

ARCHITECTURAL EXAMPLES OF INDUSTRIAL HERITAGE. PROFILE OF INDUSTRIAL ENTERPRISES IN THE CITY OF RUSE IN THE PERIOD FROM THE LIBERATION TO THE END OF WORLD WAR II

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Abstract. The industrial heritage of the city of Ruse is determined by the specifics of the industry in the city at that time, as well as by the development of trade along the Danube River, which led to overcoming national borders and introducing innovations into the production activities of that time. In this paper profile of industrial enterprises in Ruse is investigated. The first industrial zone in the city of Ruse, called the Eastern Industrial Zone, is considered. As an example, the Mühlhaupt machine factory (1907), the "Postoyanstvo" weaving factory (1905), the "Trud" brick factory (1893), and the sugar factory (1912) are presented.

Keywords: Industrial development in the city of Ruse, eastern industrial zone, architecture of the first industrial factories, European architectural influence

1. HISTORICAL PREREQUISITES FOR THE EMERGENCE OF INDUSTRY IN THE CITY OF RUSE. EUROPEAN ARCHITECTURAL INFLUENCES.

Industrial architecture emerged at the end of the 17th century after the invention of machines, such as James Watt's steam engine in 1784. The first industrial buildings were built in countries with nascent industries - Great Britain, France, and Germany. The construction of manufacturing enterprises in a historical aspect is determined by global factors: demographic growth, increased needs for goods for final consumption, increasing the well-being of societies and the accumulation of capital, development of transport infrastructure, access to social infrastructure, access to education and science, etc. [8].

With the advent of the new industrial culture, the 19th-century understanding of the essence of industrial architecture is directly related to the industrial heritage. For example, the development of metal casting has a significant impact on the possibilities for the construction of large industrial facilities, such as bridges. At the same time, a

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technology was developed that radically changed building construction – glass casting, which allowed the production of panels with dimensions of up to 1.75m x 2.50m in industrial conditions. The experience of bridge construction and the availability of large glass panels soon allowed the construction of some of the first multi-story industrial buildings in the textile industry. One of the most significant technical discoveries of that time, which has an impact on architectural solutions for construction in general, is the emergence of reinforced concrete. Auguste Perret and Tony Garnier – some of the innovators in the machine age – changed the paradigmatic concepts of the city and the building in particular. Garnier was the first to create a spatial division of functional units – for production, habitation, recreation, and transport. For him, preliminary reinforced concrete construction was the material of the future [8].

Because of the new industrial culture, the 19th-century understanding of the essence of industrial architecture is about to become history, which is also documented in some literary sources on the problems of ornamentation and aesthetics of engineering [9].

The industrial heritage of the city of Ruse is determined by the specifics of the industry in the city at that time, as well as by the development of trade along the Danube River, which led to overcoming national borders and introducing innovations into the production activities of that time [7].

The second half of the 19th century was associated with the rapid development of the industrial era. In Europe, modern factories were built for their time, railways were built, the mining industry grew, navigable canals were dug, and at that time, the Suez Canal was built in Egypt. This rapid development of industry was noticed by Mithat Pasha, and he took the first steps towards sorting industry on the territory of the Danube Vilayet (1868-1878). At that time, the brewery and the municipal mill were built in the city of Ruse, both of which operated with steam engines [10]. In 1878, the Ruse municipality became the owner of the mill established four years earlier. It was equipped with four fine flour stones, cleaning machines, and a steam engine. The municipality managed the mill until 1886 and sold it to the Papamanoli brothers in partnership with the entrepreneur Andrea Thurio. They also purchased a plot of land adjacent to the mill yard from the municipality to expand it. A new, modern, high-power steam engine and five rollers for fine flour were delivered. The average annual production of the mill for the period 1919-1938 reached 2000 tons of flour, intended primarily for export. In 1868, the “Sveta Petka” brewery was founded in Ruse. The head brewer was one of the brothers, Franz Milde. The company's buildings were located in the Rusenski Lom area. It was equipped with modern machines for the production of Bavarian and Pilsner beer. The main factory building was an eight-story, built of stone and bricks. The brewery was equipped with a steam engine, a brewhouse, a washing department, cemented tunnels for sprouting and grills for drying barley, a draining apparatus, as well as rooms for aging beer, warehouses, and an icehouse. In the large yard through which the river passed, there was a cellar and a building serving as housing for the workers. In addition to these two enterprises, the

Vilayet authorities also built two railway lines: Cherna Voda-Kystendzha and Ruse-Varna. This was accompanied by the construction of railway stations along the routes, as well as the purchase of a certain number of steam locomotives and wagons. The ports along the Danube River were modernized, and a certain number of steamboats and barges were purchased. After the Liberation, all these steam locomotives, wagons, steamboats, and barges were sold to the Bulgarian state.

After 1878, the Bulgarian authorities set about developing industry on the territory of the state. The modernization of the ports on the Danube River, as well as the Black Sea ports, continued. New, used locomotives, steamers, wagons, and barges were purchased. The construction of railway lines continued - by 1902, the Ruse-Gorna Oryahovitsa-Veliko Tarnovo railway line was completed. This led to an increase in trade and supplies of raw materials from abroad for the Bulgarian enterprises under construction. During the period from the Liberation to the end of World War I, the eastern industrial zone was formed in the city of Ruse, which was connected to the port, the old railway station, and the Haltata railway station. It was located between the Danube River, Vladikova Bahcha Park (today's Youth Park), today's Lipnik Blvd., the Danube Bridge, and the village of Marten. During the period in question, the main enterprises there were the "Trud" Brick Factory, the Sugar Factory, the "Postoyanstvo" Weaving Factory, and the Mühlhaupt Machine Factory. All four enterprises operated with steam engines that were modern for their time [6].

2. HISTORICAL DEVELOPMENT AND ARCHITECTURAL LAYOUT OF INDUSTRIAL ENTERPRISES IN RUSE IN THE PERIOD FROM THE LIBERATION TO THE END OF WORLD WAR II.

Eastern Industrial Zone:

By the end of World War I, with the help of French, Belgian, German, and Bulgarian capital, the first industrial zone in the city of Ruse was formed (note: for greater convenience of presentation in this chapter, we have named this area of the city territory the Eastern Industrial Zone). It had a convenient connection with the old railway station and had its own port - it was built by the owners of the sugar factory but was also used for other enterprises. Railway transport turned out to be an extremely adequate symbol of the changes that occurred with the development of the industrial revolution, since it was not only a product of the era, but also an engine that transformed the space. Although it exists today, the Museum of Transport in Ruse, located in the first railway station in our country (the old railway station in Ruse), does not have the official status of a museum, and the first locomotive that ran on the line, as well as the carriages from that time, are not cultural values under the Cultural Heritage Act, but are considered "rolling stock" of the state railway [7]. The old railway station and the "Haltata" railway station were connected by two railway lines that circled the city – one passed along the Danube River, and the other circled

the city on its southeastern side (both exist today). By circling it, the two railway lines marked the territorial appearance of the city of Ruse in the period from the Liberation to the end of the First World War. The eastern industrial zone housed four enterprises built at different times – the Mühlhaupt machine factory (1907), the “Postoyanstvo” weaving factory (1905), the “Trud” brick factory (1893), and the sugar factory (1912).

The construction of the buildings of the mentioned enterprises was invariably connected with the stages of development of the technological production processes organized in them. This was directly related to the degree of development of engineering and construction technologies, allowing the implementation of more rational construction and constructive solutions, as well as the influence of the general architectural trends and styles of that era on the architectural appearance of industrial buildings in the industrial zone. The evolution of production technologies led to an evolution in the architectural and constructive solutions of industrial buildings and complexes. The complexity of requirements determined by the technology of industrial production had a direct formative influence on the architectural solution of the industrial enterprise. The human factor – the workers serving and managing the production process – also has an important role in this regard. The main requirement was to provide workers with a comfortable, safe, and healthy environment [9].

The architectural solutions of the four industrial enterprises of the Eastern Industrial Zone were influenced by the following main factors:

- Dependence of the dimensions and proportions of the production space on the requirement to provide the necessary dimensions for the location and functioning of the technological and transport equipment, for optimal movement and processing of raw materials and materials along the production process. A widespread trend of that era in this regard was the use of large-sized machines driven by a steam engine, which led to the imposition of the corresponding requirements for the workspace [9];
- Requirements for the workspace of people employed in production and ensuring optimal communications, ensuring optimal conditions for work and short-term rest. The examples considered here present contemporary solutions for industrial interiors and environmental improvement for that era, meeting the increased architectural and aesthetic criteria [9];
- Air environment parameters, such as temperature, humidity, and pollution level. The requirement was both to ensure a healthy working environment for workers and to observe specific parameters related to the production process: for example, ensuring a certain air humidity in textile production, related to the quality processing of textile fabrics. In some industries, such as the sugar factory or the machine factory, the requirements for air environment parameters are extremely important and are constantly monitored and maintained. Therefore, the halls of the two factories were connected and had a certain number of windows, which allowed fresh air to enter during a certain period of time [9];

- Lighting parameters – ensuring the necessary illumination of the workplaces and the appropriate spectral composition of the light. To guarantee the desired natural lighting, tailored to the nature of the production, various architectural and structural solutions are applied. For example, the use of overhead lighting through window openings on the roof creates a specific architectural image of the industrial building [9].

Thus, the characteristic features of a certain type of production are directly reflected in the external appearance of industrial buildings, giving them clear information and an easily recognizable purpose of production [9]. For example, in the architecture of the four factories under consideration, closed spaces with evenly spaced window openings are clearly dominant - in this way, the state of the air environment and the lighting inside the enterprise were controlled. When placing the technological equipment in the complex of the industrial enterprise, a technological motif was introduced into the spatial composition [9] - the placement of the chimney for the steam engines had an impact on the architectural appearance of the buildings in the complex. The technological groups characteristic of the respective production, located in the individual indoor halls, reveal the purpose of the factory. The complexes of the weaving factory and the machine factory consist of several indoor halls, connected to each other, and several auxiliary buildings around them. In the sugar factory, several halls are grouped around a larger building and connected to each other (Fig. 1). The brick factory consists of several one-story halls grouped around two two-story buildings, which are not connected to each other. All four industrial complexes had tall chimneys, from which steam from steam engines came out. The preferred architectural style in the design of the buildings was modernism with clean forms. The only decorative element was the shape and location of the window openings, as well as the clean exposure of the brickwork.

This architectural type of industrial buildings, associated with the use of solid brickwork, was developed in the mid-19th century by the Frenchmen Auguste Perret and Tony Garnier. They were the first to use metal frame construction in combination with solid brickwork in the construction of industrial buildings. Later, in 1880, this architectural technique was applied by the Chicago School in the construction of high-rise buildings. As we have already mentioned above, Garnier was the first to create a spatial division of functional units - for production, habitation, recreation, and transport. For him, preliminary reinforced concrete construction was the material of the future [1]. A similar approach was taken when building the sugar factory complex in Ruse. A residential complex was built, consisting of single-family houses for the factory directors and multi-family blocks for ordinary workers. The complex also included a tennis court. Of the factories in the eastern industrial zone, only the residential workers' quarters have been preserved today. In part of the workers' quarter of the former Sugar Factory, the present-day "Traktsiata" quarter was later formed (the name comes from the "Traktsia" wagon and locomotive repair factory that existed until the socialist period on the territory of today's Razpreditelna station) [3].

The “Trud” Brick Factory:

In the Puhlevo Dere area near Ruse in 1893, Georgi Gubidelnikov and Georgi Gerov founded a brick factory [5]. At that time, the city was a huge construction site. Old Turkish buildings were being demolished, and modern buildings and private homes were being erected. The city was experiencing an increasing shortage of building materials. This led Gubidelnikov to become the initiator of the creation of a "Brick Company" in the city. Bricks, basalt blocks, ceramic vessels, and stoves began to be produced there. The main energy source was the "Wolf" steam engine [5]. The ever-increasing demands on the quality of the materials used to build new buildings in the European style, as well as the rapid pace of work in Ruse, forced the production to be renovated and expanded. The land on which the enterprise was built turned out to be insufficient. For three years, Gubidelnikov persistently sought an understanding of the problem from the Ruse municipal councilors, because they had to allow the factory to build its new workshops on the neighboring plots. The factory employed 500 people, for whom its fate was of vital importance. Public impatience forced the municipal councilors to give a positive answer, and so the factory expanded its production capacity. Gubidelnikov managed to prove that the establishment and development of this enterprise were important for the entire city. Therefore, no one was surprised when on December 14, 1897, he managed to unite the economic elite in Ruse around the creation of the Joint-Stock Company for Cement and Brick Products "Trud".

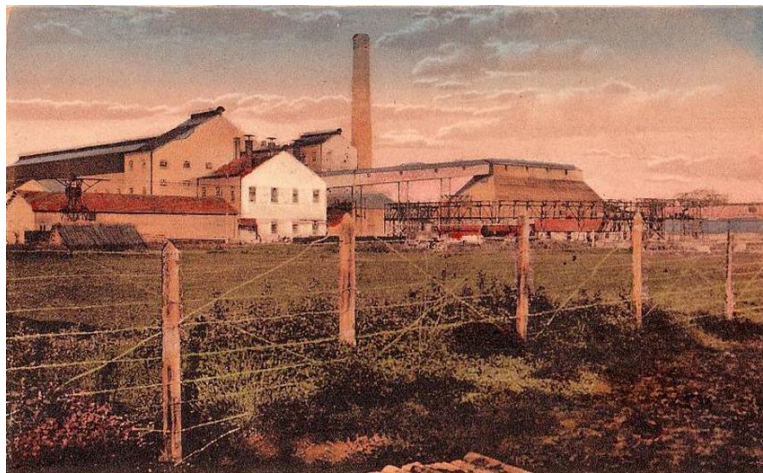


Fig. 1. Ruse. The Sugar Factory [5].

The Sugar Factory:

At the beginning of the 20th century, a large group of Belgian industrialists and bankers, known as builders and owners of sugar factories in their country, turned their attention to the young Bulgarian state. After their enterprises in Italy and neighboring Romania were already successfully operating, they looked for a way to obtain a concession for sugar production in Bulgaria. It was requested on behalf of the Sofia merchant G. Ginev. On January 23, 1912, the National Assembly gave its consent to the construction of a sugar production plant on state land. In the summer of the same year, Ginev transferred the concession to the newly established anonymous company in Brussels, which was represented and signed by Adolf Hubert and Ivan Miso. It received 270 decares of land in Ruse, bordering the Danube River, from the Bulgarian government.

The site was carefully surveyed and built in just fifteen months (Fig. 1). The Belgian investors designed the production rate to an accuracy of one hour. The factory was to process 1600 tons of beetroot in 24 hours. For this purpose, equipment was delivered from Germany, Great Britain, and Belgium. A drying workshop was also equipped with special machines for the production of beetroot slices intended for export. The enterprise employed about 800 people.

René Artzen, who was only 20 years old, was sent from Belgium to manage the Rousse factory. He was born in Brussels, where he graduated from the Free University as an engineer in roads and road facilities. He applied this knowledge when the factory began to build a pier on the Danube River and a cable car to the port. Beet production provided a livelihood for all the settlements along the Danube River in northeastern Bulgaria. 100,000 tons of sugar beet were processed annually. For its faster delivery to the factory workshops, René Artzen purchased 3 tugboats and 9 barges on behalf of the company. In just ten years, production increased from 1.9 million tons of sugar per year to 30 million tons of various types of sugar, the most famous of which was lump sugar. The factory was one of the largest in the country and produced about half of the total sugar production in Bulgaria. This necessitated the construction of a railway line to facilitate the transport of finished products loaded by train. Special facilities were also built for unloading and washing the beets, as well as inter-canal lines for the wagons that transported them to the production workshops.

The factory maintained its group of firefighters on constant alert. Separate buildings were built for them, as well as for the police squad, also subordinate to the factory management. For the workers permanently employed in the production process, housing was built at the company's expense near the factory. This entire huge complex was managed by René Artzen. On his initiative, a Cartel of Sugar Factories was created. It united the Ruse, Sofia, Gorno-Oryahovitsa, Plovdiv, and Burgas sugar factories and refineries. The efforts of this association were directed at researching the market and monitoring sugar prices. For this purpose, the "Joint Stock Company Sugar" - a common office for the sale of goods- was created. The cartel was officially

liquidated in 1931, but the de facto cooperation between the sugar factories continued for another four years.

The “Postoyanstvo” Weaving Factory:

The large “Postoyanstvo” AD weaving factory, which produced vegetable oils and textiles, was founded in 1905 [2]. It was one of the largest enterprises in this industry in the country [5]. In 1922, the “Postoyanstvo” company was bought by the German company Klinger and Sons. The old weaving factory was located at the beginning of today's Lipnik Blvd., on the site of the Mr. Bricolage store. Until nationalization in 1947, the factory had 200 looms and over 200 employees [5].

The Mühlhaupt Machine Factory:

In the last years of the nineteenth century, the entrepreneur Hartun Manukyan founded a trading company that was supposed to sell and repair watermills. His friendship with the German Evgeniy Mühlhaupt, who was an excellent fitter, gave the merchant the confidence to take on the more complex task of building a machine factory. Thus, in 1900, the “Energia” factory was founded. The workshop of Wilhelm Behmann [3], a compatriot of Mühlhaupt, was rented for its first production hall. After seven years, the partners separated, and the Germans founded the limited partnership “Machine Factory and Iron Foundry – Evgeniy Mühlhaupt and Sons”. The company had to produce water turbines, mill machines, transmission parts, and steel rollers. The great demand for production required a rapid increase in capital, labor force, and production capacity. Everyone preferred the products of the Bulgarian factory, which were not inferior in quality to the imported ones, for whose delivery they had to wait for months. While in the first year of its existence, the enterprise had a capital of 150,000 gold leva and 16 workers, only two years later, the capital reached half a million gold leva, and 120 people were already employed in production. New production workshops were built because the first wooden building, 15 by 8 meters, was already extremely insufficient.

During the years of the First World War, the factory worked hard to meet the needs of the army. In the winter of 1917, a devastating fire stopped the rise of the enterprise for a while. No one could assume that its activities could ever be restored. But in a short time, a newly built factory equipped with modern machines started its work. In the early twenties, the enterprise already employed 250 people. On February 22, 1922, the company was transformed into a joint-stock company "Machine Factory Evgeni Mühlhaup". The factory became one of the most significant industrial enterprises not only in Ruse but also in all of Bulgaria. Every year, a huge capital was invested in the improvement and expansion of production. The factory's achievements in the field of mechanical engineering affected all industries for which it produced spare parts and equipment. The efficiency of milling production was increased.



Fig. 2. Ruse. "Sveta Petka" Brewery [5].

The "Sveta Petka" Brewery and the Development of Brewing in the City of Ruse:

The entry of brewing into Bulgarian lands was associated with the emergence of the first brewery in Ruschuk, built even before the Liberation. In the newspaper "Dunav" ("Tuna"), in 1868, a note was recorded about the transport of coal from the port of Machin on the Danube, intended for the "Sveta Petka" Brewery (so named because it was located near the rock church "St. Petka", buried during the construction of the two viaducts on the road to Sofia). Old postcards show us the impressive buildings of the factory (Fig. 2). In an advertisement from 1883, it was noted that it had a new installation with advanced machines for the production of Pilsner and Bavarian beer, that it was "a producer of yellow and black beer for all parts of Bulgaria". Since 1877, the factory became the property of the entrepreneur Sava G. Velezli, and the head brewer was the Czech Franz Milde, who had been working in the newly opened brewery in Shumen since 1883 [4].

Sava Velezli sold the factory in 1887 and the company was transformed into the "Bulgarian Brewery "St. Petka". G. N. Kalushki, in the published inventory of breweries in Bulgaria in 1895-1897, indicates that the factory belongs to the company "Marin Cholakov & Co.", but does not give its name "St. Petka". Marin Cholakov also owns a beer hall on "Knyazheska" street in Ruse with about a hundred seats. In February 1897, the first public film screening in Bulgaria took place there. As noted in the newspaper "Zakonnost" of February 28, 1897, the cinema was owned by the Croatian Georgi Kuzmich. The factory was expanded several times. The central building had 8 floors, built of stone and bricks. It had a 25 hp steam engine, a brewhouse, places for sprouting and drying barley, a device for draining and aging beer, warehouses, and an icebox with ice cubes collected in the winter [4]. Later,

additional two-story massive buildings for offices and warehouses were built to the main building (Fig. 2). In 1929, the company went bankrupt and was announced for sale. Some of the premises were used as warehouses. Later, the building was demolished [4].

3. CONCLUSION

The industrial heritage of the city of Ruse is determined by the specifics of the industry in the city at that time, as well as by the development of trade along the Danube River. The construction of the buildings of the new enterprises in Ruse was invariably connected with the stages of development of the technological production processes organized in them. In this paper, we consider as an example of industrial heritage the eastern industrial zone housed four enterprises built at different times – the Mühlhaupt machine factory (1907), the “Postoyanstvo” weaving factory (1905), the “Trud” brick factory (1893), and the sugar factory (1912). The construction of the buildings of the four factories in Ruse at this time was directly related to the degree of development of engineering and construction technologies, allowing the implementation of more rational construction and constructive solutions, as well as the influence of the general architectural trends and styles of that era on the architectural appearance of industrial buildings in the industrial zone. The evolution of production technologies led to an evolution in the architectural and constructive solutions of industrial buildings and complexes.

REFERENCES

- [1] S. ASPARUHOV, Historical Review of the Development of Technologies and Their Impact on Industrial Architecture (2015) VII International Scientific Conference, Varna, May 28-30, 2015, online: https://www.researchgate.net/publication/333670026_Istoriciski_pregled_na_razvitiето_na_tehnologiyite_i_tahnoto_vzdejstvie_vrhu_promislenata_arhitektura.
- [2] M. BURCHEVA, Drilling in the Economic Life of Ruse, In: Almanac for the history of Ruse, vol. II, Ruse1997.
- [3] M. BURCHEVA, The German Presence in Ruse Until the End of the Second World War – Collection. The German Presence in Ruse from the Middle of the 19th Century to the Present Day. Ruse, 2003.
- [4] V. DOIKOV AND M. DIMITROVA, Ruse - the City of the First Beer Factory in Bulgaria, Regional Historical Museum Ruse. Izvestiya. Book XXI, 2019.
- [5] V. DOIKOV, AND M. DIMITROVA, The Buildings. European cultural heritage of Ruse. Images and History, Avangard Print, R., 2013.
- [6] L. ZLATEV, The Economic Development of the Danube Cities after the Liberation to the Wars, Almanac for the History of Ruse, No. 10, Ruse, 2010.
- [7] N. NENOV, The Industrial Heritage as a Visual Narrative in the Collections of Bulgarian Museums, In: Cultural Memory in Time and Space. Collection dedicated to the 65th

Anniversary of Prof. Dr. Simeon Nedkov, University Publishing House "St. Kl. Ohridski", Sofia, 2018.

- [8] M. PISARSKI AND A. AVRAMOVA, "Industrial Buildings", *Technika*, Sofia 1987.
- [9] A. PISARSKI, Contemporary Phenomena in Industrial Architecture, magazine. Gradat, No. 1, S, 7.03.2017.
- [10] I. RUSEV, How Many and Which Were the First Factories in the Bulgarian Lands Before the Liberation (1878)? An Attempt at Source and Historiographic Analysis. – In: Proceedings of the Center for Economic and Historical Research. T. I. Urban Economy in the Bulgarian Lands Through the Ages. Varna, 2016.

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