

## **STARTING POINT**

In Hallstatt an intensive salt mining industry can be traced back to the middle and Late Bronze Ages by a lot of single and deposit findings.

Generally three ways of salt extraction can be distinguished:

- 1) The extraction of sea salt by drying out the sea water in salt gardens.
- 2) The mainly prehistorical mining of crystalline rock salt.
- 3) The extraction of salt by dissolving salty water in a salt mine and the following drying up of the brine.

The production of brine in the salt mine of Hallstatt has been proved since 1305. The processing of the brine demanded an appropriate concentration of the production facilities, specific forms of manufacturing, organisation, and technology at this very early stage. Taking into consideration the necessary equipment, the division of labour and the diversity of tasks, the evaporation of the brine is classified as a pre-industrial activity.

Defining a "Single factory Town" as a place where one company structures the entire communal life, Hallstatt could be seen as the European prototype of this form of settlement.

The subject of this lecture will focus on the modern times period, putting stress on the urban, the operational and the functional development of Hallstatt. Furthermore I will show that the urban structure of the area is mainly determined by operational necessities.

The systematically planned medieval foundation of the site was destroyed by a catastrophic fire in 1750. All the company's buildings and about 35 town houses were destroyed in it. The reconstruction of the town of Hallstatt after 1750 and the dynamic development of tourism during the 19th century changed the site substantially.

Still, Hallstatt kept its historical importance by maintaining the original shape of the parcels of land. Being a monument of such unique importance, it was classified as a World Cultural Heritage Site in 1997.

Since the middle of the 19th century there has been a continuous decline of the salt production. More over the recession of tourism over the last few years, has brought about a significant loss of jobs and the migration of the younger.

In the village the results of this recession - vacant houses and closed shops - cannot be overlooked.

### **The "Pfannhaus" and the "Pfieseln"**

The "Pfannhaus" or boiling plant is the primary salt production centre. To extract the salt of the brine - called "Sole" or "Sulze" - that comes from the tunnels, it is necessary to dehydrate it by 75% and to bring the salt to crystallisation.

This process took place in low open basins - the "Pfannen" – They had a smoothly convex bottom, so that it was possible to collect the salt crystals at the rims and then take them out of the mother salt solution. The next step was to crack the hot salt in moulds. Those standardised wooden moulds, that changed over the times, had the form of a cone and were called "Fuder".

In the secondary salt production centres, the so called "Pfieseln", the newly produced salt was dried. Those drying chambers were situated around the "Pfannhaus" or boiling plant. We know that towards the end of the 16th century there were 52 "Pfieseln" in Hallstatt.

### **Morphology**

The historic center of Hallstatt, called "market", was situated on a piece of alluvial land in form of a cone of about nine hectares. To this day the houses are crowded together next to the steep mountain slopes.

What is especially remarkable is that since the middle of the 18th century the extension of the built up area in the town has not considerably changed. The dimensional relation of the natural landscape to the cultural landscape has stayed more or less the same. By transferring the production facilities and the administrative offices to the Lahn, the town of Hallstatt lost its initial importance.

Because of the topological condition even building sites are extremely rare in the town of Hallstatt. "The houses are built so near to the rocks that [...] you can step out evenly at the backside of the upper rooms onto the rocks and look down on the lake over the roofs. At some places in Hallstatt there is no other way than going over a sort of bridge that passes over the roofs of the houses."

The accessibility of the town became more and more difficult as more and more traffic was transferred from the water ways to the roads. Even more so because the vertical accessibility is only possible via stairs and small paths.

The unique location of the village squeezed between the steep slopes of the Salzberg and the lake of Hallstatt, has always made the waterway over the lake the main access. Until the late 19th century all the transport of goods came via the lake.

### **The medieval foundation**

The text of the market charter of 1311 talks about a foundation on wild mountains and green meadows. This would mean that at that time the village was founded systematically on the "green meadows". The validity of this interpretation is opposed by a documentary evidence on the salt production in 1305. Already in 1313 salt donations were given to several monasteries and hospitals, which indicates an important salt production right after the founding of the town.

All these indications allow us to conclude that the industrial production place was a systematically planned urban development. These built traces are still can be seen today.

The knight Nikolaus von Röhrenbach was the technical manager of the salt mining in Hallstatt during the period of the founding. He is one of the few technicians of the middle Ages, who is known by name. Before he came to Hallstatt, he directed the construction of the saltworks in Hall in Tyrol.

### **Structural patterns**

My research analyses the patterns of urban development of the town Hallstatt with the help of previously unpublished sources.

In order to reconstruct the original patterns, a graphical correction of the historic plans was necessary. The original plans were captured digitally and rectified on the basis of still existing landmarks. The structures examined comprise several layers which lie on top of each other, for example boundaries, patterns of paths and ground-plans of buildings.

In the course of my research I came across several clues that add up to a general picture. From this a specific conception of urban dating back to the Middle Ages, can be derived. With these facts we have got proof for a structural conception of urban development of a "protoindustrial" production centre for the first time.

These results also made it possible to localize production plants and public buildings which were destroyed by a fire disaster in the middle of the 18th century in the surviving structures of the village.

So the structure of the village which seems to have grown organically at first sight is actually founded on geometrical, strictly systematic patterns. By rectifying the historical plans these geometrical patterns could be in their exposed original form.

The structure of the paths and docks follows the slope lines and the contour level lines of the cone of debris. The former main street follows the cone so that the crossing streets are orthogonal to the main street. As a result the shapes of the parcels of land are trapeziform and positioned in a way that they do not lay open to the floods and muds of the Mühlbach that was not regulated before 1888. The length of the radius of the circular main street is exactly 300 "Werkschuh". A "Werkschuh" is a medieval local non-metric linear measure.

These structures are an indication for a systematical urban planning of the town as an industrial production plant in the middle Ages.

The whole of not yet built-up areas of the "Pfannhaus" or boiling plant and parts of the former court form a free space without any attern. Today this green space is situated between the prehistoric museum, protestant presbytery, the so called "Pfannhausbühel" and the northern part of the lakeside street.

The "upper town place" which was part of the former town place, was separated through the construction of the orphanage in 1767.

With this method abstract criteria for structuring, which could be an important basis for future decisions on urban development and architectural interventions, were gained. On the one hand these patterns can be used for contemporary planning in order to include new objects into the original architectural pattern. On the other hand it is conceivable to concept new architectural objects which are in

deliberate contrast with these patterns, but which are nonetheless designed in awareness of them.

In both cases the examination of the original patterns is indispensable.

### **The Extension in the 16th century**

The "Salzkammergut" was a closed economic entity of the Lower Austrian "Hofkammer" in Vienna. This "Hofkammer" was the preceding administrative body of the K.K. (imperial and royal) Ministry of Finance. This exceptional constellation means that the regional authorities were the landowners, too. That's why the Habsburgs were able to do as they pleased with the goods of the chamber without the agreement of the body of representatives. This special economic importance led at a very early stage to the situation that the landowners took special care of the stock and the development of the existing means of production.

The salt production and the trade in salt had been monopolised in the countries of the Habsburgs since 1508. After the acquisition of Bohemia and Hungary in 1526, their salt markets could be taken over, too. The continuously increasing demand on the salt towns made a significant augmentation of the production necessary. Apart from the salt works in Aussee, Hallstatt was the main production plant in this period.

Because of this development a smaller so called "Pfanne" or pan was constructed in Hallstatt in 1532. A "Pfanne" is an installation where the brine is dehydrated. Its capacity was half of the first "Pfanne", but quite often it could not be used because of the missing following production centres such as "Pfieseln" and salt containers.

### **The Recession, Starting in 1750**

During the fire of 1750 the central area around the town place was destroyed to such an extent that a complete reconstruction was necessary. Parcels affected by the fire were sold to private persons until 1773 and there is still one empty site left today.

Since the reconstruction of the "Pfannhaus" or boiling house proved to be uneconomic, it was thought about the general abandonment of the

salt production and its transfer to Ebensee. "Ex ratione publica" the "Pfannhaus" was rebuilt in 1751 outside the historic centre.

### **The Pipeline, the so called "Sulzstrenn"**

At the end of the 16th century the insufficient wood resources in the inner Salzkammergut made it impossible to process all the brine in Hallstatt. The construction of a brine pipeline from the Salzberg of Hallstatt to Ebensee passing by Ischl was the condition for the construction of the new "Pfannhaus" or boiling house in the densely wooded region of the Lake Traun. The "Pfannhaus" was the place where the pan for the dehydration of the salt was situated.

From 1595 to 1607 a 34 kilometre-long brine pipeline consisting of 13.000, about 4,5 m long wood pipes was constructed. This pipeline is called Strenn.

The most difficult section represented the crossing of the Gosau river. There the pipeline divided into three steel reinforced wooden pipes in which the brine flew down the right side of the valley and then crossed the river on a wooden construction. On the opposite side it climbed up the other slope of the valley under pressure. The only trace of this construction is the name of the place : Gosauzwang, Zwang being the German word for pressure.

In 1756 it was necessary to build a third brine pipeline from the Salzberg of Hallstatt to Ebensee and Ischl next to the two existing ones because of the rising demand of salt especially in Bohemia. During its construction a bridge on up to 30 metres high stone piers was built over the Gosau river, so that the Strenn could slope down evenly. Thus the enormous pressure in the pipes could be reduced a lot, which was a big problem for the technical possibilities at that time. In 1757 the wooden struts of the bridge, the so called "Spannwerk", was built.

This brine pipeline, which was the first raw material pipeline of modern industrial times that connected two and more villages and the exemplary crossing of the valley of the Gosau river are of special importance. The good condition of the bridge piers and the use of the

bridge in its original function, seems to guarantee its preservation for the near future.

## **Summary**

The improvement of the quality of architectural culture in connection with the label "UNESCO World Cultural Heritage" is an important precondition for an urgently needed reorientation of tourism in the area of investigation. To work out this concept the authenticity of the whole ensemble is essential. The technically correct protection and the preservation of the remaining historic objects and structures can only be guaranteed by systematic architectural investigation. By editing historic plans and analysing the abstract criteria of structuring, my resarche is trying to make the first steps in this direction:

- The unique combination of landscape and architecture in the central "Salzkammergut" was essential for the admission to the UNESCO World Heritage list. The original buildings and architectural ensembles are vital for the regional cultural identity and are also of functional value for tourism.
- The contemporary architectural culture does not reach the quality of the original architectural objects, neither in the public nor in the private sector. Even if they could be renovated, historic architectural structures are still being destroyed in the region of the World Cultural Heritage. So the cultural asset of the region is in a process of diminution, which logically results in negative consequences for the economical development of the whole area.
- The technically correct protection and preservatire use of the remaining historic objects and structures can only be guaranteed by systematic architectural investigation. The results of these investigations should also be passed on. This is only possible if architectural investigation tries to approach public building contractors, the building and construction industries and also private builders.

The missing awareness of abstract criteria of structuring cannot only be compensated by investing great amounts of money in the

architectural structure of Hallstatt. On the contrary this way of dealing with the architectural structure of the village resulted in significant architectural deficits. For years people have been trying to imitate historic buildings, but the results do not seem authentic.

Only the consequent translation of the results of architectural investigation into the architectural reality of the World Cultural Heritage region can create authenticity and in this way establish a foundation for economically successful tourism.