



GÉOPARK[®]
Harz . Braunschweiger Land . Ostfalen

Landmark 2

Ottiliae Shaft



assisted by

UNESCO

Harz



Networks of the Geoparks



The **Global Geopark Network** is a worldwide association of various Geoparks, all of which pursue common goals under the auspices of the UNESCO.



European Geoparks



-  NATIONALER
-  GEOPARK
- 

A **National Geopark** is a clearly defined region, which conveys both geological history as well as the development of a cultural landscape. In addition, the institutions responsible for the Geoparks are actively involved in the protection of its geological heritage.



The **Geopark Harz · Braunschweiger Land · Ostfalen** was founded in 2002. In the plan above you can locate all of the areas described to date around landmarks No. 1 Hübichenstein through No. 28 Hundisburg Castle.

1 Central Hoisting Shaft Ottiliae Shaft

Coming from the west along the B 242 we see, shortly before reaching Clausthal-Zellerfeld, the steel pulley frame of the Ottiliae Shaft on the left. The 19.86 m high two-piered headframe is one of the best known mining landmarks of the region. Constructed in the forge at Clausthal in 1876, it is the oldest steel pulley frame in the Upper Harz.

Up until the Preussag company closed down mining in Clausthal-Zellerfeld in 1930 the Ottiliae Shaft was the central hoisting shaft of the Rosenhöfer, Burgstätter and Zellerfeld lodes. The ore (majorly argentiferous galena and sphalerite) was first transported by boat on an underground waterway, a portion of the Ernst August Gallery, for up to 6 km from the mining point. In the underground harbor of the Ottiliae Shaft, 341 m below the earth's surface, the steel transportation



Riding the Haulage Road Train



Hoisting Winch

carts were fastened to steel cables and hoisted to the surface. At the beginning of the 20th century the shaft was deepened to the lowermost waterway attaining a final depth of 594 m. At this time the hoisting was taking place in the Kaiser Wilhelm Shaft. The ore was transported above ground by electric lorry to the ore dressing plant near the Ottiliae Shaft.

In the aboveground buildings of the shaft, which was named after the Prussian Chief Inspector of Mines ERNST HERMANN OTTILIAE (1821 - 1904), is a branch of the Upper Harz Mining Museum. On display are diverse examples of mining machinery in operating condition. The Museum visit begins with an adventurous ride on the reconstructed 2.2 km long haulage line. Weekends and on holidays during the summer season the railway runs from the former Clausthal train station to the Ottiliae Shaft.



2

GeoPark Information Center Upper Harz Mining Museum

As early as 1884 the Chief Mining Inspector ADOLF ACHENBACH (1825–1903) had urged the collection and preservation of antiquated historic mining machinery; these today are the core of the Museum, founded in 1892, located between Bornhardt- and Bäckerstraße in the Zellerfeld district. Here more awaits us than merely exhibit rooms and a museum café; a visitor's mine works with an approximately 250 m long visitor's gallery as well as original mining structures await us on the grounds. Among these are Germany's only surviving horse-driven "Gaipel" (capstan), the only ore dressing plant with a gravity stamp and the shaft house from 1787. In the main building's 30 exhibit rooms a collection of models, minerals and coins as well as a special collection of miner's lamps and miner's tools provide an overall view of the development of Upper Harz mining since the Middle Ages. That includes a look at



Museum Grounds in Winter



Dennert Plate

the life and customs of the citizens of the mining town. In the first upper floor of the building, which originally served as residential space, this is quite successfully provided. There is also a reminder of the famous son of the mining town, ROBERT KOCH. He was born on 11. December 1843 in Clausthal, the third of 13 children of the Assistant-Foreman HERMANN KOCH (1814–1877).

The Senior Inspector of Mines HERBERT DENNERT (1902–1994), for many years the chairman of the Upper Harz Historical and Museum Society, cannot go unmentioned. Not only was he in charge of the Upper Harz Mining Museum, he also developed the information signs in the form of the harz-typical spruce tree, called Dennert Plates, which keep mining history alive throughout the entire Harz area.

Museum open hours:
Daily 10:00 a.m. – 5:00 p.m.

3 Clausthal-Zellerfeld`s last Mine Works Kaiser Wilhelm Shaft Clausthal

Bordering the new extensions of the Technical University on the Erzstraße we find the above-ground installations of the Kaiser Wilhelm II Shaft. The shaft was sunk to the Burgstätter lode in 1880. The 15.6 m high steel two-piered head frame was erected by the Schmidt, Kranz & Co. engineering works of Nordhausen. By the time the vertical hoisting shaft could finally be christened in 1892 its depth had reached 864 m. The ore was first lifted to the level of the deep water drift (Ernst August Gallery) from where it was transported by ore barge to the Otiliae Shaft. In 1930 the pit was closed. Today the above-ground installations are integrated in the grounds of the Harzwasserwerke company. The restored engine house, the shaft hall, the pithead dry room and other maintenance buildings as well as exact reconstructions of wood water wheels are on the property.



Shaft Hall



Sperberhai Dam

4 UNESCO Upper Harz Water Management System Sperberhai Dam

In the region around Clausthal-Zellerfeld, Hahnenklee and Sankt Andreasberg the installations which today comprise the UNESCO World Cultural Heritage Upper Harz Water Management System were constructed beginning around 1530. It is a network consisting of approx. 600 km of trenches, 120 lakes and 30 km of underground water transportation tunnels. The system served to collect, store and transport water which in turn powered water wheels and pump stations. It was crucial to survival and capable of transporting water over great distances, for instance to the high plateaus of Clausthal from the Bruchberg and the Brockenfeld areas. To attain this the Sperberhai Dam, 940 m long with a max. height of 16 m, located beside the B 242 (B 498 junction), was constructed between 1732 and 1734.



5 Technical University GeoMuseum Clausthal

Preoccupation with geoscientific questions has a long tradition in the institute of mining education, founded in 1775, later the Bergakademie (Mining Academy) (1864) and today the Technical University Clausthal. Its mineral collection of over 120,000 specimens numbers among the largest collections in Germany. Of particular importance are the collections of ores and nonmetallic mineral raw materials. Most unique are the true-to-life models of the largest fossilized flying insects exhibited here. The GeoMuseum is located in the main building of the Technical University, Adolph-Roemer-Straße 2a. Nearby stands a memorial in commemoration of the Mining Inspector FRIEDRICH ADOLPH ROEMER (1809–1869). It was erected in memory of the famous geologist and founder of the Bergakademie Clausthal by his students in 1882. In the base rocks characteristic of the Harz are incorporated.



Roemer Monument



Unterer Schalker Teich (Lower Schalke Pond)

6 Mining up until 1904 Schalke Pond Oberschulenberg

We drive down into the valley of the Schalke and park in the community of Oberschulenberg. Here the border between the Clausthal Culm Fold Belt and the Upper Harz Devonian Saddle is exposed. It was formed by the Bockswiese lode. In some locations this lode contained ore which was extracted up until 1904. South of the fault Lower Carboniferous stones stand as they were left, exposed by the westerly flowing stream next to the forest trail towards Mertenstal. North of the fault Devonian rocks can be seen on the walk encircling the Schalker Teich. It was built by miners in the 18th century. For those short on time the path to the right at the end of the row of houses should be followed. It leads to two historic “Lochsteine” (Hole Stones) marking mining fields. A short distance further we arrive at the ore lode, with the Oberschulenberg tailings heaps adjoining to the east.

Opening Hours GeoMuseum:

Tues.-Fri. 9:30 – 12:30 a.m.

Thurs. also 2:00 p.m. – 5:00 p.m.

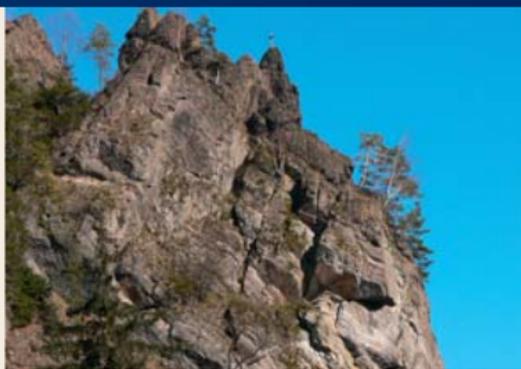
Sun. 10:00 a.m. – 1:00 p.m. (except bank holidays)

7 Archive of a Catastrophe Kellwassertal Outcrop

Travelling further through the valley we reach the Oker Valley Reservoir and cross over the Weißwasserbrücke (White Water Bridge) in the direction of Altenau. On the dam of the auxiliary reservoir we park and walk across the dam to the Kellwassertal (Kellwasser Valley) to a world famous outcrop. Here in 1850 two rock strata – which occur around the world and which are connected with one of the most massive extinction episodes of the earth's history – were first described. The outcropping limestone and argillaceous slates here bear evidence of a catastrophe in Late Devonian which is known worldwide as the Kellwasser Crisis. It went on for over 100,000 years and is marked by numerous ecological upheavals. Altogether 75 % of all forms of life were extinguished, among others the Devonian Reefs. The causes for this catastrophe and its climatic framework remain, despite intensive research, unexplained until today.



Kellwasser Valley Exposure



Rabenklippe / Raven Cliff

8 Geologic Diversity Lower Oker Valley

The canyon character of the Oker River Valley Gorge below the curved wall of the dam was formed as the water cut through massive granite. At the end of the Variscan (Hercynian) Orogeny during the Upper Carboniferous the intrusion penetrated the folded rock complex in the Lower Permian. The heat of the magmatic body altered and hardened the older Devonian or, respectively, Lower Carboniferous sediments through contact metamorphism. Slate and limestone as well as the Lower Carboniferous greywacke were thus transformed into schist and hornfels. The granites show impressive forms of corestone “woolsack” weathering, and as the other rocks were hardened by the granite contact metamorphosis, they also show great resistance to the erosive power of water. For this reason a wide variety of rocks are visible here. The steep Rabenklippe (Raven Cliff) can be reached on foot along the path parallel to the B 498 from the car park at the Romkerhalle power station.

> Glossary

Landmarks are widely visible or particularly well-known ground points or places serving for a first orientation in the largest Geopark of Europe giving its name to one of its part areas. 20 landmarks and their surrounding area have been described so far.

Geopoints are points of special interest. The geologic history and the development of the natural and cultural landscape can be seen and conveyed on them. Geopoints of the area of one landmark are continuously numbered and can be connected to individual Geo-Routes. Geopoint 1 is always the place of the eponymous landmark.

A completely individual **Geo-Route** can be planned with the help of the map of the Landmark 2 area. Let this flyer draw you into the Upper Harz as once the miners were. They followed the "Berggeschrei" (mining clamour) as the "Bergfreiheit" (miners' rights) guaranteed miners and mining towns extensive privileges which had already been granted by HEINRICH DER JÜNGERE (1489–1568), Duke of Braunschweig-Wolfenbüttel, to Zellerfeld in 1532 and to Wildemann in 1553.

Bestellung weiterer Faltblätter

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Information en français

www.harzregion.de

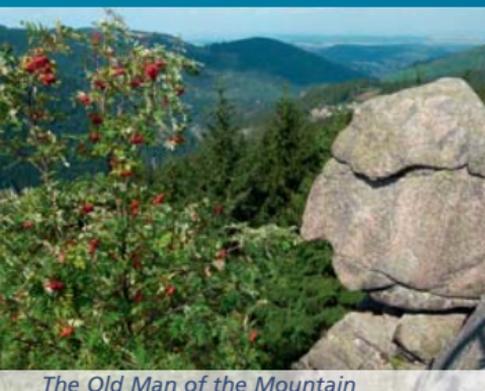


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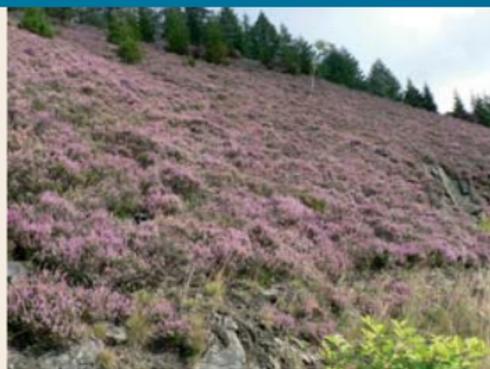
Corestone "Woolsack" Weathering

Käste Cliffs

From the car park at the power station we climb the steep path on the left-hand side of the manmade Romkerhalle Cascade and take the path marked "Schöppenstedter Weg" – "Romkerkopfweg" – "Klippenweg" in the direction of the Kästehaus (about 3 km). First we reach the Feigenbaumklippe (Fig Tree Cliff), where a stack of granite blocks formed a small cave. Long periods of erosion have laid the roof of Oker granite blocks free. Smaller and smaller blocks are formed by granite erosion, leaving forms reminiscent of wool sacks. Passing the Mausefalle (Mouse Trap) and the Hexenküche (Witches' Kitchen) we arrive at the pinnacle of the Huthberg (605 m a.s.). Just below it is an inn. On the pinnacle a cliff is quite appropriately named "Der Alte vom Berge" (The Old Man of the Mountain). A non-strenuous path takes us via the Treppenstein (Stair Rock) back to the valley (approx. 5 km).



The Old Man of the Mountain



Innerste Valley Heath Fields

10

Excursion in the Innerste Valley

Lead Smelter and Tailings Dumps

We depart Clausthal on the B 242, following the winding path of the Zellbach Creek in the direction of Bad Grund, passing the old tailings dumps of the Ottiliae Shaft ore dressing plant and finally reaching the former lead smelter in about 2 km. It was founded in 1554 as the Frankenscharrn-Hütte (smelter) and was in use until 1967. The buildings were demolished after it closed. As a result of the sulfur and heavy metal emissions of the sulfuric ore roasting processes carried on here for over hundreds of years the vegetation in the plant surroundings died off and is only slowly regenerating itself. When the heath is in bloom this is surely one of the most attractive contaminated sites in the Harz. Heavy metal contaminated tailings dumps (stamp mill sands) and slag heaps pollute alluvial plains sediments from the Harz to the North Sea, as the loose material is washed out during hard rains, ending up in the Innerste River.

11

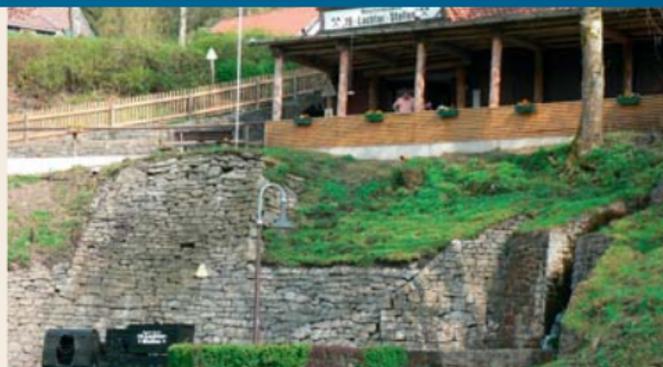
Valley of Stone Bridges and Mine Works Greywacke in the Innerste Valley

There where the Zellbach Creek and the Innerste River merge we turn off the B 242 in the direction of Zechenhaus "Untere Innerste". About 500 m further on the right is a small stone quarry where coarse-grained to conglomeratic Culm greywacke beds intercalated with layers of shale crop out. The greywacke beds are thought to have resulted from submarine suspension currents flowing from higher regions of the ocean floor into deeper lying basins.

Back on the main road we drive in the direction of Wildemann. Soon we see on the left the head gear of Meding Shaft. At the junction toward Wildemann we stop to visit the large Jung Quarry on the right-hand side of the road. In the greywacke and in the intercalated shales in particular Carboniferous plant remains can be found, for the most part horsetails (calamites).



Jung Quarry



Visitors' Mine Works in Wildemann

12

Visitor's Mine Works I 19-Lachter-Stollen Wildemann

In the Innerste valley we drive toward Langelsheim and arrive at the historic mining town of Wildemann. Here the mines were built on the western side of the Zellerfeld Lode, the Spiegelthal Lode and its westerly extension the Hüttschental Lode. Mining came to a stop in the latter two in 1760 and 1803 respectively. In the Zellerfeld Lode mining continued until about 1930. The 19-Lachter-Stollen is worth a visit. The construction was begun around 1551 and served both water drainage and metal ore mining. Both the mine works and the galleries were in use up to 1924; a visitor's mine works was opened here in 1970. Of the 8.0 km long gallery, which was drifted entirely by hand with hammer and chisel, approximately 500 m can be visited, reaching a maximum depth of 100 m.

13

Visitors' Mine Works II

"Lautenthals Glück" Mine

The mining town of Lautenthal was the seat of the Königliches Hüttenamt (Royal Bureau of Metallurgy) under the Oberbergamt (Chief Inspectorate) in Clausthal. The Lautenthal Lode was exploited up until 1945. The last mining activity here was the recycling of stockpiled tailings of high zinc content. The Lautenthaler Silberhütte (silver refinery) was in operation until 1967. At the town entryway on the right is the Lautenthals Glück (Lautenthal's Fortune) Mine with visitors mine works and refinery museum. The Lautenthal Lode, which the galleries exploited, is an important geologic fault. In the area of the Lautenthal deposits the lode was splintered into numerous parallel veins, called "Trümer" (stringers), bearing galena and sphalerite. On the hiking trail along the east bank of the Innerste River the entire strata sequence from Middle Devonian up through Lower Carboniferous is clearly exposed and information boards (in German) explain it.



Meilenstein / Mile Stone



Fossil-bearing shale

14

Fossil-rich Exposure

Quarry at the Trogtal Mountain

We drive from Lautenthal towards Seesen. At the zenith of the county road we park at the Sternplatz carpark. We continue on foot along the trail towards the Luchsstein (Lynx Stone). Before reaching it we pass, on the south slope of the Großer Trogtaler Berg, a small quarry. Here a rich fossil-bearing sequence from the Upper Carboniferous is exposed. In the so-called Posidonien-Schiefer (Posidonia shale) fossilized mussels of the species *Posidonia becheri*, goniatites and numerous other fossils are found. Collecting them is prohibited in the bedrock area, but is allowed on the scree rocks. The strata are approximately 335 million years old. The extreme folding of the Lower Carbon strata is not apparent in the quarry area, but in the slope next to the path somewhat further in the direction of Luchsstein it can be discerned.

15

Inn at the old Shaft

Maaßener Gaipel (Capstan)

Back in Lautenthal at the town center we turn left in the direction of Hahnenklee-Bockswiese. The road goes uphill and is accompanied by an extensive tailings heap area on the right. At the upper end of the heaps we turn right onto a road which curves back and brings us to the Waldgasthaus (inn). We are in a well worth seeing mountain landscape with adit entrances, mine dumps and “hole stones” connected by a hiking path and outfitted with information boards. Sphalerite is found especially often on the heaps. However, on some of the deposits mineral collection is prohibited to avoid erosion in the biotopes. In 2004 the Harzklub was able to carry out extensive nature protection measures in the entire Geopoint area to aid the heavy metal flora growing here. As the heavy metal flora growing here is of europe-wide interest and the area a NATURA 2000 habitat, extensive nature protection measures have been carried out.

*Maaßener Gaipel (Capstan)**State Mining Office Building***16**

The Authority for all of Northern Germany

State Mining Inspectorate at Clausthal

An office of the Niedersächsisches Landesamt für Bergbau, Energie und Geologie (Lower Saxony Office of Mining, Energy and Geology) is located in Clausthal. Formerly the Königlich Hannoversche Berg- und Forstamt (Royal Hannover Mining and Forestry Department), later the Königlich-Preußische Oberbergamt (Royal Prussian Head Mining Department) and 1943–1945 the Reichs-Oberbergamt (Reich Head Mining Department) was located in the building on the Silberstraße. The King or his ministers stayed here when visiting the Harz. On special occasions the Chief Inspector of Mines or his highest ranking guest stood on the balcony to acknowledge the assembled miners' respects, illuminated by the light of miners' lamps and the torches of the refinery workers. The building was reconstructed after the great fire of 1725 and was later extended to include a library and the 450-year-old mines archives.





Geological Development of the Area Landmark 2

The Clausthal Culm Fold Belt composes the largest portion of the northwestern Upper Harz in the Landmark 2 region and consists for the most part of interbedded sequences of greywacke and argillaceous shale of the Lower Carboniferous Culm. They follow immediately upon the underlying Devonian sediments and were deposited in a marine basin (Rheic Ocean) into which submarine debris from the adjacent mainland flowed. The grading of the sediments – graded bedding – makes this process very apparent: first the heavier coarse material was deposited, followed in courses of ever-finer and lighter material and finally clay minerals, which later formed the argillaceous shale, ended the cycle. Scrape marks on the ocean floor which have survived over hundreds of millions of years make it possible to reconstruct the direction of flow of the submarine debris. It came from a higher



Clausthal-Zellerfeld says it with flowers



Cockade Ore

area lying south to southwest of the Harz. Remains of plants in the sediments document the vegetation relationships in the Lower Carboniferous.

The Culm Fold Belt was dissected in the northeast by the Northern Harz Boundary Fault (Landmark 3); in the south and west the Zechstein discordance lies over the steeply uplifted sequences of the Culm Fold Belt, as can be seen for example at Geopoint Fuchshalle (Landmark 11), Geopoint 3. The Culm Fold Belt was intensively folded during the Variscan (Hercynian) plate collision orogeny more than 300 million years ago. Running crosswise through the fold belt and parallel to the Harz Border are tectonic faults on which the Upper Harz mineral veins lie. The metal content of these lodes was the basis for intensive mining in the area of Landmark 2. Mining and forestry have left their imprint on this distinctive cultivated landscape.



Selected Points of Information

Overnight accommodations



A Harzhotel zum Prinzen
Clausthal-Zellerfeld
www.zum-prinzen.de
☎ +49(0)5323 - 96610



B Waldhotel Untermühle
Clausthal-Zellerfeld
www.untermuehle.harz.de
☎ +49(0)5323 - 983098



C Ringhotel Zum Harzer
Clausthal-Zellerfeld
www.zum-harzer.de
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REGIONALVERBAND HARZ E.V.



The Regional Association Harz is a non-profit association of the following counties: Goslar, Harz, Mansfeld-Südharz, Nordhausen and Osterode am Harz. It promotes the protection of the natural environment as well as cultural life in the region. It is supported by a network of over one hundred contributing members. Its goals are realized in part within the administrative context of the Nature Parks of the Harz Region. As a corporate member of the Geopark Harz · Braunschweiger Land · Ostfalen GbR, founded in 2004, the Regional Association is responsible for the southern portion of the region. Its corporate partner, the association FEMO in Königslutter, is responsible for the northern portion. The Geopark Harz · Braunschweiger Land · Ostfalen is a member of the European and Global Geopark Networks under the auspices of the UNESCO.

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