decoration, which stood in contrast to the buildings influenced by secession, could be traced in the industrial architecture. The progressive construction used to be very often hidden behind the historicist architectural forms of the façade. The architects together with the engineering companies used to design innovative constructions. The choice of the façade was conditioned by the contemporary taste of the architect, or more likely the investor. In the early 20th century the social discourse on the choice of the appearance of the industrial architecture begun. It is now mostly illustrated in

the German journal *Der Industriebau: Monatsschrift für die künstlerische und technische Förderung aller Gebiete industrieller Bauten*, in which mainly architects were trying to figure the external forms of the industrial buildings.

Location

Several factors played an important role in determining the location of the manufacturing companies. Primarily the industrial zone was concentrated in the area with the possibility of a good transport infrastructure. Different types of transportation were needed to import the raw materials and export the goods – it was dependant on the specific manufacturing industries. '... environmental factors like the presence of raw materials, the existence of a good waterpower site and the immediate topography all influence the location of particular structure, but human agency is ultimately responsible both for its existence and for its form.' (Palmer & Neaverson, 2005, p.7). By the advent of the electrification of the industrial factories at the beginning of the century, the period which this article is focused on ends.

Other factors affecting the formation and development of the industrial complexes include the availability of labour power and various political decisions, that had considerable influence the establishment and modernisation of the factories. The appearance of the industrial buildings was influenced also by the political donation, the amount of the grant while constructing the factories, and by the fact which particular industry was supported by the political power at this time.¹

Over time the city with its infrastructure and the construction surrounding the industrial complex came into contact or even merged, such example is also Bratislava. The elements that were initially typical for urban buildings can be also found on the industrial ones. One of such examples is the clock placed over the main entrance or emphasizing the towers by the means of a profiled attic – these elements also served as orientation points in the city. According to the original design of one of the largest textile factories in Austria-Hungary, the thread factory *Uhorská cvernová továreň* in Bratislava, it is evident that its façade was designed in urban style by using the mentioned elements. However the clock was the typical sign of the city hall towers or railway station buildings, which had appeared in the city in the mid-19th, when the first railway was built in Bratislava. In every single place, where the time played an important role, this element deserved to be placed on the most distinct spot so it would have attracted the attention of the passers-by. This worked not only in the railway stations but in the entrance halls of the large factories as well.

In the second half of the 19th century and in the beginning of the 20th century the use of distinctive decorative architectural styles became dominant. The purpose of such trend could be the attempt to integrate the factory into the

¹Hungary especially used to subsidize the factories, located in its territory, in several waves of the government donations assigned to various branches. Such grant helped the industry in Austria-Hungary to develop.

location on one hand or on the other hand it could have been intentionally selected to form some kind of advertisement, or trademark, of the company itself.¹ The location of the industrial complex influenced the appearance of the factory also regarding the materials. Easy availability of the domestic materials or experience gained by the local manufacturing companies also played an important role in forming the overall appearance of the factory buildings.

Progress in the construction and new materials

The progress in the construction in the 19th century is closely linked particularly with the invention of new construction materials, like cast iron, concrete and steel, as well as new construction techniques. The constructors were then able to design rooms with larger spans as well as high quality constructions resistant to adverse impacts from production or the fire. New materials significantly accelerated also the production that was able to meet more expectations of the rapidly developing industry. The invention of these new materials also led to an improvement of the working environment as the rooms of the factory became sufficiently illuminated, ventilated and spacious so it improved not only the factory operation but the hygienic conditions in it as well.

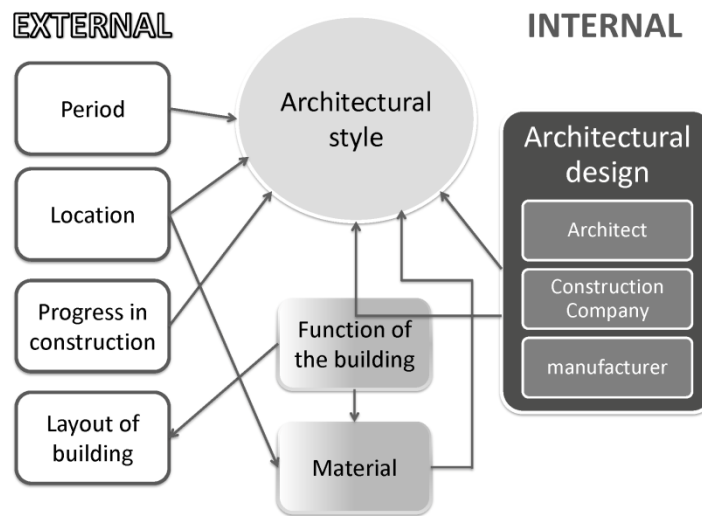
The construction of the factories accelerated when the cast iron (previously used just as a complementarily material) started to be used as a basic component – it enhanced the quality of the factory buildings in many aspects, e.g. improvement of the statics and the fire resistance characteristics. The individual components of the construction used to be made to measure or were prefabricated. Initially riveted constructions were later on substituted by rolled shapes that simplified the production and the assembly at the construction site itself even more. Structural cast iron systems used cast-iron beams in the combination with brick arching that influenced the appearance of many factory buildings both in the interior and exterior. By attaching it to the external walls the raster of the metal anchors was formed on the façade – the anchors were very often emphasized to stand in a contrast to the brickwork or plaster. For instance, on the façade of the largest spinning mill of the former thread factory *Uhorská cvernová továrň* in Bratislava these elements were aimed to function also as a trademark of the company. On the streetward façade of the factory the original idea was to seal the decoratively shaped letters RS representing the initial letters of the owners' names (Salcher & Richter), that founded one of the largest factories in Austria-Hungary, to the anchors. And again the factory façade functioned as a trademark of the company.

Thanks to its ductility the cast iron was predetermined to be used richly in the interior as well as in the exterior. The decorative cast-iron railings, corbels, staircases and many more very often carried the plant and ornamental motifs.

¹The idea of creating the trademark based upon the decorative styles of the factory building was also described in (Behne,1920)

Small elements on the cast iron constructions have been preserved in the original state up to this day also in the engine room of one of the largest textile factories in Bratislava. More specifically they can be found on unique staircase made of prefabricated components that enabled to construct such staircase according to specific taste of the architect in desired height as well as with the required degree of decoration. Last but not least thanks to the cast iron the significant progress had been recorded in the field of the window and wooden constructions. Large windows segmented into small rectangular panes in different variations have become one of the signs of the industrial architecture (Figure 2).

Figure 2. *Factors affecting the architectural style*



At the end of the 19th century, specialized companies focused on reinforced concrete constructions were established at the architectural market. In 1870 the company *Betónové stavby - Pittel & Brausewetter* (Concrete Constructions - Pittel & Brausewetter) was founded. 'The company begun to operate at the time of the expansion of the first wave of the industrialization in Slovakia. It became famous thanks to the use of new building materials and technological processes implemented in dozens of realized works.' (Lukáčová & Pohaničová, 2008, p. 141) In 1878 the company established its main construction office in Bratislava. The company operated throughout Austria-Hungary and in its portfolio of the constructions also industrial buildings in Slovakia and Czech Republic can be found. The German company Wayss & Freytag, that was founded in 1893, (Beran & Vlachařová, 2007) is also another significant corporation in the field of reinforced concrete constructions in this area. The industrial constructions that they built in Bratislava can be found up to this day.

New discoveries in the field of reinforced concrete structures begun to be used in constructing the industrial buildings. Fire resistance of concrete, good static properties and resistance to aggressive production process were the dominant characteristics that attracted the manufacturers to use these materials

while building the factories. The reinforced concrete constructions were still at the beginning of the 20th century hidden behind the façades of historicist architectural styles or of the elements of one of the newly formed styles at the turn of the centuries. Yet some exceptions where this construction was presented in its shape and in the appearance of the building itself can be found. As an example the double-hall used for enamel baking in the former enamel factory *Uhorská továrň na smaltové a kovové výrobky* in Bratislava by the architect Heinrich Zieger from Zittau (1873 – 1943)¹ can be mentioned. Besides the unique construction design, the architect used the ochreous brickwork from this region as a covering. The elegant concrete arch is supplemented by the industrial windows and distinctive brick texture creating the unconventional harmony of the materials (Figure 3). This hall was one of the largest, if not even the largest, reinforced concrete hall in Austria-Hungary.²

Figure 3. *A double-hall from the enamel factory in Bratislava*



In spite of the possibility of new materials the decorative style consisting of laying the bricks into different patterns was in the field of the architecture of the industrial buildings very popular for a long period of time. The combination of the bricks of different colours to form various interesting patterns was also used very often. Protruding lesenes, cornices under and above windows, profiled under-roof facings and other elements followed the tradition of historicism, that was deep-rooted in Austria-Hungary. Despite some reproduction of the elements from the civil architecture, there could be evident the great effort of the architects and the investors to decorate the industrial architecture, whose objective was to represent the progress and the prosperity of the production department and as such the city itself (Figure 4).

¹Published as an example of the concrete constructing in various publications, see e.g. (Gössel & Leuthäuserová, 2006; Der Industriebau, 1919).

²as it was published in the journal (Der Industriebau, 1919).

Figure 4. *A brickwork from munition factory in Bratislava*



The function of the building

The function of the building affected mainly the form of the buildings in terms of the parameters of the floor plan and the height of the particular storeys that were subordinated to the operation. The parameters and very often also the construction system that was used while constructing the particular object used to be determined by the companies supplying the factories with the machines themselves. Besides this obvious factor – the influence of the function on the construction itself – there are some other influences caused by the function that can be visible on the façades of the objects. It depended on the importance of the particular building in the industrial complex – the more important the function of the building was the more decorative elements and pretentious architectural figuration on the façade could be found.

The most representative objects of the industrial complexes were two groups of the buildings – the largest ones regarding the height or the capacity and the engine houses representing the abstract heart of the factory pumping the energy into manufacturing process. For instance within the textile industry it were the spinning mills, as the largest buildings in the factory, together with their water tower and the ventilation shaft, that carried the greatest number of decorative elements. The chimneys and water towers together with their decorative endings not only defined far and near the owner of the factory but many times served as the landmarks. Their profiled attics or the brick capitals with distinctive endings provided the company some advertisement at a distance. It was the spinning mills that were almost always the most representative objects in the factory and that determined its architectural or advertising activities in the city.

The engine rooms, as the power producing heart of the factory became the most decorative objects thanks to their function. The most common elements placed in the buildings of the engine rooms included the distinctive windows, inscriptions with the company name, semi-circular arch (or atypical) roofing and expressive bossage. The factory water plants, often situated outside the industrial complex, can also be included into this group. The architectural

forms on their façades were used to express the importance of the function of the object. The importance and the representativeness of the engine houses were present also in the interior of the object. For instance, in the engine house of the former thread factory of Austria-Hungary the interior floor consisting of ceramic tiles fulfilled two functions – it increased the level of decoration of the room and kept it clean as well.

The architect – the construction company – the manufacturer

The factories have been frequently named after their founders, who brought the initial impulse and the capital to the investment in the particular area. The construction company is also an important element in relation to the architectural style of the manufacturing objects. While carrying out the archival research the hardest and many times never been answered question is the name of the architect, who had designed the particular factory. By resolving all three components involved in the process of the construction and the design of the factory (architect – construction company – manufacturer) it is easier for us to determine which factor was the strongest one while forming the appearance of the factory. The summarizing of the realizations of these three components and identifying of the role of every single one in the process of the design can significantly help.

There are several examples, when the investor – manufacturer and the construction company didn't ask the architect to participate. Such cooperation could work thanks to the company's experience with the similar type of buildings. The architectural style of the complexes is derived from taken models of other previous realisations, which both investor and the manufacturing company had experience with. In the second half of the 19th century already mentioned combination of the brick façade and the plaster façade became an universal industrial style. It can be found on the façades of various factories of various functions in one single city, e.g. in Bratislava – the thread factory, the cable factory, the factory manufacturing the dynamite or cartridges. As it was mentioned above it resulted from the tradition of the historicist style that had very strong background in Austria-Hungary. Among other factors causing the popularity of this style include easy availability of the brick, as the principal construction material, as well as its price. The combination of plastered and brick parts of the façade emphasized the points of the bearing system giving the industrial buildings the appearance of the exterior coming out the bearing construction of the building itself. Thus the inspiration resulted not only from the tradition, the availability of the material at accessible price but also from the construction itself.

Industrial buildings whose author can be clearly identified sometimes stand aside the historicist tendencies occurring in the 19th century and in the beginning of the 20th century. These factories have their own characteristic architectural design influenced mainly by the taste of the architect and his tendencies or direction. Large amount of such unique factories have been

constructed in this way – their architectural style was adjusted to one of the newly formed styles, in the area of Bratislava mainly to the architecture of *werkbund* and secession. As an example we may mention the textile factory *Danubius* (1906) by Viennese architect Julius Mayreder, who together with his brother Karl designed, again very originally, in oriental style, the Zacherl *insecticide factory* (1892 – 3) in Vienna (Figures 5, 6). At the insecticide factory the author was inspired by the oriental architecture whose pattern was found in the area of the occurrence of the substance from which the final products were made, whereas at *Danubius* textile factory the intention was different. Despite the fact that *Danubius* textile factory was constructed of the reinforced concrete by the Pittel and Brausewetter company, the author decided not to indicate it on the façade. Architect used the forms of secession instead – he got to know this style very well in Vienna and through Secession club, as he was one of the members. 'These buildings are rationally designed upon the calculation of the production capacity and their plans are being delivered to distant constructors that used the standard construction components by the means of the correspondence' (Beran, 2010).

Figure 5. Zacherl's factory in Vienna

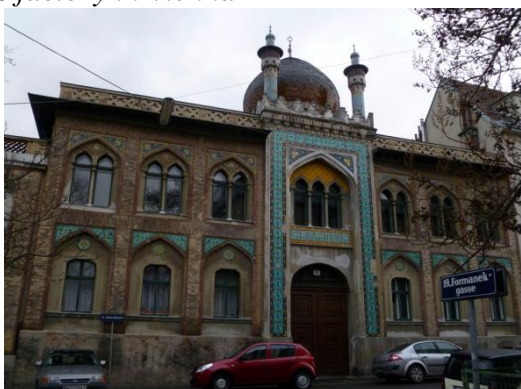


Figure 6. Danubius factory in Bratislava



Some architects chose the other direction – they started to realize that the concrete could be more than the hidden part of the industrial building and began to closely cooperate with the above mentioned construction companies with the orientation on the construction and the development in the sphere of

the reinforced concrete. For instance, the already mentioned Heinrich Zieger (1873 – 1943) while constructing the enamel hall in Petržalka decided to present the elegant double-arch on the front façade. (Figure 3). His idea to arch over the operation premises that required the layout without any columns, with the space left for redundant heat leakage, could have been realized thanks to the strong partner focused on the reinforced concrete engineering, the Wayss & Freytag Company. He made his unique construction dominant on the façade by means of which it became the symbolic element standing in the contrast to the brickworks that had been the traditional material in this area.

Urban and transportation buildings

The buildings constructed by the city for its inhabitants to increase the comfort in the transport and improve the hygiene can fall into separate chapter. The objects of former gas plants, power stations, railway stations or city slaughter-houses etc. had more representative architectural style as they often served as some symbol of the municipality. Mainly the historicist architectural forms, that were very popular and common also on the objects of city halls, banks or churches by the end of the 19th century, were applied on them. More complex study, that would work with this group as the separate part within the frame of the industrial heritage, would be needed for whole range of these buildings.

Results and discussion

This study shows that the architectural style of the industrial buildings is of irreplaceable importance regarding the image of the city itself. It is the part of diverse urban infrastructure complementing it by the production element, even though nowadays only in the form of remembrance. Many factors had been affecting the formation of the architecture of the particular buildings – they were influencing the overall impression of the objects in the factory complex as well as in wider surrounding areas. The formation of the industrial complex meant a lot to the city in the term of the economy and the architecture of the factory also brought to the towns new architectural type manifesting the influence of the investors and constructors that were creating the image of new city districts.

Analysing of the possible factors affecting the architectural style of the industrial buildings can move us forward in understanding their uniqueness and originality. The larger number of the factories is studied the more factors appear. The research of the architectural style of the industrial buildings isn't therefore limited so far. By better knowledge or the analysis of the historical documents new or complementing view on this question always emerges. Despite this we can now say without any doubts that the architectural style represented the inseparable and important part of the industrial architecture –

this fact should be implicitly taken into account while restoring and preserving the industrial heritage.

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