

Investigation of Industrial Architecture's Monuments in the 19th to Early 20th Centuries in Volgograd Region

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Abstract—The article considers the historical industrial architecture of the second half of the 19th and the early 20th centuries on the territory of the Volgograd region. Analysis and systematization of the identified information about the construction of industrial facilities (both existing and lost), the use of visual and cartographic material, and field surveys allowed classifying the main types of industrial buildings of the late 19th and early 20th centuries in the region of consideration. There was identified the degree of preservation of industrial heritage sites and proposed ways to transform them for modern. The article provides archival and field illustrative materials.

Keywords—*industrial architecture; industrial complex; renovation; Volgograd region*

I. INTRODUCTION

The attention to the problem of preserving and using the historical industrial heritage has recently been increasing. For the Volgograd region, which has monuments of industrial architectural heritage of the second half of the 19th-early 20th century, high historical and cultural value is a specifically acute problem. Such heritage is very important, both as a collection of separate objects and as objects that form the city landscape. Not only they undoubtedly have regional value, but also represent the whole history of Russian industrial architecture.

However, unfortunately, there are not many buildings of industrial heritage left for the considered period of time and on the considered territory. The rest can only be judged by archival documents. Development of industrial architecture in Volgograd region remains unexplored. There is no list of monuments under state protection. The dictionary by A. Minkh gives some information on the matter [1], as well as works by V. Varzar [2]. In this regard, this study is

especially relevant since there is the need to analyze the architecture of industrial buildings, complexes, their reconstruction, and introduction of new modern functions.

The objective of this study is to define historical industrial heritage and its current state.

In order to reach it, it is necessary to define and study preserved industrial architectural sight, define their types, create proposals for conservation of regional industrial heritage.

Methodology of this research is based on comprehensive analysis of industrial heritage of the late 19th and early 20th century: iconographic material, field studies (photographs, measurements).

Scientific novelty of this research project rests in the fact that historical objects of industrial heritage of the second half of the 19th and beginning of the 20th centuries are defined and studied, field and archive materials are summarized, typology of industrial architecture is created, archival and graphic materials are introduced into scientific circulation, degree of preservation of objects is revealed; proposals for restoration works and their inclusion in the modern life of cities in the region are revealed.

II. REVIEW

Formation of industrial architecture in the Volgograd region of the second half of the 19th and early 20th century occurred in the historical period of intensive development of industry in the Volga region. The largest center here was the Saratov governorate. Since the 1870s, the volume of industrial production in the governorate increased. Significant contribution to the development of industrial production in the Saratov governorate was made in Tsaritsyn and Kamyshin.

It is now difficult to analyze the forms of many industrial facilities since time destroyed most buildings made of wood. Stone buildings that lost their original function were destroyed. However, the surviving industrial buildings and the sources allowed us to find out their types, space-planning solution, and style. The typology of industrial buildings in the research is identified on the basis of functional affiliation. Only the largest and most significant architectural sights are considered in detail.

III. TYPES AND STYLES OF INDUSTRIAL BUILDINGS

In the second half of the 19th and early 20th century flour production was the most developed industry in the Saratov governorate throughout the entire study period. The architecture of the milling industry in the governorate is, above all, the achievement of migration architecture. German colonists, who from 1863 settled by the decree of Catherine II free lands of the Volga region, built watermills. The first one-story water mills appeared in Sarepta in the 18th century. In the 1840s–1870s, in the Saratov governorate, the flour-milling industry was mainly represented by wooden water and windmills.

At the turn of the 20th century there occurred industrial progress in Russia. Late 19th century saw construction of the railway, due to a great increase in the number of industrial enterprises. Due to poor performance, water and windmills were being replaced by low-powered mills. The first steam mill was built in Saratov in 1856. It is worth pointing out that steam mills were largely an achievement of German immigrants: "... not only did the activity of German entrepreneurs not coincide with the rise of industry and transport production, but was also quickly captured and made real in its priority areas, primarily in the construction of fundamentally new technologies for flour mills" [3]. German colonists built multi-storey mills in Saratov Volga region in 1870.

In the last quarter of the 19th century there were built powerful steam flour mills in Saratov governorate. They looked like industrial enterprises. The boom of construction of this type of mills was reached at the turn of the centuries.

A striking confirmation of this is the architecture of the milling complexes: E. Raisih in Kamyshin; E. Borolya in Lower Dobrinka (Moninger German colony); A. Vaaga in Dubovka.

The most significant one among them was a large mill complex in the former German colony Lower Dobrinka. The complex was erected in 1876 in the estate of the merchant E. Borel as part of the large flour-milling complex "E.I. Borel Trading House". In 1890, in connection with the construction of a new railway, the mill construction was expanded and the production was brought up to date with the latest and most modern equipment of the firms Dobrov and Nabgolts and Anton Erlanger [4].

The six-floored mill built with red brick is one of the brightest and most significant architectural sights of this type. It served as a compositional center of the complex. Following the architectural style of Romanticism, the

building imitated the forms of medieval castles: faceted tower-like volumes of eight floors, tents with hatch boards and spires. The modest decor was intentionally made eclectic. The building's architecture gives a clear sense of the influence of classicism: rustic masonry on the two lower floors, segmentation of the facades designed to resemble pilasters of the Tuscan order. On the inside, galleries and original oak interior decoration are preserved. Surprisingly, the E.E. Borel Mill in Lower Dobrinka is still used for its intended purpose.

Tsaritsyn (now Volgograd) was a major center for milling production. Tsaritsyn Volga German merchants were engaged in flour-grinding business here: Bauer, A.A. Gergardt, V.M. Miller. The mills built by them in the Soviet times were nationalized and continued to work until the war.

The Bauer Brothers Trading House steam flour mill was built at the turn of the centuries on the free territory of the Sarepta German colony, to the south from Tsaritsyn (part b of "Fig. 1"). The building is representative of industrial architecture of eclecticism with modern elements. Preserved in the original form, wooden beams overlap. Due to modern requirements, the original appearance of the building has been changed. The company, however, continues to work today.

After the war, only the ruins of the A.A. Gergardt mill remained. Together with a one-story office building that was initially a part of the complex, two wooden grain warehouses completely destroyed.

The 1904 building of the mill on six floors compositionally represents a strongly elongated rectangle with an avant-corps and a pediment slightly protruding on the front facade. Interfloor belts divide the facades into three tiers. Modest decoration consists of a blind arcade belt on an avant-corps.

During the construction of the Battle of Stalingrad Museum-Panorama ensemble in 1985, the ruins of the mill were included in it. The mill became one of very few "witnesses" of military events in Volgograd (part d of "Fig. 1").

Other curious examples of Volga milling districts are the steam mills of the Dubovka suburb in the Tsaritsyn district. This large-scale milling complex appeared at the beginning of the 20th century. It was built by the German merchant A.E. Waag. The complex occupies a vast space shaped almost as a rectangle. Its composition is perimetral and consists of a large main building of the mill and maintenance buildings. The central core of the complex is a brick four-storey mill. Maintenance buildings adjoin the mill to form a T-shaped composition. An overall appearance can be called restrained. There are some barely noticeable motifs of classicism (part c of "Fig. 1"). The mill worked until 2012.

Along with immigrants from the German colonies, Russian merchants also actively manifested themselves in milling business. The merchants of Kamyshin, Tsaritsyn, and Dubovka invested in construction of industrial enterprises. By the 1880ies, under the influence of the German construction style, there was established a certain

construction type of steam mills. There were the following general principles for composition: elongated bodies of buildings having a symmetrical and axial construction of facades, having vertical and horizontal division of the facades, and possessing decorative elements of the “brick style”. This style was characteristic for industrial enterprises of Russia.

The German type of steam mills of German flour millers was willingly borrowed by Russian owners, however, of course, the steam mills of Kamyshin, Tsaritsyn, and Dubovka were inferior to the giant mills of the German Volga flour mills of E. Borel, K. Reineke, and Schmidt. Although mills in southern parts of the governorate show similarities with the ones of Saratov, they still differ: not only in size, but also in plasticity. The facades at the top of the buildings were usually artistically designed.

Studies of industrial architecture in Volgograd region included the search for wooden mills. Expeditionary work revealed that few mills built of wood remained to this day. However, it was found that there were numerous wind, water, multistory mills in the second half of the 19th and early in the 20th century in Volgograd region. Windmills were most common. There often were several windmills located next to each village or city. These mills were possessed many similarities. In 1982, there was discovered a windmill

without wings in the abandoned village of Ezhovka (part e of “Fig. 1”).

There were also built many water mills which no longer exist. We can imagine what they looked like based on the two mills remained in Saratov region.

Furthermore, it is known that late in the 19th and in early the 20th century many wooden multistory mills were built in the considered area. There were discovered three mills: one in the village of Antipovka, one in Mountain Proleyka, and one in the city of Nikolayevsk (parts f, g and h of “Fig. 1”). In the early 2000s, the mill in Antipovka was demolished. The mill in Mountain Proleyka worked for a long time, but then it was abandoned, and in 2006 it burned down. However, the fire did not destroy the equipment inside the mill.

The mill in Nikolaevsk is the largest of the three. It still exists, and it continued to work until 2011. The mill and its equipment are now in good working condition, serving as an exemplar monument of wooden industrial architecture with elements of modern. The Nikolaev Mill was built in 1905 by the German Pflaumer. The four-floored mill has a gable roof with windows (lutherns). The facades are visually separated with thin wooden racks between the windows decorated with arched bow lintels. There is horizontally arranged wall covering, framed lining with “broken” gables.

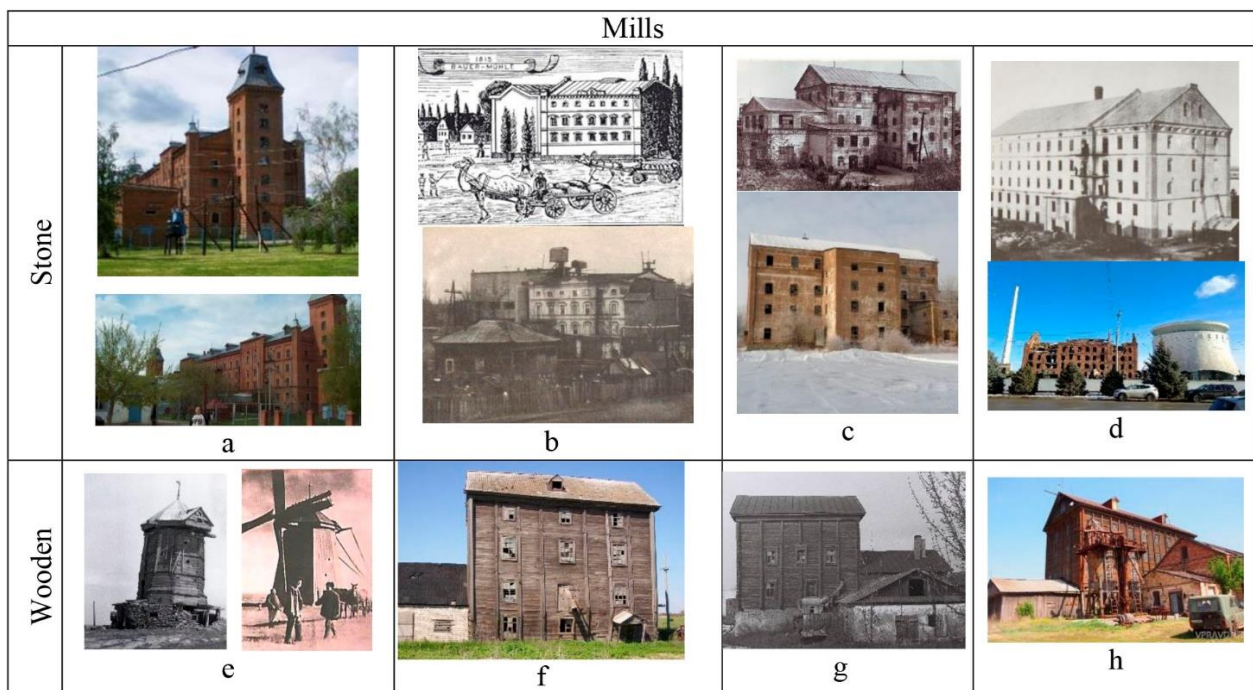


Fig. 1. Stone and Wooden Mills.

^a. a - Lower Dobrinka, b - Sarepta, c - Dubovka, d - Tsaritsyn, e - Ezhovka and Nikolayevsk, f - Antipovka, g - Mountain Proleyka, h - Nikolayevsk

^b. Source: Photos of authors from archives: The State Archive of the Saratov Region (GASO), local history museums in Kamyshin, Dubovka, Nikolayevsk, Old Sarepta.

Apart from milling, Saratov governorate had developed oil pressing production, which now has a history of more than two hundred years. The first mustard oil made of locally grown mustard was made in 1794 by N. Beketov in his estate

Otrada near the German colony Sarepta. A local citizen Konrad Neitz adopted Beketov’s methods and opened the first oil mill in Sarepta in 1801. In 1810, the manufactory was expanded and mechanized and it started to work on

horse traction. In 1816, the factory was acquired by I.K. Glitsch. In 1857, his sons built a new factory complex of brick and installed a steam engine there. The complex consisted of a brick four-storey production building and a one-storey management building. Technical improvement of the factory presupposed new equipment. In order to place it, in 1905 there was constructed a three-storey extension. The management building has a complex volumetric composition. The four volumes are combined to form a courtyard. The territory of the factory was landscaped very well. The plant continues to work, and the building of the plant management is now empty (part d of "Fig. 2").

In the 19th century there appeared a center of oil and mustard industry of the Lower Volga region around Sarepta. Similar enterprises appeared in Tsaritsyn, Dubovka, and they were also created by German settlers of the Volga region. The first mustard and oil pressing factory in Dubovka was

built in 1842 by Christian Miller. In 1872, his sons reconstructed the factory and equipped it in accordance with modern requirements (part c of "Fig. 2").

In 1867, A.E. Waag built a stone mustard steam factory, which was destroyed in Soviet times. However, there remain complete archival drawings of it, which allow us to analyze its space-planning structure [5], (part a of "Fig. 2"). The factory building is L-shaped and consists of two rectangular buildings: the four-storeyed main building and a one-storey building attached to the northern end of a larger building.

The largest mustard plant in Dubovka was the plant of I.I. Nebeschestniy (1910). The complex has almost completely preserved its initial form (part b of "Fig. 2"). Today, various enterprises are located at the plant. There were made various alterations: the main building was painted in red, the adjoined building was plastered and added with windows.

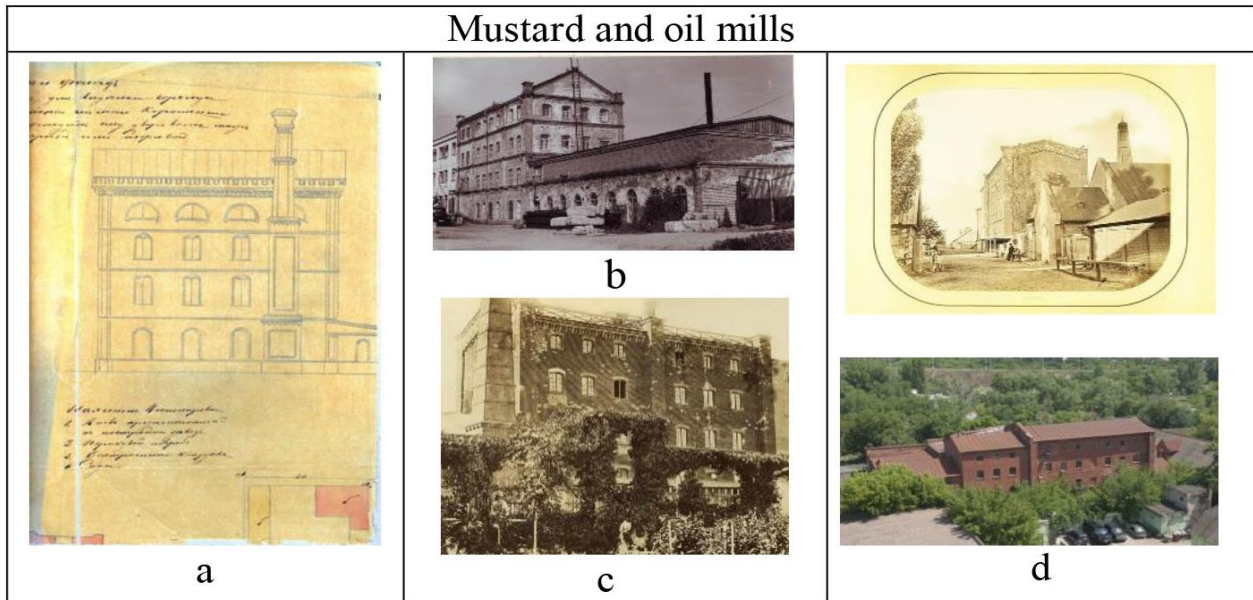


Fig. 2. Mustard and oil mills.

a – c – Dubovka, d – Sarepta

Source: Photos of authors from archives: The State Archive of the Saratov Region (GASO), local history museums in Kamyshin, Dubovka, Nikolayevsk, Old Sarepta.

At the turn of the century, the sawmill industry developed rapidly. Tsaritsyn could be called an "all-Russian sawmill" [6]. The Maximov sawmill (1914) remains present to this day, with its eclectic décor combining elements of modern and classicism ("Fig. 3"). The only sawmill

preserved in Volgograd region worked as a woodworking plant until the middle of the 90s of the 20th century. Now there is a construction market on its territory. The facades of the buildings are entangled with pipes and partially covered with advertising.



Fig. 3. The Maximov sawmill.

Source: Photos of authors from archives: The State Archive of the Saratov Region (GASO), local history museums in Kamyshin, Dubovka, Nikolayevsk, Old Sarepta.

In archival files disclosed the names of the developers of industrial building projects: A.M. Salko, Y. Terlikov, K.V. Tiden, S.I. Tikhomirov, Lavrentiev.

There are excellent examples of the type of industrial buildings on the territory of the region: complexes of state-owned wine warehouses in Volgograd (Tsaritsyn, 1899) and Kamyshin (1901). They were all built according to the "model" project. An integral part of every complex is a dwelling house for engineering workers. All the buildings were made of red brick and linked to each other functionally, stylistically, and compositionally. Elements of brick style were widely introduced to the construction of these complexes, however, the forms of the early 20th century art nouveau can also be traced.

The factory in Kamyshin worked for its original purpose after the WWII. After the war there was an educational

institution. The factory in Volgograd has been producing alcoholic beverages throughout its whole existence. Both plants were not promising. In 2016, they were sold to private individuals and closed.

Reconstruction of the former wineries has not been conducted, which causes their slow decay. Before the complex in Kamyshin was closed, it had been kept in an almost completely mint condition. Unfortunately, at the moment, its main technological building, whose appearance has remained the same for more than 100 years, causes concern. After the academy was closed, the house for specialists lost valuable elements of the main facade and in the interior ("Fig. 4").

The wine complex in Volgograd is now in a much worse condition ("Fig. 4").

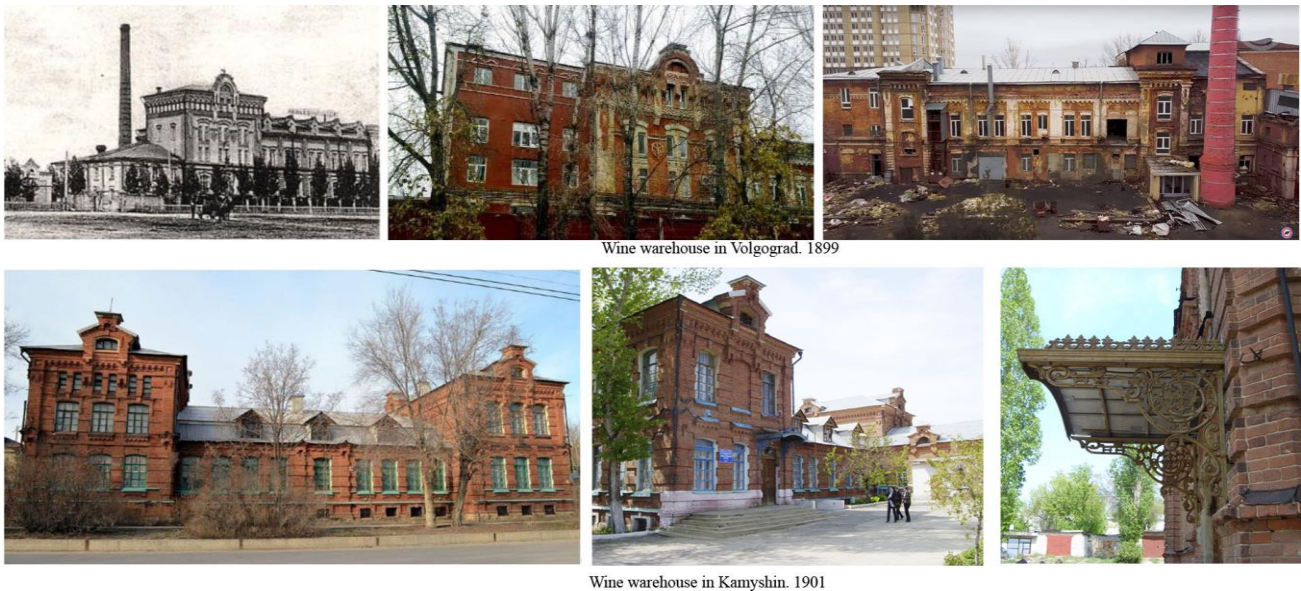


Fig. 4. Wine warehouses.

^a Source: Photos of authors from archives: The State Archive of the Saratov Region (GASO), local history museums in Kamyshin, Dubovka, Nikolayevsk, Old Sarepta.

Many buildings were destroyed. The original appearance of the main production building was distorted by multiple extensions built when the factory was being extended. Now the building is now in a dilapidated state.

When railways were built in the late 19th and early 20th century, there appeared industrial sites appeared in Volgograd region. The largest buildings among them were the water towers. Analysis of the 11 located towers showed

that their architecture is diverse. They differ in terms of building mass. Various architectural forms create the appearance of a medieval castles or bell towers. There are towers on a plan that consist of two different volumes — octahedral (in Kamyshin) or cylindrical (in Volgograd) — that are adjacent to each other. Round towers are more abundant on the plan. Eclectic decorations of the facades of these towers combine elements of various styles: romanesque, gothic, brick, classicism ("Fig. 5").

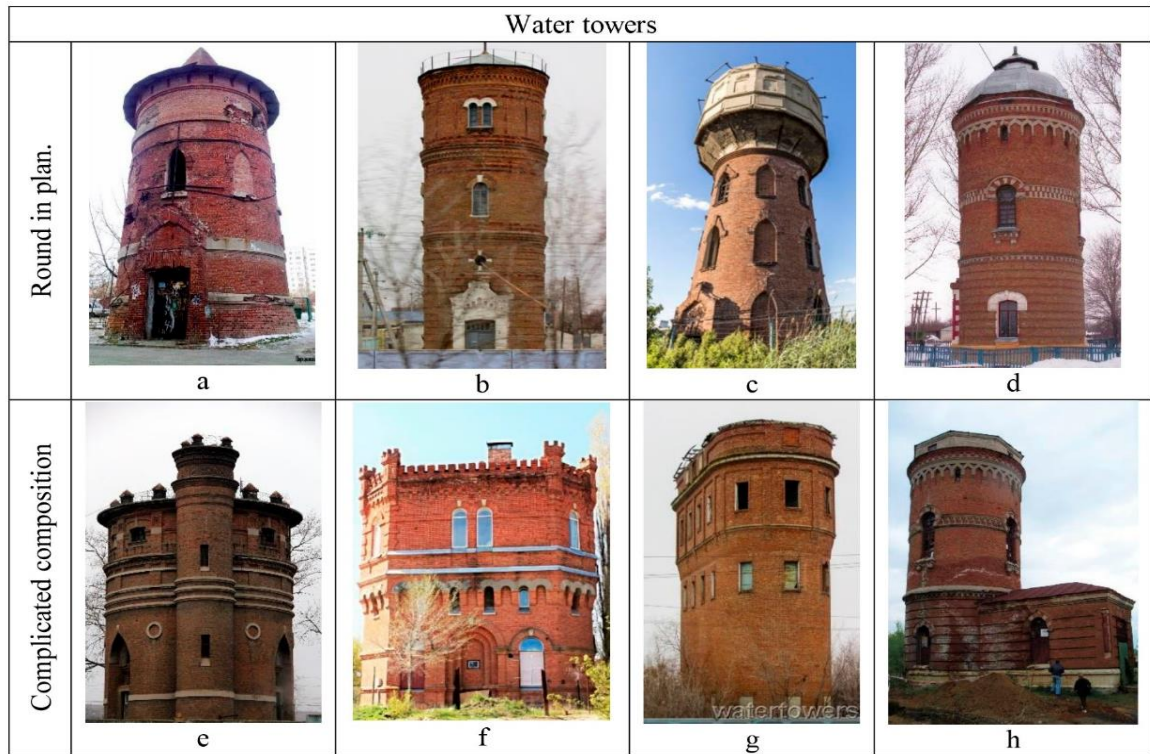


Fig. 5. Water towers.

a, c – Volgograd, b, g - Pallasovka, d – Elan, e – Sarepta, f, h – Kamyshin.

b. Source: Photos of authors from archives: The State Archive of the Saratov Region (GASO), local history museums in Kamyshin, Dubovka, Nikolayevsk, Old Sarepta.

Currently water towers are not functioning. They still retain their original appearance, but there is danger of their loss. In the diploma project “Renovation of Water Towers of the City of Kamyshin”, an attempt was made to solve the

problem of preserving the water towers, giving one of them the function of the Volga-German ethnographic museum (“Fig. 6”).



Fig. 6. Renovation of the water tower. Kamyshin.

a. Source: Photos of authors from archives: The State Archive of the Saratov Region (GASO), local history museums in Kamyshin, Dubovka, Nikolayevsk, Old Sarepta.

IV. CONCLUSION

The study of industrial architecture in the Volgograd region of the second half of the 19th and the early 20th century indicates that there were built large mills, mustard-oil-making facilities, and wineries. The entire historical industrial architecture of that time plays an important part in the structure of the settlements of the region. Even today it has significance not only for the urban planning and volume-spatial environment of cities, but also in their artistic representation and image. To preserve the industrial heritage, it is necessary to perform urgent research and renovation of buildings.

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