The Barnaul Silver Smelting Works

history, production, architecture

from the 18th century to the present day
The Barnaul Copper Smelting Works was established by an estate manager Ivan Osipov, also known as "Pike", and a dam builder Roman Latnikov at the mouth of the Barnaul River (now the Barnaulka River) that gave the name to what would become a town on September 28, 1739 (Old Style). The Barnaul Works was the second Altai plant owned by a prominent industrialist, Akinfy Demidov. There was not enough wood in the vicinity of his first plant – the Kolyvan-Voskresensky Works – therefore the new one was built on a site rich in woods but located remotely from the mines. It took 5 years to build the plant that was finally opened on July 5, 1744. It was equipped with six smelting furnaces to produce black copper and three slag cleaning furnaces. With the discovery of silver-bearing ores in Altai, the plant was re-equipped for silver smelting. This happened after Demidov's death in 1746. On May 1, 1747, the Empress Elizabeth issued a decree which confiscated all Demidov's Works and returned them to the treasury. Thus, the Administrative Office of the Kolyvan-Voskresensky Mining District was established to operate under the authority of His Imperial Majesty's Cabinet. The Barnaul Silver Smelting Works became an administrative center of a large industrial region and every year the precious silver was transported by sledges to Saint Petersburg Mint. In the late 1780s – early 19th centuries, Altai Works produced 1,000 pounds (16 tonnes) of silver annually.

The Barnaul Works influenced the layout of the old town: all streets were perpendicular to the dam and parallel to the bed of the river. The first street in the town – Ryaposovskaya Street - ran on the site of present-day Tsentralsy District Park and if you continue the line of the modern Lva Tolstogo Street directly across the park, that line will ultimately bring you to the very first street of Barnaul. Later on, Bolshaya Posadskaya Street appeared instead. In the 1750s, the main street in Barnaul was Oliyskaya Street renamed to Petropavlovskaya later (now Polianovskaya Street).

The settlement of the Barnaul Works was surrounded by two fortresses: the small fortress was built around the plant itself and the big-
A larger one was constructed around the settlement. This fortress had two closed towers and three gate towers. Two gate towers were constructed on opposite sides of the dam: one was "under the hill" (on the southern side) and the other stood on Kasmalinskaya Road (that would become Knyushenny Pereulok, later and now is known as Krasnoarmeyskiy Prospekt). The main gate tower was crowned with a weathercock and stood on Bolshaya Posadskaya Street (at the corner of present-day Iva Tolstogo Street and Lenina Prospekt). A bell tower faced Peter and Paul Church. Seven cast iron cannons were mounted on the walls.

The plant was quite a large enterprise at the time. It had from 300 to 750 workers in different years. In 1781, the Barnaul Works was equipped with 20 smelting furnaces, while in the late 18th century there were 32 of them.

The settlement was awarded town status in 1824 when Barnaul Uyezd, an administrative subdivision of Tomsk Province, was established. Four years later, it received "mining town" status since both town administration and mining authorities were in power. In May 1846, Barnaul acquired its coat of arms; its bottom part featured a smelting furnace and the top part had a white horse on a green field, a symbol of the administrative center of the province.

The abolition of serfdom that freed many plant workers made silver production unprofitable and it was decided to shut down the plant. On May 3, 1893, the Barnaul Silver Smelting Works was closed after nearly 150 years of work. Its buildings were in good shape and it was decided not to dismantle or sell plant facilities but to preserve the original architectural ensemble. More than that, when the members of a special commission were asked to assess the durability of them, they said, "If someone asked us to estimate the useful life of those buildings, we could not give a better answer than "The buildings will be able to stand forever." A sawmill that was not dependent on water started its operation in these facilities in 1897. However, in 1928, as a result of human carelessness or negligence the dam was washed away at the very place where a devastating flood of 1793 destroyed the dam 135 years ago. Eventually, Demidov Square and the sawmill area was flooded. Responding to flood, the authorities drained the Barnaul Works pond. The burst dam was filled up and a spillway between plant buildings was dismantled to allow river to flow.

The Dam. The Barnaul Works used water wheels to generate power. Water was pumped from a pond formed by a dam which construction was launched in April 1720. In order to build a pond at the mouth of the Barnaul River, the builders needed to construct a dam that was more than half a kilometer in
length (524 m long). It was 5 m high (maximum) and had two sluices allowing water to flow. The main sluice, or the big one, was located in the center. It was used to release water during spring floods and therefore was referred to as a “spring sluice”. Flood water was usually filled with ice floes and trash and therefore the sluice was fenced with a row of vertical piles and binding materials within the pond, the protecting facilities called “yard”. The second sluice was much smaller and was called a “working sluice” or a “small sluice”. It was used to feed the water wheels that were rotated by water and thus generated power. Sluices were the most sensitive elements of the dam and therefore clay-filled timber cribs were constructed along their edges. These structures were called “pigs” and “bulls” because of their large size.

In May 1793, Barnaul was struck by a devastating flood. The main sluice did not manage to release all water from the pond and the dam failed in the north (the area of modern Demidov Square). Strong flood waves created a 200-meter-long and 3-meter-wide moat in the sandy soil. A 50-meter-wide pit appeared near the edge of the dam. As the Ob water rose, the dam began to fail on its downstream slope. After the disaster, the second - “small spring” - sluice and a spillway were constructed on the site of a pit while the downstream slope was protected by brick pitching (60–85 cm thick) that has survived to this day.

In terms of size, a modern dam is very different from what it used to be in the Demidov Period. The dam was reinforced by regular stone pitching, particularly at its northern side. The dam itself was a dominant element of the settlement image; there were trees planted and pavilions built.

The Forge, the Roasting Plant, and the Weigh House. Most buildings of the Barnaul Works of the 18th century were wooden and did not survive to this day. Only five brick buildings have been preserved since the 18th century. Except for the Mining Pharmacy and the Administrative Office buildings, they are located in the facilities of the former Barnaul Silver Smelting Works: the Forge, the Roasting Plant, and the Weigh House. There exists a
castle rather than a plant facility. Unfortunately, the building has lost its original appearance but is still considered the oldest stone building in Barnaul.

The Roasting Plant had an auxiliary function essential for metal production. It was used to roast silver ore to drive out the unwanted sulfides and accelerate the leaching process. Roasting sheds made from wood were first built on the right bank of the Barmaulka River in the 1760s. However, in the 1780s, they were reconstructed of brick. Massive arched walls of the plant are still preserved but the building itself needs a thorough restoration: occasional visitors to the city may find it difficult to notice the building and understand its importance.

The Weigh House where the ore was weighed was a two-aisle pole barn with large posts where loaded wagons drove up. In the 19th century, its archways were blocked off and the building has blank walls now. However, you may still see the silhouettes of those posts and arches and imagine its original design.

The First Smelting Plant. The first wooden shop of Demidov’s Works was built on the site of the brick building of the first smelting plant. Bellows were powered by water when a wooden headrace of a working sluice brought it from

unique picture drawn before the flood of 1793 that showed these buildings constructed in the mid-1780s. The Forge had the most unusual design: a picture showed two tower-like entrances (where the first one led to the blacksmith shop and the second one led to the laboratory) and the building resembled a
the pond to the water wheels. One wheel powered three furnaces. Originally, brick buildings housed from 2 to 3 furnaces and up to 6 furnaces afterwards. Barnaul coat of arms shows that in the 19th century, there were two furnaces in a building. Wooden buildings were relatively short-lived; the first plant was rebuilt in 1751, 1768, and following the flood of 1793. It was only after the fire of 1808 which totally destroyed the second plant that mining authorities decided to construct a brick building to house the main plant facility. This building was built from 1809 to 1811 and then it was reconstructed from 1839 to 1842.

Carl Ledebur, a German traveller, said, “The large size of a building, its façade with columns, and overall attractive style make it very impressive.” There was a Doric portico supported by eight columns across the middle part of a façade that was crowned with a low-ceilinged stepped attic with Doric 4-column porticos topped with triangular pediments accentuating the massing of the side walls. An architectural historian Mikhail Yudin wrote, “An alternating rhythm of shapes and forms, a unified system of proportions, a contrast between elaborate porticos and rather plain walls created the integrity and expressivity of the design.” The Classical style of the building was chosen as it corresponded to the general production needs of the Barnaul Works, expressed its importance as well as formed an integral part of the architectural ensemble of the works and the square in front of it, harmonious in style and composition.

The Second Smelting Plant. As late as the 18th century, the facilities of the Barnaul Works were built on the right bank of the river. In 1759, Cabinet of His Imperial Majesty decreed to construct the second smelting plant equipped with 12 furnaces, “downstream the Barnaul River; against the spillway, on the right bank.” Its construction was completed in 1761. However, just 20 years later, it was rebuilt since wooden construction elements deteriorated. Mining au-
authorities decided to put up a brick building only after the fire of 1808. Under the guidance of a mining engineer Mikhail Lulin, it was built from May 1809 to 1811. Unstable soil and foundation settlement caused massive (more than a meter thick) walls to crack but the plant continued its operation until 1858 when the walls were finally repaired and new slabs were laid under the guidance of Ivan Zobin, an architect of the Barnaul Works. The building was designed in the Classical style: a portico of eight Doric columns formed its central entrance and porticos supported by four pilasters were located at both sides of its façade. Brick columns and pilasters had cast iron capitals which are still preserved. The cornice was also paneled with cast iron plates. The interior design of the plant was reconstructed by Mikhail Yudin. Longitudinal arches divided the building into two unequal parts. For the first time in Siberia, wooden struts and ledgers were installed above the main shop that housed smelting furnaces. The original design of the construction allowed to cover an area that was more than 20 meters wide; thanks to it, flue gases did not accumulate inside the building. Behind the plant there appeared to be an outbuilding that housed three blowing machines powered by three water wheels.

In 1855, the Second Smelting Plant was severely damaged by fire when the roof of the main shop burned down. Later on, the badly burnt wall of the rear façade was dismantled. A front façade and a blind arcade survived the fire. Archways were filled with bricks over time which were apparently taken from the walls of the destroyed building.

Excavation on the Site of the Works. The team of Regional Studies Laboratory of Barnaul State Pedagogical Institute (now Altai State Pedagogical University) excavated the site of the former Barnaul Silver Smelting Works from 1991 to 1994. The over-
sailing brickwork of a downstream slope was chosen as the main dig site to be studied. Here, in the corner formed by the curve of the wall, at the depth of about 3 meters, the archaeologists found a wooden water well constructed in the late 18th—early 19th century. Another excavation site was near the southern side of the dam in the area of a road junction to be built. Lower timber sets of a log building—supposedly a stable—dated back to the mid-16th century were discovered at the depth of 2.5 meters. The third dig near the Forge foundation was to show the saturation of the cultural layer of the Works area. Here, the archaeologists found a unique artifact, a birch bark receipt, dated back to 1641. Those receipts were given to peasants who brought burnt coal to plant facilities.

The excavations have revealed that not only the architectural landmarks of the Works but also the cultural layer of its site are particularly valuable and to be thoroughly studied. The Barnaul Works is unique since its facilities are still preserved and integrated in one architectural ensemble. There is no other architectural landmark in Siberia that provides such a complete overview of how a mining town of the 19th century looked. In 1949, Altai Regional Executive Committee decreed to grant the local historic landmark designation to the Works Dam. In 1974, all complex was awarded a local historic landmark status while in the late 1980s, it became protected by regional authorities. In 1997, the President of the Russian Federation decreed to grant the federal historic landmark designation to the former Silver Smelting Works complex.

The Barnaul Silver Smelting Works operated from 1744 to 1893 is a federal historic and architectural landmark. It is the very place where Barnaul history began. For almost 150 years, a settlement formed near the plant was a center of a large mining district, the greatest storehouse of silver in Russia. This architectural ensemble is one of the few places in Siberia that still preserves the original layout dating back to the Demidov Period. However, a tall fence built on the site of the former Works now hides these oldest buildings in Barnaul. Those 19th century plant facilities—resembling classical castles—are half-ruined today. Several projects to restore the facilities of the main Altai plant were proposed for the last 50 years to come to nothing in the end.

In the 1990s, the federal historic and architectural landmark was sold to private owners. With every new owner, the buildings deteriorated. Those days there exist several projects to restore, museumify, and include the Works facilities into Barnaul. The Mining City tourism cluster. Hopefully, the landmark will be finally treated with respect and have a new lease of life.

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View of Barnaul Silver Smelting Works of the 1850s. Figure by P. M. Kosharov