

VIENNESE IRON ARCHITECTURE IN HISTORISM

Renate Wagner-Rieger

For the artistic recognition and, accordingly, the use of iron as a structural material some basically different points of view can be observed in Vienna in the first and second halves of the 19th century. Up until 1848 iron is mainly used for purposes which, before and also at the same time, were served by wood. For this reason, no attempt is made to conceal the use of iron, all the more so since it corresponded to the ethical concept of the legitimate use of materials which had developed in the Classicistic period. However, in the second half of the 19th century the visible use of iron is rejected for representative and, hence, artistic building projects. In its open form iron is employed only for socially less prominent functions in utilitarian buildings whereas, in so-called monumental buildings, the excellent technical possibilities of iron, which are not neglected, are made use of only in a concealed or hidden form. Towards the end of the century a synthesis of the two concepts emerges in which the artistic possibilities of metal structures are exploited also for representative buildings.

This situation, which also exists elsewhere, is influenced by the particular conditions existing in Vienna. In general it can be said that no pioneering achievements of iron architecture were developed in Vienna, but that some rather interesting special designs originated there which should be considered as central European variants of western European sources.

Since Austria was a country with an old established iron production and the use of this material for formerly unusual purposes, such as tombstones, spiral staircases etc., had increased since the 18th century, conditions for the emergence of iron architecture were quite favourable. However, there soon developed a gap between official and private building activities which is characteristic of the pre-March period in Austria. Official building controlled by a clumsy administration adhered to the Classicistic style up until 1848, a style which, mainly after the death of Emperor Franz I in 1834, had been preserved also under Emperor Ferdinand as a demonstration of the maintenance of the status quo. The concern about irrational romantic excesses not only prevented the appearance of any Gothic Revival architecture in public buildings, but also entailed a reserved attitude towards the new building material, iron, in analogy with the famous principle of literary censorship which says: "You never know". For this reason, often very sophisticated timber structures were designed for public buildings to bridge large spans, for instance by Paul Sprenger, the leading man in the Imperial Building Office, in his designs for a military practising hall around 1840. A large roof externally shaped like a hood had one variant of the inner timber structure with a system very similar to that found in iron buildings erected at the same time. The first railway station for the Gloggnitz line built around 1840 (the predecessor of the Südbahn) included a spacious train hall which also had an open wooden roof frame with skylights.

In addition, especially the nobility, frequently also members of the Imperial family, launched building activities which were supported by private initiative and sought to link up with technical progress in western Europe. Thus, around 1812 a stable building of Archduke Anton at Baden near Vienna was fitted with a roof of cast iron arches covered with iron roof battens and iron plates, an invention by the mechanic Egger. Count Wrba is said to have used iron roof tiles on

his estates. Things technical in general met with the interest of noble amateurs, as is evidenced, e.g., by Prince Metternich's invention of a ventilation system for the ballroom of the State Chancellery in 1836. The same circles kept close contacts with England or France where they could find suggestions for further development, and it is certainly no coincidence that the large iron foundries, which received orders especially in the second half of the century, were established by members of the same class of society, for instance, the Salmsche Eisengiesserei of Blansko, the iron foundries of Archduke Albrecht of Teschen, or the Rottschildsche of Wittkowitz. However, in the Styrian village of Gusswerk near Mariazell a production facility was built up which was supported by public building activities.

The social basis just indicated also determined the building projects for which iron was used. There were, first of all, greenhouses which, in the course of the 19th century, were more and more integrated into the programmes of castle and palace architecture as winter gardens and which must be regarded as eminent socio-architectural problems. Enthusiasm for horticulture at that time swept society, from the Emperor down, and accordingly iron was soon used for this purpose also in Vienna, for instance, in Mayer's greenhouses at Hietzing designed and built in a kind of Tudor style by Peter von Nobile together with the architect Schedel, the plans of which were published in 1838. The glass houses of the Liechtensteins of Eisgrub displayed great wealth of ideas, and this line can be traced continuously to the end of the century. In 1882 the imperial palm house of Schönbrunn was created, the building which is now causing such problems of conservation; its outer shell was transparent, separating an ambiente of social life in Historism from, and at the same time connecting it with, its environment - a quality which is one of the fascinating aspects of glass-iron architecture, ensuring the artistic character of that style. In the period of Art Nouveau, Friedrich Ohmann in 1901 renewed the glass houses of the Imperial Hofburg in which the flowing lines of the building style of late Historism were interlocked. Above them rises the tower of St. Augustin's, whose iron spire was designed and built by Paul Sprenger after the Baroque-style calotte had been damaged in the 1848 revolution.

Another private building activity for which iron was gradually accepted instead of wood was the roofing of swimming halls also used as ballrooms. There is a good documentation on the roof of the Dianabad made in 1847 by Karl von Etzel and Ludwig Förster; the design included cast iron flying buttresses supported on solid brick walls with a roof covering made of wooden rafters. This structure spanned a pool 12.5 m wide, while the later builders of the Opera House, Eduard von der Null and August Sicard von Sicardsburg, in 1845 spanned the Sofienbad with an iron structure 18 m wide. Ludwig Förster, to whom the history of Viennese architecture owes many impulses, in the pre-March period used iron structures also in other, novel types of buildings open to experimentation without any traditional backing. Thus, he built a "passage" with a glass hallway and a central cupola on Rotenturmstrasse in 1843, the type of building so characteristic of the 19th century and yet with surprisingly little resonance in Vienna; he also applied the new building material in the galleries of Protestant churches or Israelite temples built belatedly and thus unable to claim any architectural tradition or to be bound to it.

The structural use of iron was accompanied by a rather extensive employment of the material for decorative purposes, which indicates that iron was found not only to offer load carrying capacity, the capability to bridge spans and to be resistant to fire, but was

used also as a material for artistic achievements. Garden architecture developed from wooden structures culminated in a cast iron pavilion produced by the Salmsche Eisengiesserei, which was shown at the London International Exhibition in 1851 and set up in the municipal park in 1862. Its rich decoration in a transparent frame makes it appear as a set piece on a society stage of the Vienna Ringstrasse world.

A related architectural problem is represented by the high iron fences made up of lances with gold plated tips which were erected after 1863 to enclose the municipal park, the people's park and the palace garden; they were designed by Moritz von Löhr. In the age of democracy their artistic function was thoroughly misunderstood and they were removed from the municipal park.

Even if iron monuments are something entirely different, I should yet like to add two references. Ludwig Förster, when designing Klein house at Brno, decorated the window frames with miners made of cast iron by request of the builder who was engaged in the iron industry and wanted to use motifs from his field of activity. It may also be of some interest in connection with our topic that the largest private park of monuments, the so-called Heldenberg near Klein-Wetzdorf north of Vienna, consists of iron statues and iron busts. Pargfrieder, a supplier of war material, created a strangely monstrous tomb there for Field Marshal Radetzky amidst the iron guards of familiar and anonymous heroes of the Austrian army.

In the pre-March period, public building was extremely hesitant to employ the new structural material; but even at that time there was one area in which iron was, and continued to be, used with a remarkable absence of reservations: bridge building on the basis of the chain bridge design. Vienna had a huge need for bridges to be built over the Wien River and the branches of the Danube. After the latter, wildly branching river had been given a new bed in 1870, large bridges had to be built over the Danube and its inundation areas, while the numerous bridges and structures over the Wien River were no longer necessary after that river had been canalized around 1900. These latter bridges, which were frequently renewed, partly with brick buildings and partly equipped with iron structures, again and again included a surprising number of chain bridges after the twenties of the 19th century, such as Sophienbrücke, Karl-Kettensteg, Rudolf- und Schikaneder-Kettensteg. This was followed by the second Franzensbrücke in 1848, the bridge for the railway link by Schmirch in 1860, and Aspernbrücke in 1863. And even in the thirties of the 20th century, Reichsbrücke was built as a chain bridge, violently debated in the public. Together with the view of St. Stephan's Cathedral situated right in the axis of this bridge it was one of Vienna's identification symbols in the period between the wars and, for this reason, there were many attempts in the competition to design the bridge with the same outline again after its collapse in 1976.

Although Viennese experience with chain bridges had not only been good, even in earlier periods, this design was still the preferred solution, and even if different systems were applied, such as in Augartenbrücke of 1873, the characteristic outline had to be included, in this case reputedly in order to not obstruct the view of the Kahlenberg.

While iron designs were regarded as artistic objectives in the field of bridge construction throughout the century, to which concept even sacrifices were made in technical respect, monumental architecture in the second half of the 19th century gradually banned iron from any use in the external appearance of buildings. The Classicistic ideology of legitimacy in the use of materials, which not only led

to the open display of iron structures, but also enforced building construction with face brickwork, which had not been the custom in Vienna so far, plaster being preferred - this ideology was now suppressed or substituted by a different ideology which replaced the economy of the pre-March period by a new magic of materials on the basis of which ashlar was preferred in monumental public buildings; where possible, the materials to be employed had to be brilliant in colours and surfaces. It was quite in line with that concept that iron, wherever it was visible part of the architecture, was made to resemble traditional forms, such as columns with capitals, and to imitate "nobler" materials by being stained in the proper colours (those of stone or bronze). The about-face represented by this approach is very significant for our understanding of Historism artistically. However, it was also influenced by some negative experience that had been accumulated in the use of iron, especially with regard to fire resistance. At any rate, the protective enclosure of iron pillars demanded by the authorities since 1883, without having been laid down expressly in the building regulations then in force, had already been used earlier. Building authorities were very reluctant to employ iron. Uniform rules and regulations existed only for the design of skylights, whereas special permits had to be sought for all other structures on the basis of the planning documents to be submitted. There also was a certain romantic trend entailed, above all, by working along the lines of Medieval stonemasons' lodges, especially in buildings done in the Gothic Revival style. The change in mood is very apparent from the history of the restoration of the steeple of St. Stephan's. After the bombardment of 1809 it had been restored in a most unsatisfactory way so that, in 1838-44, the steeple was renewed on the basis of an iron skeleton. However, this work by Paul Sprenger soon exhibited new defects which, it was felt, could be repaired only by a complete replacement. Friedrich von Schmidt, who came from the Cologne Cathedral Building Office, took over the post of cathedral builder from Leopold Ernst in 1862 and, by 1864, had replaced the steeple so that it was only of stone again and held in place by a central iron bar.

Historism, which gradually became the dominating style in Vienna after 1848, due also to a certain backlog demand, regarded iron structures as technical systems devoid of any artistic pretension. Theophil Hansen, whom Maximilian II of Bavaria asked his opinion on contemporary architecture in 1860, expressed himself in no uncertain terms: "Iron structures in new buildings are made only for economic purposes, whereas in monumental buildings, which are to be dominated above all by the artistic element, such iron structures, which as yet have nothing to do with art, must be avoided. However, if such structures were yet to be used, only a genius could try to pave the right way to achieving a stylish result".

Hansen, and his colleagues, accordingly did use iron in constructing roofs, but completely concealed these structures outwardly. Van der Nüll and Sicardsburg, when building the cap roof of the Opera House, erected a roof frame of iron; even Friedrich von Schmidt, who had been so firmly entrenched in tradition when restoring St. Stephan's, had to use an iron structure when building the large dome of Maria-vom-Siege Church in 1867-75. However, outwardly he completely concealed this design. Only in one, albeit very remarkable, place the aesthetic possibilities of glass-iron structures were used also in representative monumental buildings, i.e., in skylights. The use of skylights in staircases, courtyards or large halls certainly has major practical advantages and means a more efficient utilization of the building ground. Yet, the enthusiasm for this type of

lighting, which was not always the best solution, must have had a certain ideological character which may have stemmed from a reference to the vertical light of the Pantheon and, hence, to Antiquity. At any rate, it is probably no coincidence that all representative buildings in Vienna not crowned by domes had the corresponding main rooms closed by glass ceilings transparent to the skies: this is true of Parliament, the Palace of Justice, the Museum of Industrial Arts.

So, iron architecture had its great chance not in representative buildings, but in different social sectors, and the type of material used allows conclusions to be drawn to the social rank of the building involved. Let me quote a few examples of the different architectural problems encountered at that time, excluding factory buildings, which became more prominent in Vienna after the 1870's as a result of the construction of new facilities designed for specific functions.

In railway construction, new designs of Classicistic passenger buildings sprang up everywhere after the middle of the century. As in other cities, the large halls were spanned by visible Polonceau-type trusses, as in the Westbahnhof built from plans by Moritz von Löhr in 1857-59. The respective waiting rooms and staircases, which always included elegant spaces for the courtyards, were of a different style altogether. They were most sophisticated in the former Nordbahnhof built by Theodor Hofmann in 1858-65. In this building the whole iron structure was covered behind stucco marble and granite columns in rooms richly decorated with chandeliers, furniture, fountains and tiles. The external design of railway stations, which had replaced the old town gates, mostly employed traditional motifs, such as towers or arches, and sometimes (as in the former Südbahnhof) even religious motifs appear to occur. The traditional townscape was respected also in the compact outward appearance of the depot for the decorations of the Imperial Theatres built by Gottfried Semper and Karl von Hasenauer, a building whose inside includes iron structures designed on the basis of purely functional aspects.

This tension between "monumental" shells on the outside and iron structures on the inside gradually developed in the large department stores, a leading example of which was the Au-bon-marché of Paris. In 1865-67, Van der Nüll and Sicardsburg built Haas house on the Stock-im-Eisen-Platz of Vienna, which may be regarded as an example of a most efficient utilization of space by iron structures. The resistance to the devastating fires of the Second World War of this richly decorated stone facade is impressive when viewed against the twisted metal of the structure. Unfortunately, the building was demolished. Although some pure iron structures for department stores were planned in Vienna, they were never implemented. What has remained to this day is a draft by Karl Tietz elaborated before 1871 and obviously based on designs by Schinkel: an almost square building was to have four inner courtyards covered with domes. Such radical solutions were never implemented in Vienna in the second half of the 19th century. Even around the turn of the century, for instance, in the department store of Gerngross built by Hellmer and Fellner in 1904-05, representative stone framing was a must. Only in market halls no tribute was paid to the customary decorum. Even in the Ringstrasse area a uniform iron-glass structure was built around 1870 from prefabricated components, the Zedlitzhalle. The large slaughterhouses built at the Zentralviehmarkt in 1880-1883 also had no walls, which made for extremely transparent hall space easily subdivided. At the same time, after the eighties, the streets of Vienna were embellished with prefabricated public lavatories of iron

which came in two models. The larger one, with a basilica-style elevation and an elegant ridge, was characterized especially by the use, as a window closure, of a transenna motif from late Antiquity, whereas the small pavilions were built as rotundas.

The name rotunda, however, also had an entirely different connotation in Vienna: it was reserved for the central dome structure built for the International Exhibition of 1873. Building a structure of glass and iron for such purposes had meanwhile become a tradition with the large exhibitions. Vienna, the Imperial City, chose a dome structure and crowned it with an Imperial Crown, with some unavoidable formal connotations to the Karlskirche. Ideas of the British shipbuilding engineer John Scott-Russell very much influenced the design of the building, but the final solution was worked out by the architect Karl von Hasenauer, who was responsible for the artistic design. The tent-shaped dome designed like a lampshade is subdivided by horizontal tension rings and radial ribs topped by two lanterns. This time the outer building revealed the structural system of the dome, where galleries extending around the square structure with four powerful triumphal arches framed the building in the sense of traditional representative architecture. Also in the interior it was attempted, wherever possible, to clad the system of supports by means of pillars. With a diameter of slightly less than 105 m the rotunda was one of the world's largest dome buildings until it was destroyed by fire in 1936.

At that time the skyline of the city lost one of its most characteristic points, but after the war it had retained another "gigant's toy", the Giant Wheel. The wheel was built by British engineers and a British company in 1896-97 on the occasion of an exhibition called "Venice in Vienna," a moving, dynamic structure rather indicative of the dynamic qualities of architecture around the turn of the century.

It is strange to see that a city which officially opposed iron architecture for a whole century yet can boast of a number of monuments built in that style. The synthesis between monumental stone structures and glass-iron systems finally achieved around 1900 is largely due to Otto Wagner and his school; however, entering into the details of this aspect would certainly exceed the framework of my paper.

Notes

Renate Wagner-Rieger, *Wiens Architektur im 19. Jahrhundert*, Vienna, 1970.

Robert Waissenberger, *Wiener Nutzbauten des 19. Jahrhunderts als Beispiele zukunftsweisenden Bauens (Wiener Schriften, Heft 38)*, Vienna, 1977.