

REPUBLIK ÖSTERREICH

# THE WORLD HERITAGE

**Documentation for the Nomination  
of the Cultural Landscape**

**Hallstatt – Dachstein / Salzkammergut**

Material based on various studies compiled by the Bundesdenkmalamt

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## **Hallstatt – Dachstein / Salzkammergut**

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## 1. SITUATION AND BOUNDARY OF THE HALLSTATT-DACHSTEIN/SALZKAMMERGUT CULTURAL LANDSCAPE

The above Hallstatt-Dachstein region is situated almost in the centre of Austria in that part of Upper Austria that is inserted like a gusset in between the Salzburg and Styria provinces. It is approx. 25 km wide and goes from the *Koppental* exit of the *Traun* river to the northern shores of the *Traunsee*. A member of the cultural landscape region IV "North Alps", it forms the core of the *Salzkammergut*, an organically evolved cultural region stretching across three federal provinces (Upper Austria, Salzburg, Styria) but no longer having any administrative borders of its own. Thanks to the "common history", or rather the common economic history of salt mining manifest in both settlement structures and art historic treasures, as well as to the beauty of its landscape characterised by varying forms of mountains and numerous lakes, the *Salzkammergut* represents a generic cultural geographic unit of the highest order.

### The Salzkammergut cultural landscape – an ideal miniature of the entire Alps

The main river of the *Salzkammergut* landscape is the *Traun* river. With its tributaries and lakes it constitutes the determining element of this natural space and is of indirect importance for industry and transport in the *Salzkammergut*. Up until the comparatively late opening up of the region through road and railway networks in the 18th and 19th centuries this waterway was its main artery. A tell-tale document is the 23 m long representation of the entire *Traun* river course by F.N.Pernlohner dating from 1688. Using diagonal views, Pernlohner shows the bank landscapes from the source in the Styrian *Salzkammergut* to the mouth into the *Danube*.

The dominant south-west pillar of the *Salzkammergut*, the north-sloping *Dachstein*, represents the most beautiful and varied group of the northern limestone Alps. Extensive glaciers, sharply profiled peaks and steep rock precipices characterise the *Dachstein* massif, the *Hohe Dachstein* being the highest mountain with 2996 m (Fig. 20). To the south the jagged rocks of the massif go down to the green valley of the Styrian *Ramsau*, to the west the *Dachstein* glaciers are reflected in the two *Gosau* lakes; to the north the mountain range drops down to the hollow-like basin of the *Hallstättersee*; hidden beneath the *Dachstein* plateau extend the giant underground caves, the *Dachstein-Rieseneishöhle* and the *Mammuthöhle*. (Figures 42–44).

The south-western corner of the region is marked by the *Totes Gebirge*, the highest elevated plain of the limestone Alps, dotted with a number of small lakes.

In a nutshell the geological development of the *Salzkammergut* can be explained as follows: *Dachstein* and *Totes Gebirge* originally formed a single massif, a limestone tableland without any noteworthy river system; the water worked its way underground through the cracks and fissures, thus forming major caves which can still be seen and visited today. When the elevated plain between *Dachstein* and *Hoher Priel* gradually

disintegrated into blocks, the water began to fill the crevices and form the web of seven large and numerous small lakes (all in all more than 76 bathing and mountain lakes) that coin today's Salzkammergut.

The unique mountain and lake landscape of the Salzkammergut represents an *ideal miniature of the entire Alpine region* in all its beauty and variety covering an area of some 2,500 square kilometres.

### **Hallstatt – natural environmental conditions forming the cultural landscape**

The close association of the Dachstein region with the Hallstatt area can be seen in many historico-cultural and economic respects beginning with the early settlement and salt mining up to today's reception by artists and tourists. This evolution is mainly rooted in the natural spatial conditions of the region. The shape of the landscape is determined by the glacier basin washed out during ice ages and enclosed by ruggedly dropping rock walls. The bottom of this basin is filled by the Hallstättersee through which the Traun river flows. The hollow-shaped area is broken up by the Traun to the north whereas the eastern side of the lake is interrupted by three almost parallel valleys: the *Gosautal* (Figures 34–38) approximately in the middle of the lake, farther to the south and next to each other the *Salzberghochtal* and the enclosed U-shaped valley of the *Eterntal*. The brooks that drain these valleys flow in delta embankments into the lake and thus constitute the natural precondition for the development of settlements between lake and rocks. On the fan delta of the *Mühlbach* at the foot of the *Salzberghochtal* the present market centre of Hallstatt evolved. The buildings of the inner market crowd the alluvial cone, to the south they show a looser pattern towards the settlement that has grown on the alluvial land of the *Waldbach* in the Lahn quarter; even the steep rocky slope accommodates some isolated houses. High above the market, beyond the trough shoulder, a loosely scattered miners settlement (Figures 15–30) developed in the high valley of the *Mühlbach* on prehistoric foundations.

### **Hallstatt – the historico-cultural nucleus of the entire Salzkammergut**

The appearance and current settlement structures of the Salzkammergut cultural landscape were determined by four differently long building phases that correspond to the historico-cultural eras below.

1. Heydays of salt industry in prehistoric and historic times
  - a) Cultural prime of the Hallstatt period, salt mining till the time of the *völkerwanderung*
  - b) Salt industry since the Middle Ages, "government" salt works
2. Biedermeier period (first half of the 19th century): discovery and development of the Bad Ischl spa
3. Period of rapid economic expansion till the beginning of the First World War: Bad Ischl as the summer residence of Emperor Francis Joseph I.
4. Time after the Second World War: development of the tourist industry

In major parts of the Salzkammergut the settlement structures of the early periods have gone almost entirely, or have been largely superseded by subsequent building phases. Only the dense stock of historic material in the Hallstatt basin is characterised by continuity within the meaning of "continuing cultural landscape".

Owing to the concentration of intact and recognisable historico-cultural structures in harmony with their natural spatial environment the Hallstatt-Dachstein region represents the nucleus of the entire Salzkammergut. A historico-cultural centre of the Salzkammergut, the proposed zone is *a model* of the current state of the cultural landscape with history and evolution being well and clearly exemplified in a small area.

### **Boundaries of the proposed zone for inscription on the World Heritage List**

The area proposed for inscription on the list covers the local Upper Austrian communities of Hallstatt, Gosau and also a small part of Bad Goisern plus the entire Dachstein massif with the southern and eastern zone running along the border of the Federal Province of Upper Austria and the buffer zone extending beyond the border into the Federal Provinces of Salzburg and Styria. The core area focuses on the Dachstein, the historic settlement centres of Hallstatt market and Lahn, and the Hallstättersee with the bank zones defined by nature conservation. For the exact boundary of the zone to be listed and the corresponding buffer zone see map (Fig. 1).

## 2. LEGAL BASIS AND FRAMEWORK TO PRESERVE THE HISTORICO-CULTURAL LANDSCAPE OF HALLSTATT-DACHSTEIN/SALZKAMMERGUT

The extent to which the Hallstatt-Dachstein/Salzkammergut region is appreciated can be seen in the number of already existing natural site and monument-related protection regulations designed to ensure preservation of the cultural landscape.

Individual buildings and structures of existing settlements, as well as archaeological ground monuments and excavation finds, will be protected under the Austrian Monument Protection Act, a federal law of 1923, Federal Law Gazette No. 533/1923, as amended in 1978 (Federal Law Gazette No 167/1978) and 1990 (Federal Law Gazette No. 473/1990) once their preservation-worthiness is ascertained by the *Bundesdenkmalamt* (Federal Monument Office) to be in the public interest due to their historic, artistic or other cultural value. This is why any changes in the original material, the traditional appearance and artistic effect are prohibited and/or require approval by the *Bundesdenkmalamt*.

The Monument Protection Act applicable all over Austria mainly ensures the substantial and historically authentic conservation of selected monuments, whereas the provincial townscape regulations, building codes and spatial planning provisions ensure preventive protection and influence the (building) design within the cultural landscape (Upper Austrian Townscape Law, Provincial Law Gazette No. 4/1990; Upper Austrian Building Code 1994, Provincial Law Gazette No. 66 as amended in the promulgations of the Provincial Law Gazette Nos. 5/1995 and 93/1995, Upper Austrian Spatial Planning Law 1994, Provincial Law Gazette No. 114/1993).

All matters coming under nature conservation and the provision of funds are co-administered by federal and provincial authorities. The Act on Water Law of 1959 and the Forestry Act of 1975 (Federal Law Gazette No. 440) apply throughout Austria and include conserving, defending and regenerating measures relating to the landscape-shaping elements of water and forest. Otherwise, the comprehensive protection of the Hallstatt-Dachstein cultural landscape is subject to the 1995 Upper Austrian Nature and Landscape Conservation Act (Provincial Law Gazette No. 37), its buffer zones are subject to the 1993 Salzburg Nature Conservation Act (Provincial Law Gazette No. 1/1993) and the 1976 Styrian Nature Conservation Act (Provincial Law Gazette No. 65/1976).

The legal framework of the Upper Austrian Nature and Landscape Conservation Act encompasses, inter alia, the protection of bank zones stretching 500 m deep into the land and designates landscape conservation zones, protected parts of a landscape, nature reserves and individual natural sites. A provincial regulation of 1963 (Provincial Law Gazette No. 25/1963) is of particular importance to the proposed zone as it declares the central karst mountains of the Dachstein group with their glaciers, barren land and the high alpine flora a nature reserve, and also declares the *Koppenwinkel* a nature reserve (Provincial Law Gazette No 9/1978) and the *Gosau* lakes a nature reserve (Provincial Law Gazette No. 9/1965).

General protection measures concerning the cultural landscape as a whole are defined in the Alps Convention ratified by the Alpine countries Germany, France, Italy, Liechtenstein, Switzerland and Austria on 7 November 1991 in Salzburg.

In addition to the measures designed to maintain the cultural landscape, also the right of public use of the natural space is guaranteed by law. For cultivated zones and forestry areas Austria has the so-called "right of way", i.e. public access to the recreation areas provided by nature. In this respect the natural environment of the Hallstättersee, the caves, woods, etc. are accessible to the public as are the architectural and cultural monuments of the market town and the salt mines.

That the quality and quantity of the high monument density has been preserved to this very day is due not only to the continued existence of salt mining or the spatial constraints upon land development but also to the historic awareness of the population. People are actively involved in the maintenance of original settings and architectural traditions. This is how preservation has become an issue of public interest. The attitude is also illustrated by the financial assistance provided by federal, provincial and local authorities. The region of the Hallstatt-Dachstein cultural landscape boasts a regional planning and a regional management plan that prevents any further development of mass tourism and any hazard to the mountain landscape. The future preservation of the Hallstatt-Dachstein/Salzkammergut cultural landscape is thus ensured by a) the provincial governments of Upper Austria, Salzburg and Styria, which are bound by their legal and technical instruments to pursue constant control and maintenance as well as the policies necessary to conserve the cultural landscape to the extent mentioned above, and b) the monument protection afforded by the Austrian federal government, which guarantees the maintenance of the monuments and sites situated in this zone.



### 3. CULTURAL HERITAGE IN THE HISTORICO-CULTURAL LANDSCAPE

#### 3.1 Archaeological heritage of the Hallstatt region (Figures 4–14)

Hallstatt, set in the Upper Austrian lake district known as Salzkammergut, justifiably claims world-wide fame not just for its scenic beauty but also as the site of prehistoric finds. It is particularly two places that have yielded major finds: the necropolis (Fig. 4) that gave the Hallstatt culture its name, and the salt mine (Fig. 5). Both are located high above the present market town of Hallstatt in the inaccessible Salzberg valley, and they are joined by a causal relationship: salt mining provided the economic base for a wealth which found its expression in an abundance of burial offerings in the graves.

Large-scale salt mining was already an established industry in Hallstatt in the middle of the Bronze Age. Then the brine spring was caught in large deep basins and the water boiled in special vessels. The ceramic material used for these vessels is found only in Hallstatt and Bad Reichenhall, another ancient salt mining town.

Right at the start of modern mining, workers must have come across traces of their predecessors' labour in the underworld, naming them *Heidengebirge* ("Heathen Hills"). So far, more than 60 underground sites have been discovered, primarily on three spots known as Western, Northern and Eastern Group respectively. The groups are viewed as consecutive and independently worked mines.

Salt mining in Hallstatt started towards the end of the Bronze Age. Steep pits were driven down to extract the salt rocks, applying a method on loan from copper mining and not adapted to the features of a saline deposit. Copper miners had to follow the seam and cut wide, deep shafts that sloped with the mineral vein. The same happened in the Northern Group of the Hallstatt mine even though the more or less homogeneous deposit would have permitted other methods. Major find sites in the Northern Group are the *Appoldwerk*, where workers cut across an ancient shaft in 1879, and the *Grünerwerk*, where a large system of shafts and trial pits was investigated in recent years. The largest known shaft width is 17 metres (*Flechnerwerk*), the lowest depth is 215 metres below ground (*Colloredokehr*).

At all exposures of the Northern Group – to the extent known – the old cavities were filled in with very fine sediments. The material, slipped in from the surface, indicates that the late Bronze Age mine had been shut down systematically and over time filled up with sediments. The closure was probably due to events external to Hallstatt, perhaps trading routes blocked by fighting or political events or a slump in sales.

Salt mining in Hallstatt, however, was not suspended for long. Production started again already in the 8th century B.C., although miners now developed a new district (the Eastern Group) and employed a fundamentally different method. They still strove to reach the body of salt through steeply slanting shafts with as little detour as possible; but once there, they drove almost horizontal drifts to mine the salt. One site yielded some interesting details: through some fortunate circumstances, an ancient opening

was preserved at the *Stügerwerk* (Fig. 6) which clearly shows that a horizontal tunnel was first driven and its roof raised at various points so that several crews could work at the hanging wall simultaneously. The broken material was no longer conveyed but remained in place, and the floor rose at the same extent as the roof, guaranteeing that the working level would stay the same. Efforts were made to mine larger rocks, which was achieved by the following method: curved channels facing each other were carved and linked by a short central channel to form a heart-shaped structure which was then cut out in whole. Tests using emulated tools found that a medium-sized structure could be shaped by a crew of two in about nine hours; at the tests, however, it was not possible to cut out the halves of the heart-shaped structure in one piece although the method appears useful only in the light of this goal. But a piece found in the *Stügerwerk* shows that it was basically feasible. The prehistoric miners must have used a trick that we have not yet discerned. As a consequence of the mining method, the roofs and side walls of the prehistoric section in the *Stügerwerk* are covered with heart-shaped cutting traces – rows of pick-axe marks. Similar marks were also found in the *Katharina von Edlersbergwerk*.

Finds give us a clear idea of the tools used in the Eastern Group: they were bronze lobed pick-axes with a short, thick handle sharply tapering in the upper third. The head is large and lobe-shaped, the prongs are short, thick and conical. The handle's tapered shape must have caused considerable springiness in the pick-axe. The mines were lit with wide, very flat splints. At working level, large fires appear to have been kindled, as is evidenced by charred logs. Digs at the salt dilution works yielded broken pieces of large clay bottles with tapered necks and a beech cooking spoon encrusted with pap – proving that the large fires were also used for cooking.

The miners wore clothing made of fur or leather and carefully woven woollen fabric. On their heads they had pointy caps with the fur worn inside and berets which were made by pulling at the edge of a circular piece of fur. Their shoes were made of a single piece of leather. The heel was sewn with much care, while the three lobes of the front and sides were folded and tied with a string. The sacks used for hauling, also found in the Eastern Group, were similarly characterised by practical thinking. The hide of a large animal was skinned without an abdominal incision and sewn together at the back. The neck was used as a filling funnel, the stumps of the front legs served as handles. A second model had its neck sewed together and fitted with a loop. This model was filled from below, closed by folding and – probably – carried with two belts slung across the shoulders: the original model of an alpine rucksack (Fig. 7).

Work at the flourishing mine in the Eastern Group was terminated abruptly by a local accident, when a landslide, probably laying waste to the entire alpine valley, penetrated deep into the mountain through the air shafts. The disaster appears to have killed the miner whose body was found in the *Kilbwerk* in 1734 and who attained posthumous fame as the "Man in the Salt". It probably happened in the middle of the 4th century B.C. when the necropolis became disused. The survivors attempted to get the mine back in operation, driving new air shafts (*Katharina von Edlersbergwerk*, prospecting in the *Christina* tunnel), but their efforts were not crowned with success. The settlement was moved to the Dammwiese, a meadow at the southern foot of the

Plassen, where no repetition of the disaster was feared, and a new district was opened up: the Western Group. The highest-lying of the three groups, it became the first to be mined in modern times. As a consequence, this is where archaeological sources are worst, with few finds and usually just short references to the *Heidengebirge* in the work reports. Nevertheless the number and location of finds indicate that the mine was successfully worked for a long time.

The necropolis, second archaeological dig in the Salzbergthal, gives us evidence that the pains and risks of salt mining were found to be worthwhile. There is hardly any other place which yielded finds of similar quantity and quality (Fig. 8). The Hallstatt necropolis was discovered by master miner Johann Georg Ramsauer in 1846. He was the first to recognise the graveyard character and decided to start a dig. By 1863 he had excavated 980 graves and documented them with the support of the Museum Franciscum Carolinum in Linz and the Vienna Museum of Art History (Fig. 14 ab). Ramsauer thought that the dig was exhausted, but his successors were able to discover another 290 graves. Friedrich Morton dug up 62 more graves in 1937–39, which had been the last to be filled. A penstock laid through the Salzbergthal in the last two years unearthed the – so far – last graves. They provide an indication of the wealth of pottery which must have been there and was missed by the digs of the previous century.

Ever since the discovery (the first publication appeared in 1848), scientists have been working to analyse and interpret the abundance of finds. The first comprehensive presentation was furnished by Eduard von Sacken. Moritz Hoernes, who first inventoried the prehistoric department of the Vienna Museum of Natural History, where the finds were brought, and who in the course of his work acquired an intimate familiarity with the material, attempted an in-depth analysis. He selected 240 graves, categorising them in two stages and breaking them down into men's and women's graves. In his opinion, the composition of the necropolis was perfectly typical. Karl Kromer, who finally did the full presentation (a task frequently demanded and attempted) in 1959, arrived at an entirely different conclusion. He found a clear predominance of men's graves, inferring a very specific population structure governed by the purpose of the settlement. According to him, the necropolis was filled in line with distinct rules, with graves furnished with arms encircling those without arms, so that the buried "warriors" continued faithfully to do their duty of protecting the community against enemies even beyond the grave. His theories were fiercely disputed but also used as underpinnings for further speculation. Thus, Imma Kilian-Dirlmeier accepted the specific population structure but still views the mingling of rich and poor, young and old graves as an indication that those associating in life wanted to continue their closeness after death. Systematically pursuing this idea, she guesses that communities interested in salt mining sent working parties to Hallstatt who had sections of the necropolis allotted to them. According to her, the necropolis was thus structured not by clan or family, nor by social status, but rather by provenance. Recently, Frank Roy Hodson reconsidered the old model developed by Hoernes, believing that, on the basis of his computer analysis, he can see graves of men, women and children.

The Hallstatt necropolis is at the entrance to the Salzbergtal valley, at the steep slope of the Niederer Sieg. Estimates put the number of dead originally buried here at 2000, but only 1270 graves are under museum administration and open to research today. About half of the dead (45%) were cremated before burial. Nevertheless more than 70% of the bronze vessels – surely an indication of the dead person's wealth and power – were found in cremation graves (Fig. 9). Cremation burial thus was reserved to a higher social stratum and was less dependent on the time of burial. It should be noted in this connection that the bronze vessels are not so much cooking pots but are rather connected to drinking habits, as witnessed by the large buckets used for mixing and the bowls. Similarly, weapons are found primarily in cremation graves. A special accessory for the rich graves were clay vats, described by the excavator as oval clay coffins without lids. Their incidence is so far restricted to the Hallstatt necropolis, and even there they are a rare sight. Normally, the bottom of the grave was simply levelled or perhaps compressed.

There have been repeated complaints that the documentation of the Hallstatt graves, in spite of the good quality of depiction and undisputed pains taken by the excavator, is not quite satisfactory by today's standards, harbouring many an uncertainty. Yet recently so many previously untapped sources have been discovered by a careful search that there is a fair chance of clarifying many issues. But an irretrievable loss was caused by Ramsauer when he disposed of the skeletal remains and clay vessels – digging for precious antiquities as dictated by the spirit of his time – as being shabby and therefore useless. The more valuable are the few clay vessels that have survived, a pointer to the splendid variety that was lost.

Ramsauer was also frequently reproached for leaving finds to celebrity visitors. With the Vienna imperial court resident in Bad Ischl during the summer months, the Hallstatt digs were soon becoming a popular destination for excursions. Emperor Francis Joseph visited the site several times. As a mine employee, Ramsauer was not in a position to refuse requests for finds, may have felt flattered even – and many a find was lost. Yet in many cases Ramsauer at least recorded the find in his protocol and had reproductions made for major pieces (as was the case with the cattle figurines) (Figures 10, 11).

The Hallstatt necropolis was mainly filled in two periods: the older one in the 8th and 7th centuries B.C. and the younger one in the 6th century B.C. A more detailed categorisation in line with the Southern German chronology is not fully feasible. A few graves demonstrated that the graveyard was still used in the 5th and early 4th century B.C. The main phases (known as "*Hallstatt C*" and "*Hallstatt D*") can be excellently visualised by the graves furnished with weapons, because of a change in fighting techniques. Typical for the older phase was a long cutting sword made of bronze or iron (Fig. 12), which later changed to a short dagger with antennae (Fig. 13), which probably did not play much of a role in actual fighting but is by many experts perceived as a symbolic weapon marking out the leader, a theory bolstered by the magnificent workmanship of some specimens.

An iron sword from grave no. 573 serves as an example for the far-reaching trading links of the time. The hilt and pommel are cut from ivory and richly inlaid with

amber. Neither material was indigenous to the region where the sword was almost certainly made. The ivory was probably imported from Africa, and the amber from the beaches of the Baltic Sea. Trading over large distances was not restricted to raw materials, but extended to finished products. The glass jars found at the Hallstatt necropolis (actually the oldest glass vessels to the north of the Alps) were manufactured around *caput Adriae*, an area which also yielded the bucket lid in grave no. 696. The type of figural representation is typical for the Este region in Upper Italy.

Even people appear to have come from afar. Markus Egg pointed out that the furnishings of the man buried in grave no. 259 were largely similar to those of a man lying in Vace/Slovenia. Brisk trading with this region is evidenced by numerous objects, e.g. the many pieces of armour found in the older weapons graves.

When we attempt an overall assessment of prehistoric Hallstatt, visualising life in the narrow valley, mining experts will tell us that it probably was a well-considered and strictly managed organisational structure. "Laborious burrowing" alone certainly did not enable men to do down 300 metres below ground and keep pits open for centuries. Recent digging has shown that mining was very extensive. Thus at the *Kilbwerk*, gravelly *Heidengebirge*, i.e. bottom settlings, was exposed which had a substance of three metres without reaching the top or bottom. Recent excavations at the salt dilution works supplied evidence of a prehistoric pit with a clearance of 15 metres. Such a production-driven enterprise would not have depended on traders passing through by chance, especially since Hallstatt probably had to rely on outside supplies. It is thus likely that they themselves organised the salt transport. Trading in the vicinity appears to have been done by pack animals and predefined counterfreight, as suggested by Ludwig Pauli for the trade between Hallein and Bohemia; it certainly was not an uncontrolled chance business.

It is more difficult to find out the reach of Hallstatt at the height of the culture that took its name. It is noticeable that the place is included in almost every map showing the range of the Hallstatt culture: maps of western incidences indicate it as one of the easternmost sites while on their eastern counterparts it is one of the westernmost sites. The intense ties to the south and south-east have already been noted. It appears that Hallstatt was linked by trade directly or indirectly to almost the entire culture.

In the valley near Hallstatt, archaeologists are still faced with major challenges. Current work concentrates on the salt mine because modern miners have already penetrated to larger depths beyond the reach of prehistoric miners and access to the few underground sites still open today cannot be ensured for an unlimited period. The work is thus of an emergency excavation type that is performed under pressure of time. The situation is aggravated by the difficulties of archaeological mining and the high costs associated with it. The fact of prehistoric pits being of a rambling type excludes short-term examinations and quick results. Findings so far have provided answers to some questions but raised new ones just as quickly. The reconstruction of the mining technique in the Northern and Eastern Groups is largely based on assumptions, still to be confirmed by excavations. The preliminary chronological interpretation similarly needs to be verified, although it is highly likely that salt was mined in Hallstatt

throughout the last millennium B.C. It can thus be concluded that many surface finds are still awaiting discovery. Houses and graves of the late Bronze Age, the settlement and graves of the Eastern Group, and the graves of the people who lived on the *Dammwiese* and worked in the Western Group are still hidden in the narrow valley. Many a discovery may still remain buried in the ground to surprise future archaeologists.

Romans too left their traces in Hallstatt. Although no evidence of Roman mining has yet come to light, it is difficult to find any other reason than salt for their massive presence in this remote spot. The Celtic mine of the Western Group may have continued to operate far into the Roman era.

The Roman settlement was located in the Echerntal valley, at the foot of the sunny Echernwand mountain face. The extensive *vicus* included all the blessings of Roman civilisation: window panes made of glass have been documented as well as hot-air heating systems and luxury tableware from the Rhine. The Roman cemetery has not yet been fully explored, and rich archaeological horizons can be found in the cellars of modern houses. Recently a Roman layer was discovered in the *Markt* quarter on the debris cone of the Mühlbach rivulet. Even here in the valley, the soil of Hallstatt has not yet yielded all of its secrets.

### **3.2 History and development of Hallstatt in the last 2000 years**

The history of Hallstatt and its vicinity has been a history of salt mining ever since the first written records were made. Salt mining has dominated all walks and spheres of life and their architectural and artistic expressions. The rich salt lodes also explain the special historical position assumed by the Salzkammergut and its salient centre of Hallstatt among Austrian provinces.

No reliable information has yet been obtained on whether salt mining continued in the early and high Middle Ages, but sources are firm again from the mid 13th century that salt mining took place in Hallstatt. A decisive event for the "birth" of the Salzkammergut was the marriage between Duke Albrecht (Albert) I of Habsburg (German king from 1298) and Elisabeth of Tyrol who was given, as a wedding present, the inner core of the Salzkammergut, the so-called "Ischlland", in c. 1286–90 (today approximately the territory of the Ischl district and the Styrian Ausseerland).

As sovereign, Elisabeth signed a deed in 1305, together with her son Rudolf (1281–1307, duke of Austria from 1298), which regulated the title to the salt mines previously held by the Traunkirchen monastery and which was the first record of the name of "Hallstatt" (derived from the Western Germanic word *hal* for salt and the Old High German word *stat* (settlement)). After her husband's death, Elisabeth devoted herself more fully to organising and re-arranging the salt business, as documented in three patents of 1311. With the monasterial title finally commuted in 1312, salt mining came

under the direct and exclusive rule of the Austrian sovereign, an ownership which soon put its bureaucratic stamp on the business.

The deeds of 1311 recorded conferral of the right to hold markets in Hallstatt and included the first structural guidelines that governed the Hallstatt region economically for the next two centuries. They also created a class of citizens unique in Europe: the *Salzfertiger* or salt makers, a limited number of privileged burghers, usually innkeepers and merchants, who were responsible for drying, packing and selling the cart-loads of salt assigned to them. Their estate is reflected architecturally by a special type of house, the *Salzfertigerhaus*, which can be found primarily in Hallstatt and Bad Ischl.

The ascendancy of salt mining went hand in hand with forestry. Large quantities of timber were required – as fuel for the salterns and also to convey the salt on rafts and boats. Hallstatt had been extracting salt from the mountain since time immemorial – and in this way was clearly distinct from other medieval salt operations which concentrated on refining natural brine springs – and tunnelling created a large demand for timber. A record of 1478 provides the first mention of a "head forester" appointed to manage the forestry operations.

An indication of accelerated salt mining activities is the settlement on the debris cone of the Mühlbach. The first salterns were built directly in the line of fall from the high-lying Salzberg valley, and they were fed with brine through timber piping. In its surrounding, the core of Hallstatt was developed as a planned settlement for the workers around a triangular market square.

In 1494, a patent by Emperor Maximilian I granted Hallstatt additional market town rights, specified marketing regulations and conferred a coat-of-arms on the market town. In the course of his progress through the Salzkammergut in 1504, Maximilian I passed through Hallstatt. His visit is commemorated by a stone indicating where the emperor rested on his way to the Rudolfsturm lookout.

Salt shipping on the Traun river received a major boost by a sluice built (1511) in Steeg at the mouth of the lake. It is still existent, largely unchanged in form and function, next to an imposing inn of about the same age. The notable engineering feat and other river training structures to improve navigation of the Traun got their inceptor Thomas Seeauer elevated to the nobility.

Starting in 1514, Maximilian I took another step towards "nationalising" the salt mining business which, while subject to the sovereign in general, was yet operated in many of its particulars by independent burghers bound by lease contracts. The business being one of the most profitable lines, the sovereign naturally strove to eliminate private participants, restricting the burghers' autonomy in order to secure all of the revenues for his own coffers. In 1514, his agents thus began systematically to terminate and redeem all liens granted to private citizens. The boom initiated in the late 15th century came to its climax in the 16th century under the guardianship of the state, and it bore rich fruits for the arts and architecture of Hallstatt.

A *Erste Reformationslibell* (first reformation libellus) dating from 1524 specified the organisational structure of the – by now fully nationalised – salt works. It revoked existing rights of burghers and conferred them on about twelve newly appointed

*Salzfertiger* families. It also introduced controlled forest management and integrated the forests of Goisern and Gosau to supply timber to Hallstatt. The second libellus of 1562 supplemented the earlier rules with a view to increasing production to meet the greater demand for salt. The third deed of the libellus series was issued in 1656.

Like the Traun river training scheme, construction of the brine pipeline was an outstanding example of Renaissance engineering. The brine extraction capacity by far exceeded the processing capacity of Hallstatt salterns so that under Emperor Rudolf II in 1595, work started for a pipeline to feed brine to the salterns at Ebensee which could handle much greater volumes. In a first stage, the wooden pipes were run to Bad Ischl, where the local salt mine was integrated and linked. The line to Ebensee was completed in 1613. For Hallstatt and its economic situation, the technical innovations once again led to an extension of its mining operation.

Modelled on the Traunkirchen procession staged by the Jesuits, the Corpus Christi procession was first introduced in 1623. Involving flower-decorated boats floating on the Hallstätter See, the lake procession has since been repeated annually, an important element of the cultural heritage of the Salzkammergut.

The Reformation period brought with it political and social upheaval, accompanied by often fierce conflicts, especially in the Salzkammergut. The Protestant faith found numerous adherents among miners and forest workers, who in taking on the new religion revolted against the Catholic authorities. Conflicts in the inner Salzkammergut reached their culmination point by the end of the 16th century; in Hallstatt too, a majority of the population put up active resistance to counterreformatory measures. Their attitude caused them to lose the market-town rights temporarily in 1601; their patents were reconferred in 1628. As a result of repeated bans by the sovereign and emperor against the exercise of the Protestant faith and banishment of Lutheran preachers (i.a. in 1624 by Emperor Ferdinand II), the faith continued to flourish secretly; as late as 1734, several Protestant families were expelled from the country. It was not until Emperor Joseph II published the Edict of Toleration in 1781 that Protestants were allowed the free exercise of their faith.

A decisive turning point in the development of the market town since its economically driven origin in the 15th and 16th century was the fire of 1750. The devastating destruction and damage of the core area provided the momentum for a late Baroque phase of renewal which still characterises the architectural and visual appearance of the place. As an important consequence of the fire, the salterns and administrative buildings were removed from the centre and rebuilt in the southern quarter of Lahn near the inflow of the Waldbach stream after 1750.

In the course of renewal works at the brine pipeline between Hallstatt and Ebensee, the *Gosauzwang* barrier was erected to bridge the Gosautal valley in 1757 (Fig. 17).

The 19th century started with another boom time for the salt industry. Production was increased through the exigencies of politics which required money to finance the war against France. Peace was immediately followed by severe production cutbacks and layoffs; harbingers of the economic decline of the salt mines that was to come. Technical innovations in the late 19th century such as electricity (own power



generating plant in 1896; mines electrified in 1897) and a train link (1877) which allowed coal to be delivered) brought about the last major building phase for the Hallstatt mine.

But while the salt mines gradually diminished in their importance for the economy, nature and its treasures lost nothing of their value and standing for the Salzkammergut. Where once the economic and cultural development of the region had been driven by salt, its decline went hand in hand with the germination of a new cultural and economic factor, based once again on a natural resource, but this time in its aesthetic dimension.

Originally it was the Dachstein massif which primarily attracted visitors to its alpine setting and drew public attention in the course of the 19th century fuelled by two events: a visit by Archduke Charles to Hallstatt in 1812, and the first ascent of the Hoher Dachstein by Peter Gappmayr in 1832. One of those who spread the fame of the region was Dr. Friedrich Simony (1813–96), a natural scientist who focused his geology and glacier studies and documentations on the Dachstein massif and its surrounding. The first owner of the chair of geography at the University of Vienna (1856), he disseminated his research findings to a global scientific forum.

His friendship with Friedrich Simony caused Adalbert Stifter (1805–68), major Austrian writer and first Upper Austrian *Conservator* (head of the heritage preservation office), to take an interest in Hallstatt. Stifter's repeated stays after 1834 were echoed in his literary oeuvre which has given him a firm place among Austria's greatest authors. His novella *Der Bergkristall* makes direct reference to Hallstatt and the Dachstein glaciers, erecting a lasting monument to Hallstatt in world literature. The picturesque place wedged in between rock and water makes for a repeated motif in others of his novels and stories (*Der Nachsommer*).

Other prominent visitors arriving on the first wave of Salzkammergut tourists were Franz Grillparzer (1791–1872), a major Austrian dramatic poet, and poet Nikolaus Lenau (1802–50).

Hallstatt, its lake and its mountains were preferred subjects of almost all the painters of the Austrian *Biedermeier* period. Landscapes of the region form part of the oeuvres of painters such as Ferdinand Georg Waldmüller, Jacob, Rudolf and Franz Alt, Wilhelm and Franz Steinfeld, Ernst Welker, Friedrich Gauermann, Franz Reinhold and Thomas Ender.

Another factor which directed the interest of a broader public to Hallstatt was the first excavation phase in the Salzbergtal (1846–63) and its sensational finds which rank among the key discoveries of archaeology. They were depicted by Hallstatt's own Isidor Engl (1832–1918). As an expression of a highly distinct culture in the early Iron Age, the era was given the name of "Hallstatt culture".

A second, systematic excavation phase set in under Isidor Engl in 1871; among the notable later digs, those of the Grand Duchess of Mecklenburg (1907) and Dr. Friedrich Morton (1937–39) should be mentioned.

From the early 19th century, Hallstatt and its technical salt mining installations were a popular destination for day trips by spa visitors and summer guests from Bad Ischl (several excursions by the newly married imperial couple Francis Joseph and Elisabeth are reported). By the mid century, several facilities began to be added to improve the local tourist industry: the first hotel was built in 1855; brine baths were introduced in the 1860s, modelled on the Bad Ischl spas, to attract longer staying spa guests; a line steamer for passengers travelled the lake on a regular route from 1862.

A land route to Hallstatt was developed rather late (1875), by building a branch road from an existing road running to the Gosautal valley. The opening of the "Crown Prince Rudolph Railway" between Attnang and the Ennstal valley in 1877 linked the inner Salzkammergut to the dense railway network of the Austro-Hungarian monarchy. Hallstatt was given its own railway station in 1881, which is still situated across the lake and reached by a liner.

Benefiting from the novel means of passenger transport, the *Sommerfrische* institution (summer holiday) flourished in Hallstatt during the *Gründerzeit* period towards the end of the 19th century. As a result, more hotels were built after 1884, several summer villas were added after 1886, and an archaeological museum opened in 1889.

A royal school for wood and marble working (*K.K. Fachschule für Holz- und Marmorbearbeitung*) was opened in 1873. Together with the *Hallstatt-Keramik* workshop (founded by Prof. Gudrun Baudisch-Wittke in 1946), it keeps Hallstatt in the public eye as a centre of art and preserver of traditions in the arts & crafts.

Accelerating motorisation was countered by tunnels high above the market town, in consequent continuation of the concept of maintaining the attractiveness and lifestyle of the central market town by restricting private and through-traffic as widely as possible.

Following the discontinuation of local salt production in 1846, the Hallstatt salterns were finally shut down in 1965. With the salt mines changing from an operative business into a major element of the tourist industry, Hallstatt has developed into a tourist centre of world-wide fame in the second half of the 20th century.

### **3.3 Historical buildings in the central area and in the Lahn quarter**

#### **Description and characteristics (Figures 15–38)**

The splendid natural backdrop grants but a small stage to the architectural evolution of human settlements between the lake and the abruptly rising rock face. The desire to make optimum use of the restricted space is signalled by the narrowly staggered houses of a core area which, Gothic at heart and extended in the Baroque, has been preserved in its striking silhouette and closed development (Figures 15, 16, 18, 21–27, 28, 30).

Viewed from the raised vantage point of the *Rudolfsturm*, the inner market town can be seen in its basic structure: the Mühlbach debris cone, projecting as a round peninsula into the lake, carries the actual market town. The houses of the burghers and

artisans, late Gothic in their core, rally in close formation around a triangular market square. Fingers of timbered boat-houses fan out into the lake. Hovering above the square, former mills, hemming in the waterfalls, cling to the precipitous rock. A 16th century house of commanding presence on the south, and, in a raised position, the mighty complex of the Catholic parish church on the north act as standfasts and cornerstones of the inner area. Adjoining these pivotal points defined by nature and underlined by urban planning, houses spread along the arterial roads, following the coast line in witness of the rapid growth experienced by the Gothic market town: to the north extends a line settlement known as *Im Römischen*, mostly stemming from the 17th and 18th centuries; to the south the late Gothic core widens along the *Seestrasse*, a street laid out much later, and the irregularly running *Friedrich-Morton-Weg*. The *Seestrasse* was not constructed until 1890 (replacing a boardwalk projecting over the lake in front of the houses), connecting the inner area with the Lahn quarter.

Houses in Hallstatt are typically built in a rather narrow and tall manner, to make the most of the restricted space and in recognition of the sloping location. The lower storeys are of masonry and vaulted inside, carrying upper storeys constructed of logs, the prevailing system in the region. Only a few instances of the typical flat saddleback roof covered with boards or wood shingles have been preserved.

The houses in the centre and along the *Friedrich-Morton-Weg* date back essentially to the construction phase of the 15th and 16th century which was fuelled by the organisation and upswing of the salt operation. A turning point in their appearance came with the fire of 1750 and the Baroque reconstruction and conversion.

The southern quarter Lahn (or In der Lahn), clearly demarcated from the main town by its location at the entry of the Echerntal valley, received its architectural appearance only in the 18th century, especially after the fire. Among the buildings erected after 1700 and shaping the landscape are the Calvary Church, finished in 1711, the Baroque almshouse and chapel (from 1713; today housing the mine administration), and the imposing mine office (1751). In the late 19th century villas began to interrupt and disperse the formal-industrial character of the place. The Echerntal valley itself is dedicated to farming.

The Dachstein region around Hallstatt features one of the most important continuously operated salt mines in the Central European mountains, an industry which gave a major impetus to the European economy for many centuries.

Thanks to its geographical location, the historic settlement of Hallstatt is a unique example of a Gothic mining town, whose basic structures are still clearly visible, later redone in the Baroque taste after a fire in 1750. In spite of the place's natural remoteness, its main representative buildings are firmly included in a network of Austrian references. Thus the parish church merges architectural traditions of Upper Austria, Salzburg and Styria; its late Gothic Lady altar is a milestone of medieval wood-carving in Austria; the late Baroque mine office exemplarily anticipates Classicist tendencies.

The fact that the great density and quality of the monuments could be preserved until today is due to the historical continuity of the mining operation, but also to the

naturally limited amount of space suitable for construction. The population itself preserves a sense of historical awareness, actively contributing to the preservation of old substance and architectural traditions, which has become a general concern promoted and supported by the local, provincial and federal authorities.

Another salient factor of the abiding historical value is supplied by the picturesque qualities of the Salzkammergut stemming from its natural and man-made features, the discovery and artistic formulation of which was a "pioneering deed" of major painters and writers of the *Biedermeier* period.

### 3.3.1 Notable buildings: a survey

With its great density of listed buildings and historical aspects, the market town of Hallstatt is a first-ranking monument all on its own. Below a description is given of some distinguished buildings characterised by their extrao

rdinary importance for history, art or culture.

#### a) *Ecclesiastical buildings*

Regardless of the angle chosen, the view of the town centre is always dominated by the pointed spire of the Protestant church and, even more, the impressive building of the Catholic parish church. Together with St. Michael's Chapel, the graveyard and the little Mount of Olives Chapel, it forms a terraced close enthroned on mighty fortress walls high above the lake and market square.

#### **St. Mary's Roman Catholic Parish Church (Fig. 23)**

References of a church on the site can be found in 12th century deeds. A previous structure in the late Romanesque style was consecrated by Sufragan Hermann of Passau as *Maria-Hilf-Kirche* in 1320. The massive square southern tower with round-arched triforium galleries serving as belfry windows still remains from the Romanesque construction phases.

Following a – probably long – construction period in the last third of the 15th century, the new church in the late Gothic style must have been almost completed in 1505, as evidenced by a letter of indulgence to finance the building and a charter of foundation for an altar. The latest construction date known to us is the inscription of "1519" on the southern entrance portal marking final completion of the work. Reflecting the social structures of the early 16th century, the two-bayed choir provided for separate altars for the burghers and miners.

The fire of 1750 did little damage to the church, so that the Baroque additions were limited to the roof and the striking, multi-tiered spire.

Purifying restoration work in the late 19th century aimed to restore the ideal state assumed for c. 1510. The latest renovation work was done in 1966–67.

Its outer appearance is characterised by the high-rising tower and large, broadly based nave which appears to have fused with the rock face. The high, steep roof and

noticeable late Baroque spire are clad with the larch shingles that are typical of the region. The choir, facing east towards the lake and lit by slim pointed arches, appears from outside without an apse, as a closed block that dominates the setting, with the massive tower and entrance to the south and an oblong chapel on the north side. The choir façade is centrally decorated with a late Gothic fresco of St. Christopher, retouched several times. The image of their patron saint was clearly visible to the boatmen on the lake and today makes for a vivid reminder of the importance of navigation on the Hallstätter See.

A splendid, highly detailed marble portal of 1519 distinguishes the southern entrance front; frescos above the portal, dated 1490 and 1507, show two stations of the way of the cross. They are the remarkable work of an unknown master of the Danube School.

The wide interior of the hall church consists of two units of distinctly different architectural features: the square nave and organ loft has plain stellar ribs in its four vault-bays carried by a slim central support; in a delicious contrast, the two-bayed choir, crossed by three round piers and flooded with light, is fitted with ornamental ribs in a diamond vaulting.

One of the most prominent and salient works of arts in the possession of Hallstatt is the late Gothic winged altarpiece from the purported Lienhard Astl workshop. Ever since the signature "Lienhard Astl" was discovered under the circumcision relief in c. 1840, art historians, who first misread it as the master's signature, have used it as a provisional name for a workshop in the Gmunden region to which many carvings in the Salzkammergut are ascribed. The altarpiece, placed in the southern choir apse, in addition to giving a name to a major workshop, is deemed the artistic highlight of its production. By its style as much as by the date of the church's completion, the altarpiece is a work of the 1520s. It was last restored in 1985.

Its iconographic programme identifies the altarpiece as a Lady altar. The main shrine is dominated by a statue of the Madonna, flanked by St. Catherine and St. Barbara and embedded in a rich architectural frame. The shrine's guardians, St. George and St. Florian as tradition prescribes, are usually hidden behind the open pairs of double wings. The eight flat-carved reliefs of the inner wing pair depict scenes from the Virgin Mary's life; the outer wing pairs make reference to the life of Jesus in another eight panels. The truss frame, dissolved into fine pinnacles, is furnished with ten figurines depicting the Saviour and assorted saints. The three remarkable wooden sculptures, almost life-sized, of the Crucifixion (Christ, Mary and John) are part of the Astl group and are today placed in the entrance hall.

A neo-Gothic rood altar made in the tradition of the winged altar serves as the northern pendant of the famous Lady altar. It was created by students and teachers of the local woodworking school from a design by Ritter von Riewel in c. 1890 within the scope of the Gothic revival restoration started after 1888. The neo-Gothic pulpit (1905) is another product of the *K.K. Fachschule für Holz- und Marmorbearbeitung*.

A drawn-out rectangular chapel of two and a half bays joins the nave and choir on the northern side. The late Gothic rib configuration, forming a densely woven stellar pattern, points to an influence from the northern Salzburg region and is sometimes

attributed to Stefan Wultinger. Another Gothic winged altarpiece was given a secondary position in the chapel. It is a Gothic panel work of c. 1460, showing a many-figured Crucifixion in the main shrine against a backdrop of embossed gold. The vivid representation may be an indication of its origin in the Salzburg region. The insides of the wings depict saints, the four external panels show episodes of the lives of St. Joachim and St. Anna. (The altarpiece was disfigured and damaged by theft in 1987.)

A crypt to the north underneath the choir dates from 1656, with an altarpiece of 1658, serving as burial place of Christoph Eyssl von Eysslberg and his wife.

### **St. Michael's Chapel and Charnel House (Fig. 24)**

To the north of the parish church, a little Gothic church nestles against the slope. The choice of St. Michael as a patron saint clearly points to its function as a cemetery chapel. Resting on a barrel-vaulted basement, the single-span, two-bayed chapel rises to an eastern-oriented three-eighth closer. Outside, two Gothic candle houses are visible which probably housed the watch candles. One pointed-arch window holds a remarkable Gothic glass pane (c. 1440–50) depicting St. Michael balancing the souls in his scales. The diamond-vaulted hall contains several Baroque altars which were removed from other chapels and churches in Hallstatt and placed here for secondary use.

The vaulted basement became a charnel house in c. 1600 and – a unique feature in Europe – is still used for this purpose, which has given it considerable fame for this particularity. The bleached skulls stored here are marked with the names and vital statistics of the deceased and decorated with folklore paintings. The complete skeletons of whole families from several generations makes the collection highly interesting for anthropologists and has already yielded important insights.

### **Mount of Olives Chapel**

Known as *Angstkapelle*, the chapel was built in 1730, integrated in the wall enclosing the cemetery and oriented against the wall and St. Michael's Chapel. Following the model of Baroque devotional chapels, the square structure with its pyramidal roof opens on one side; its interior holds a painted and sculptured depiction of the scene on the Mount of Olives.

### **Calvary Chapel in the Lahn quarter**

At the southern end of the market town, four octagonal way-of-the-cross stations covered by curved pyramidal roofs line the road to the Baroque Calvary chapel set close to the southern face of the Echerntal valley. The chapel, an endowment of court writer and salt manufacturer Franz Georg von Sumating, was begun in 1700 and dedicated to the Exaltation of the Holy Cross by Count Lamberg, suffragan of Passau, in 1711.

The central space, formed by five sides of the octagon and a segment of a circle, has small annexes of varying height, which makes for a picturesque shingled roofscape. Its interior is dominated by a highly expressive Crucifixion group (Christ between the thieves on their crosses, with saints Mary, Mary Magdalene and John) attributed to the workshop of Meinrad Guggenbichler (d. 1723), a major Baroque sculptor.

The high Baroque structure with its vivid Crucifixion group bears witness to the Catholic revival around 1700, a spiritual movement emanating from the Jesuit monastery at Traunkirchen in line with counterreformatory intentions. The chapel built towards the end of the 17th century at Traunkirchen was the first of its kind, serving as model for a type that spread throughout the inner Salzkammergut: the life-sized, highly expressive figures of the Crucifixion groups spectacularly placed on hills realistically made of natural stone against a painted background point to an origin in the Jesuit Baroque theatre. The Hallstatt Calvary chapel is a superior example of the tradition.

### **Protestant Parish Church**

Construction of the Protestant parish church (1859–63) put a monumental mark to the end of the conflict between the Protestant and Catholic faiths that ran through many centuries, illustrating the final establishment of the Protestant religion.

The impressive neo-Gothic Christ church, begun in 1859, was raised in place of a modest prayer chapel. Its central location, mediating between the shore of the lake, the landing stage and the market square, makes the unplastered building with its tall narrow tower and pointed spire a significant element of the urban structure and its aspects.

#### *b) Secular buildings*

##### **Rudolfsturm**

The three-storied tower on a square base is situated at an elevation of 863 metres above sea level, on the wooded summit of the *Himbergkogel*, a dome with a precipitous face towards the lake and market town. It is a landmark signalling far and wide the beginning of the high-lying Salzbergthal valley that extends beyond it. The tower was built as a peel in the late 13th and early 14th centuries to protect the salt extraction facilities in the valley. According to an oral tradition recorded only later, the tower was founded by Duke Albrecht (Albert) I of Austria in 1284, who, in memory of his father, King Rudolf I of Habsburg, is said to have named it "Rudolfsturm". Other sources link the name to Duke Rudolf III, son of Queen Elisabeth, which would place its construction in the early 14th century. Apart from its fortification and defence functions, the tower was used as residence and office of the *Berghauptmann* (the regional inspector of mines) continuously from the late Middle Ages until the 20th century, first documented in the *Erstes Reformationslibell* of 1524.

Conversions in c. 1833, which also involved extensive rebuilding of the southern ancillary buildings, stripped the tower of its fortress character and, following the then

current fashion, interpreted it as a lookout tower. With the discovery of the aesthetic qualities of scenic attractions and following the dictates of contemporary villa styles, an observation chamber was put in at the top of the roof frame and painted in the romantic manner after 1833.

### **Mine Administration Building in the Lahn quarter (Figures 25, 26)**

Directly after the disastrous fire of 1750 plans were made for a new administration building to be located in the Lahn quarter, and construction began in 1751, to remove the salterns and mine offices from the centre. Prominently located at the slope and facing the lake and town centre, the stately Baroque building and the older Calvary chapel have fused into an impressive ensemble pounced upon by many a painter and photographer, often as a *repoussoir* of Hallstatt viewed from across the inlet.

The mighty square cube with a curved mansard roof has façades organised by colossal pilasters and ornamental plaster panels; the main façade is accentuated by an attached curved central gable. The simplicity and sheer functionality of the building, astonishing in view of its early origin and markedly of a Classicist trend, is of interest to art historians and architects alike. In this it is typical and exemplary of public administration buildings until the 19th century.

### **Schloss Grub**

On the eastern shore, in a corresponding position across from the market town, Schloss Grub is Renaissance in its core, enveloped in a neo-Gothic mantle. The peninsula on the foot of the *Sechserkogel* is an ancient settlement area, as evidenced by Neolithic finds, and has been settled continuously ever since, as documented by the archaeologists.

A first expansion stage is recorded for 1520, but reports of structural changes become more frequent only after Christoph Eyssl von Eysslsberg, a high-ranking mining official from Ischl, purchased the estate in 1658. The property at that time consisted of a manor-house and ancillary buildings set in extensive lands. Christoph Eyssl von Eysslsberg, of which uncountable legends are still current, is linked to Hallstatt not just by his rank in the mining industry but also by his foundation of a crypt in the Catholic parish church in the year he acquired the estate, where he was buried after dying in 1668. (His last will stipulated that his coffin be conveyed in procession through the market and on a boat across the lake on every 50th anniversary of his death.)

In 1864, Schloss Grub passed into the hands of Russian diplomat Alexander Chevkinie, who gave the building its present romantic-historicist appearance. Situated against a slope and shaped as an irregular hook, the building has its profile picturesquely emphasised by three round corner towers and a square tower connecting it to the chapel.



## Museums

During the first excavation phase in the Salzbergtal valley (1846–63), numerous valuable finds had to be surrendered to museums in Austria and abroad, but soon efforts were made to present the remaining finds in Hallstatt, near to the place where they were discovered. The increasing flow of excursionists and travellers in the second half of the 19th century provided an additional motivation for establishing a prehistoric museum. A house in the upper market area was chosen as a suitable site (today Friedrich-Morton-Weg 27) and adapted in 1894–98. In selecting the large, tall and narrow burgher and merchant house nestling closely to the rock face and dating back to the 15th or 16th century, a decisive factor may well have been its old-fashioned castle-like appearance, the result of unrendered rough-stoned masonry, which appealed to the romantic-historicist taste of the fin-de-siecle. With its outer appearance preserved, the interior was extensively renewed in 1971, to meet the demands of more modern museum presentation. Its prehistoric finds removed to another site, it harbours today a rich and varied collection on ethnic studies, regional history and natural science. Many parts of the exhibition bear the stamp of Friedrich Simony (1813–96), a geographer of importance far beyond the region, and Friedrich Morton (1890–1969), a natural scientist and author.

The wealth of prehistoric finds are now on view in the more spacious building on Markt 56. The centrally located building of a plain Baroque appearance was used for administrative purposes (court writer's office) before the mine buildings were removed to the Lahn quarter, after which it served as the Catholic parsonage.

## Small monuments

Of the many memorials and other small monuments, the following are of particular relevance to art:

A Baroque trinity column, donated in 1744 by Johann Ignaz Etzinger, salt manufacturer and councillor, commands the centre of the market square. It is furnished with high-quality sculptures allocated to the circle of artists around Josef Anton Pfaffinger in Salzburg.

The northern quarter (*Im Römischen*) features a little devotional chapel with a late Gothic Crucifixion group (c. 1510–20), another remarkable work from the "Asth group".

## 3.4 Vedutas of Hallstatt

(Figures 15–19, 27, 29, 31, 32, 34, 36, 38)

In calling Hallstatt "the most beautiful lake spot in the world", famous global traveller Alexander von Humboldt joined the ranks of many who paid homage to the place on the lake. It is only right to say that Hallstatt was among the first places of worship for tourists and culture addicts.

Spa guests from the upper middle class, aristocrats, globetrotters, travelling writers and artists – they all flocked to the Salzkammergut, to the imperial spa and holiday town of Ischl, and from there to Hallstatt, that "odd swallow's nest" at the foot of the Dachstein, at the time accessible only by crossing the lake or travelling narrow bridle paths.

*Österreichische Schweiz* (Austrian Switzerland) was the name that Franz Sartori gave to his 1813 book in which he described Hallstatt thus: "The peculiar location of Hallstatt is unique among places I have so far seen. Houses just appear to be glued to the steep and narrow shore." Waxing enthusiastic, Sartori noted that in Hallstatt "nature herself exhibits her charms". Wilhelm Raabe, on the other hand, wailed: "Stairs, stairs, stairs! Up, down, up again!", concluding that "there can't be another place in the world quite as dangerous to get drunk in".

The special thing about Hallstatt is that little has changed since. The place wedged in between the mountain and the lake, the whole picturesque veduta, has remained almost untouched (Figures 27–30). The old market town, built close to the shore and on steps of an abruptly rising slope, was able to preserve its original unique character until today. Since time immemorial, the tall, narrow houses of the miners and forest workers have dominated the scene, facing their gables to the lake, covered by pent roofs and gambrel roofs, some still shingled, walled up to the attic.

Along the shoreline, boathouses crowd closely in their effort to gain a small foothold from the lake. Interspersed torrents tumble and rush to the lake water, only just tamed by narrow embankments, brushing the bases of the houses. Towering above, virtually perpendicular slopes ascend to the celebrated glaciers of the Dachstein.

The reason for Hallstatt's picturesque location is practical and technical: From the 14th century, the settlement and its salterns were built directly in the fall line below the salt mine, in order to get the shortest possible route for the brine piping.

The little settlement drew its importance from mining on the Salzberg, which had been a going concern since the first millennium B.C. Excavations started on the Salzberg in the mid 19th century dug up a gigantic necropolis of more than 2000 graves from the early Iron Age (900–400 B.C.) with an incredible abundance of offerings, primarily weapons, jewellery and everyday-use objects made of bronze. As a result, the culture is known as "Hallstatt period", which formed its own "Hallstatt style". In 1937, a second, smaller cemetery was found which dates back to the La Tène period. Salt mining and salt making continued to shape the economy and history of Hallstatt over the following centuries. From the Middle Ages, the region enjoyed a special community status. Salt mining and – later – forestry (which produced the timber required for operating the salterns) made it exempt from the demesnes of aristocrats in the vicinity, and it was ruled by the *Hofkammer* in Vienna (which incidentally gave it the name of *Kammergut* (crown land), i.e. it was a demesne of the crown). With the title to the property remaining unchanged after 1260, the land itself was developed. Nature did not remain pristine but was improved in a sustained manner, to harvest and yet preserve its richness. While forests were plundered elsewhere, this forest enjoyed the care and supervision of the state. Forest management and – some – appreciation of

the scenic beauties combined with the pleasures of hunting and shooting, and the court's predilection for staying in the mountains.

The special tie to the imperial court began to develop an almost intimate character in the *Biedermeier* period. It started with romantic hero Archduke Johann and continued with Emperor Francis Joseph, who resided here every summer, sometimes accompanied by his wife, Empress Elisabeth. In the imperial-familial setting of the *Kammergut*, visits of monarchs, meetings with emperors, diplomatic assemblies, etc. lost their strictly functional character and were embraced by the conciliatory atmosphere of the Austrian monarchy. The Salzkammergut became a top celebrity spot.

Artists too found the ambience highly stimulating. It appears that for a time a majority of the creative powers that were assembled here came expressly to be inspired by the *genius loci*. Musicians such as Meyerbeer, Zierer or Millöcker were regular visitors. Johann Strauss became domiciled. Lehár composed no fewer than 24 operettas in Ischl. Brahms, who spent 13 summers in the *Kammergut*, drew his inspiration for his *Deutsche Tänze* from the local folk music. Stage luminaries such as Nestroy, Girardi, Katharina Schratt, Charlotte Wolter, Sonnenthal, Kainz, Moissi and Bassermann held court among an audience that could justly be styled the flower of the last occidental universal state and that bore witness to Austrian culture and tradition.

But the greatest role was reserved to the poets. Adalbert Stifter, to name but one of those who frequently visited the *Kammergut* including the likes of Grillparzer and Lenau, recorded his impressions in some of his novels, among them *Feldblumen* or *Bergkristall* which are set in Hallstatt and the caves of the Dachstein.

Next to the noble nimrods and pioneering mountaineers, it was the writers who enthusiastically advertised the attractions of the Salzkammergut to the world. While royals such as Emperor Francis I or Archdukes Josef and Johann were accompanied by a train of court painters who minutely recorded scenic sensations such as gorges, waterfalls, glaciers and spines, scholars and travelling writers prepared the intellectual ground for the landscape painters. The early 19th century saw the publication of a flow of books describing journeys and excursions which, in addition to furnishing encyclopaedic knowledge on the country and its people, gave recommendations on how to achieve optimum aesthetic pleasure. They commended views, described suitable motifs for painters, portrayed picturesque parts as being particularly profitable for tourists and artists. Painters' spots thus promoted by the writers-cum-travellers were the Königsee, the city of Salzburg or the Schneeberg region. There is a similar proliferation of object drawings of the Salzkammergut, most of them made by Joseph August Schultes, a botanist, writer and early pioneer of the region, who described Hallstatt in his book *Reisen durch Oberösterreich in den Jahren 1794, 1795, 1802, 1803, 1804 und 1808* (Travels Through Upper Austria in 1794, 1795, 1802, 1803, 1804 and 1808). Encouraged by the presence of extravagant aristocrats and bohemians, the Hallstätter See grew into a painters' corner of the first order. Thus in 1831, several travelling landscape painters chose Hallstatt as their venue: Gauermann, the Steinfeld brothers, Fischbach and Welker. Stays at such places that were already canonised by the *Zeitgeist* and regularly visited by the artists took on the character of visits to annual

trade fairs: one met one's colleagues and peers and was able to sound them out about their latest techniques and trends.

The travelling salesmen of aesthetics journeyed by post or on foot. They carried the tools of their trade in a *Ranzen*, a kind of knapsack. It is interesting to note that a small number of sites and motifs deemed sufficiently worthy of painting to cover great distances contrasted with large areas which were crossed as quickly as possible without evincing any particular interest in their charms. The *Biedermeier* painter's taste thus did not run to "the Alps" but only to specific motif constellations that were perceived as typical of the ideal and chosen like a brand name. Vivid examples of this are given in Friedrich Gauermann's diaries. In 1827, when he was still a student, he deemed the *Gesäuse*, a bare rockscape passage of the Enns river, to be disappointing, but just a few days later he was "busily" making sketches at the picturesque Strub forest rivulet, which had long since acquired a firm standing as a worthy motif. As early as 1809, writer-traveller J. A. Schultes had declared the rivulet to be "one of the world's most beautiful waterfalls" (Fig. 31). The places which were aesthetically "discovered" in the early 19th century had just a few key compulsory motifs which were constantly described, painted and gazed at. In Hallstatt it was the view from the lake towards the town, which was usually constructed as a triad: the water in the front, backed by the mighty timber forest and hovering above the waterfall roaring over precipitous rock faces. A variation on the "standard view" was the outlook from Hallstatt across the lake, as is shown by Anton Schiffer's slightly later painting (Fig. 29). They were rounded off by some *vues* of the vicinity: the Strub forest rivulet, the Gosau lakes with the Dachstein and sundry high-lying alps which offered panoramic views of the Hallstätter See and Dachstein (Figures 32–37). Particular piquancy was derived from the contrast between craggy precipices and idyllic pictorial elements such as lakes and gentle valleys; painters were striving for "lovely contrasts", the balance between terror and beauty. They appreciated the varied flora of the lake shores, the oaks, beeches and maple trees, which could be comfortably painted right from nature. After all this was exactly the point of the transition from the ideally composed landscape of Classicism to the realistic depiction of nature in the 19th century: actually finding the ideal of a real landscape. The search for "real reality" (Adalbert Stifter) instituted by the *Biedermeier* landscape painters went on at the Hallstätter See against the backdrop of an ideal setting which appeared to dissolve the classical tension between elevation and reality.

The first painter who systematically explored motifs in and around Hallstatt, spending his life on variations of them, was Franz Steinfeld (Fig. 38). He was one of the widely travelled reporters of the time, holding, i.a., the post of court painter to Archduke Anton. Here at the Hallstätter See he found not just his artistic home but also his masterpiece: his oil painting of 1824, *Am Hallstätter See*, is considered the first of the Austrian *Biedermeier* landscape paintings.

Another master of Austrian vedutas chose the place as his old age residence: Rudolf von Alt (1812–1905) settled near the lake and never tired of rendering in watercolours a setting that he had traversed as a young man with his father. Jakob von Alt (1789–1872) had been commissioned in 1823/4 to depict the alpine scene of the *Kammergut*

in a series of paintings. Twelve-year old Rudolf was permitted to accompany his father and give him a helping hand. Seen in the context of the time, their tour was something of a journey of exploration. It yielded a series of 32 paintings published in 1825 and entitled *Vorzüglichste Ansichten des k.k. Salzkammergutes und dessen Umgebungen in Oberösterreich nach der Natur aufgenommen und lithographiert von Jacob Alt* (Most Exquisite Views of the Salzkammergut crown land and its vicinities in Upper Austria, depicted from nature and lithographed by Jacob Alt). In the last sheet, recording a splendid view of the Dachstein massif with its crags and glaciers, Jakob Alt showed himself and Rudolf working to immortalise the view on paper (Fig. 34).

The shift from Classicism towards "*Biedermeier* realism" in landscape painting, a change in style as much as attitude, thus was gradual, synchronously with the "discovery" of the Austrian landscape, especially in the Salzkammergut.

Nature as the only true and proper teacher of art, and the conscientious study of nature were the key elements of the credo of Ferdinand Georg Waldmüller (1793–1865). He was one of the greatest Austrian painters of the 19th century and also the prototype of Salzkammergut painters. He first visited Hallstatt in 1831 and over the next years returned with 15 paintings which art historians agree are the undisputed apex of his career (Fig. 32).

After 1850, landscapists looked for new departures. A new generation of *plein air* painters appeared, but Hallstatt remained a challenge for them. They produced works such as *Eckermühle bei Hallstatt* (Ecker Mill near Hallstatt) by the famous Austrian impressionist Emil Jakob Schindler (1842–92), which in spite of their sketchy "wildness" sound another, gloomier, side of the scene on the lake: a rainy day, the flooded Strub rivulet – they evoke a new mood.

The confrontation between artists and Hallstatt and the Dachstein continues to this day. Franz Xaver Weidinger and Wolfgang Bucher document the taut link between nature impression and analytical symbolism in the 20th century. In studying the dark, mountain-bound lake, Bucher arrives at nightmare visions, a synthesis of nature as seen (water, rocks, crystals) and the scientific knowledge of it. In *Kristallpfahlstadt* (Crystal Pile Town) the title itself furnishes the intended associations: pile dwellers, rock crystal, salt mountain, mountain lake, water, transparency, isolation, trapping, loneliness, old age.

## **4. NATURAL HERITAGE IN THE HISTORICO-CULTURAL LANDSCAPE**

### **4.1 Fauna and flora in the Dachstein-Hallstatt region**

#### **Introduction**

The highly variegated flora and fauna dispersed throughout the Hallstatt-Dachstein region draws its support from a changing mountain landscape which reaches up to the nival belt, thereby providing for numerous small and large ecological niches.

The major forms of the Dachstein region shaping its flora and fauna are as follows:

1. the valley bottoms of the Traun, Gosau and Enns;
2. the lakes and little "ponds" in the Koppenwinkel and between the two Gosau lakes;
3. the precipitous northern flanks of the Dachstein massif which get little sunshine (large areas go without sunshine for weeks in winter) and have a high humidity level. It is these northern precipices which harbour the entrances of the caves;
4. the plateau, averaging an altitude of 1850 m above sea level;
5. the peaks framing the southern edge of the plateau, ascending for 2100 to 2993 m; while the peaks of the northern rim rise just 2125 m;
6. the impressive southern cliffs of the Dachstein massif, towering up to 900 m, the highest of the Northern Limestone Alps. Gigantic debris cones are deposited at the foot of the rock faces which stretch upwards for up to 400 m. The southern side is much drier and warmer than the northern side of the Dachstein;
7. the glaciers and their moraines;
8. the moors in the Gosau-Hallstatt region.

#### **Climate**

The Salzkammergut is governed by a suboceanically tinted climate. The rapidly approaching westerly fronts are checked in their path by the Northern Limestone Alps and forced to shed much of their moisture. The main cloud barriers in Upper Austria are Höllengebirge, Totes Gebirge and the Dachstein massif, whose higher altitudes receive more than 2500 mm in annual precipitation. Hallstatt, situated on the northern foot, collects just 1735 mm of precipitation per year, most of it in summer.

On the plateau, the snow cover remains for an average 200 days; a figure that rises to 300 at 2500 m above sea level. The mean annual temperature on the Krippenstein peak (2109 m) is 0.5°C. A noticeable phenomenon is the temperature inversion between the valley bottoms and the plateau, which is especially frequent in the winter season.

## Flora

Exhaustive mapping of the vascular plants in Austria, a project headed by Dr. H. Niklfeld of the University of Vienna, and supplementary examinations of the Botanic Working Group of the Linz Biocentre found approximately 1100 species (*Botanische Arbeitsgemeinschaft* 1996), which corresponds to about a third of the species found in Austria.

It is safe to assume that no other massif of the north-eastern section of the Northern Limestone Alps has a comparable diversity of species and plant communities, caused primarily by the fact that the Dachstein peaks are unique in that they reach into the nival belt, carrying glaciers, while at the same time extensive parts belong to the subnival belt. As a result, the mountain flora typically covers large areas.

The sheer variety of plants is depicted below, broken down by the main plant communities.

### *1. Valley bottoms*

Throughout the millennia, man has exploited the valley floors of the waterways encircling the Dachstein massif – Gosau, Traun and Enns – as a settlement and farming area, so that they have become an ancient culture area. The soil is alluvion deposited by the rivers and the remains of moraines from the most recent advance of the glaciers during the Würm. According to Simony (1853), grain was customarily grown in the Traun valley up to an altitude of 950 m and in the Enns valley up to 1200 m in the mid 19th century. Since the middle of this century, tillage farming has been retreating rapidly and grassland farming has taken its place. The forest was left standing only on unmanageable places such as very dry gravel plains, the steep slopes of moraines and swampy patches. Edges of water bodies sometimes still feature near-natural vegetation.

### *2. Lakes*

The only water body to have obvious submersed vegetation is the Hallstätter See, in the form of various pondweed species (*Potamogeton spec.*). Where the lake floor does not descend in a sheer drop right at the edge or the shore is not destroyed by human settlement, its banks are bordered by sedge (*Carex spec.*) living in community with bulrush (*Juncus spec.*), horsetail (*Equisetum fluviatile*) and mint (*Mentha spec.*).

The same plant communities embrace the Koppenwinkellacke, a pond and site dedicated as a nature reserve.

The two Gosau lakes are framed by rocks almost barren in vegetation.

### *3. Forests*

The forests in the Salzkammergut have been subject to intense management for many centuries, as they had to deliver gigantic quantities of timber to fire the salterns. Even forests in very inconvenient hauling locations were cleared over large areas, as the shortage of timber became acute by the end of the 17th century. Regeneration was

originally left to nature, until Empress Maria Theresa, in her forest regulations of 1766, mandated systematic tending and required reforestation of denuded areas by sowing seeds or planting saplings.

The history of the Dachstein forest is well documented. Until the Middle Ages, the lower-lying parts of the plateau and upper slopes of the northern precipices were covered by stone pines, spruce and fir trees, interspersed by some red beech. People at the time encouraged the larch on the higher slopes, with the result that a zone of larch and spruce trees formed which is still visible today.

Today the middle- and low-lying slopes should be covered by a mixture of spruce, fir and red beech trees, which was, however, converted into an almost pure stand of spruce trees over the last centuries.

A relatively wide zone on the plateau, at heights of 1500 to 1900 m, is taken up by a forest of limestone larches and stone pines (*Pinetum cembrae*). The forest dissolves in groves and ancient single trees, often gnarled by the wind. They are stone pines, larches and fir trees, alternating with pasture, almost barren karrenfelder and dwarf pine shrubberies. The soil is covered by knee-high dwarf shrubs, dominated by the alpine rose (*Rhododendron hirsutum*). The forest community is the most impressive sight offered by the vegetation on the Dachstein plateau.

Large parts of the plateau are at altitudes of 1700 to 2000 m above sea level. The undulating rocky ledges, polished into their round shape by Ice Age glaciers, are interspersed with basin-shaped sinkholes of varying sizes. Rock steps and flats enrich the multifaceted landscape. This is the zone of the limestone alpine roses and dwarf pines (*Rhodothamno-Rhododentretum hirsuti*). In its core, the dwarf pine (*Pinus mugo*) grows to more than 2 m in height, forming almost impenetrable thickets underneath which moss and dwarf shrubs cover the soil. With rising height, the dwarf pine grows increasingly lower, shorn by the wind to form highly compact cushion-type bushes of just a few decimetres in size. By 2150 m above sea level, only a few specimens huddle in rocky niches favoured by the weather.

#### 4. *Subalpine meadows and dwarf shrub heaths*

Differences in soil moisture and structure, inclination and exposure to the sun and wind have caused the development of varying plant communities in the subalpine and alpine belt, both of which harbour a colourful diversity of alpine plants.

#### 5. *Small water bodies on the plateau*

The eastern part of the Dachstein plateau is dotted with minute lakes held by fine-sealed sinkholes, spread across impassable terrain. Progressive filling with sedimentation has reduced their surface to just a few hundred square metres. Some of these "puddles" have metamorphosed into moors, like the one on the Gjaidalm. Many of these low moors are adorned by Scheuchzer's cotton-grass (*Eriophorum scheuchzeri*).



## 6. *Screes*

Steeply sloping screes are found at the foot of the rock faces. They are often large in size and constantly moving, especially in their middle and upper sections, as weathering supplies them with a steady shower of limestone ranging from fine grains to thick boulders.

The screes and moraines are inhabited by about 15 alpine plants that are unique to the Dachstein.

## 7. *Plant communities in the crevices*

Three plant communities can be observed on the exposed limestone rock of the Dachstein. The montane belt harbours small and rare patches of cinquefoil (*Hieracio humilis-Potentilletum caulescentis*). Nestling in the cracks of dry and sunny rock walls are *Potentilla caulescens*, *Valeriana saxatilis*, *Kerneria saxatilis*, *Globularia cordifolia*, *Carex mucronata* and many more.

Eastern Alpine cinquefoil pastures (*Drabo stellatae-Potentilletum clusianae*) are widespread on the rocky ridge of the plateau and the rim encircling it. The peaks of the Dachstein massif and the Gosau ridge have communities of rock plants consisting of just a few species of rock jasmin (*Androsacetum helveticae*). A few moss and lichen species are among the rare plants that can subsist at the borderline of life.

## 8. *Alpine pastures*

Recent investigations found that alpine dairy farming on the Dachstein plateau dates back to the Bronze Age, when it was favoured by a milder climate. Indications of dairy farming have also been found from the Hallstatt period, Roman and medieval times. We are well informed of conditions in the 18th century: thus we have records of the Gmunden salt supervisory board of 1793 according to which 37 alps were operated in the Hallstatt and Obertraun region, which comprised 92 mountain cabins and 41 sheds for animals. Altogether 1125 cattle were driven to the pastures, mostly from the Enns valley. The narrower Traun valley offered space only to small-scale farmers; most of the population earned their livelihood from salt mining and subordinated forestry. Sheep from Schladming still graze on the Upper Austrian Dachstein plateau.

The cattle caused considerable damage to the forest. They were supplemented by large herds of goats and sheep, with the result that few saplings survived their browsing. The peasants needed large quantities of timber to build their huts and fuel their fires, and they took it from the sensitive zone along the tree line, with the result that bitter clashes between forest management and animal husbandry were all but preordained. A decree of 1707 threatened the seizure of excess animal stock; and a new regulation on alpine dairy farming was issued in 1764. But matters were taken out of man's hands: the climate worsened in the early 18th century, the Dachstein glaciers advanced accordingly, and the once flourishing dairy business flagged.

## 9. *Moors between Hallstatt and Gosau*

Experts have counted and described 20 moors in the area. The largest of them, the *Grosses Leckernmoos*, spreads over 7.7 hectares. Both high and low moors can be found. The low moors typically have low sedge turfs (*Caricetum davallianae*, *Caricetum migrae*) with a rich flora of sedges (*Carex diandra*, *C. echinata*, *C. panicea*, *C. nigra*, *C. davalliana*), cotton-grass (*Eriophorum latifolium*), sheep rot (*Pinguicula vulgaris*), orchis (*Dactylorhiza incarnata*, *D. majalis*) and globeflowers (*Trollius europaeus*), while dwarf pines (*pinus mugo*) predominate in the high moors.

## Fauna

Exploration of the animal world of the Dachstein region is far less advanced than that of its flora; summarising descriptions are still lacking.

### 1. *Mammals*

Of the larger mammals, red deer, roe deer and chamois inhabit the Dachstein region. The Alpine white hare (*Lepus timidus*) is found on the plateau, as are some colonies of marmots which were released there on purpose. So far it has been ascertained that six caves at the northern cliffs serve as hibernating quarters for bats.

### 2. *Birds*

Ornithologists have problems proving for a limited area that a given species actually breeds there. Their problems are further aggravated by a terrain which is as impassable and broken as the Dachstein region. Accordingly, they are restricted to assumptions that a relatively large number of species breeds in the region, based on observations of specimens during their known breeding period and the fact that the area is within their potential breeding grounds.

A small group of bird species in the Dachstein region is unique to the Alps in their Central European dispersal area. Very few of them can also be found at the highest altitudes of low mountain ranges. They are typically species that live in the subalpine belt and breed mostly on the Dachstein plateau, from where they penetrate to the peaks in search of food. Known breeders are the rock ptarmigan (*Lagopus mutus*), ring ouzel (*Turdus torquatus*), water pipit (*Anthus spinoletta*), Alpine accentor (*Prunella collaris*) and snow finch (*Montifringilla nivalis*). A golden eagle (*Aquila chrysaetos*) breeds in the western part of the Dachstein region, although, considering that this bird requires an enormous territory, it is possible that observations concern birds from other parts of the region. Sparrow owl (*Glaucidium passerinum*), white-backed woodpecker (*Dendrocopos leucotos*), Bonelli's warbler (*Phylloscopus bonelli*), red-breasted flycatcher (*Ficedula parva*), common raven (*Corvus corax*) and Alpine chough (*Pyrrhocorax graculus*) are believed to breed in the region.

A second group of birds nests primarily in the montane belt. With a few exceptions, they are typically species which have chosen the forest as their habitat. They are mainly black, three-toed and grey-headed woodpecker (*Dryocopus martius*, *Picoides tridactylus*, *Picus canus*), nutcracker (*Nucifraga caryocatactes*), crossbill (*Loxia*

*curvirostra*), wood and black grouse (*Tetrao urogallus*, *Lyrurus tetrrix*) and peregrine falcon (*Falcon peregrinus*).

Among the breeding birds of the Dachstein region the largest group (some 30 species) breeds in lower-lying parts up to the middle montane belt.

The Hallstätter See serves as breeding ground for great crested grebe (*Podiceps cristatus*), mute swan (*Cygnus olor*), mallard (*Anas platyrhynchos*) and coot (*Fulica atra*). Compared to other lakes in the Salzkammergut, the lake is not much used as winter quarters.

### 3. Reptiles

Several representatives of the reptilian family can be found in the region. The grass snake (*Natrix natrix*) is a relatively frequent sight at the lakes and in the Koppenwinkel. For adders (*Vipera berus*) the upper montane and subalpine belts offer occasional spots to their liking. Sand lizards (*Lacerta agilis*) are sometimes encountered in the valleys. A more frequent, although not easily distinguishable inhabitant of the region is the common lizard (*Lacerta vivipara*), which has settled the valleys, plateau and moors. As a viviparous species, it is excellently adapted to the short activity period at higher altitudes. Last but not least, the blindworm (*Anguis fragilis*) merits mentioning.

### 4. Amphibians

So far, data could be collected on five species of amphibians in the Dachstein region. The two most frequent species are the Alpine salamander (*Salamandra atra*) and the grass frog (*Rana temporaria*). Both species have been observed on the plateau in altitudes of up to 1900 m, which is also the limit for the Alpine newt (*Triturus alpestris*) which lives in the small lakes. Rarer are sightings of the spotted salamander (*Salamandra salamandra*) and the common toad (*Bufo bufo*).

### 5. Fishes

The Hallstätter See and the Gosau lakes have been fished by man ever since the region was settled. The cold, clear, oxygen-rich water is particularly popular with the salmonids (*Salmonidae*). The lake harbours powan (*Coregonus lavaretus*), saibling (*Salvelinus alpinus salvelinus*), lake trout (*Salmo trutta lacustris*), brook trout (*Salmo trutta forma fario*) and grayling (*Thymallus thymallus*). Of these, only the brook trout and saibling are autochthonous, while the others were released later. Frequently found representatives of other fish families are the minnow (*Phoxinus phoxinus*), European roach (*Rutilus rutilus*), rudd (*Scardinius erythrophthalmus*) and perch (*Perca fluviatilis*). Fish species were released in both lakes to benefit the fisheries: the rainbow trout (*Oncorhynchus mykiss*) in both lakes, the white bream (*Blicca björkna*) in the Vorderer Gosausee, and the eel (*Anguilla anguilla*) in the Hallstätter See. Altogether, 15 species are known in the Hallstätter See and 14 in the Vorderer Gosausee.

## 6. Insects

The birds on the plateau which feed on insects give us an indication of the abundance of insects to be found there. Another indication comes from the number of plant species which rely on insects for pollination.

Inconspicuous beetles live underneath stones, in moss cushions or beneath rotting bark.

Of the *Carabidae*, the brightly shining copper-coloured *Carabus fabricii* should be named. Growing to a size of 25 mm, it lurks under stones to watch out for prey. Another specimen is *Nebria catanea*, pitch-coloured, which scrambles along the edges of snow-fields on very long, thin legs excellently adapted to survive in occasional snow water. The caves on the northern side of the Dachstein provide a habitat for the *Arctaphaenops angulipennis*. The discovery of the beetle in the *Koppenbrüllerhöhle* in the winter of 1924 caused quite a sensation among entomologists and was even kept a secret originally to protect the beetle. Meanwhile the eyeless beetle, well over 50 mm long and tinted a light reddish-yellow, has been discovered in other caves of the Dachstein massif, i.a. in the *Rieseneishöhle* and *Mammuthöhle*. It is not known in any other cave system and is therefore endemic to the Dachstein region.

Butterflies penetrate the upper regions of the Dachstein until the alpine belt. Two species from the Alpines genus *Erebia* are regulars of the subalpine meadows and dwarf shrub heaths of the plateau up to altitudes of 2200 m above sea level.

The abundance of foraging plants for the caterpillars and nectar-yielding flowers for the butterflies has caused a rapid growth in the number of species of the montane belt. This zone is more favoured by the weather and thus offers a longer vegetation period.

## 4.2 The Dachstein – its karst and its caves

### Introduction

Among the karst massifs of the northern limestone Alps, built mainly from Triassic and partially well-karstable carbonate rocks, the almost 3,000 m high glaciated Dachstein mountains are the most salient (Fig. 20). They are known for their great number of underground caves, with the *Hirlatzhöhle* being the longest (currently 81 km) and the *Dachstein-Mammuthöhle* being the third longest (50 km) among Austria's explored caves, as well as for their three major show caves that are accessible to the public and well-suited for imparting knowledge on cave development and formation, each of the three caves representing another spelaeological type. Especially the giant ice cave, the *Dachstein-Rieseneishöhle*, is an outstanding example of its kind in Austria. The *Dachstein-Mammuthöhle* is a typical giant high alpine cave with enormous passageways and labyrinths, whereas the *Koppenbrüllerhöhle* down in the valley exemplifies an active water cave situated in a valley. The Dachstein region has gained natural scientific significance through the excellent documentation work that has been going on for more than a century now. It started with the work done by F. SIMONY in the past century and has continued almost uninterrupted up to the most recent research

operations of 1996. The outcome of these studies is reflected in an enormous bulk of literature. Also, the Dachstein mountains have been used for scientific comparisons and for clarifying karst-specific, cave-related and hydrogeological issues. At the same time this region has, time and again, been a trailblazer in the field of cave documentation. For instance, the *Dachstein-Mammuthöhle* served as a model for the first presentation of an underground atlas, or since its definition as the longest cave in Austria the data of the *Hirlatzhöhle* have been captured by modern CAD means.

The possibility to compare the pictures made by F.SIMONY in 1895 and those made c. 1950 by F. BAUER and other more recent ones is an excellent opportunity to study the changes in a karst landscape. The Dachstein region can also be considered the model of subterranean karst drainage. The first major attempts of pegging out the area have been made. It is precisely this area where a number of recent trials have resulted in a reassessment of underground drainage patterns whereby the currently well-recorded enormous horizontal and vertical insights into the underground (especially via *Hirlatzhöhle* and *Mammuthöhle*) have heightened the understanding of these drainage systems through visual and scientific information obtained from the interior of the karst massif.

The fact that the Dachstein massif is one of the few karst regions in the Alps that are still glaciated will enable further research approaches.

The very early development of this area above and under ground for mountain climbing and tourist purposes, as well as its forestry and dairy farming use, enable to study the influence of man on a major Alpine karst area.

### **Geological, morphological and spelaeological overview**

In geological terms, the Dachstein massif is comparatively simple and clear in its set-up. Its central part is dominated by Upper Triassic Dachstein limestone flatly running towards the north. Thus the Dachstein is a globally typical location of the well-banked Upper Triassic limestone of an extensive lagoon area, this limestone having been widely spread throughout the whole area of the then ocean (Tethys).

Some 45 km long and some 20 km wide, the Dachstein massif is quoted in literature to have a surface of 574 square kilometres. The underground drainage surface amounts to approximately 240 square kilometres. As compared to the 300 square kilometres of the large subterraneously drained plateau of the *Totes Gebirge*, the Dachstein mountains represent the second largest closed karst area in Austria. The still glaciated peaks (*Hoher Dachstein*, 2995 m) rise above extensive plateaus (such as *Am Stein* featuring 1800 to 1900 m above sea level). Especially in the south (*Ennstal*, 750 m above sea level) and north (Traun furrow, Hallstättersee, 508 m above sea level) the mountains drop over escarpments against the local water table.

Rock stratification, which is so important for cave formation, drops slightly north/north-west towards the Traun and Echern valleys. The joints and faults necessary for karsting mainly run NW-SE and NE-SW, a few ones also W-E and N-S (Fig. 40).

Especially along the northern edge of the mountains giant glacial valley formations push into the mountain body. An allocation of the differently high remnants of former

surfaces to a specific age seems to be particularly difficult. There is evidence that tectonic movements have transported originally united and equally old surface areas to different heights. The large plateau areas are mainly characterised by a (partially glacially sculptured) *Schichttreppen* landscape, with synclinal landscapes frequently having evolved along bed faces. These faces of bed often have smaller caves along the strait underneath. A more detailed study of the location of cave entrances in the Dachstein cave park has shown that most of the cave entrances are either in steep rock (mostly glacially opened up) or in the highest zones of mountain ridges (Fig. 42). In the synclinal and deep zones we see a clear decline in the number of passable entrances, most of them having probably been sealed off by moraine material.

The Austrian cave list refers to the Dachstein subgroup under figure 1540. This figure is subdivided into groups 1541 to 1549. The highest topographic point of the subgroup is the *Hohe Dachstein* (2995 m), the lowest is the Hallstättersee featuring 508 m. The lowest down cave is the *Kessel* (1546/2), 512 m above sea level in today's valley level, the highest up cave is the *Nördliche Durchgangshöhle* (1543/46), 2770 m above sea level; 522 caves are currently recorded for the Dachstein.

### Historic survey

Historic documents dating from the past century are mainly due to the research work, drawings and publications by F.SIMONY (1895). A systematic kind of cave research, however, began in 1910 only in the so-called Dachstein cave park (these are caves situated in the area of the *Schönbergalpe*) when the two most important caves, the *Dachstein-Rieseneishöhle* and the *Dachstein-Mammuthöhle*, were discovered. A few years later numerous kilometres had already been surveyed and recorded. More recent research started with a theodolitic investigation into the most important parts of the *Dachstein-Mammuthöhle* in 1952 (Fig. 43).

The current speleological studies are still focused on the area of the Dachstein cave park and the *Hirlatz* area, with work going on both above and below ground. In recent times absolutely novel discoveries have been made in the *Hirlatzhöhle*. For years the Dachstein cave park has also been an area for accompanying geo-scientific investigations with special emphasis on what is inside the caves (such as sediments, waters, ice) and what climate these caves have (inter alia, to study human influence). These studies are conducted by the speleological unit the Museum of Natural History. Both the *Hirlatz* cave area and the Dachstein cave park are subject to active exploration and documentation of hitherto unknown cave parts by speleological societies; i.e. our knowledge of the Dachstein caves is far from being complete.

### Karst water, springs and colour tracing

Cave formation and the "karsting" of a landscape require the presence of "karstable rock" (such as limestone) plus corrosively acting water. In such a way karst areas become important "water reservoirs", and the knowledge of subterranean drainage patterns will help understand karsting and cave formation and be an important factor in water management.

This aspect has been the focal point of the pioneering spore drift and colour tracing tests in the Dachstein area since 1953. The first trials revealed mainly radially directed drainage patterns. This led to drawing up a revised map of the known drainage systems. The first series of colour tracing tests (1984-1986) has resulted in a map of the spring conservation areas that took into account the now proven main drainage direction (north), a direction that was to be expected from existing geological data.

In 1990 a number of supplementing and more detailed studies was made in the central Dachstein area revealing minor differences to the 1984-1986 test results due to the different meteorological conditions, but basically the original findings were confirmed. The studies reasserted the necessity of introducing a comprehensive karst water conservation plan for the Dachstein so as to maintain the water quality of the major water supply systems (Gosau, Hallstatt).

The more recent results now show drainage patterns in north/north-west direction towards the *Echern* valley, the *Gosau* lakes and the *Traun* furrow. All these trials and investigations have provided evidence for a direct correlation between the waters sinking into the karst plateau and the major springs and spring caves (with differing flow times) along the north edge of the Dachstein. The (often giant) underground water streams meanwhile discovered both in the *Mammuthöhle* and especially in the *Hirlatzhöhle* and frequently running down to valley level complete the results of the colour tracing trials.

### **Karst and caves**

Although SIMONY has already described and documented the karst and some of the caves in his publications and notes (1895), and although KRAUS lists a great number of caves in the Dachstein region in his *Höhlenkunde* (1894), major progress in speleological terms was made in 1910 only when the *Dachstein-Rieseneishöhle* and the *Dachstein-Mammuthöhle* were discovered (Figures 43, 44). A few years later some 9 km of cave area had been explored. At the same time this region served and still serves as a ground for experimentation for different cave formation theories and karst hydrological examinations which have resulted in a great number of publications on the Dachstein caves, karst and underground drainage system. Owing to continuous studies some 25 km of cave area were recorded in 1950 (at the onset of renewed and intensified research after World War II). The venture into the upper levels of the *Hirlatzhöhle* in 1983 (the cave passage length has grown since 1983 from about 8 km to more than 81 km!), the current studies of the *Dachstein-Mammuthöhle* (in 1959 10 km of passage were known, in 1996 slightly more than 50 km) and research into the *Schönberghöhle* have unearthed in the past decade completely new findings on the pattern of the giant cave systems at the north edge of the Dachstein. Scientists now have full information on 150 km of cave passage (of 5 caves) including their underground horizontal and vertical courses.

A current cave register where all the plotted caves have been entered (these are approximately 70 % of all caves, the missing ones being small caves) clearly shows a cluster of caves in the northern part of the Dachstein massif which mainly houses the largest and deepest caves. Fig. 41. A closer look at the situation underground enhances

this picture as the chambers of the major cave systems of the Dachstein, stretching some 10 km W-E and some 3 km N-S, are all situated in the north precipices of the region. More recent cartographic and statistic evaluations have shown that the subterranean course of a major portion of these giant cave systems is bound to the fault directions mentioned earlier and to the inclination of straits. Whereas most of the inactive cave parts of various sizes run NW-SE and NE-SW, and also partially W-E, there are enormous (mostly aquiferous) canyons that fall steeply down north and frequently reach the phreatic zone. Here the overlying strata are only some 200-500 m, in some cases up to a maximum of 800 m. Apart from the more than 81 km long *Hirlatzhöhle* (i.e. the longest cave in Austria) the Dachstein cave park occupies a special place with its 50 km long *Mammuthöhle* (also one of the deepest caves in Austria featuring a level difference of 1180 m in total and reaching from the edge of the plateau almost down into the valley), the 2 km long *Dachstein-Rieseneishöhle* and the 10 km long *Schönberghöhle*. This area is particularly well explored and recorded. That this part also features most of the currently known caves is certainly also due to the cable railway system that enhances the accessibility of the region.

The Austrian cave register currently lists 522 caves (as of January 1996) as compared to KRAUS's list of 16 caves (1894), BOCK's list of 30 caves (1913), ARNBERGER's list of 229 caves (1964) and the 1988 cave register that mentions 450 caves in the Dachstein region. A statistic evaluation of the data on the state of research, type and size of caves shows the comparatively fine store of knowledge (3/4 of the caves are either fully or partially explored) and the dominating feature of approximately the same number of horizontal caves (mostly in steep slopes) and shaft caves (mostly on plateaus). About 15 per cent of the caves are – as is typical of Austria – ice and/or water caves. If we categorise the caves by their size (length of passage) we see the great portion (about 70%) of small caves having a total passage length of 5-49 m. However, among the great number of caves there are only 3 which are giant caves (more than 5 km of passage) and only 17 which are large caves (500–5000 m). Interestingly, there are hardly any caves of 5–25 km currently known. If we add to the known passage lengths of the giant caves the mean passage length of the small and medium-size caves, we have some 210 km of known and surveyed cave passage in the Dachstein area.

Allocation of the cave entrances by their altitudes reveals the maximum to lie between 1,500 m and 2,000 m above sea level. However, the altitudes recorded for most of the cave sections of the *Hirlatzhöhle* and *Dachstein-Mammuthöhle* show that the level of the entranceways is of little relevance in relation to the actual altitude of the voids inside the rock. For instance, the more than 81 km long *Hirlatzhöhle* currently has only one entrance at about 890 m above sea level, whereas the overall level difference of the cave amounts to some 1,000 m.

### **Thoughts on the boundaries**

The most important cave specimens of the Dachstein region are already under protection (1928 Natural Cave Act). Moreover, the *Schönbergalpe* is also protected under this law in terms of an area that is directly connected with the underground karst



husbandry (litter); wood, especially maple, was a base material for making utensils in small undertakings.

Within the historical forestry context mention must be made of the highly-developed timber skidding methods employed in the Salzkammergut. Timber hauling from the logging camp to its destination was made possible by a dense "drift network" making full use of a landscape abounding in watercourses. The brooks and rivers were equipped with artificial defiles, rakes, sluices, special rakes with lifting and lowering gear, etc. to meet wood drift requirements. The Salzkammergut-based woodworkers and their leaders gained such a fine reputation in this field that they were called to the most distant parts of the Austrian monarchy to install timber skidding facilities, thus opening hitherto inaccessible woodland territories. Although there are only a few remnants of such timber hauling facilities left in the Salzkammergut itself, we have a number of maps and sketches that give a survey of those early technical achievements. A well-preserved typical example would be the *Steegerklause*, a defile at the exit of the Traun river from the Hallstättersee, and the training of the Traun rapids and falls near the market town of Lauffen, both innovative engineering achievements of the 16th century.

Most of the woodlands of the Hallstatt-Dachstein/Salzkammergut cultural landscape are now in the hands of the Federal Republic of Austria for the historical reasons referred to above. They are administered by the *Österreichische Bundesforste*, the federal forestry agency, a fact that ensures an ecology-minded wood management and maintenance policy. Historically, the economic use of forests was the main concern, whereas now emphasis is on the protective effect of forests. Since, as already mentioned, the government-owned forests are mostly along mountain slopes they are mainly "shelter belts" and "protection forests" as defined by the Austrian forestry legislation (1975 Forestry Act, Federal Law Gazette No. 440), i.e. these are forests designed to protect from such dangers as soil being washed away, landslips, boulder drifts and avalanches. Other important functions of forests are their positive effects in terms of balancing both climate and moisture household, cleaning and renewing air and water, or contributing to noise protection. And last but not least, forests are important recreation areas for the population.

### 5.3 Recreation potential

Alexander von Humboldt wrote in 1797 to the director of the Botanical Gardens of the Vienna University, Joseph Schot: "I admit that I know of no such beautiful scenery in Switzerland as the ones I have seen in Upper Austria". This is but one document that shows the deep impression the exceptional beauty of the Salzkammergut left on many contemporary travellers and explorers. A number of pictures and travel books, e.g. those by the natural scientist and writer J.A. Schultes, turned the world public's attention to this landscape.

However, it was only after the introduction of balneological facilities based on the local salt mining products, the selection of Ischl as the summer residence of the Austrian imperial family and the development of the region in terms of traffic and

transport (since 1877 a railway connection from Attnang-Puchheim to Stainach-Irdning) that tourism started to evolve.

Displaying great variety within a comparatively small area, the Salzkammergut is well-suited for tourism in terms of its geographic situation and natural scenery. Its major features can be best summarised as follows:

- The charming trinity of mountains, lakes and woods coins the varied and diversified beauty of the landscape.
- The abundance in lakes and rivers offers many possibilities for water sports.
- The Dachstein massif provides ample ground for any kind of alpine sports; skiing in the glacier zone is possible all year round; the numerous and spacious caves are special attractions for visiting tourists and unique challenges for divers and mountain climbers.
- Based on the therapeutic and balneological spin-offs of salt mining and the use of the sulphur-containing mineral springs a complex spa system has evolved since the early 19th century which has maintained its tourist-related importance to this very day. The cold sodium-chloride/sulphate/sulphur springs of Bad Ischl and the iod-containing sodium-chloride/hydrogen-carbonate/sulphur spring of Bad Goisern number among the most important mineral springs in Austria.
- The curative effect of the climate is based on the special alpine climate, sufficient insolation and sheltered slopes, which can be found also outside such "air resorts" as Bad Goisern and St. Wolfgang.
- "Culture tourism" has a long tradition, especially in the Hallstatt area. The publicly accessible prehistoric cemeteries, the portion of the Hallstatt salt mine that visitors may see, the richly endowed museums of Hallstatt as well as the monuments of the market town are all sites that attract people from all over the world.

#### **5.4 The Dachstein – a water reservoir**

In addition to salt deposits and the abundance in wood, water is another essential factor of the Salzkammergut region. The significance of lakes and rivers as former main arteries and especially as a haulage network for timber and salt has been mentioned before. Water has thus been one of the foundations for the Salzkammergut industry. Mention has also been made of the aesthetic importance of lakes, brooks, waterfalls enhancing the attractiveness of a landscape, and of their recreational and tourist functions in the Salzkammergut. Moreover, the water riches of the cultural landscape of Hallstatt-Dachstein/Salzkammergut also constitute an essential ecological factor. The necessity to preserve and protect the ecologically sensitive region mainly results from the fact that the Dachstein massif is one of future's potential drinking water reservoirs.

Today only the communities of Hallstatt and Gosau get their drinking water from the Dachstein. However, the Dachstein massif is suited as a fine source of drinking water in several respects: its landscape is characterised by very few settlements and farmlands because of its many glaciers, waste lands and densely wooded areas, thus

ensuring an extremely low degree of pollutants in the drinking water; moreover, the wet climate ensures constant water supply. The wells and springs of the Dachstein are all fed from the karst zones which have a very positive effect on the drinking water quality (almost no nitrates). Another characteristic of such karst springs is the comparatively short time that elapses between rainfall getting into the ground and the spring water leaving the ground. As water stays below ground for a brief period of time, natural cleaning processes can act to a limited extent only, i.e. the quality of the final product (=drinking water) will greatly depend on the degree of contamination or non-contamination of the rainwater.

In order to guarantee the availability of drinking water from the Dachstein springs, which are promising options for future drinking water supply, and to ensure proper water quality as such legal measures of protection have been taken and will be supplemented by the proposed designation of water conservation zones.

## 6. A FEW THOUGHTS ON THE "ASSOCIATIVE SIGNIFICANCE" OF THE HALLSTATT-DACHSTEIN/SALZKAMMERGUT CULTURAL LANDSCAPE

### 6.1 Painting and literature in the Salzkammergut

against the all-European backdrop of historico-cultural developments

It took quite some time till mountains began to serve as a motif for drawings and paintings in Europe. Moving away from a schematic, symbolised prop called "nature", Late-Gothic artists started to picture views of real landscapes. With regard to the Salzkammergut the Danube School, so called after its centre in the Austro-Bavarian Danube area, is of some relevance for the early 16th century. In stylistic terms, the Danube School continued the oeuvre of Albrecht Dürer. The main representatives of this artists' circle are Albrecht Altdorfer and the Salzkammergut-based Wolf Huber. His pen and ink drawing *Mondsee with Schafberg* of 1510 and *Traunkirchen* of 1511 provide evidence of a newly-discovered delight in the beauty of nature, a feeling that was also expressed in contemporary literature (inter alia, Conrad Celtes). The depiction of nature and scenery, however, was not an end in itself but embedded in a religious-moral understanding of the world.

The artistic reception of the Alps is a product of the Age of Enlightenment, a view of nature that evolved in the 18th century. This process transformed the formerly hazardous and uninviting high mountains into an aesthetic delight. This change in human attitude was introduced by the poems *Die Alpen* (The Alps) by the Berne explorer Albrecht von Hallen and the nature-praising epistolary novel *Julie ou la nouvelle Héloïse* (1761) by the Genevan philosopher Jean-Jacques Rousseau.

The way Rousseau saw nature was to influence people for a long time. It encompassed the whole world, landscape became a carrier of human emotions. The mountains which hitherto had only evoked fear and awe turned into something like paradise on earth. A journey to the Alps was tantamount to moral experience, it was a pilgrimage to the sources of humankind and a healing cure for mind and body.

Described in literature and numerous travel books, the newly interpreted relationship between man and nature greatly influenced 19th century painting, the first to establish landscape painting as a special genre. The Alpine mountains gave Romanticist painters an ideal motif, they were expressive bearers of their written-down theoretic intentions and of their message to the viewer. Newly developed means were intended to impart the spaciousness and emotive effect of the Alpine landscape and involve the viewer in the scenic beauty. An increasingly naturalistic representation met with a predilection for the pathos of the symbol-laden, awe-inspiring nature.

The exploratory, artistic and philosophical interest in the Alps introduced by Rousseau's literary motif first focused on the Swiss mountains which also later were used as a yardstick to measure other mountain regions. This is documented, inter alia,

by a report of Friedrich Satoris written in 1813 in which he calls the Salzkammergut an Austrian variety of Switzerland.

Alexander von Humboldt (1769-1859), explorer, universal scholar and founder of modern earth sciences, told in a letter to the botanist Josef Schot that he knew of no such beautiful scenery in Switzerland as the ones he had seen in Austria. His brother Wilhelm von Humboldt (1767-1835), humanist, poet and statesman, called the Salzkammergut the "region that is probably the most beautiful in Germany". A comparison with the Swiss "original" was also made by the imperial and royal forestry official Johann Steiner when he entitled his travel handbook of 1820 *Der Reisegefährte durch die Österreichische Schweiz oder das obderennische Salzkammergut als Begleitung in dieser Gegend* (The Travel Guide through Austria's Switzerland, or the North-of-the-Enns Salzkammergut).

A representative microcosm of the Austrian Alps, the Dachstein region embodied the romantic idea of a "paradise on earth" as postulated by 19th century artists and poets, and served as a motif for innumerable works of art.

### **6.1.1 The role of the Salzkammergut as an "ideal landscape" in Austrian landscape painting of the Biedermeier and early Realist periods**

The pioneers of Romanticism in the German-speaking lands considered the artistically depicted nature mainly to be a vessel and carrier of their subjective ideas and images. For the beginning of Romanticist landscape painting it is important to know that it did not primarily evolve from mere raptures about nature but was seen as a new possibility for the emancipated artist to reveal his own poetic view of the world. Romanticism is to be understood as a detachment from evasive, idyllic, bizarre, exotic and fantastic contents, it made the "ways of being" a topic as seen and poetically realised by the artist, these ways of being claiming to be linked up with the entire universe. In terms of the programmatic dictum of Romanticism, art is a revelation of the self and the world. (Figures 15-19, 29, 32, 34, 36, 38).

Similar objectives were laid down by the most important Biedermeier painter, Ferdinand Georg Waldmüller (1793-1865), in his autobiography published in 1847 which in some respects even went beyond Romanticism. He declared nature to be his only model which he had to serve in all truth, and life was to be the content of his art (cf. *Anleitung zur Belebung der vaterländischen Kunst*, 1857). It is no coincidence that the varied landscape of the Salzkammergut, which met the pictorial demands of Biedermeier to a special degree, stood at the beginning of his painting career. The discovery of the Salzkammergut as an "ideal landscape" of the Biedermeier was actually made by Franz Steinfeld (1787-1868). In 1824 he created his great canvas of the Hallstättersee which today is thought to be a stylistic breakthrough and a work that initiated the so-called "Biedermeier landscape". In 1834 Steinfeld varied this motif in a number of paintings (Fig. 19).

Ferdinand Georg Waldmüller came to the Salzkammergut only in the second third of the 19th century. This was a period of moderate Romanticist tendencies in landscape painting. Outstanding examples of this epoch would be the sun-flooded panorama of a

painting entitled *View from the Hütteneckalm across the Dachstein area and Hallstättersee* of 1838 and another one called *Dachstein with Gosau Lake* of 1832. The innovative achievement of Waldmüller in art historic terms, which can be seen in these motifs, lies in the creation of a "pictorial pattern" which was to remain the standard for about a century (cf. Wied 1982) and captivated a whole generation of artists (Fig. 32).

Besides Steinfeld and Waldmüller, there were a number of other major artists such as Rudolf von Alt (1812-1905), Jakob von Alt (1789-1872) (Figures 17, 34) and Friedrich Gauermann (1807-1862) who worked on the canonisation of pictorial motifs and tried to find and define motif constellations (see also chapter 3.4 Vedutas of Hallstatt).

The Salzkammergut landscape, perceived as typical of the ideal, was to attract landscape painters but also the renowned Austrian writer Adalbert Stifter (1805-1868) who first came to the Hallstatt-Dachstein region in 1834. His original artistic leaning was to become a painter, and as such he travelled to the Salzkammergut; both the charm of the landscape and his acquaintance with the geographer Friedrich Simony influenced his artistic development and later his literary oeuvre. Gradually he turned away from painting and to writing, a medium that came closest to expressing his artistic ideal. Adalbert Stifter introduced the picturesque landscape of the Salzkammergut into world literature and made its portrait immortal in such stories as *Bergkristall*, *Der Kondor*, *Der Waldsteig*, and *Feldblumen* (Wildflowers), as well as in his greatest novel *Der Nachsommer* (Indian Summer).

### 6.1.2 Some thoughts on the role of the Salzkammergut in literature

Just like the painters, 19th century poets and writers were lured by the "pioneering works" of travel writers and flocked to the Salzkammergut in search of motifs. Especially Joseph August Schultes's popular reports *Reisen durch Oberösterreich in den Jahren 1794, 1795, 1802, 1803, 1804 and 1808* (Travels through Upper Austria in 1794, 1795, 1802, 1803, 1804 and 1808) and *Die österreichische Schweiz* (Austrian Switzerland) by Franz Santoris published in 1813 spread the fame of the Salzkammergut and its natural attractions. Just like painting, Salzkammergut-related literature reached its first bloom in the Biedermeier period. In terms of artistic reception Hallstatt played a central and outstanding role as this place seemed to combine natural beauty and millennia-old traces of history into a mythical atmosphere.

Among the main representatives of German-language Biedermeier poets, such as Jeremias Gotthelf (1797-1854), Eduard Mörike (1804-1875) and Annette von Droste-Hülshoff (1797-1848), it was Nikolaus Lenau (1802-1850) and Franz Grillparzer (1791-1872) who incorporated the impressions gained in Salzkammergut travels in their oeuvre. The greatest impact the Hallstatt-Dachstein region made was that on the life and work of Adalbert Stifter (1805-1868).

As one of the many landscape painters Stifter had come to the Salzkammergut, as a poet and writer he returned from there (cf. chapter 6.1.1). His first story *Der Kondor* has the Alpine landscape as a main topic, as has the story *Der Waldsteig* where the experience of nature leads to a turning point in a person's development. In 1845 Stifter met the geographer Friedrich Simony who introduced him to his special exploratory

addiction, the Dachstein massif. The product of Stifter's confrontation with the glacier and cave landscape of the Dachstein is one of the most beautiful children's stories in world literature in which the poetic idea of a motherly nature is developed by means of a mountain world that had formerly been thought to be hostile to man. Stifter's greatest work is the educational development novel *Der Nachsommer* (1857) in whose protagonist he mirrored the personality and exploratory spirit of Friedrich Simony. Called the "most perfect prose in German" by Friedrich Nietzsche, this novel had a decisive influence on 19th and 20th century literature.

Aside from the fact that *Der Nachsommer* was recognised as a masterpiece only late, it constitutes an invaluable eyewitness account. The first representative of government monument conservation to be appointed Upper Austrian Official of Historic Monuments, Stifter uses the novel to express his own thoughts about art and monument conservation; the described preservation and conservation operations mirror Stifter's actual job as a civil servant responsible for monument preservation. Inter alia, he describes – hardly disguised – the restoration works on the winged altarpieces of Kefermarkt and Pesenbach and the regothicising work on the parish church of Steyr. And Hallstatt is depicted as a differently called idyllic place on a mountain lake.

Thanks to Adalbert Stifter's oeuvre Hallstatt found its way into world literature. However, the cultural landscape of the Salzkammergut is characterised not only by being an ideal motif for literature but also and in particular by providing a cultural environment, a special *villegiature* ambience, a meeting place for bourgeois spa tourists, aristocrats, travellers and artists that together have helped spawn works of 19th and 20th century literature. The great writers of Fin-du-siècle Austria were active in the unique cultural environment of *villegiature*. These were, inter alia, Arthur Schnitzler (1862-1931), Hugo von Hofmannsthal (1874-1929), Hermann Bahr (1863-1934), Jakob Wassermann (1873-1934) and later Friedrich Torberg (1908-1979), or Thomas Bernhard (1931-1989).

Hallstatt continues to be the motif of 20th century literature, but now it is the possibility of experiencing history and the myth of the past that has come to the fore. Fine examples of this approach would be some of the works of European literature, such as the novella *Keltische Knochen* by Wilhelm Raabe (1831-1910), a noted story by the Austrian author Christoph Ransmayr (b. 1954) about the Hallstatt cemetery of 1984, as well as the historical play about history and humanity written by the Slovenian playwright Drago Jancar *Hallstatt - A Play*, originally written in Slovenian in 1994 and published in English in 1995 (Trient).

## **6.2 The Dachstein glacier as an ideal object of scientific research:**

glacial and alpine research conducted by Friedrich Simony

In the wake of the "discovery" of the Salzkammergut and the Dachstein by artists it was primarily the Dachstein glacier that increasingly attracted natural scientists in the second third of the 19th century. The scientific lifework of Dr. Friedrich Simony (1813-1896) made major contributions to international high mountain and glacier research, as well as geological developments.

The visit of Archduke Charles, the brother of the ruling emperor Francis I, in 1812 brought the Dachstein into a broader public's, and particularly into the Vienna society's, awareness. After the conquest of the Dachstein peak by Peter Gappmayer in 1832, Friedrich Simony was the first scientist to set foot on the Dachstein glacier in 1840. Impressed by the much-praised beauty of the ice-covered mountain, Friedrich Simony made the Dachstein glacier the centre of his explorations. Over a period of 50 years, which coincided with a major glacier advance, he documented the changes. He was able to watch both the advance of the glacier, it reaching its highest ice level, and the beginning retreat of the glacier. Innumerable drawings, photographs and measurement results – part of which were published in Simony's monograph *Das Dachsteingebiet* – show the glacier in its different stadii of ablation and are still of great scientific and historic value.

Watching the retreating glacier and the exposed moraine debris closely, Simony studied the formation of lateral, medial and ground moraines. Based on the detailed analysis of ice movement Simony developed his theories on the geographic genesis of the entire Salzkammergut whose features were shaped by glacial movements. These revolutionary, observation-based findings were published under the title *Über die Spuren vorgeschichtlicher Eiszeit im Salzkammergut* (On the Traces of Prehistoric Ice Age in the Salzkammergut) between 1846 and 1847 in the *Wiener Zeitung*, a Vienna daily newspaper, and abstracts of it were published in the *Haidinger Berichte* in 1847. In recognition of his achievements Friedrich Simony was given the first professorial chair for geography at the University of Vienna. He was portrayed by the Austrian writer Adalbert Stifter (1805-1868) in his most important novel *Der Nachsommer* (1857).

The rich lifework of Friedrich Simony, however, does not only consist in the said pioneering achievements in mountain glacial research but also includes the still valid works on water research, geology, mineralogy, climatic research and meteorology in the Salzkammergut region. Not least because of the universal approach does the scientific heritage of Friedrich Simony constitute an outstanding example of comprehensive high mountain research of European significance. The Hallstatt-Dachstein/Salzkammergut cultural landscape can be regarded as a universal model for scientific research.



## **7. SUMMARY OF THE REASONS FOR INSCRIPTION OF THE HALLSTATT-DACHSTEIN/SALZKAMMERGUT CULTURAL LANDSCAPE ON THE WORLD HERITAGE LIST**

The Hallstatt-Dachstein cultural landscape is part of the Salzkammergut and thus of the Eastern Alps. Owing to its varied mountain ranges, numerous lakes, beautiful features and art historic treasures, as well as the economic outline conditions in both the past and the present, it forms a generic cultural geographic unit. The Dachstein is characterised by its massif shape, extensive and highly karsted plateaus, high and often wall-like precipices, and finally the exceptionally wide glaciation. The landscape is coined by the U-shaped valley of the Traun river and the fjord-like Hallstättersee with the market town Hallstatt wedged between mountain and south-western lake shore. Favoured by its natural location, the core of the town is a unique example of a Gothic miners' settlement with its still discernible basic structures and Late Baroque additions made after the great fire of 1750. Due to its high density of historic monuments and expressive material evidence Hallstatt represents a town monument of the first order. The magnificent scenery grants but little space to the architectural evolution of human settlement. The attempted optimum space use can be clearly seen within the basically Gothic settlement core and its Baroque additions whose salient silhouette and almost complete original ensemble have been preserved to date. The realisation that this was a unique landscape in its traditional context led to any interventions (e.g. construction of a lakeshore road) being rejected as early as in the 1960s and appropriate alternatives (tunnels) being encouraged to preserve the historic material.

The cultural landscape of the Hallstatt-Dachstein region boasts a continuing organic evolution covering 2,500 years. Its history from the very beginning is primarily linked with the economic history of salt extraction. Salt mining has always determined all aspects of life as well as the architectural and artistic material evidence. Salt production on a major scale can be traced back in Hallstatt to a middle period of the bronze age.

The greatly differing and rich flora and fauna of the Hallstatt-Dachstein region draws its support from a changing mountain landscape that reaches up to the nival belt, thereby offering numerous small and large ecological niches. It is remarkable for such a mountain region to have so many rare and endangered plant species of the "red lists". The fact that many large stretches of wood in inaccessible locations are almost untouched by man deserves special mention. Due to the low degree of development and enclosed character of the region the said conservation zones are also of major importance to those animal species that are very sensitive to human interference.

In karst and cave terms, the significance of the almost three thousand meter high glaciated Dachstein mountains lies in the great density of caves and in the presence of three important showplaces designed to impart knowledge on cave formation and origin to the general public, with each of the three show caves representing a different speleological type.

However, Hallstatt is of global significance not only because of its natural beauty and features but also and in particular because of its archaeological heritage from the time of the prehistoric Hallstatt culture which shaped Central Europe 2,500 years ago. Two places in particular have yielded major finds: the cemetery that gave the Hallstatt culture its name and the salt mine. Both are located high above the present market town of Hallstatt in the inaccessible Salzberg valley. They are linked by a causal relationship, that is salt mining provided the economic base for the affluence and refinement of objects found in the graves. More than a thousand graves have been excavated so far, the provisionally last ones in the past two years. At no time in earliest history was man so much influenced by metals in terms of manufacturing skills, craftsmanship and artistic design as in the Hallstatt period. Among the sensational finds, considered to be some of the most important archaeological discoveries, are magnificent jewellery, richly decorated weapons, bronze and clay vessels. Ivory, amber and glass refer to extensive trading relations. The Salzberg valley near Hallstatt still has much in store for archaeological research, scientists expect further spectacular finds.

An essential factor of the continuing historic value are the pictorial qualities of the region, a combination of natural and architectural form and component features. Their discovery and artistic development was the pioneering work of important painters (inter alia, Ferdinand Georg Waldmüller, Jakob and Rudolf von Alt, Wilhelm and Franz Steinfeld, Friedrich Gauermann, Reinhold and Thomas Ender) and writers (Adalbert Stifter, Franz Grillparzer, Nikolaus Lenau, etc.) of the Biedermeier era and early Realism in Austria. Adalbert Stifter, who was also the first pioneer of official monument preservation in Austria, wrote "a book on monument conservation" with his internationally famed novel *Nachsommer* (Indian Summer) set in the Hallstatt-Dachstein literary landscape. The main character of the novel conducts important monument preservation operations, as did Stifter, and develops visionary ideas on the future of monument preservation.

Apart from the scenic variety and the bio-climatic conditions, the balneological spin-offs of salt mining have been essential prerequisites for the gradual evolution of an internationally renowned tourist location welcoming politicians, scientists and artists to its spas. With the development of the transport system in the 19th century, the Salzkammergut enjoyed a flourishing *villegiature* culture, the special kind of summer vacation in and around Hallstatt. Since the second half of the 20th century Hallstatt has been known internationally as one of the most famous tourist places.

The cultural landscape of the Hallstatt-Dachstein/Salzkammergut region is a unique documentation of an epoch of human history and also reflects the inseparable unity of nature and culture in both the landscape and the man-made monuments and sites.

## ANNEX

## BIBLIOGRAPHY

- ANGELI, W., Die Erforschung des Gräberfeldes von Hallstatt und der „Hallstattkultur“, Krieger und Salzherren, Römisch-Germanisches Zentralmuseum, 4, Mainz 1970.
- ARNBERGER, E., Die Dachstein-Mammuthöhle, Lage, Erforschung, Raumgestaltung und Entstehung, Jahrbuch des österreichischen Alpenvereines, 88, 1964.
- , Die wissenschaftliche Erforschung der Dachstein-Mammuthöhle und ihre Bedeutung für die Speläogenese, Die Höhle, 35, 3/4, 1984, 93-194.
- ATLAS der Gefäßpflanzenflora des Dachsteingebietes, Katalog des oberösterreichischen Landesmuseums, N.F. 103, 267-355.
- AUBELL, W., Die Soleleitung von Hallstatt nach Ebensee, Oberösterreich, 31/1, 1981, 17-22.
- AUBRECHT, G., und Böck, F., Österreichische Gewässer als Winterrastplätze für Wasservögel, Grüne Reihe Bundesministerium für Gesundheit und Umweltschutz, 3, Wien 1985.
- BARTH, F. E., Abbauversuche im Salzbergwerk Hallstatt, Der Anschnitt, 1, Bochum 1976.
- , 25 Jahre prähistorische Forschung in und über Hallstatt, Mitteilungen der österreichischen Arbeitsgemeinschaft für Ur- und Frühgeschichte, XXV/2, Wien 1974-1975.
- , Das Stügerwerk im Salzbergwerk Hallstatt, Fundberichte aus Österreich, 1, 1982.
- , Bronzezeitliche Graphittonkeramik vom Salzbergtal bei Hallstatt, Annalen des Naturhistorischen Museums, 85/A, 1983, 19-26.
- , Zur Geschichte des Begriffes Heidengebirge, Annalen des Naturhistorischen Museums, 89/A, Festschrift Paget, 1987, 205-209.
- , Salzbergwerk Hallstatt, Quellen und Literatúrauszüge zum „Mann im Salz“, Hallstatt 1989.
- , Falerenensembles im Gräberfeld Hallstatt, Situla 20/21, 1980, Festschrift Gabrovec, 211-217.
- , Das Stügerwerk im Salzbergwerk Hallstatt, Fundberichte aus Österreich, 1, 1982.
- , Bronzezeitliche Graphittonkeramik vom Salzbergtal bei Hallstatt, Annalen des Naturhistorischen Museums Wien, 85/A, 1983, 19-26.
- , Prähistorisches Schuhwerk aus den Salzbergwerken Hallstatt und Dürnberg/Hallein, Universitätsforschungen zur prähistorischen Archäologie, 8, 1992, 25-35.
- , Zu den Tragsäcken aus dem Salzbergwerk Hallstatt, ArchA 76, 1992, 1993, 121-127.
- BARTH, F. E., FELBER, H., SCHAUBERGER, O., Radiokohlenstoffdatierung der prähistorischen Baue in den Salzbergwerken Hallstatt und Dürnberg-Hallein, MAGW, 105, 45 ff.
- BAUER, F., Die unterirdischen Abflußverhältnisse im Dachsteingebiet und ihre Bedeutung für den Karstwasserschutz, Report d. Umweltbundesamtes UBA-89-28, Wien 1989.
- BAUMERT, H., GRÜLL, G., Burgen und Schlösser in Oberösterreich, 3, Salzkammergut und Alpenvorland, Wien 1983, 60.
- BEZIRK GMUNDEN UND SEINE GEMEINDEN, Von den Anfängen bis zur Gegenwart, Linz o.J., 1007-1029.

- BOCK, H., LAHNER, G., GAUNERSDORFER, G., Höhlen im Dachstein und ihre Bedeutung für Geologie, Karsthydrographie und die Theorien über Entstehung des Höhleneises, Graz 1913.
- BRADER, M., Beitrag zur Kenntnis der Vogelwelt des Dachsteingebietes, Monticola 7, 1995, 214-224.
- , Erhebung von Schwimmvogelbruten in Oberösterreich, Zwischenbericht 1995, Vogelkundliche Nachrichten OÖ., Naturschutz aktuell, 4/2, 11-24.
- BRUCHER, G., Gotische Baukunst in Österreich, Salzburg 1990.
- BUCHOWIECKI, W., Die gotischen Kirchen Österreichs, Wien 1952.
- DAS SALZKAMMERGUT, OÖ. Landesverband für Fremdenverkehr, Linz, o.J. 1934.
- DEHIO-HANDBUCH, Die Kunstdenkmäler Österreichs, Oberösterreich, hrsg. vom Bundesdenkmalamt, bearbeitet von Erwin Hainisch et al., Wien 1977, 105-107.
- DICKLBERGER, A., Systematische Geschichte der Salinen Oberösterreichs, 2 Bde, Ischl 1817.
- DOPSCH, H., SPATZENEGGER, H., Geschichte Salzburgs, I/1, Salzburg 1981.
- DVORAK, M. et al., Stillgewässer Österreichs als Brutgebiete für Wasservögel, Bundesministerium für Umwelt, Jugend und Familie, Wien 1994.
- EGG, M., Das Grab eines unterkrainischen Kriegers in Hallstatt, Archäologisches Korrespondenzblatt, 8, 1978, 191 ff.
- EIBNER, C., et al, Die Hallstattkultur, Bericht über das Symposium in Steyr 1980, Linz 1981.
- ENGL, I., Führer durch das Ortsmuseum in Hallstatt, Wien 1904.
- , Geschichte von Hallstatt und Umgebung, 3 Bde., Hallstatt 1905.
- ERICH, R., Die Baudenkmäler des Salinenwesens in Oberösterreich, Wien 1972.
- FEUCHTMÜLLER, R., Friedrich Gauermann, Rosenheim 1987.
- , Kunst in Österreich, Band II, Wien 1973.
- FINK, M.H., Karstformen und Karstentwicklung, Höhlenkundliche Vereinsinformationen, Hallstatt-Obertraun, 9, Sonderheft 1982.
- FREY, O.-H., Die Entstehung der Situlenkunst, RGF, 31, 1969.
- FRIEDRICH, C., Minna Kautsky - Auswahl aus ihrem Werk, Berlin 1985.
- FRODL, G., Wiener Malerei der Biedermeierzeit, Wien 1987.
- GAISBERGER, J., Die Gräber bei Hallstatt im oberösterreichischen Salzkammergut, Linz 1848.
- GIELGE, I., Topographisch-historische Beschreibung aller Städte, Märkte, Schlösser, Pfarren und anderer merkwürdiger Oerter des Landes Oesterreich ob der Enns, Wels 1814, 1815.
- GOETZE, E.-G., Den Glauben leben 1785-1985, Chronik der evangelischen Pfarrgemeinde A.B. Hallstatt / Obertraun, Hallstatt - Bad Ischl 1985.
- GRABHERR, N., Burgen und Schlösser in Oberösterreich, 2 Bde., Linz 1963/64, 79.
- , Historisch-topographisches Handbuch der Wehranlagen und Herrensitze Oberösterreichs, Veröffentlichungen der Österreichischen Arbeitsgemeinschaft für Ur- und Frühgeschichte 7-8, Wien 1975, 36.

- GRIMS, F., Über die Besiedlung der Vorfelder einiger Dachsteingletscher (Oberösterreich), *Stapfia* 10, 1982, 203-233.
- GUGENBAUER, G., Glasgemälde in Hallstatt, *Christliche Kunstblätter*, 70, 1929, 11-16, 74-75.
- HAIDER, S., *Geschichte Oberösterreichs*, Wien 1987.
- HÄUSLER, A., Kritische Bemerkungen zum Versuch soziologischer Deutungen ur- und frühgeschichtlicher Gräberfelder - erläutert am Beispiel des Gräberfeldes von Hallstatt, *EAZ*, 9, 1968, 1 ff.
- HEILINGSETZER, G., Der Rudolfsturm in Hallstatt, *Oberösterreich*, 34/2, 1984, 11-16.
- HELL, M., Ein Zeugnis für römische Almwirtschaft aus Hallstatt, *Mitteilungen des Museums Hallstatt*, 12, 1950.
- HENNE, P., KRAUTHAUSEN, B., STUMMER, G., Höhlen im Dachstein. Derzeitiger Forschungsstand, Anlage der Riesenhöhlensysteme am Dachstein-Nordrand und Bewertung der unterirdischen Abflußverhältnisse, *Die Höhle*, 45, 2, 48-67, Wien 1994.
- HERLICKSKA, H., HOBIGER, G., Karsthydrologische Untersuchungen im westlichen Dachsteinmassiv in Hinblick auf die Erlassung einer Wasserschongebietsverordnung, UBA-Report UBA-91-056, Umweltbundesamt, Wien 1991.
- HOCHRATHNER, P., Alpin-Ornitho-Ökologische Untersuchungen im Dachsteingebiet 1995, *Monticola* 7, 1995, 195-213.
- HODSON, F.R., Hallstatt, The Ramsauer Graves, Quantification and Analysis, RGZM Mainz, Monographien 16, 1990.
- HOERNES, M., Das Gräberfeld von Hallstatt, seine Zusammensetzung und Entwicklung, *Mitteilungen des Staatsdenkmalamtes*, 2-3, 1920/21, 1 ff.
- HOFFMANN, A., *Studien und Essays; Staat und Wirtschaft im Wandel der Zeit, Österreich und das Land ob der Enns*, Linz 1979, 1981.
- , Die oberösterreichischen Städte und Märkte. Eine Übersicht ihrer Entwicklungs- und Rechtsgrundlagen, *Jahrbuch des oberösterreichischen Musealvereines*, 84, 1932, 63ff.
- , *Wirtschaftsgeschichte des Landes Oberösterreich*, 1, Salzburg 1952, 38 ff., 212 ff.
- , Thomas Seeauer und der Wasserweg von Hallstatt nach Prag, *Studien und Essays*, 2. Bd., Wien 1981, 205-215.
- HÖPLINGER, K., Das prähistorische und heimatkundliche Museum in Hallstatt, *Oberösterreich*, 30/1, 1980, 43-47.
- HUNDT, H.-J., Vorgeschichtliche Gewebe aus dem Hallstätter Salzberg, *Jb. RGZM*, 34, Mainz 1987, 261-286.
- KENNER, F., Die römische Niederlassung in Hallstatt, *Denkschrift der k.k. Akademie der Wissenschaften in Wien*, 48, Wien 1901.
- KILIAN-DIRIMEIER, I., Beobachtungen zur Struktur des Gräberfeldes von Hallstatt. *Mitteilungen der Österreichischen Arbeitsgemeinschaft für Ur- und Frühgeschichte*, 22, 1971, 71f.

- KOLLER, E.J., Forstgeschichte Oberösterreichs, Linz 1975.
- KOLLER, M., Die gotischen Flügelaltäre Oberösterreichs als Aufgabe der Denkmalpflege, Kunstgeschichte und Denkmalpflege, Festschrift für Norbert Wibiral, Linz 1986, 102-105.
- KOMAREK, A., Salzkammergut, Wien 1994.
- KOSCHATZKY, W., Aquarellmalerei, Wien 1987.
- KRAL, F., Pollenanalytische Untersuchungen zur Waldgeschichte des Dachsteinmassivs, Rekonstruktionsversuch der Waldgrendendynamik, Veröffentlichung des Institutes für Waldbau, Hochschule für Bodenkultur Wien, Wien 1971.
- KRAUS, F., Höhlenkunde, Wien 1994.
- KRAUS, V. F. von., Die Wirtschafts- und Verwaltungspolitik im Gmundner Kammergut, Wiener Staatswissenschaftliche Schriften, 1/4, Freiburg/Leipzig/ Tübingen 1896, V-VII, 321-488.
- KRENN, K., Hallstatt, Geschichte der Ausgrabung und Erforschung des ....Gräberfeldes, Oberösterreichische Heimatblätter, 4, 1950, 1-16.
- KRISAI, R., SCHMIDT, R., Die Moore Oberösterreichs, Natur- und Landschaftsschutz in Oberösterreich 6, Linz 1983.
- KRÖKEL, F., Stifters Freundschaft mit dem Alpenforscher Friedrich Simony, Vierteljahresschrift Adalbert- Stifter-Institut des Landes Oberösterreich, Linz 1955.
- KROMER, K., Gedanken über den sozialen Aufbau der Bevölkerung auf dem Salzberg bei Hallstatt, Oberösterreich, ArchA, 24, 1958, 39 ff.
- , Das Gräberfeld von Hallstatt, Firenze 1959.
- , Die ersten Europäer, Innsbruck 1980.
- , Hallstatt, die Handelsmetropole des ersten Jahrtausends vor Christus in den Alpen, Wien 1963.
- , Vom frühen Eisen und reichen Salzherren, Wien 1964.
- KYSELAK, J., Skizzen einer Fußreise durch Oesterreich, Steyermark, Kärnthen, Salzburg, Berchtesgaden, Tirol und Bayern nach Wien, Wien 1829.
- KUNSTWERK STADT, Österreichische Stadt- und Ortsdenkmale, hrsg. vom Bundesdenkmalamt, Wien-Salzburg 1988.
- LEHR, R., Dachstein - Abenteuer in Vergangenheit und Gegenwart, Linz 1980.
- , Dem Herrgott sein Klettergarten, Oberösterreich, 2, Linz 1989.
- , Der Kampf um den Dachstein, Linz 1976.
- , Friedrich Simony - Ein Leben für den Dachstein, Ausstellungskatalog OÖ. Landesmuseum, Linz 1996.
- , Hallstatt - Geschichte und Gegenwart, Linz 1978.
- , Hallstatt - Schönheiten und Schätze, Hallstatt 1985.
- , Im Salzkammergut, Wels 1987.
- , Landes-Chronik Oberösterreich, Linz-Wien 1992.
- , Salzbergwerk Hallstatt, Bad Ischl 1982.

- LEHR, R., Vergnügliche Ausflüge ins k.u.k. Salzkammergut, Linz 1982.
- , Hallstatt, Hallstatt 1975.
- , Das Salzbergwerk Hallstatt, Bad Ischl 1978.
- , Hallstatt, Geschichte und Gegenwart, Linz 1979.
- LIPP, F. C., Hallstatt-Blockhaus und Dachstein-Almhütten, Archäologia Austriaca, Beihefte 13/14, 1976, Festschrift für R. Pittioni, Bd. 1, 611-633.
- , Region Salzkammergut, Oberösterreich, 1, Linz 1981.
- , Volksart und Brauch, (Kristian Sotriffer, Das Salzkammergut), Linz 1978.
- LIPP, W., Haus und Hof im Salzkammergut, Oberösterreich, 32, 1982, H. 1, 33-39.
- MAHR, A., Das vorgeschichtliche Hallstatt, Veröffentlichungen des Vereines der Freunde des Naturhistorischen Museums, 8-12, 1925.
- MAIER, F., Die Waldvegetation an der Dachstein-Nordabdachung, Oberösterreich, Pflanzensoziologie, Floristik, Naturschutz, Stapfia 35, 1994.
- MANDL, F., Die Besiedlung des östlichen Dachsteinplateaus, Beiträge zum Kulturleben Bezirk Liezen, 5, 1984.
- MANDL, F., NEUMANN, H., Forschungsergebnisse auf der Lackenmoosalm und nahe dem Lackenofen, Beiträge zum Kulturleben Bezirk Liezen 4/5, 1984.
- MAYER, G., Atlas der Brutvögel Oberösterreichs, Natur- und Landschaftsschutz in Oberösterreich, 7, Linz 1987.
- MAYER, H., et al., Urwaldreste, Naturwaldreservate und schützenswerte Naturwälder in Österreich, Institut für Waldbau der Universität für Bodenkultur Wien, Wien 1987.
- MORTON, F., Zur Frage der Grubenarbeit im Hallstätter Salzbergwerk, ArchA 2, 1949, 68 ff.
- , Der kleine gotische Flügelaltar in der Hallstätter Pfarrkirche, Christliche Kunstblätter, 71, 1930, 16ff.
- , Vorarbeiten zu einer Geschichte Hallstatts, Heimatgäue, 10, 11, 12, 1929-1931, 172-186, 98-102, 49-56.
- , Wirtschaftsraum Hallstatt, Wirtschaftsgeographie 5, Berlin-Wien 1934.
- , Die Pfarrkirche von Hallstatt, München 1939, Kleine deutsche Kunstführer, 388/389.
- , Adalbert Stifter und Friedrich Simony in Hallstatt, Adalbert-Stifter-Almanach 1941/42.
- , Hallstatt und die Hallstattzeit, Hallstatt. Kultur und Natur I, Hallstatt 1953.
- , Hallstatt, Die letzten 150 Jahre, Hallstatt. Kultur und Natur II, Hallstatt 1954.
- , Salzkammergut. Die Vorgeschichte einer berühmten Landschaft, Hallstatt. Kultur und Natur III, Hallstatt 1956.
- , 4500 Jahre Hallstatt im Bild, Hallstatt. Kultur und Natur IV, Hallstatt 1959.
- , Die Grabungen in der römischen Niederlassung in der Lahn, Jahrbuch des oberösterreichischen Musealvereines, 110, 1965, 172-203, 204-205.
- , 4000 Jahre Verkehrsprobleme. Der Salzmarkt Hallstatt, Universum, 22, 1967, 182-185.



- MORTON, F., Pflanzensoziologische Aufnahmen aus Oberösterreich, Beih. Arch. 24, 1929.
- , Pflanzensoziologische Studien im Dachsteingebiete, Rep. Spec. Nov., Beih. 61, 1930.
- , Pflanzensoziologische Untersuchungen im Gebiet des Dachsteinmassivs, Sarsteins und Höllengebirges, Rep. Spec., Nov., Beih. 71, 1933.
- , Botanische Aufnahmen aus dem Salzkammergut, Jahrbuch des oberösterreichischen Musealvereines, 113, 1968.
- , Hallstatt und die Hallstattzeit, Hallstatt 1953.
- , Salzkammergut, Hallstatt 1956.
- MORTON, F./POLASCHEK, E., Die römische Niederlassung in Hallstatt, Jahrbuch des oberösterreichischen Musealvereines, 91, 1944, 293-351.
- MOSER, R., Hallstätter- und Obertrauner Almen im Bereich des Dachsteinmassivs, Musealverein Hallstatt, 1994.
- MUCINA, L., et al., Die Pflanzengesellschaften Österreichs, 1-3, Jena 1993.
- NEUMANN, D., LEHR, R., Bad Ischl und die Habsburger, Bad Ischl 1995.
- NOVOTNY, F., Adalbert Stifter als Maler, Wien 1940.
- OTRUBA, G., Geschichte des Bergbaues, o.O. 1988.
- PALME, R., Die landesherrlichen Salinen- und Salzbergrechte im Mittelalter, Innsbrucker Beiträge zur Kulturwissenschaft, 34, Sonderheft, Innsbruck 1974.
- , Rechts-, Wirtschafts- und Sozialpolitik der inneralpinen Salzwerke bis zu deren Monopolisierung, Rechtshistorische Reihe, 25, Frankfurt-Bern 1983.
- PAULI, L., Der Goldene Steig, Münchner Beiträge zur Vor- und Frühgeschichte. Ergänzungsband 1/I, Festschrift Werner, 1975, 115 ff.
- , Die Gräber vom Salzberg zu Hallstatt, Erforschung - Überlieferung - Auswertbarkeit, Mainz 1975.
- PAVUZA, R., STUMMER, G., Höhlen im Dachstein, Pilotprojekt „Karstwasser Dachstein“, 1, Karstwasserqualität, Monographien Bd. 41, Umweltbundesamt, Wien 1994.
- PFARL, W., Das Salzkammergut, Wien 1975.
- POLASCHEK, E., MORTON, F., Die römische Niederlassung in Hallstatt, Jahrbuch des Vereines für Landeskunde und Heimatpflege, Linz 91, 1944, 293-351.
- PÖTSCHNER, P., Genesis der Wiener Biedermeierlandschaft, Wien 1964.
- PRINZ, A., et al., Straßentunnel Hallstatt, Linz 1966.
- REITINGER, J., Oberösterreich in ur- und frühgeschichtlicher Zeit, Linz 1969.
- RIEDL, L., Notizen über Grabsteine und Gedenksteine an der Pfarrkirche Hallstatt, Adler, 7, 1911/16, 2-7.
- SACKEN, E. von, Das Grabfeld von Hallstatt in Oberösterreich und dessen Alterthümer, Wien 1868.
- SACKEN, E. von, Das Grabfeld von Hallstatt in Oberösterreich und dessen Alterthümer, Wien 1868.
- SALLMANN, A., Der Hallstätter Salzberg, Innsbruck, Wirtschaftswissenschaftl. Diss., 1953.

- SARTORI, F., Die österreichische Schweiz oder mahlerische Schilderungen des Salzkammergutes in Oesterreich ob der Ens, Wien 1813.
- SAUSER, E., Der Hallstätter Marienaltar, Hallstatt. Kultur und Natur, V, Hallstatt 1956.
- , Meister Astl als Persönlichkeit und kunsthistorisches Problem, Oberösterreich, 30/1, 1980, 37-41.
- SCHAUBERGER, O., Einführung in die Geologie des Dachsteingebirges, Höhlenkundliche Vereinsinformationen, Hallstatt-Obertraun, 9, Sonderheft 1982.
- ; Ein Rekonstruktionsversuch der prähistorischen Grubenbaue im Hallstätter Salzberg, Prähistorische Forschungen, 5, 1960.
- , Neue Aufschlüsse im „Heidengebirge“ von Hallstatt und Dürnberg/Hallein, MAGW 106, 1976, 154 ff.
- SCHMIDT, R., Grundzüge der spät- und postglazialen Vegetations- und Klimageschichte des Salzkammergutes, Österreich, aufgrund palynologischer Untersuchungen von See- und Moorprofilen, Mitt. Komm.f. Quartärforschung der österr. Akademie der Wissenschaften, 3, 1981.
- SCHMID, H., STIELER, K., Aus Deutschen Bergen, Stuttgart 1873.
- SCHOBBER, F., Beitrag zur Geschichte des Baderwesens in Hallstatt, Heimatgaue, 16, 1936, 169-175.
- SCHRAML, C., Die Entwicklung des oberösterreichischen Salzwesens im 16. und 17. Jahrhundert, Jahrbuch des oberösterreichischen Musealvereines, 83, 1930, 153-242.
- , Alte Salzwege nach Böhmen, Blätter für die Geschichte der Technik, 1, 1931, 158-166.
- , Studien zur Geschichte des österreichischen Salinenwesens, Wien 1932, 1934, 1936.
- , Die Salinen der Ostmark, o.O., 1941.
- , Studien zur Geschichte des österreichischen Salinenwesens, Wien 1932, 1934, 1936.
- SCHRÖCKINGER-NEUDENBERG, Ritter von, Reisegefährte durch Ober-Oesterreichs Gebirgsland, Linz 1851.
- SCHULTES, J. A., Reisen durch Oberösterreich in den Jahren 1794, 1795, 1802, 1804 und 1808. Tübingen 1809.
- SCHWARZ, H., Salzburg und das Salzkammergut, Wien - München 1926.
- SIMONY, F., Das Dachsteingebiet, Wien 1895.
- , Die Seen des Salzkammergutes, Sitzungsberichte der math.-naturw. Classe Kaiserlicher Akademie der Wissenschaften, 1850.
- , Fragmente zur Pflanzengeographie des österreichischen Alpengebietes, Verh. zool.-bot. Vereins Wien, 3, 1853.
- , Das Dachsteingebiet. Ein geographisches Charakterbild aus den Österreichischen Nordalpen, Wien 1895.
- ; Die Alterthümer vom Hallstätter Salzberg und dessen Umgebung, Beilage zu den Sitzungsberichten d. kaiserl. Akademie d. Wissenschaften, Phil.-hist. Classe 4, Wien 1850.

- SIMONY, F., Das Dachsteingebiet - Ein geographisches Charakterbild aus den österreichischen Nordalpen, Wien 1895.
- SOTRIFTER, K., Das Salzkammergut, Linz 1969.
- SPÄTGOTIK IN SALZBURG. Die Malerei 1400-1530. Salzburg 1972, 73f.
- SPÄTGOTIK IN SALZBURG. Die Plastik. Salzburg 1976, 112.
- SRBIK, H. Ritter von, Studien zur Geschichte des Salinenwesens, Forschungen zur inneren Geschichte Österreichs 12, Innsbruck 1917.
- STADLER, F., Saumwege und Salzsteige an der Dachstein-Ostseite, Salz aktuell, Bad Ischl 1983, 1.
- STEINER, J., Der Reisegefährte durch die Oesterreichische Schweiz oder das ob der ennsische Salzkammergut, Linz 1820.
- STIFTER, A., Bergkristall, Sämmtliche Werke VII, Bunte Steine, Prag 1908.
- STUMMER, G., Atlas der Dachstein-Mammuthöhle, 1:1000, Wissenschaftliches Beiheft zu „Die Höhle“, 32, Wien 1980.
- TEMMELE, L., Evangelisch in Oberösterreich, Linz 1892.
- TIRONIEK, E.M., Studien zu Lienhard Astl, phil. Diss., Wien 1976.
- TREMEL, F., Der Bergbau als städtebildende Kraft Innerösterreichs, Beiträge zur Wirtschafts- und Sozialgeschichte, Festschrift für Hektor Ammann, Wiesbaden 1965, 97-115.
- , Salz-Eisen-Straßen und Salztransport auf See und Fluß, Berg- und Hüttenmännische Monatshefte, 119, 1974, 515-522.
- TRIMMEL, H. Markierungsversuche und Karsthydrographie des Dachsteinstockes. Eine Würdigung der letzten Arbeiten von Dr. Fridtjof Bauer. Akten zum Symposium über die Karstgebiete der Alpen, Die Höhle, Wissenschaftliches Beiheft, 42, 33-44, Wien 1993.
- UNTERBERGER, H., Die Marktgemeinde Hallstatt in ihrer historischen Entwicklung, Hallstatt 1984, 1986.
- URSTÖGER, H.-J., Hallstatt-Chronik. Vom Beginn der Besiedlung bis zum Jahre 1884, Hallstatt 1984.
- VANCSA, M., Geschichte Nieder- und Oberösterreichs, Gotha 1905, Stuttgart/Gotha 1927.
- VIERTHALER, F. M., Meine Wanderungen durch Salzburg, Berchtesgaden und Österreich, Wien 1816.
- VORNATSCHER, J., Arctophaenops angulipennis Meisner, Der voreiszeitliche Höhlenlaufkäfer Oberösterreichs, Jahrbuch des OÖ. Musealvereines, 95, 1950.
- WEIDMANN, F. C., Darstellungen aus dem Steyer-märkschen Oberlande, Wien 1834.
- WEISGERBER, G., Hallstatts Blockwandbauten, Archäologische Korrespondenzenblätter, 11, Mainz 1981, 119-125.
- WEISSBACHER, J., Hallstatt, Das Dekanat Altmünster, Topographie des Erzherzogthums Oesterreich XIV, Wien 1835, 196-212.

- WENDELBERGER, G., Die Pflanzengesellschaften des Dachsteinplateaus, Mitt. Natuwiss. Vereins Steiermark, 92, 1962.
- WETTSTEIN-WESTERSHEIMB, O., Die Wirbeltiere der Ostalpen, Wien 1963.
- WIROBAL, K. H., Das Klima von Hallstatt, Musealverein Hallstatt, 1994.
- , Die Verteilung des Niederschlages in Oberösterreich im Zeitraum 1901-1975, Amt der OÖ. Landesregierung, Landesbaudirektion, 1979.
- WUTZEL, O., Erinnerungen an Dr. F. Morton, Oberösterreich, 30/1, 1980, 48ff.
- , Die Werkstatt „Keramik Hallstatt“, Oberösterreich, 30/1, 1980, 61ff.
- ZABEHLICKY, H. und ZABEHLICKY-SCHEFFENEGGER, S., Eine Grabung im römerzeitlichen Gräberfeld von Hallstatt, Norisch-pannonische Hügelgräber, Vorträge der Tagung Várpalota 1988, Veszprém 1990, 135-148.
- ZAUNER, A., Die bürgerlichen Siedlungen im oberösterreichischen Salzkammergut bis zur Mitte des 16. Jahrhunderts, Wirtschafts- und sozialhistorische Beiträge. Festschrift für Alfred Hoffmann, Sozial- und wirtschaftshistorische Studien, Sonderband, Wien 1979, 67-93.
- ZÖHRER, F., Ob der Enns, Gera 1881.

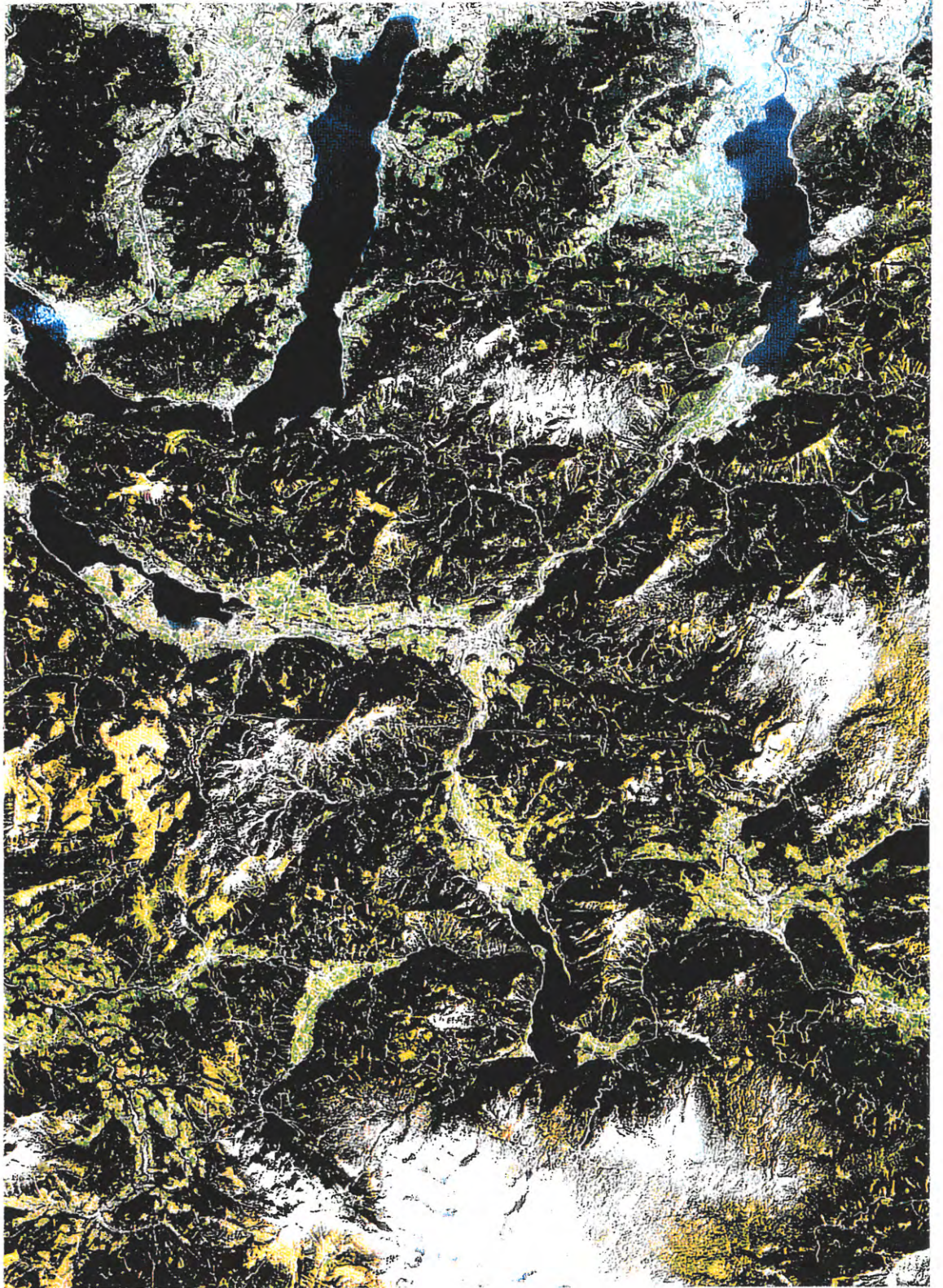
Expositions-catalogues: (Ausstellungskataloge:)

- Fascination Landschaft, Salzburg 1995.
- Barock und Biedermeier, Berlin 1969
- Spätgotik in Salzburg. Die Malerei 1400-1530, Salzburg 1972, 73f.
- Spätgotik in Salzburg. Die Plastik, Salzburg 1976, 112.
- Straub, D. et al., Hallstattkultur. Ausstellungskatalog des Landes Oberösterreich, Linz 1980.
- Die Hallstattkultur, Linz 1980.
- Die Hallstattkultur, Linz 1981.
- Kirche in Oberösterreich, Linz 1985.
- Krieger und Salzherren, Mainz 1970.

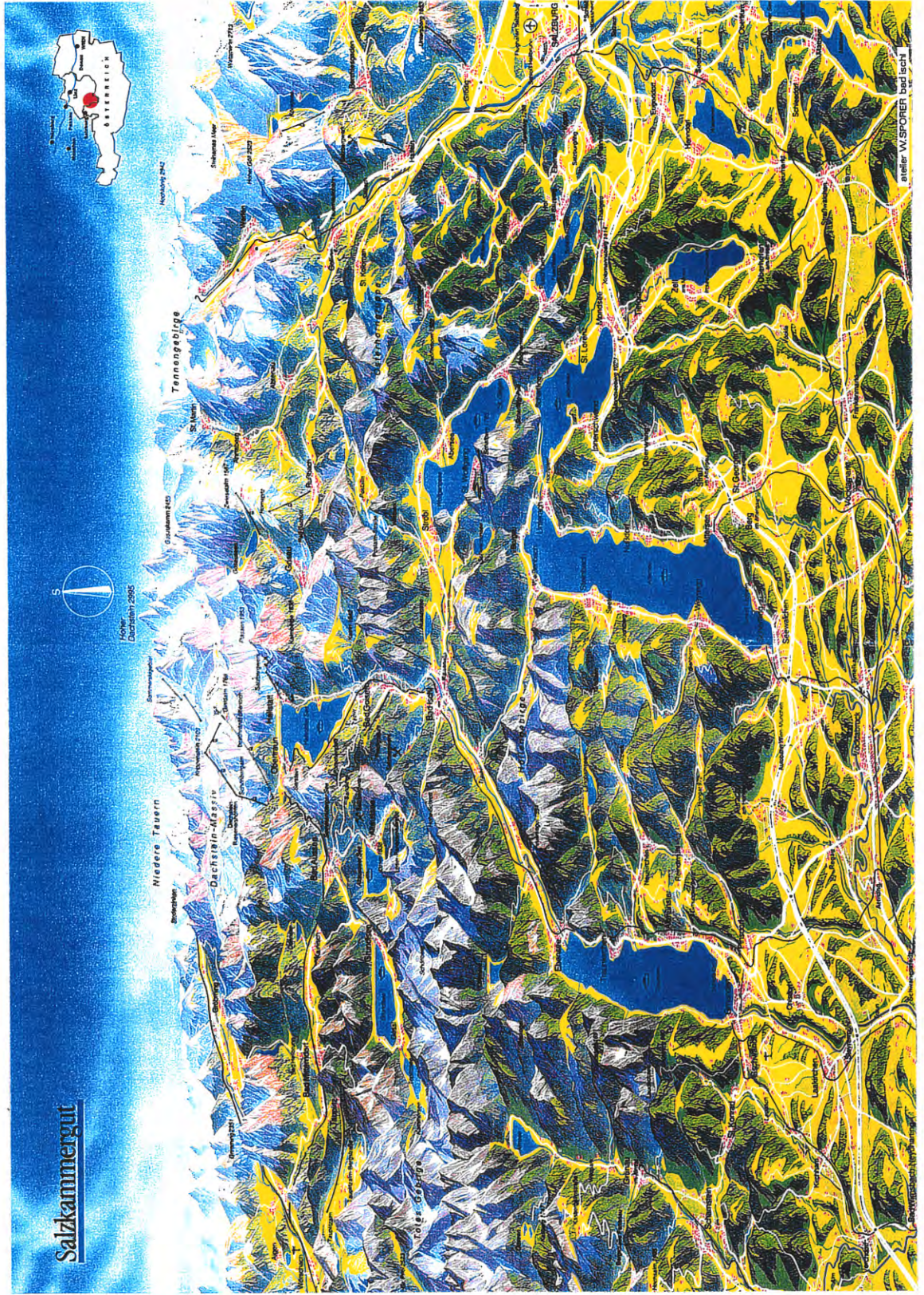


1. Cultural landscape Hallstatt-Dachstein/Salzkammergut:

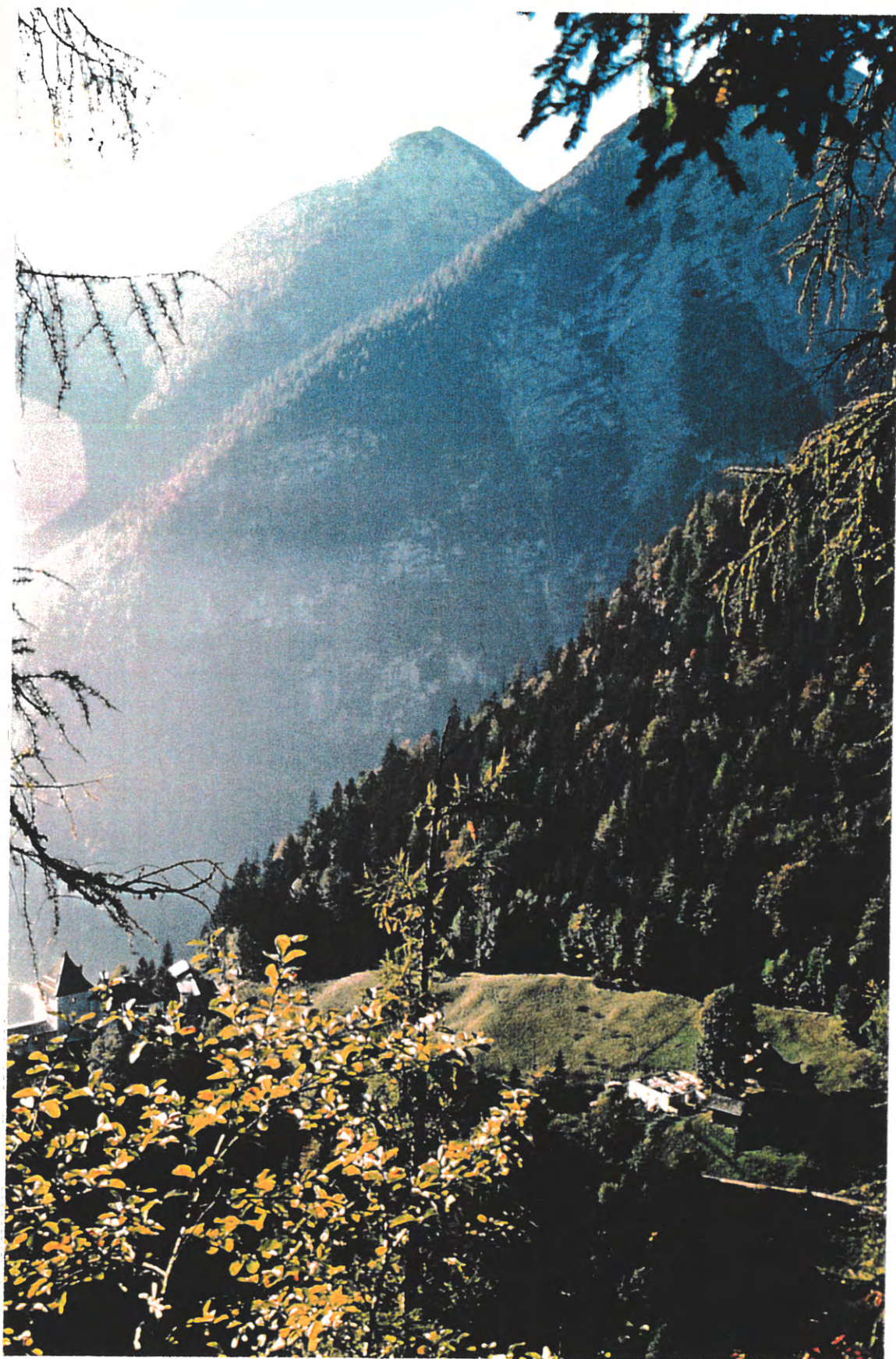
- boundary of the proposed zone for inclusion in the World Heritage List
- - - - boundary of the buffer zone



2. Satellite view of the Salzkammergut.



3. Panorama view of the Salzkammergut.



4. Hallstatt necropolis, on the slope facing the Niedere Sieg peak, vis-à-vis the Rudolfsturm observatory at the mouth of the Salzberg valley.





5. The Salzbergtal, a valley on the mountain behind Hallstatt, centre of prehistoric life. The main excavation sites are in the immediate vicinity of the mine. Mine buildings in the foreground.



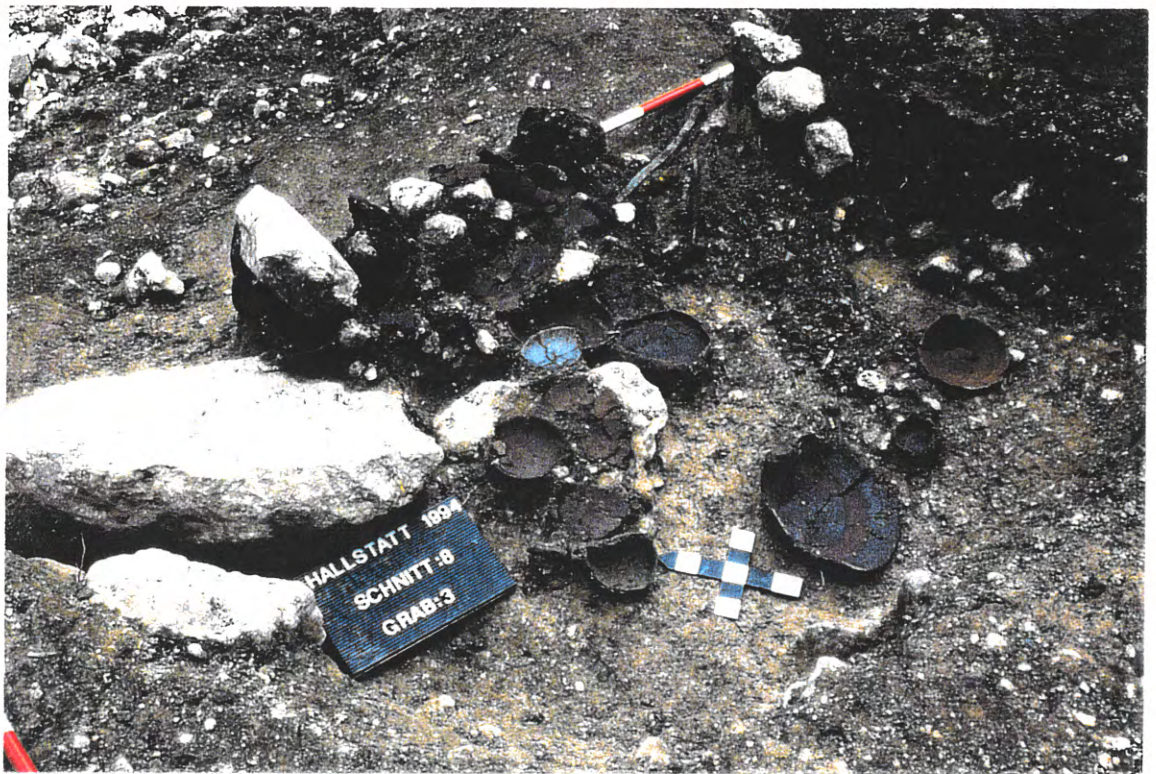
6. The only prehistoric pit preserved as a cavity in the *Stügerwerk*. Timber supports were used to preserve the unique find.

TRAGKÖRBE von LEDER  
aus der Hallstatt-Culturperiode.



cm 10 20 30 40 50 60 cm  
 Dieselben ausgewaflert im Appold Werke der Leopold Stollen Etage am k. k. Salzberge zu Hallstatt  
 unter den im Betten und ausgelaugten Salzthon (Haidengebirg), mit vielen Holzwerk ausgezimmert  
 und eingestürzt keltischen Schachtbaues. im Monate  
 Beide Tragkörbe befinden sich im Naturhistorischen Hofmuseum in Wien.  
 Nach der Natur gezeichnet von Isidor Engl.

7. Prehistoric cowhide sack with special carrying straps; watercolour painting by Isidor Engl. The artifact was found in 1839 and is in the Naturhistorisches Museum in Vienna.



8. The richest grave located by the emergency excavation of 1994 demonstrates the sheer volume and variety of ceramic objects, as they can be still found today.



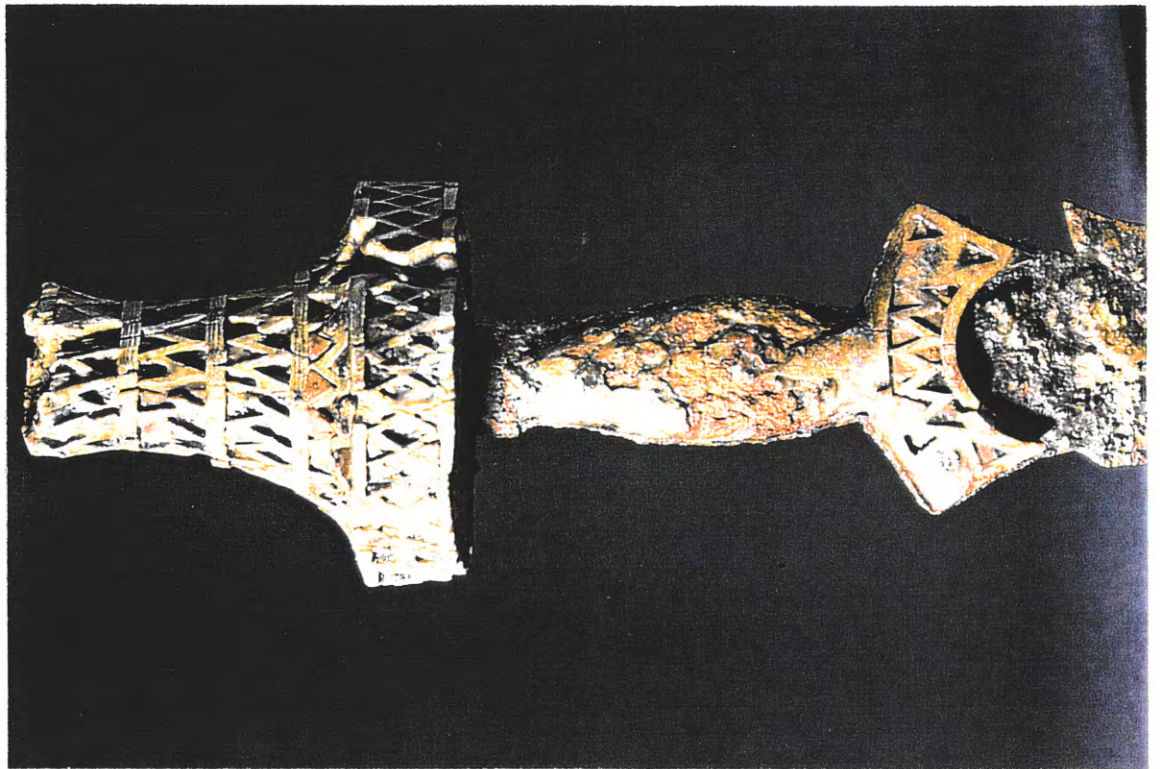
9. Bronze vessels are among the most precious grave furnishings of the Hallstatt period, pointing to the affluence and social status enjoyed by their owners.



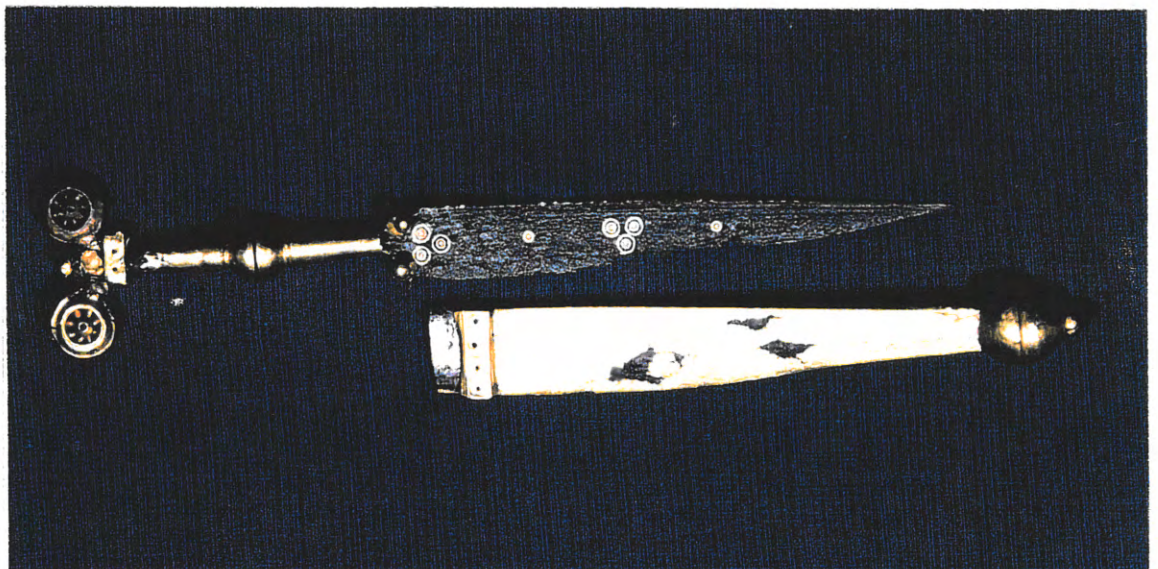
10. Burial offering from the Hallstatt period. The bull, symbolising strength and power, indicates that the grave was made for a wealthy man.



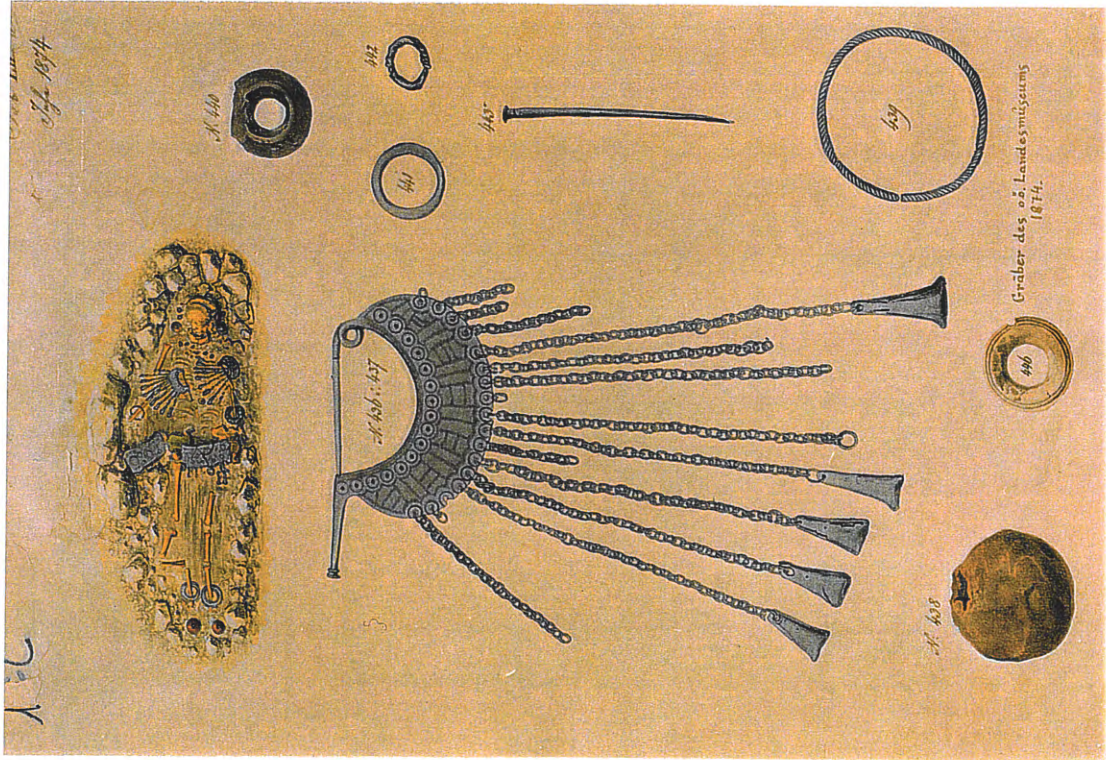
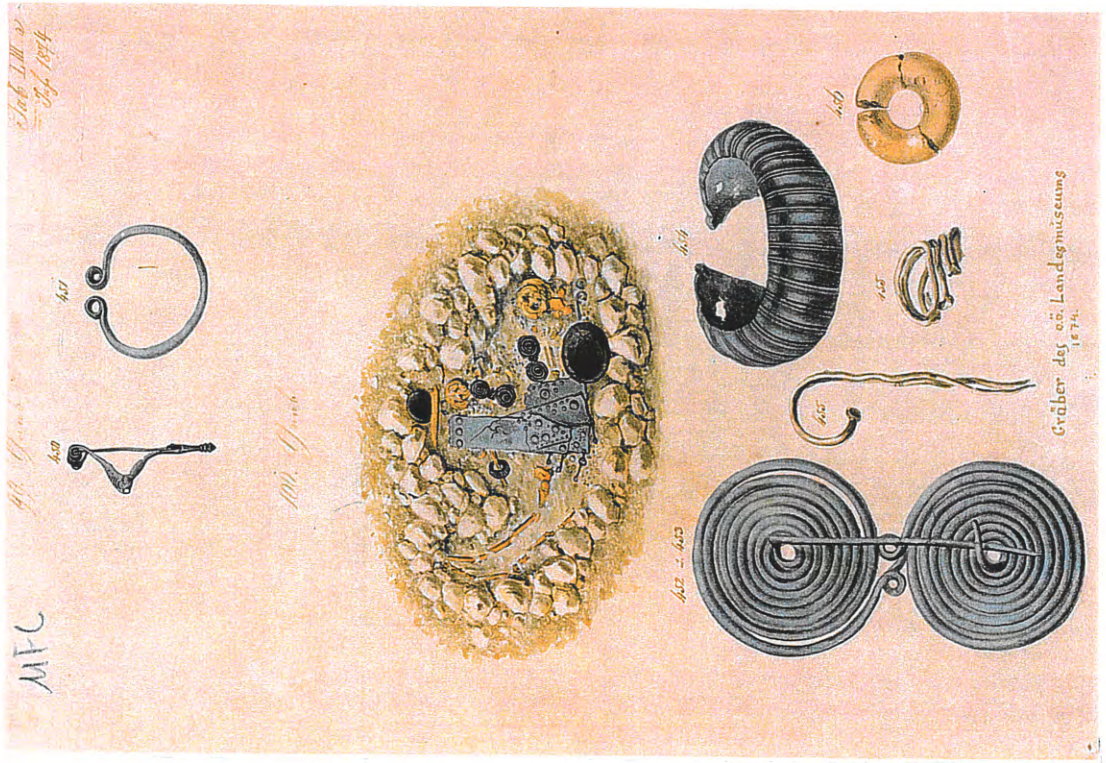
11. Bowl with handle formed in the shape of a cow leading a small calf.



12. Hilt of a typical Hallstatt sword of the earlier period, made of iron. The hilt and pommel are cut from ivory and richly inlaid with amber.



13. Precious „antennae“ dagger of the later period. The iron blade is decorated with fine gold inlay work, the handle and sheath are coated with gold foil.



14 a,b. The graves also yielded exquisite jewelry. Watercolour paintings illustrating an excavation report by the Upper Austrian Provincial Museum of 1874.



15. Hallstatt: View of the Inner Market in the 17th century. Detail of an oil painting owned by the Hallstatt Museum.



16. Hallstatt. Coloured engraving by Ferdinand Runk, c. 1795.



17. The Gosauzwang Barrier. Coloured engraving by Jakob Alt, 1825.

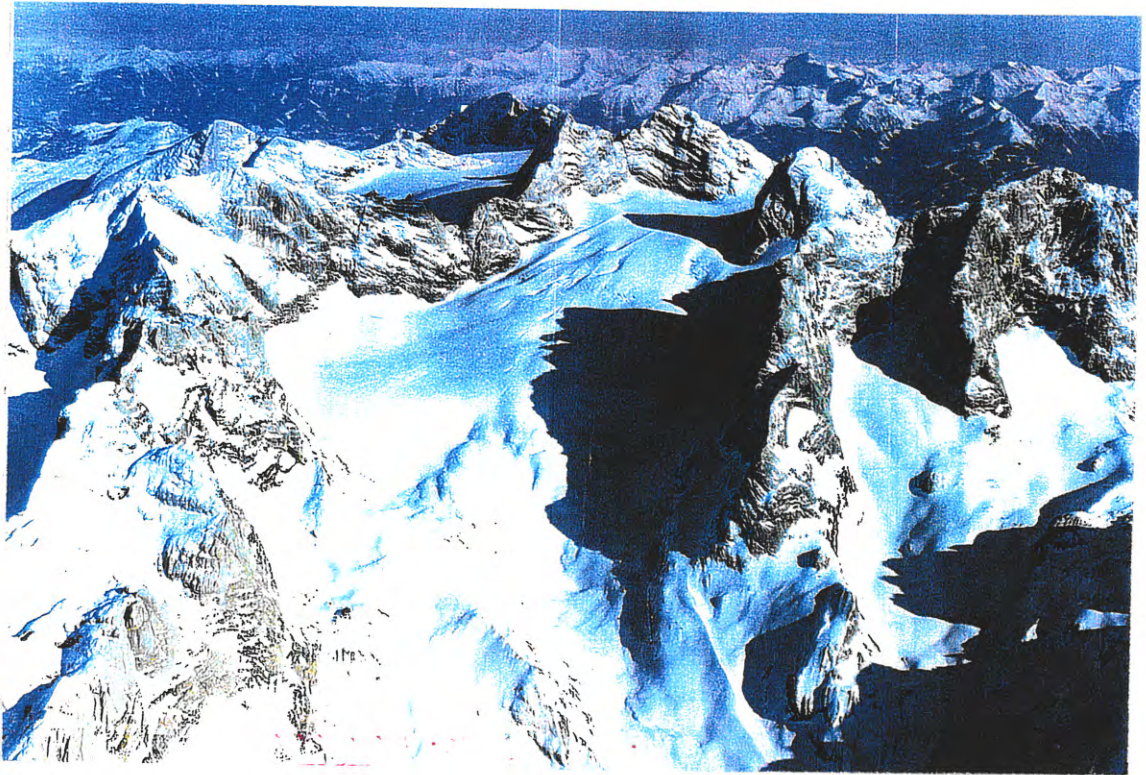


18. Hallstatt. Watercolour painting by Károly Lajos Libay, c. 1845.





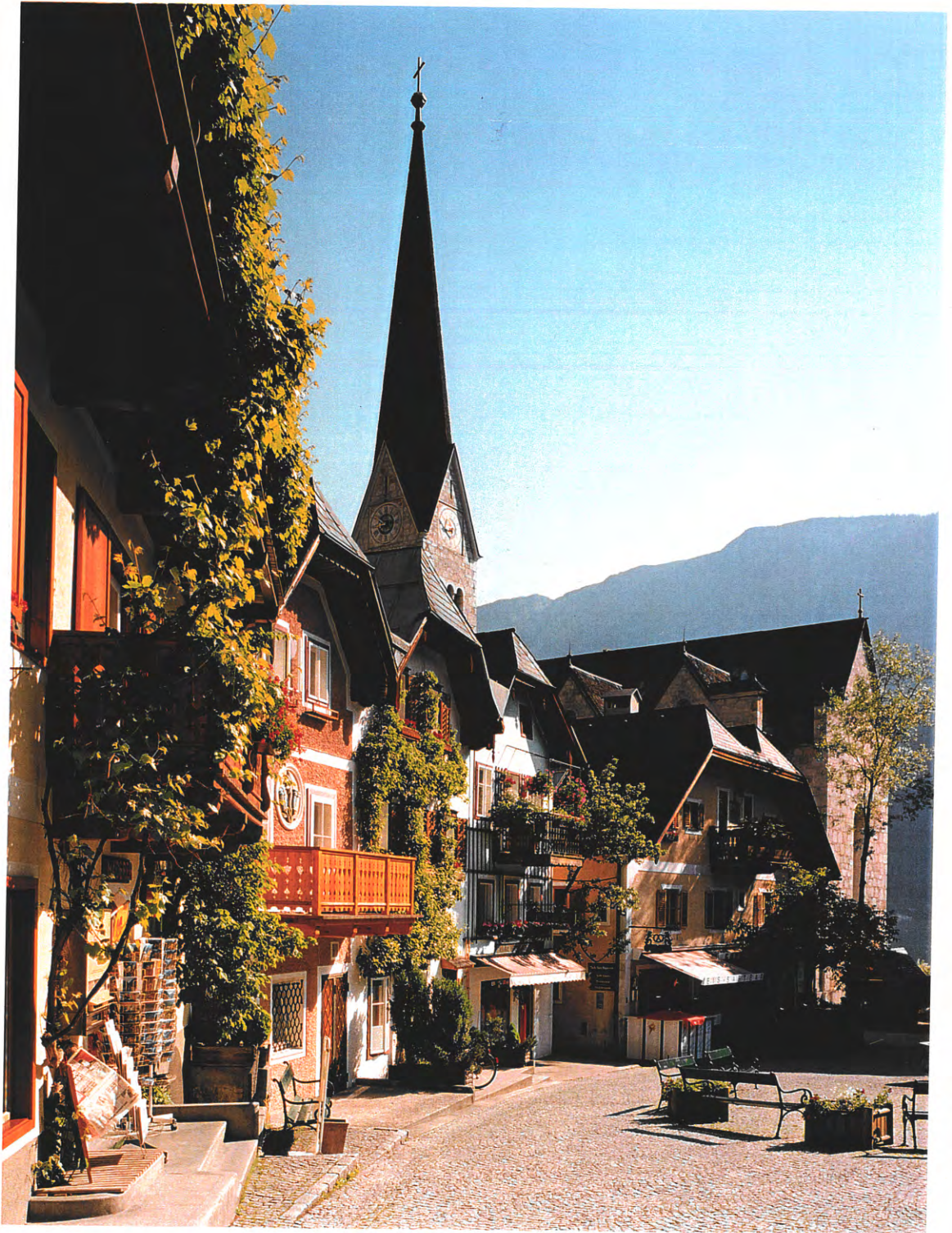
19. Dachstein and Hallstätter See. Oil painting on wood by Franz Steinfeld, c. 1830.



20. Hoher Dachstein, the highest peak towering over the glaciers of the Dachstein massif.



21. View of Hallstatt from the Salzberg. the historic old-town centre stands out by its closely folded roofscape.



22. The historic market square of Hallstatt.



23. Interior of the Hallstatt parish church. In the background the massive Gothic altarpiece and triptych by Lienhard Astl, early 16th century.



24. Hallstatt, St. Michael's Chapel, charnel house in the lower level vault, still in use.



25. View from the Echern valley towards the Lahn quarter.



26. Hallstatt, Lahn quarter, mine administration building, 1751.



27. Hallstatt from the north, view in the second half of the 19th century. Oil painting by Theodor Nocken, 1870.



28. Hallstatt from the north, modern view.



29. Hallstatt. Oil painting on cartoon by Anton Schiffer, c. 1870.



30. The „Painters' Corner“, viewed from the lake.





31. The Strub forest rivulet: a favourite motif for painters.



32. View from the Hütteneckalm across the Dachstein area and Hallstätter See.  
Oil painting by Ferdinand Waldmüller, 1838.



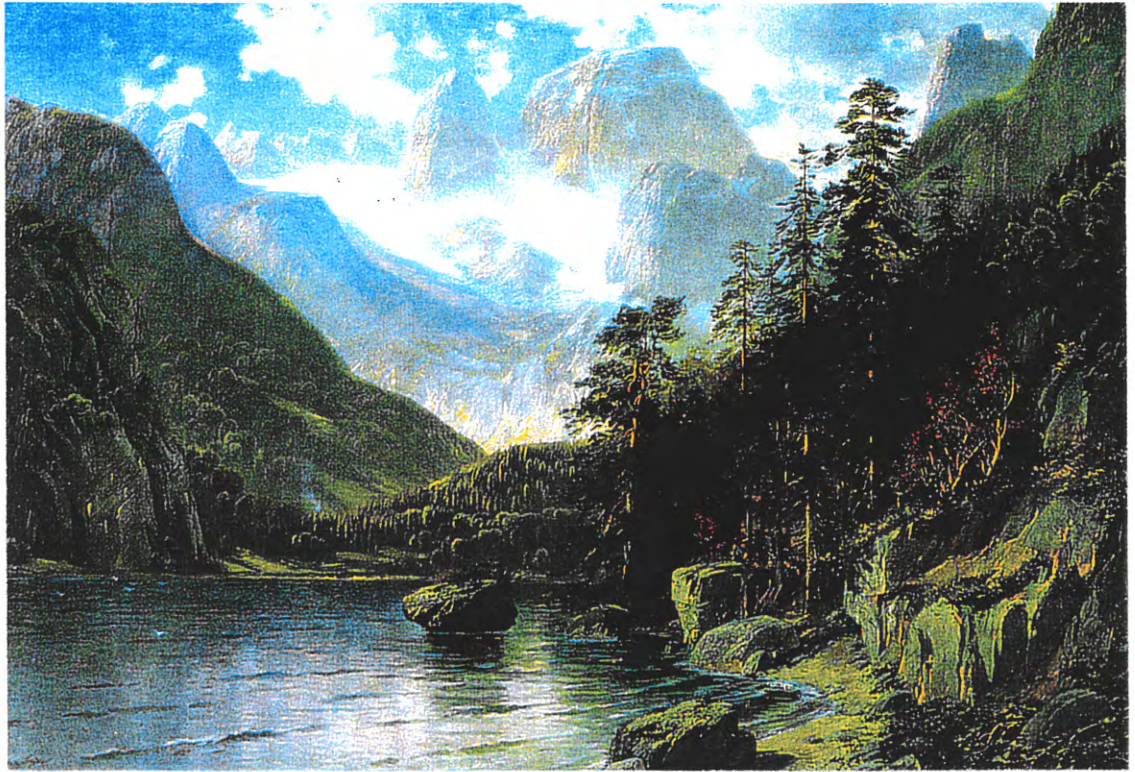
33. The Hütteneckalm today.



34. Gosausee and Dachstein. Watercolour painting by Jakob von Alt, 1840.



35. View of Gosausee and Dachstein today.



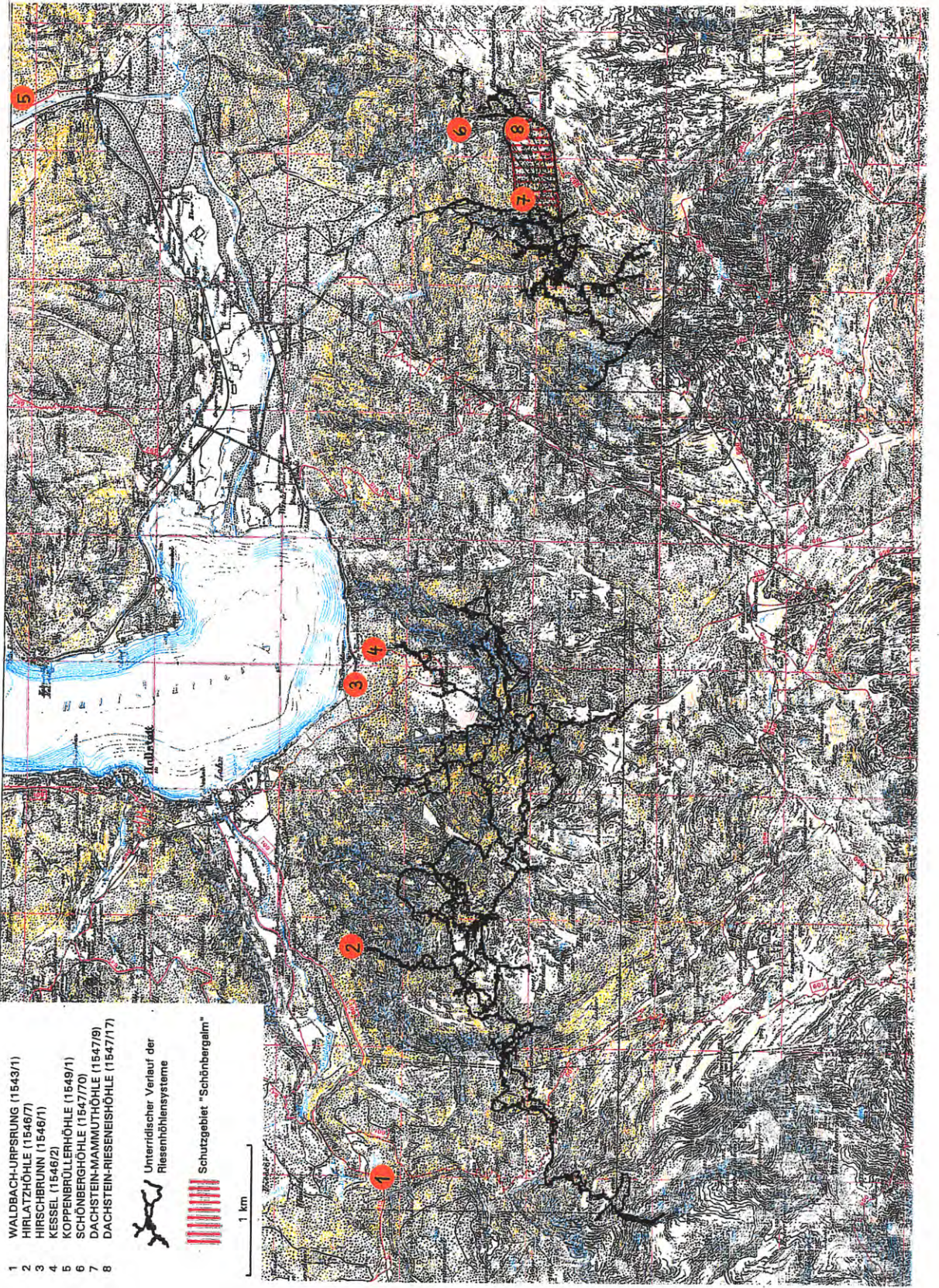
36. Romantic view of Gosausee at the foot of the Dachstein. Oil painting by Horst Hacker, second half of the 19th century.



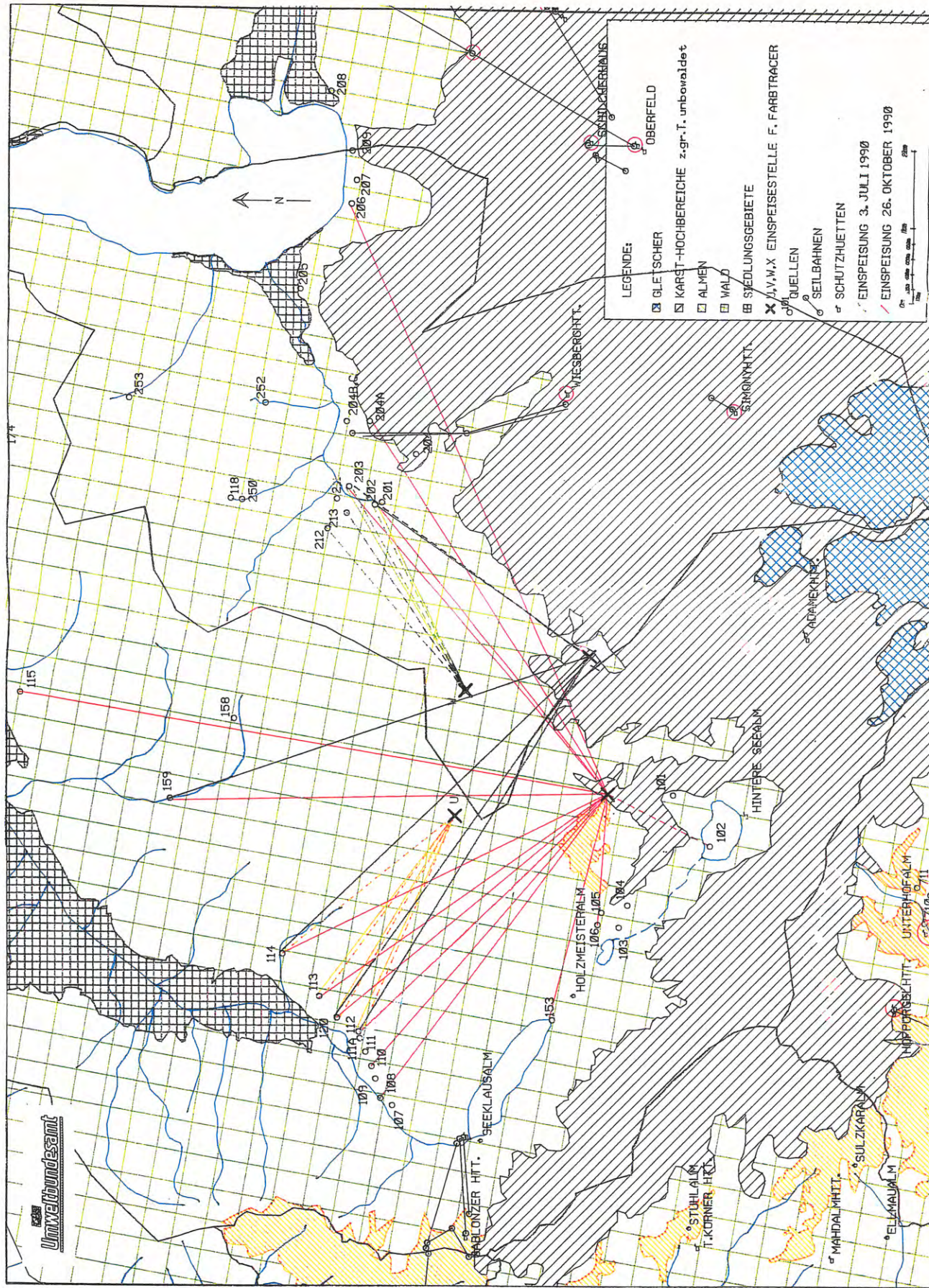
37. Scene around Gosausee and Dachstein massif, a natural setting still unspoiled today.



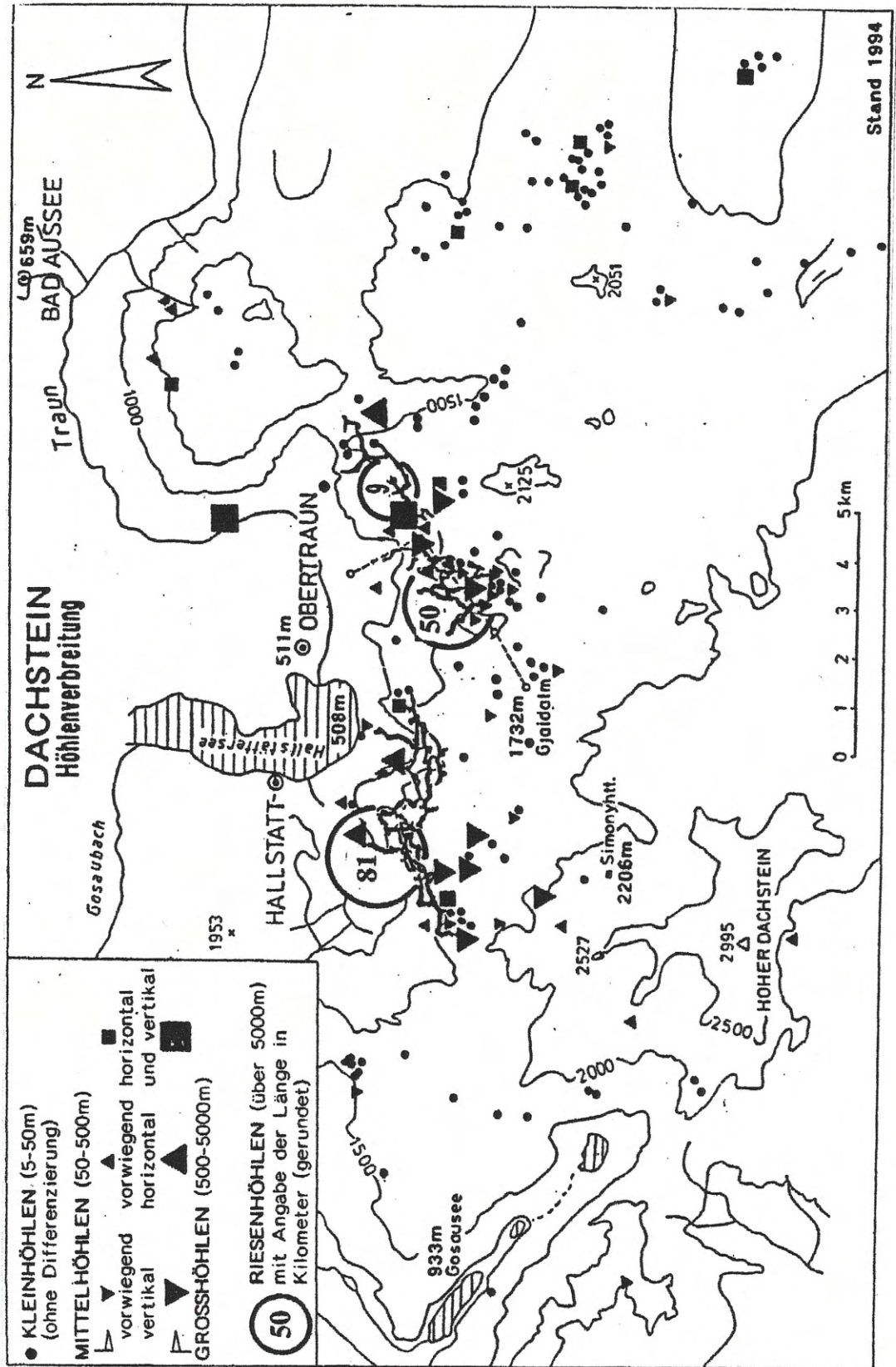
38. Painter Franz Steinfeld crossing the Gosausee. Watercolour painting by Franz Eybl, 1837.



39. Underground course of the giant cave systems at the northern edge of the Dachstein, with major springs marked.



40. Documented routes of the Karstwater in the western Dachstein area.



41. Incidence of caves in the Dachstein.

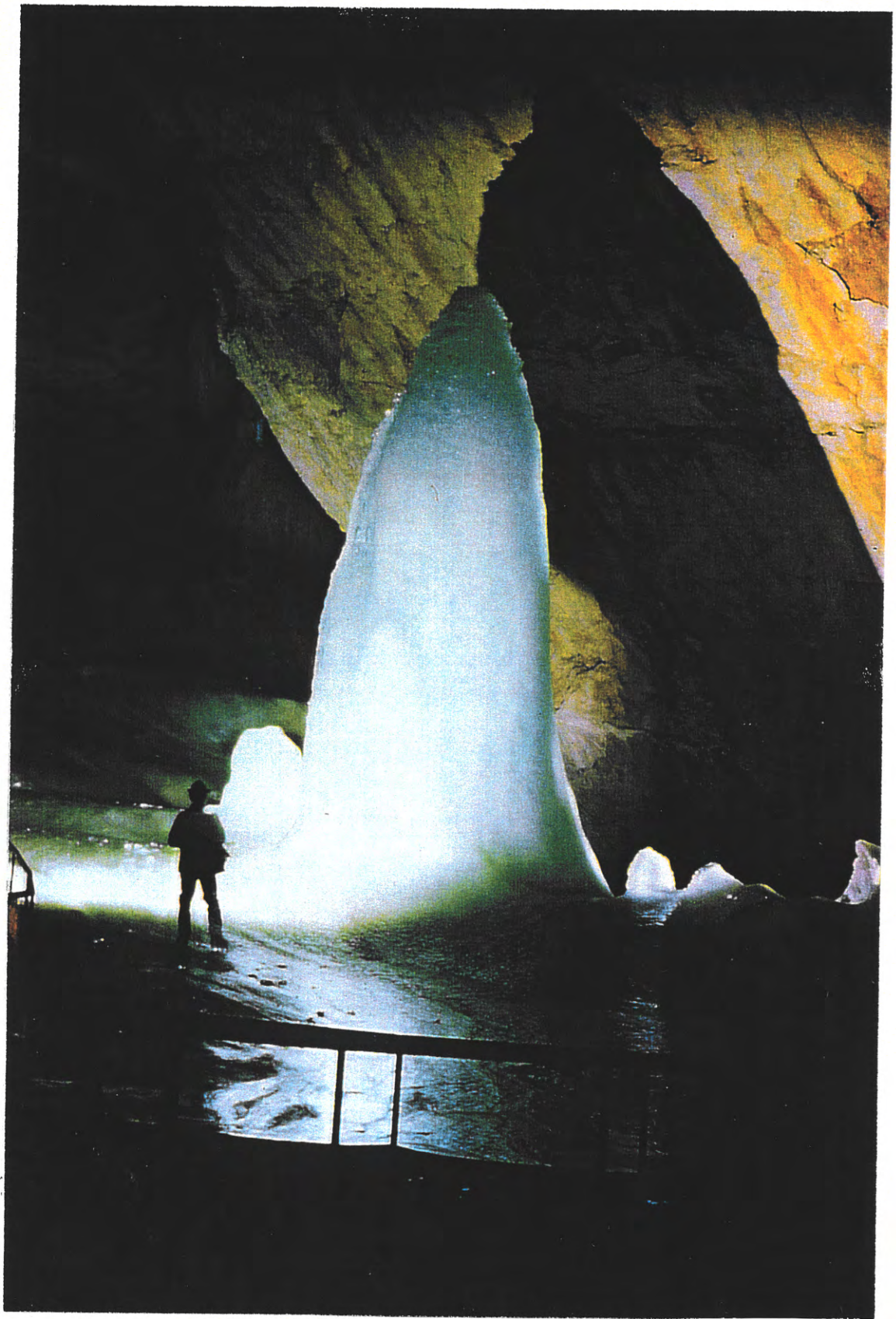




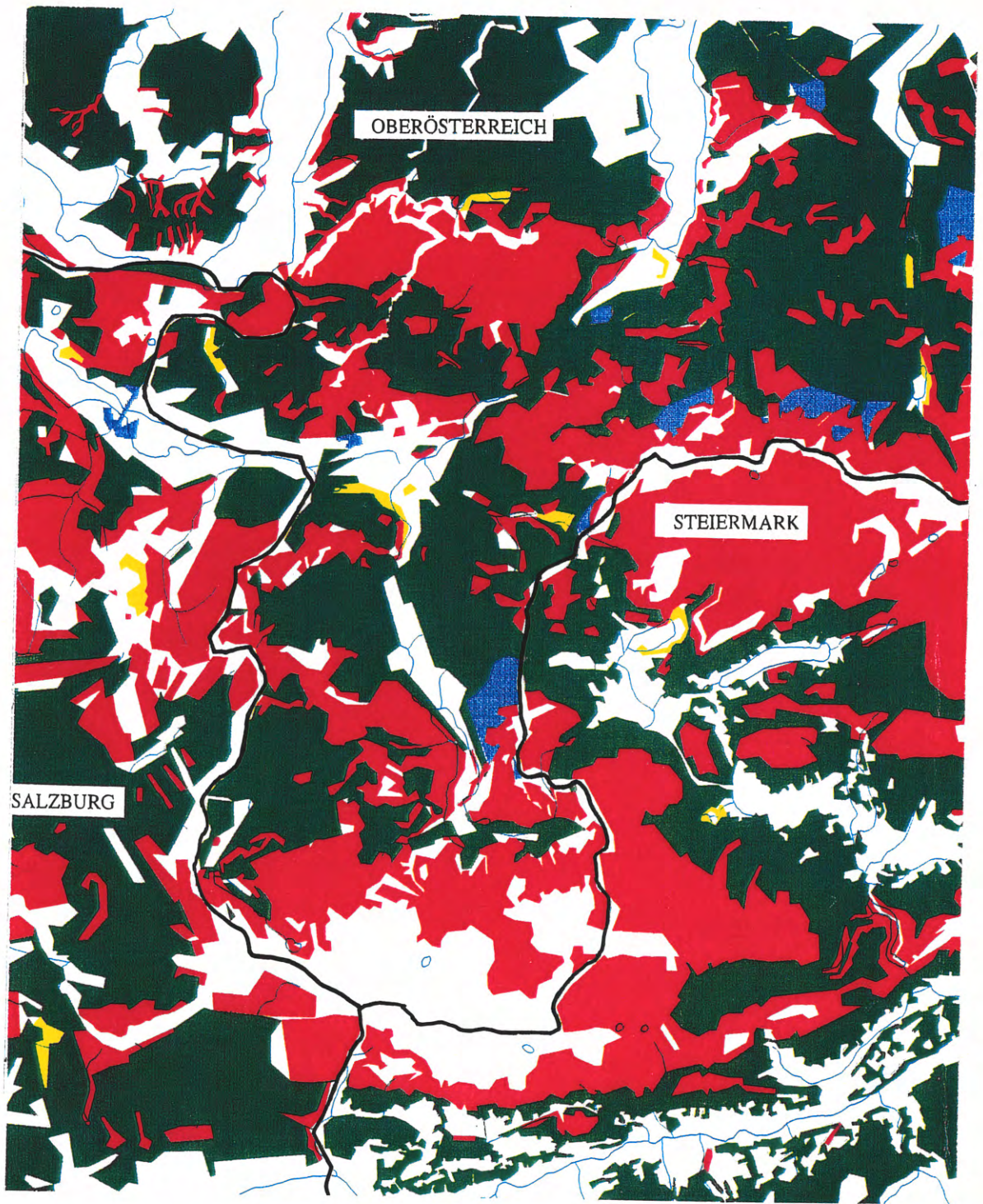
42. Dachstein massif, mouth of a cave.



43. Dachstein massif, *Mammuthöhle*.



44. Dachstein massif, *Rieseneishöhle, Parzivaldom.*



45. Potential profits from forestry  
Types of function:

- |   |            |   |            |
|---|------------|---|------------|
|  | protection |  | recreation |
|  | welfare    |  | economy    |