

## P Odlagališče rude in vhod v predor

Osnova železarstva je železova ruda. Rudno bazo za železarstvo na območju današnjih Jesenic (fužinarska naselja Plavž, Javornik in Sava) so do konca 19. stoletja predstavljal rudišča v Karavankah med Golico in Begunjsčico. V rudniku v Savskih jamah nad Jesenicami, na katerega se nanaša najstarejša kodifikacija rudarskega prava na Slovenskem, to je Ortenburški rudarski red iz leta 1381, je bila za gospodarsko izkoriščanje najbolj primerna železova ruda – siderit, ki spada med karbonatne minerale. Železovo rudo so pražili v pražilnih pečeh, da se je iz železovega karbonata tvoril železov oksid, ki je bil bolj primeren za uporabo v plavžu. Pražilna peč, odlagališče železove in manganove rude je bilo vzdolžno od **Kolperna (4)**, na mestu današnjega parkirišča. Za železarsko dejavnost zlasti v 19. stoletju so bila pomembna nahajališča manganove rude nad Javorniškim Rovtom in na Begunjsčici. Med najbolj cenjenimi je bil manganov mineral braunit. V drugi polovici 19. stoletja je bilo odlagališče rude opremljeno z ozkimi tiri in vagoni, ki so jih nalagali z rudo, žlindro, apnencem in ogljem. Oglje, ki so ga skladiščili v kolpernu, so vozili z različnih kopišč na Gorenjskem. Vagone so skozi predor odpeljali do poševnega dvigala, ki jih je dvignil na vrh oziroma žrelo visoke peči ali plavža.

## 5 Plavž

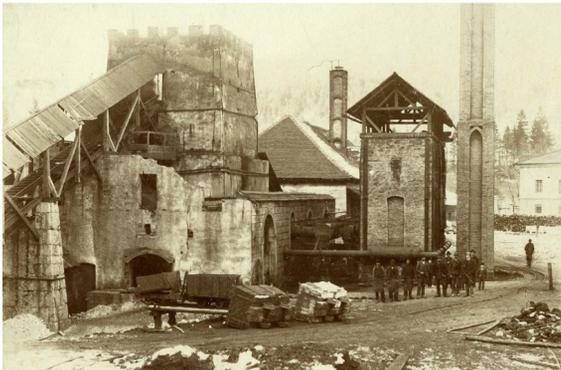
Plavž na Savi je od 16. do 19. stoletja doživel več rekonstrukcij in posodobitev, s katerimi so povečevali njegovo zmogljivost. V drugi polovici 18. stoletja je bil visok približno 19 čevljev, sredi 19. stoletja pa že 38 čevljev. Vrednost čevlja je bila 31,6 cm. Naloga plavža so kemijske reakcije, ki pod visokimi temperaturami okoli 1300 °C pripeljejo do redukcije železove rude, za katero so potrebni zrak, železova ruda in gorivo z vsebnostjo ogljika. Glavni proizvod redukcije je surovo železo ali grodelj, stranski produkti pa žlindra in dimni plini. Plavža na Javorniku in Savi sta proizvajala tudi feromangan, dodatek za izboljšanje kakovosti jekla. Razvoj plavžev je bil usmerjen v izboljšanje vsipa in vpiha ter v uporabo stranskih produktov. S sistemom rekuperacije so dimne pline uporabili za segrevanje zraka za plavž in tako prispevali k visokim temperaturam v spodnjem delu plavža, kjer je potekal glavni proces redukcije. Ker je lastnik savske fužine nov plavž postavil v Škednju pri Trstu, je leta 1897 savskega zaprl. Od savskega plavža so se ohranili spodnji

## 1 Bucelleni-Ruardova graščina in cerkev

V pritličju graščine je bila uprava fužine, v prvem nadstropju in mansardi pa stanovanje fužinarjeve družine. Prva znana lastnica graščine je bila družina Bucelleni, ki je v 16. stoletju prišla z gradu Gromo severno od Bergama, in je prispevala k modernizaciji železarske proizvodnje v Gornjesavski dolini. Družina se je izkazala tudi kot graditeljica cerkva. Leta 1606 je zgradila cerkev Marijinega vnebovzetja in sv. Roka na Savi. Med letoma 1766 in 1871 so bili savski fužinarji Ruardi, ki so izvirali iz Belgije. Obnovili so graščino, cerkev, plavž in fužino. Zahodno od upravne stavbe, kjer je bila v drugi polovici 20. stoletja skladiščna hala Hladne valjarne in žičarne in je danes depo tehniške dediščine, je bil v 19. stoletju graščinski park. V severnem delu, na mestu današnjega mostu in ceste, je bil takrat živalski vrt. V stavbi vzhodno od graščine, kjer je danes zelenica z obcestnim kamnom, je bil od zadnje četrtine 19. do začetka 20. stoletja kemijski laboratorij, katera naloga je bila predvsem pregledovanje kakovosti surovin in proizvodov.

Fužinarji so iz lastne radovednosti in želje po gospodarskem in tehnološkem razvoju podpirali raziskovalno dejavnost. Med njimi je najbolj znana rodbina Zois. Žiga Zois (1747–1819), ki je dal zgraditi nov plavž v Bohinjski Bistrici in na Javorniku, je zbiral minerale. Po njem je dobil ime mineral Zoisit. Brat Karel (1756–1799) je bil botanik. Po njem so dobili ime Zoisova vijolica in zvončica ter Zoisov park v Javorniškem Rovtu. Park se nahaja za Domom na Pristavi, ki je bil zgrajen leta 1647 in je bil prvotno namenjen nastanitvi rudarskih nadzornikov. Leopold Ruard je leta 1796 v metalurških procesih v savskem plavžu in fužini namesto oglja poskusno uporabil rjavi premog iz Zagorja ob Savi. Čeprav so bili rezultati dobri, pa prevoznih stroški niso dopuščali redne uporabe premoga. Raziskovalna dejavnost je v času Kranjske industrijske družbe prinesla Jesenicam svetovni sloves. Tehničnemu direktorju Lambertu von Pantzu je uspelo iznajti postopek za pridobivanje feromangana v plavžu. Iznajdba je prinesla diplomu in priznanje na svetovnih industrijskih razstavah na Dunaju leta 1873 in v Filadelfiji l876.

del, **rekuperatorski dimnik (3)** in zunanje stene obrata. Najbolj ohranjen plavž na Slovenskem je v Železnikih. Čeprav se je pri nas v 16. stoletju uveljavljala tehnologija redukcije železove rude v plavžih in proizvodnja grodlja, je še več kot dve stoletji vzporedno živela starejša tehnologija redukcije železove rude v pečeh na volka. Glavni proizvod je bila kepa (volk), sestavljena iz jekla in žlindre.



Plavž / Blast furnace 1897

## 7 Pudlovka

V plavžu proizveden grodelj še ni bil koven, ker je vseboval preveč ogljika. Treba ga je bilo predelati v jeklo – zlitino železa, manjše količine ogljika in elementov, ki vplivajo na njegovo kakovost. Za nadaljnjo obdelavo so ga odložili v **skladišče za grodelj (6)**. Pred sredino 19. stoletja so jeklo v savski fužini proizvajali z ognjiščnim žilavenjem. Pri tem so večkrat ponovili postopek, ki je vključeval uporabo težkih kladiv in vpihovanje zraka skozi oglje v ognjiščni prostor. Od sredine 19. stoletja so jeklo v savski fužini proizvajali v pečeh pudlvokah. Bile so sestavljene iz predprostora za predgrevanje grodlja, kurišča z rešetko, ognjišča, kjer je potekalo razogljichenje jekla, ter odvoda plinov v dimnik. Na rešetki kurišča so kurili oglje in s strani vpihovali zrak. Zrak, pomešan s plini, so usmerili v ognjišče, da bi iz grodlja vezal ogljik. Da bi pospešili oksidacijo ogljika, so žarečo zmeščano kepo mešali z dolgimi drogovi. Testasto kepo so prevallili iz peči in jo odpeljali v nadaljnjo obdelavo pod težka kladiva. Jeklo so v kovačnicah predelali v končne izdelke. Čeprav se na Savi prva kovačnica omenja že v Ortenburškem rudarskem redu leta 1381, je bilo naselje znano predvsem po proizvodnji jekla.



Pudlovka v 2. polovici 19. stoletja / Puddling furnace in the second half of the 19th century

## 8 Vodni kanal – rake

Jeklo so v savski fužini proizvajali, dokler ni stekla proizvodnja v jeseniški Siemens-Martinovi jeklarni, manj kot kilometer vzhodno od Stare Save in južno od stavbe današnje občine Jesenice. Jeklarno, livarno, valjarno in obrate za predelavo jekla so odprli leta 1890. Obratom so energijo zagotavljala vodne turbine, ki so poganjale strojno opremo ali pa dinam in generatorje za proizvodnjo električne energije. Vodo za vodne turbine so zajemali zahodno od Stare Save in jo speljali v vodni kanal.

## 10 Mlin

Pred izgradnjo vodnega kanala je Sava poganjala vodna kolesa savske fužine, žage in mlina. Lastniki fužine – fužinarji so žito v večjih količinah kupovali pri veletrgovcih v večjih mestih in jih za svoje in delavske potrebe mlieli v svojem mlinu. Delavcem so za opravljeno delo plačevali v gotovini in naturalijah, v kurjavi in živilih. V 19. stoletju so jih izplačevali tudi v nadomestnih bonih, ki so jih lahko porabili v lastnikovi trgovini. Fužinar je delavcem ponujal možnost nastanitve v bližnjih stanovanjskih hišah. Največja izmed njih je bila **Kasarna (2)**, ki je sedanjo podobo dobila v prvi polovici 19. stoletja.

## INDUSTRIJSKA DEDIŠČINA V BLIŽINI STARE SAVE

Zahodno od graščine se v nekdanji skladiščni hali Hladne valjarne in žičarne nahaja **depo tehniške dediščine**. Železnica je železarski in jeklarski industriji omogočala odvoz izdelkov, prevoz surovin iz oddaljenih krajev in polizdelkov med obrati. Jeseniška železarna je imela med letoma 1890 in 1988 močno razvejano omrežje ozkotirnih prog s širino 76 cm. Po tem omrežju so prevoze opravljali z bencinskimi, električnimi, parnimi in dizelskimi lokomotivami. Za prevoze jekla iz jeseniške jeklarne v valjarno na Javornik so uporabljali električne lokomotive. Na tej relaciji je najprej vozila bencinska lokomotiva, po letu 1906 pa električna. Železarna je prvo **parno lokomotivo O-I** kupila leta 1907 v tovarni Kraus & Co. v Linzu. Pomen ozkotirnega omrežja se je zmanjšal po izgradnji valjarne in jeklarne na Koroški Beli. Leta 1974 so ukinili železniško povezavo do Javornika, **električni lokomotivi E-II** in E-VI. pa predelali v akumulacijski in jih zadolžili za prevoz surovega železa iz plavža.

Jeseniška plavža, ki sta bila zgrajena leta 1937 in 1940, so zakladali z železovo rudo iz Hrvaške ter Bosne in Hercegovine. Za zakladanje plavža so uporabljali rudo ustreznih velikosti in sestave, ki so jih zagotavljali s pražilnimi pečmi, **drobilci rude** in z zgoščevanjem – sintranjem rudnega prahu in pomembnih dodatkov za redukcijski proces. Praženje rude je sproščal rdeči prah, ki je bil tako značilen za Jesenice. Po koncu redukcijskega procesa je tekoči grodelj stekel v **ponovcu na vagonu**, ki jo je lokomotiva odpeljala pred Siemens-Martinovo jeklarsko pečo, v kateri je bilo staro železo. Ponovce so bile obložene s šamotno opeko, ki so jo tudi s pomočjo **meščalcev** ognjevzdržnega materiala izdelovali v šamotarni. Iz starega železa in grodlja so v procesu rafinacije in dodajanja proizvedli jeklo zelene kakovosti. Jeklo so lahko odpeljali v livarno ali valjarno. Iz jeseniške livarne so se ohranile **livarske ponovce**. V žični valjarni so jeklo na **valjalnih strojih** zvaljali v okroglo žico. Jeklo so valjali tudi v valjarni na Javorniku v debelo, tanko ploščevino ali pa v profile različnih dimenzij. Zaradi velikih obremenitev so imeli veliko

dela v strugarni valjev. Po obdelavi na **stružnici** so vzdrževalci valje namestili v valjalne stroje. Za pogon strojev in ogrevalnih naprav so potrebovali električno energijo, ki jo je železarna zagotavljala iz treh hidroelektrarn na Radovni, dveh na Savi, dveh na Javorniku ter ene parne elektrarne. Iz elektrarn so se ohranile **turbine**, tista v depozu je iz savske elektrarne. Iz valjarn so jeklo odpeljali v predelovalne obrate. Iz cevarne so se ohranile **industrijske škarje**, iz žebjarne **žebljarski stroj**, iz žičarne stroj za vleko žice, iz jeklovleka pa **brusilni stroj**. Staro železo, ki so ga začeli kot surovino uporabljati šele v drugi polovici 19. stoletja, je v elektroobločnih jeklarskih pečeh glavna surovina za proizvodnjo jekla. Prva elektroobločna peč na Slovenskem je bila postavljena leta 1940. Za prenos jekla iz te peči so uporabljali **jeklarsko ponovco**, ki je tudi razstavljena v depozu.

Severno od graščine na Stari Savi sta ohranjena brusilni stroj iz leta 1903 in **hladnovaljalni stroj Demag**. Uporabljali so ju v bližnjih industrijskih halah nekdanje Hladne valjarne in žičarne. Na hladnovaljalnem stroju so valjali trakove za embalažo, žaromete in vojno industrijo. Vzhodno od cerkve se nahaja **jekleni cerkveni zvon** iz leta 1923. Med prvo svetovno vojno je avstrijska vojska zaradi pomanjkanja surovin za orožje slovenskim cerkvam pobrala bronaste zvonove. V jeseniški jeklolivarni so začeli z ulivanjem jeklenih zvonov. Do leta 1929, ko se je zaključila njihova proizvodnja na Jesenicah, so jih ulili več kot dva tisoč. Največji je v cerkvi Device Marije v župniji Ljubljana - Polje. Na območju trgovskega centra se nahaja **dimnik nekdanje aglomeracije**. Gre za ostanek obrata, ki je veljal za pomožni obrat plavža. Ko so konec 60. let 20. stoletja gradili aglomeracijo, so na območju Hrenovce in Stare Save porušili več stanovanjskih hiš. Takratni rušitvi se je izognila **Korenova hiša**, ki pa ni ušla zobu časa. Na mestu njenih zunanjih sten so postavili jeklene mreže. Iz Korenove hiše je prihajal Franc Koren, nekdanji pevec ansambla bratov Avsenik.

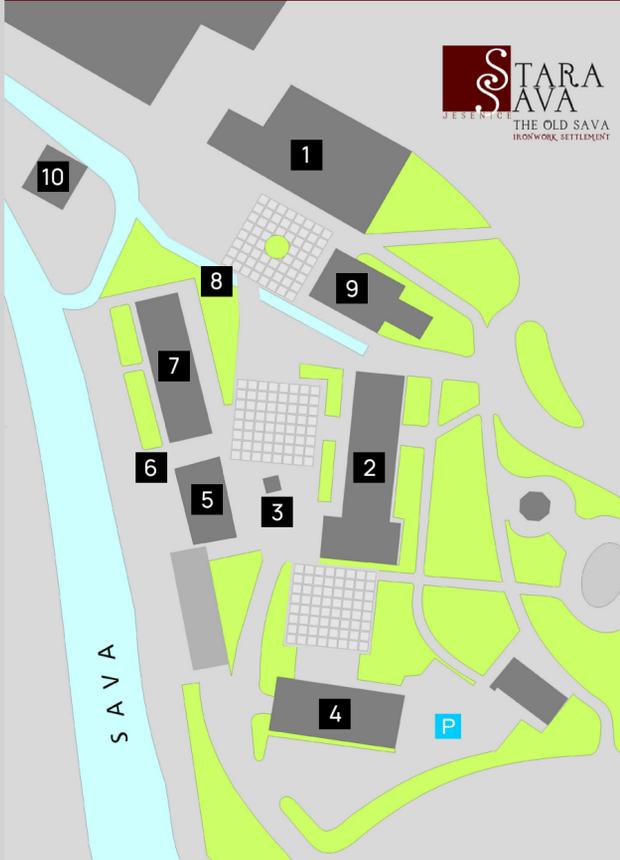


Zbiranka Gornjesavskega muzeja Jesenice, zanj Aljaž Pogačnik / Lead of the Gornjesavski muzej Jesenice, Aljaž Pogačnik on its behalf. Avtor / Author: dr. Marko Mugerli. Slikovni gradivo / Picture material: Gornjesavski muzej Jesenice. Jezikovni pregled / Proofreading: Aleksandra Kržaj. Prevod / Translation: Monika Kržaj. Oblikovanje / Designed by: Rosja. Sofinanciranje: Ministrstvo za kulturo RS / Sponanced by Ministry of Culture of the Republic of Slovenia. Jesenice, 2025

Fužina na Savi v drugi polovici 19. stoletja / Ironworks on the Sava in the second half of 19th century



## Stara Sava



### FUŽINA NA SAVI IRONWORKS ON THE SAVA

- 1 Bucelleni-Ruardova graščina / Bucelleni-Ruard Manor
- 2 Kasarna
- 3 Dimnik / Chimney
- 4 Kolpern
- 5 Plavž / Blast furnace
- 6 Skladišče grodlja / Pig iron warehouse
- 7 Pudlovka / Puddling furnace
- 8 Rake / Water Channel
- 9 Cerkev / Church
- 10 Mlin / Mill

## P Ore deposit and tunnel entrance

The foundation of ironmaking is iron ore. Until the end of the 19th century, the ore supply base for the iron industry in the area of today's Jesenice (the ironworking settlements of Plavž, Javornik, and Sava) consisted of ore deposits in the Karavanke Mountains between Golica and Begunjščica. In the Savske jame mine above Jesenice — to which the oldest codification of mining law in Slovenia, the Ortenburg Mining Code of 1381, refers — the most suitable iron ore for industrial use was siderite, a carbonate mineral. The iron ore was roasted in roasting furnaces to convert iron carbonate into iron oxide, which was more suitable for use in the blast furnace. A roasting furnace and a storage area for iron and manganese ore were located east of the **Kolpern (4)**, on the site of today's parking lot. For the iron industry, especially in the 19th century, the manganese ore deposits above Javorniški Rovt and on Begunjščica were of great importance. One of the most valued manganese minerals was braunite. In the second half of the 19th century, the ore storage area was equipped with narrow-gauge tracks and wagons, which were loaded with ore, slag, limestone, and charcoal. The charcoal, stored in the Kolpern, was transported from various charcoal-burning sites across the Gorenjska region. The wagons were then taken through a tunnel to an inclined lift, which raised them to the top or the throat of the blast furnace.

## 5 Blast furnace

The blast furnace on the Sava underwent several reconstructions and modernizations between the 16th and 19th centuries, aimed at increasing its capacity. In the second half of the 18th century, it stood about 19 feet high, while by the mid-19th century it had reached 38 feet. The length of one foot was 31.6 cm. The function of the blast furnace is to enable chemical reactions that, at high temperatures of around 1300 °C, lead to the reduction of iron ore. This process requires air, iron ore, and carbon-based fuel. The main product of the reduction process is pig iron (also known as cast iron), while the by-products are slag and exhaust gases. The blast furnaces in Javornik and Sava also produced ferromanganese, an additive used to improve the quality of steel. The development of blast furnaces focused on improving the efficiency of charging (the addition of raw

materials) and air blowing, as well as on the use of by-products. Through a recuperation system, the hot exhaust gases were used to preheat the air entering the furnace, which helped achieve the high temperatures in the lower part of the furnace where the main reduction process took place. When the owner of the Sava ironworks built a new blast furnace in Škedenj near Trieste, the Sava furnace was shut down in 1897. Of the Sava blast furnace, the lower part, the **recuperator chimney (3)**, and the outer walls of the plant have been preserved. The best-preserved blast furnace in Slovenia is located in Železniki. Although the technology of reducing iron ore in blast furnaces and producing pig iron became established in Slovenia in the 16th century, the older method of iron ore reduction in bloomeries (so-called wolf furnaces) continued to be used for more than two centuries. The main product of this older process was a lump (bloom), composed of steel and slag.



Skladišče za grodelj v drugi polovici 19. stoletja / The pig iron warehouse in the second half of the 19th century

## 7 Puddling furnace

The pig iron produced in the blast furnace was not yet malleable, as it contained too much carbon. It therefore had to be refined into steel — an alloy of iron with a smaller amount of carbon and other elements that influence its quality. For further processing, the pig iron was stored in the **pig iron warehouse (6)**. Before the mid-19th century, steel was produced at the Sava ironworks through a process known as finery forging.

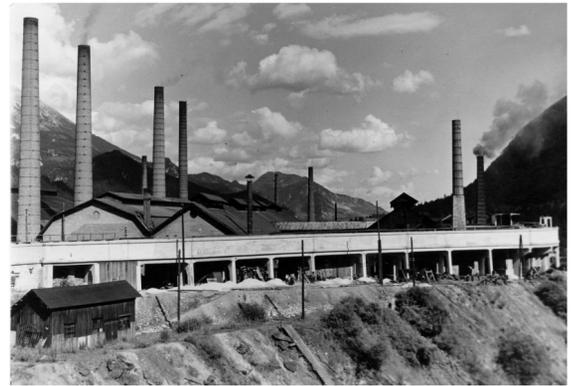
This involved repeatedly reheating the iron and hammering it with heavy hammers while blowing air through the charcoal into the hearth. From the mid-19th century onward, steel at the Sava ironworks was produced in puddling furnaces. These consisted of a preheating chamber for the pig iron, a firebox with a grate, a working hearth where the decarburization of the iron took place, and a flue leading to the chimney. Charcoal was burned on the grate, and air was blown in from the side. The air, mixed with gases, was directed into the hearth to react with the carbon in the pig iron. To accelerate the oxidation of carbon, the glowing, softened mass was stirred with long iron rods. The pasty lump was then rolled out of the furnace and taken for further processing under heavy hammers. In the forges, the steel was shaped into finished products. Although the first forge (smithy) on the Sava is mentioned as early as in the Ortenburg Mining Code of 1381, the settlement was known primarily for its steel production.



Pudlova v drugi polovici 19. stoletja / Puddling furnace in the second half of the 19th century

## 8 Water Channel – Rake

Steel production at the Sava ironworks continued until operations began at the Jesenice Siemens-Martin steelworks, located less than one kilometer east of Stara Sava and south of the present-day Jesenice municipal building. The steelworks, foundry, rolling mill, and steel-processing plants opened in 1890. The facilities were powered by water turbines, which drove the machinery or the dynamos and generators used to produce electricity. Water for the turbines was collected west of Stara Sava and directed into a water channel (rake).



Vodni kanal leta 1933 / Water channel in 1933

## 10 Mill

Before the construction of the water channel, the Sava River powered the waterwheels of the Sava ironworks, the sawmill, and the mill. The owners of the ironworks — the ironmasters — purchased grain in large quantities from wholesalers in major towns and milled it in their own mill to provide flour for themselves and their workers. Workers were paid both in cash and in kind — in the form of firewood and food. In the 19th century, they were also paid with substitute vouchers, which could be used in the owner's shop. The ironmaster also offered workers accommodation in nearby residential buildings. The largest of these was the **Kasarna (2)**, which acquired its present appearance in the first half of the 19th century.

## 1 Bucelleni-Ruard Manor and Church

The ground floor of the manor housed the ironworks administration, while the first floor and attic were the living quarters of the ironmaster's family. The first known owners of the manor were the Bucelleni family, who came in the 16th century from Gromo Castle, north of Bergamo. They contributed significantly to the modernization of iron production in the Upper Sava Valley. The family was also known as builders of churches. In 1606, they built the Church of the Assumption of Mary and St. Roch on the Sava. From 1766 to 1871, the ironmasters at Sava were the Ruard family, who originated from Belgium. They renovated the manor, the church, the blast furnace, and the ironworks. West of the administrative building — where in the second half of the 20th century stood a warehouse of the Cold Rolling Mill and Wire Factory, and where today the technical heritage depot is located — there was a manor park in the 19th century. In the northern part, on the site of today's bridge and road, there was once a small zoo. In the building east of the manor — where there is now a green area with a roadside stone — a chemical laboratory operated from the last quarter of the 19th to the early 20th century. Its main task was to monitor the quality of raw materials and products.

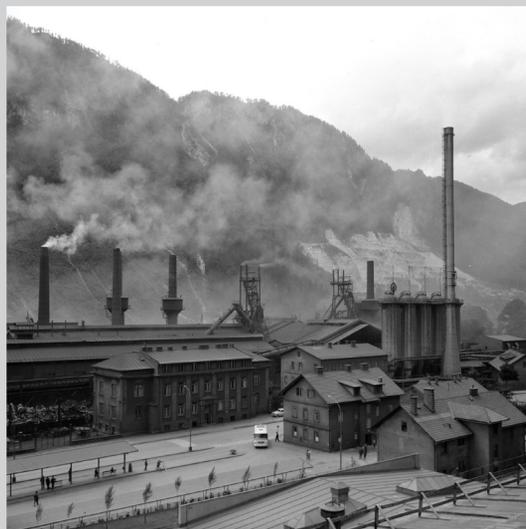
The ironmasters supported research out of curiosity and a desire for economic and technological progress. Among the most famous of them was the Zois family. Žiga Zois (1747–1819), who had new blast furnaces built in Bohinjska Bistrica and Javornik, was a mineral collector. The mineral zoisite is named after him. His brother Karel Zois (1756–1799) was a botanist — Zois's violet and Zois's bellflower are named in his honor, as is Zois Park in Javorniški Rovt. The park is located behind the Dom na Pristavi, built in 1647, originally intended to house mining overseers. In 1796, Leopold Ruard experimentally used brown coal from Zagorje ob Savi instead of charcoal in the metallurgical processes of the Sava blast furnace and ironworks. Although the results were good, transport costs prevented its regular use. Research activity during the period of the Carniolan Industrial Company brought Jesenice international recognition. Its technical director, Lambert von Pantz, succeeded in developing a process for producing ferromanganese in the blast furnace. His invention earned him a diploma and awards at the world industrial exhibitions in Vienna in 1873 and in Philadelphia in 1876.

## INDUSTRIAL HERITAGE NEAR STARA SAVA

West of the manor house, in the former warehouse hall of the Cold Rolling Mill and Wire Factory, is the **Technical Heritage Depot**. The railway played a vital role in the iron and steel industry — it enabled the transport of finished products, the supply of raw materials from distant regions, and the transfer of semi-finished goods between production plants. Between 1890 and 1988, the Jesenice Ironworks operated an extensive network of narrow-gauge railway lines with a track width of 76 cm. Transport along this network was carried out using petrol, electric, steam, and diesel locomotives. Electric locomotives were used to transport steel from the Jesenice steelworks to the rolling mill in Javornik. Initially, this route was served by a petrol locomotive, but from 1906 onwards, an electric one took over. The ironworks purchased its **first steam locomotive (O-I)** in 1907 from the Kraus & Co. factory in Linz. The importance of the narrow-gauge network declined after the construction of the rolling mill and steelworks in Koroška Bela. In 1974, the railway connection to Javornik was discontinued, and **the electric locomotives E-II and E-VI** were converted to accumulator locomotives, used for transporting molten pig iron from the blast furnace.

The two Jesenice blast furnaces, built in 1937 and 1940, were charged with iron ore imported from Croatia and Bosnia and Herzegovina. Only ore of appropriate size and composition was used for charging the furnaces. This was ensured by roasting furnaces, **ore crushers**, and the sintering of fine ore dust with additives essential for the reduction process. The roasting of ore released red dust — a characteristic feature of Jesenice at the time. After the reduction process, the molten pig iron flowed into a **ladle** mounted on a rail wagon, which was hauled by locomotive to the Siemens-Martin open-hearth furnace containing scrap iron. The ladles were lined with fireclay bricks, which were manufactured in the refractory plant with the help of **mixing machines** for refractory materials. Through refining and alloying processes, the combination of scrap iron and pig iron produced steel of the desired quality. This steel could then be sent to the foundry or rolling mills. The Jesenice **foundry's ladles** have been preserved. In the wire rolling mill, the steel was rolled into round wire on **rolling machines**. At the Javornik rolling mill, it was rolled into thick and thin sheets or profiles of various dimensions. Due to the heavy loads, the roll-turning workshop had plenty of work maintaining and machining the rolls. After turning on the **lathes**, the maintenance workers installed the rolls back into the rolling

machines. The machinery and heating systems required electricity, which the ironworks supplied from three hydroelectric power plants on the Radovna River, two on the Sava, two on Javornik, and one steam power plant. **Turbines** from these plants have been preserved; the one displayed in the depot originates from the Sava power plant. From the rolling mills, the steel was transported to processing plants. Preserved equipment includes **industrial shears** from the pipe factory, a **nail-making machine** from the nail works, a **wire-drawing machine** from the wire factory, and a **grinding machine** from the steel-drawing plant. Scrap iron, which only began to be used as a raw material in the second half of the 19th century, became the main raw material for steel production in electric arc furnaces. The first electric arc furnace in Slovenia was installed in 1940. To transport steel from this furnace, a **steelmaking ladle** was used — one of which is



Železarna Jesenice 1961 / Ironworks Jesenice in 1961

North of the manor house in Stara Sava, a grinding machine from 1903 and a **Demag cold-rolling machine** have been preserved. They were used in the nearby industrial halls of the former Cold Rolling Mill and Wire Factory. The cold-rolling machine processed steel strips for packaging, headlights, and the military industry. East of the church stands a **steel church bell** dating from 1923. During World War I, the Austrian army confiscated bronze bells from Slovenian churches due to a shortage of raw materials for weapons. In response, the Jesenice steel foundry began casting steel bells. By 1929, when production ended in Jesenice, over two thousand bells had been cast. The largest of these is located in the Church of the Virgin Mary in the Ljubljana–Polje parish. In the area of the shopping center stands the **chimney of the former agglomeration plant**, a remnant of a facility that served as an auxiliary plant for the blast furnace. During the construction of the agglomeration plant in the late 1960s, several residential houses in Hrenovce and Stara Sava were demolished. The **Koren House** survived this demolition but eventually succumbed to the ravages of time; steel meshes now mark the location of its outer walls. Franc Koren, a former singer in the Avsenik Brothers Ensemble, came from the Koren House.



Hladna valjarna in žičarna leta 1964 / Cold Rolling Mill and Wire Factory in 1964