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# IRON ARCHITECTURE IN THE BOHEMIAN LANDS FROM THE MID-NINETEENTH CENTURY UNTIL ART NOUVEAU

Dobroslav Libal

The Bohemian lands had already been to the forefront in iron production in central Europe for some centuries. Production in the modern period thus has a long tradition in the past. Already by the end of the first quarter of the nineteenth century, iron architecture was beginning to influence the appearance of our countryside. It was first represented by several chain suspension bridges. Their main planner, the engineer Friedrich Schnirch, built the first chain bridge over a side arm of the Morava close to the town of Strážnice in south-east Moravia in 1823-24. It was the earliest chain suspension bridge on the European continent, with a span of nearly 30 m.
Only one of these chain bridges has survived down to the present. It was built by Friedrich Schnirch to provide a bridge across the Vltava (Moldau) for the Tábor-Pisek road in 1847-48. The bridge was dismantled in 1960. The granite blocks and iron components were transported into the nearby valley of the Lužnice, where the bridge was reconstructed in 1975. It was classified as a historical monument and is used as the river crossing of a minor road in this picturesque landscape.
By the period shortly before the middle of the last century, iron architecture had developed within the framework of late, Gothicising Historicism. Direct English influence played a decisive role here.
In the Liechtensteins' castle at Lednice (Eisgrub) on the Moravian-Austrian border, the iron glasshouse or palmhouse was erected in 1843-45 to the design of the English architect P.H. Desvignes. The cast-iron construction was supplied by the Klein Brothers' Iron Works in Sobotín in northern Moravia.
An exact parallel to this is the iron orangery erected by the engineer Damian Devorecký, following English designs, in the Schwarzenbergs' south Bohemian castle of Hluboká.
By 1830, the technique of iron statue casting had been highly developed. The centre for this were the Salmische Eisenwerke foundry in Blansko to the north of Brno (Brünn), which was also called the "School of the Moravian Foundry Industry". Sculptures, monuments and reliefs were cast there with the greatest skill and to high artistic standards.

Already from the eighteen-twenties on, cast iron had made its breakthrough as a material for architectural details, mainly for staircases and railings in general. We could take as an example the stair handrail on the magnificent stairway in the town mansion No. 1023-II in the New Town in Prague, opposite the new railway station. The mansion was built by the architect J.O. Kranner in 1843-44 for Albert Klein, a member of the afore-mentioned iron-founding and railway-building family. The renowned Viennese architect, Ludwig von Förster, built a town mansion for the Klein brothers on the main square in Brno(Brünn). The building, which was erected in 1848, was at the same time intended to represent the products of the Kleins' iron foundries in Sobotín. Within the framework of the late-Classicistic façade composition, Förster employed very original and striking cast-iron architectural elements. On both sides of the frontage of the house, two two-storey high bay windows project out, each richtly decorated with figures and ornaments. Cast-iron details were also particularly developed for the windows and on the main cornice. In the case of the cast-iron components, the decorative function played a more important role than the structural one. The whole frontage of Förster's mansion was an interesting

combination of plasterwork façade with iron elements which were still not in general use at that time.
The superb figured and ornamental cast-iron details were also used in the Schlicks' town mansion in the New Town in Prague, which was demolished in 1937. It was built by the architect J.O. Kranner in 1848. The preserved cast-iron elements are kept in the Prague industrial museum.
In the eighteen-forties, brick-built pillars were replaced by slender cast-iron ones. This building technique then came into general use in the third quarter of the nineteenth century. In connection with the construction of the new Prague railway station, a coffee house was constructed directly opposite, in the first floor of house No.1029-II in 1845 by the architect A. Hellmich. The new splendidly decorated rooms were divided up by two rows of cast-iron pillars. Their decorated capitals have prismatic top pieces, the surfaces of which were covered with Moorish paintings.
The golden age of chain suspension bridges was limited to the second quarter and the middle of the nineteenth century in our country. The popularity of this type of bridge construction did not, however, cease in the second half of the nineteenth century. One good example which could be mentioned here is the former Elisabeth Bridge in Prague. It was built from 1865 to 1868 to the English Ordish Lefevre system. Its average span was 150 m. The bridge was rebuilt as a cable suspension bridge in 1898 and survived until 1947.
To keep to the subject of bridges: seen from the purely architectural aspect, they are sometimes not very interesting, but from the point of view of town planning and landscape bridges are always extremely important. One very positive example is the viaduct over the Jihlava valley near Branice in Moravia on the railway line from Brno (Brünn) to Znojmo (Znaim), a really impressive piece of iron architecture in the landscape. The viaduct was built by the later renowned French architect Alexandre Gustav Eiffel in 1870. The bridge has six spans of 62.7 m each. The original supports of concrete-filled cast-iron tubes were later replaced by wrought-iron supports. With a length of 373.5 m and a height of 43 m, the bridge is among the largest still extant examples from the latter half of the nineteenth century. It was in use for 108 years until replaced by a new steel bridge in 1978. However, the Eiffel viaduct was retained and classified as a monument to technology. The bridge is now used as a pedestrian crossing and is under the care of the technical museum in Brno (Brünn).
In the third quarter of the nineteenth century. the late Neo-Gothic style of the age of Romanticism gave way to a Neo-Renaissance style. During the last third of the nineteenth century, iron architecture became particularly well established in the world-famous spas of western Bohemia. The first example of this, with a remarkably short period of construction from October 1878 until 1879 was the Sprudelkolonnade in Karlovy Vary (Karlsbad), built to the design of the Viennese architects F. Fellner and H. Helmer. The cast-iron construction together with all the iron cast statues and detail work were supplied by the Salmische Eisenwerke in Blansko. The whole building was 107 m long, the large hall with its system of flying buttresses being designed like a basilica. Both cupolas in the pump room and the adjoining room reached a height of 22.75 m. The outer façade and the interior rooms were richly decorated with cast-iron reliefs and statues. The colonnade had a typically Neo-Renaissance appearance.



Unfortunately, this important Karlsbad building was a victim of the Second World War. It was dismantled as early as 1939, and together with all its cast-iron statues was used for war purposes.
The colonnade at the Kreuzbrunnen in Mariánské Lázně (Marienbad), built to the designs of Julian Niedzalski from Vienna in 1888-89, had a happier fate. In contrast to the Karlsbad colonnade, the construction in Marienbad had a steel skeleton. The iron works in Blansko were again responsible for the production of all cast-iron parts and decorative details. The structural measurements and the space composition are closely related to the example in Karlsbad example. The stylistic expression in Marienbad is a mixture of Neo-Renaissance and Neo-Baroque.
Corrosion did not only seriously damage the cast-iron elements, but also the steel construction. The technical state of the structure was so bad that the colonnade had to be closed to the public in 1974. Thanks to the culturally receptive attitude of the city authorities and the state spa administration in Marienbad, the devotion and great technical and architectural skill of the staff in the state design department in Marienbad, and, of course, thanks to the willingness and high degree of craftsmanship of the building organisations, it was already possible to begin with construction work in 1975. In the first phase of construction, a new steel skeleton structure was erected and the badly damaged cast-iron elements were restored. As tradition required, the ironworks in Blansko took over the role of the principal supplier. The reconstruction and restoration works were extremely difficult. Here many technologically modern methods and procedures were used alongside traditional ones also (sand blasting, surface priming, welding, the use of synthetic adhesives, paints, etc.).
The reconstruction of the colonades, which had been classified as a monument, lasted until 1981. The operation is in keeping with the requirements of modern balneology. This important monument, with all its details, was saved, and it is once again possible to breathe in the century-old atmosphere of the spa in Marienbad in its halls again.

In the last quarter of the nineteenth century, cast-iron gradually lost its predominance as a building material. The Neo-Baroque pavilion from the Hanau Iron Works in Komárov to the west of Prague, which was erected at the Prague Jubilee National Exhibition in 1891, is at the end of this development in monumental structures. The architect was K. Sleif, Zdeněk Emanuel Fiala, the designer and sculptor of the Komárov iron works, designed the richly ornamented cast-iron details. The building was erected in 1898 at the dominant western extremity of the Letná plateau in Prague, overlooking the city centre. The heart of the centrally designed pavilion is constructed in brickwork, combined with superb cast-iron elements and decoration, a magnificent stairway, window details, a richly decorated side bay or ressault. In the interior, the cast-iron pillars are concealed. The cupola, however, was constructed in wood. Cast-iron was particularly important as a decorative element. According to Dr. Poche, the pavilion of the Komárov iron works was the maximum contribution which cast-iron was able to make in an architectural work.
After the Second World War, the pavilion was completely derelict and close to demolition. In 1967, steps were taken towards a complete restoration which was completed in 1969. Numerous cast-iron decorative elements had to be replaced by newly made copies.
At the end of the development of iron architecture in the Bohemian lands during the second half of the nineteenth century we have the monumental building of the former Palace of Industry at the Jubilee

National Exhibition of 1891, designed by the architect B. Münzberger. The iron construction was supplied by the Böhmisch-Mährische Maschinenfabrik in Prague, the predecessor of the modern ČKD organisation. The Palace of Industry was expressly erected as the first iron architecture not tu use cast iron. The building is in three parts. The construction of the high central section, with its rectangular ground plan 40 m wide and 65 m long with four brick-built corner pylons, is formed by iron lattice arches with a span of 38 m. The front and rear façades are designed as vast glass walls, originally with a brick-built entrance portal. The central part is dominated by the iron tower, 51 m high, with spiral staircases and gallery.

The long, low side wings have a similar iron construction to that of the central main building. The Palace of Industry was rebuilt in 1952-53 for congresses and other social purposes, but the main features of the construction were retained.
In the year of the Jubilee National Exhibition in 1891, an even more original building was erected in Prague, the 60 m high look-out tower on the Petřin hill, a miniature copy of the Eiffel Tower in Paris which was erected in a mere six weeks. The designer was J. Prášil, the iron construction being again supplied by the Böhmisch-Mährische Maschinenbaufabrik.
In the second half of the nineteenth century, cast iron played an important role as the material for monuments and street lamps, often in closest connection with monumental architecture. Particularly in Prague, some very interesting and, from the town-planning aspect, superb examples have been preserved, for instance the lamp-posts for the gas street lighting of 1867, the lamp-posts in front of the main façade of the House of Artists (the former Rudolfinum), designed by J. Schulz between 1876 and 1884, and the lamp-posts on the Mayday Bridge by the architect A. Balšánek, 1899-1901.

In conclusion, it must be remarked that from the point of view of quantity, Bohemian and Moravian iron architecture did not play a great role, something which is a little surprising in view of our large and well-established iron industry. Certainly, the somewhat backward provincial atmosphere of the towns of the time is the reason for this. There were not all that many great building technological and architectural tasks. This only changed radically at the turn of the century.

Despite the restricted quantity of tasks, our iron architecture has produced some very remarkable works. They fit in harmonically and naturally into the wonderful thousand years' development of Bohemian, Moravian and Silesian architecture and, indeed, art as such.



## IRON IN THE HISTORICAL ARCHITECTURE OF THE NINETEENTH CENTURY IN POLAND

Andrzej Tomaszewski

The nineteenth century, the century of steam power and electricity, but above all the century of iron, was a period of history in which Poland did not exist on the map of Europe. Partitioned by the three great powers, Russia, Austria and Prussia, towards the end of the eighteenth century, it ceased to exist as an independent state for over one hundred years, until the First World War. In the century of lost independence, there were periods of relative political independence within the restricted territorial limits of the Grand Duchy of Warsaw at the time of the Napoleonic Wars, or in the Kingdom of Poland created at the Congress of Vienna. Despite the fact that they belonged to three different powers, the ethnic Polish areas of the erstwhile aristocratic republic did retain a unified architectural scene for the most part during the whole nineteenth century. The architecture erected on the initiative of Polish clients, the aristocracy, the gentry, the bourgeoisie and Polish organisations and associations, played the decisive role here. Polish and foreign architects carrying out these works often worked in areas of all three annexed parts of the country. Lying on top of this fundamental layer of buildings erected for Polish investors there was a thin layer of architecture built by the governments of all three particioning powers. Only in the Prussian part did this also include public and ecclesiastical buildings, in the other parts it was generally restricted to "architectura militaris", especially the fortifications constructed in the frontier areas. As a result, present-day Poland, through whose territory the frontiers between three great powers ran, is nowadays the only country in Europe to possess high-quality monuments of the defensive architecture of the nineteenth century: Napoleonic, Prussian, Austrian and Russian.
The bases for the application of iron in building and architecture in the Polish regions were created shortly after the Congress of Vienna. At that time, the shrewd authorities in the Kingdom of Poland set about building up the iron and steel industry. For this purpose two regions were selected: the so-called "old Polish mining district" (around Kielce) and the Dąbrowa area, which both had two thousand years of tradition in iron ore extraction and had for centuries been the main centres for Polish iron production. The construction of numerous new and modern iron foundries in these areas was not just intended to satisfy local needs. They were also intended to serve for extensive iron and steel exports to Russia. The Kingdom of Poland was to become an industrial base for Russia with which it was linked. The energy thrown into the whole undertaking, as well as the individual works, made it one of the largest investments in the iron and steel industry in Europe of that time. The largest industrial foundation, the construction of which lasted until the eighteen-fifties, was begun after 1830. It was an investment by the Polish Bank, a metallurgical combine which arose along a 40 km section of the river Kamienna. The river, which was transformed into a canal and had dams constructed along it every few kilometres, became a gigantic production line, along which the raw material, iron, went through all the stages of its processing in succession. Although these industrial works from the first half of the nineteenth century in general displayed Classicist or Neo-Gothic architectural forms, their importance for the development of architecture and of the building industry in Poland was considerable. From the beginning of the eighteen-twenties