



Organisation
der Vereinten Nationen
für Bildung, Wissenschaft
und Kultur



• Harz - Braunschweiger
• Land - Ostfalen
• UNESCO
• Global Geopark

Landmark **3**

Rammelsberg



 **GEO PARK**[®]
Harz . Braunschweiger Land . Ostfalen

Harz



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Harz - Braunschweiger
Land - Ostfalen
UNESCO
Global Geopark

On the 17th of November, 2015, during the 38th UNESCO General Assembly, the 195 member states of the United Nations resolved to introduce a new title. As a result, Geoparks can

be distinguished as **UNESCO Global Geoparks**.

As early as 2004, 25 European and Chinese Geoparks had founded the Global Geoparks Network (GGN). In autumn of that year Geopark Harz · Braunschweiger Land · Ostfalen became part of the network. In addition, there are various regional networks, among them the European Geoparks Network (EGN). These coordinate international cooperation.



In the above overview map you can see the locations of all UNESCO Global Geoparks in Europe, including UNESCO Global Geopark Harz · Braunschweiger Land · Ostfalen and the borders of its parts.

UNESCO-Geoparks are clearly defined, unique areas, in which geosites and landscapes of international geological importance are found. The purpose of every UNESCO-Geopark is to protect the geological heritage and to promote environmental education and sustainable regional development. Actions which can inflict considerable damage on geosites are forbidden by law.



1

World Cultural Heritage Rammelsberg

Rammelsberg

In the Middle Ages a clustering of royal and Ottonian family properties formed a core landscape in the Harz region. Not by chance, then as early as 968 – during the reign of Emperor OTTO I. (936–973) – the extraction of ore in the area had first been documented. Archeological finds bear evidence of mining activity on the Rammelsberg as early as 3,000 years ago. Millions of tons of ore once lay within the mountain. They were rich in galena, sphalerite, chalkopyrite, barite, as well as other ore minerals. These along with the surrounding sediments were formed during the Devonian period. From the floor of a gigantic ocean hot metallic solutions emerged. Two enormous elongated lens-shaped ore deposits were formed, which later (in the Carboniferous period) were included in the folding of the Harz Mountains. Recognizing their tilted over form is, however, only possible for a geologist. The imposing



Maltermeister Tower



Vitriols, secondary ore minerals, in the Rammelsberg

silhouette of the 635 m high mountain first catches our eye. From the distance we can make out a tower. It is the Maltermeister Tower. As the oldest still existent above ground mining structure, it was constructed around 1500 on the slope of the Rammelsberg and first served for mine supervision.

In order to enter the mines ourselves we leave the B 241 in Goslar and follow the Rammelsberger Straße. At the World Cultural Heritage Rammelsberg there is ample parking. Upon crossing the entry forecourt the imposing ensemble of the above ground mine buildings from the 1930's with the sloped ore dressing plant and the Rammelsberg shaft, now under architectural heritage protection, rise up impressively. The ensemble and the historic town of Goslar were inscribed on The World Heritage List of the UNESCO in 1992. Four years earlier, the deposits had been depleted and the mine works and ore dressing plant were closed.

2

Old Town
Goslar

After efforts to extract silver from the ore of Rammelsberg were successful, HEINRICH II. († 1024) founded a royal palatinate on the banks of the small Gose stream where a royal hunting preserve had been. The Emperor HEINRICH III. (1017–1056) chose the newly founded town of Goslar to be his favorite residence. He had the Imperial Palace, the core of which still stands, erected and the Chapter Church St. Simon and Judas built. Today the Imperial Throne from the 12th century reminds us of that period. The throne of the Salian and Hohenstauffer emperors is visible in the Domvorhalle (former church entry hall) at all times. Kaiser WILHELM I. (1797–1888) is said to have been seated on it when he opened the Reichstag of the German Reich on March 21, 1871 in the Prussian House of Parliament in Berlin. The former entry hall is all that remains of the Imperial Church, demolished because of dilapidation in 1819. Where the church once stood there is now a large



Imperial Palace



Lohmühle/Tanbark Mill

car park, “Kaiserpfalz Nord”. The Imperial Palace, the core of which is a two-storey hall, was referred to as the most famous residence of the empire by LAMPERT VON HERSFELD (born about 1008). The upper (summer) hall wall murals were painted at the end of the 19th century by HERMANN WISLICENUS (1825–1899). The monumental works depict scenes of German history taken from fairy tales and legends. Located between the Imperial Church and the Market Square are the Tin Figure Museum and the Goslar Museum, on the bank of the Abzucht stream flowing through the Old Town (Museumsufer). The Tin Figure Museum is housed in a 500 year old restored mill built to produce tanning extract for use in leather tanning. Inside in fifty showcases the Old Town of Goslar, mining and the Upper Harz Water Management System can be experienced “en miniature”. The Goslar Museum is housed in a former church prebendary’s house, built in 1541. The permanent exhibits of “The Classical Square Mile of Geology” and “From Ore to Metal” (both in German) make it a centre of Geopark information.



Opening hours Tin Figure Museum

Tues. – Sun. 9 a. m. – 5 p. m.

☎ 0049 5321 - 25889

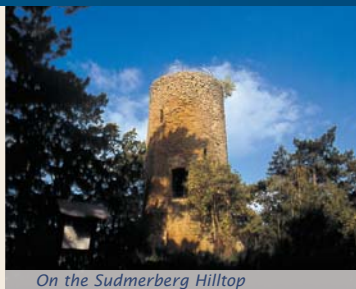
www.zinnfigurenmuseum-goslar.de

3 Cliff Cave Chapel Klus Cliff

To reach the 20 m high cliff, located within the city limits, we ask the way to the Osterfeld fairgrounds and car park and then follow the street sign Kluskapelle at the Petersberg Street corner. The street name refers to the ruins of the St. Peter's church, destroyed in the 16th century, from whence there is a magnificent view out across the Old Town. The Klusfelsen cliff consists of coarse grained, porous, yellow Hils sandstone which was formed near the coastline in the Lower Cretaceous about 110 million years ago. A cave in the rock was first referred to as a "Klause" (cell) in 1167. The room was later first used as simple residential space and has served as a chapel (restoration 1982/83) since the 19th century. The Hils sandstone strata formerly supplied stone of significance for sacral structures and finely modeled architectural ornaments.



Klusfelsen/Klus Cliff



On the Sudmerberg Hilltop

4 Observation Tower Sudmerberg Hilltop

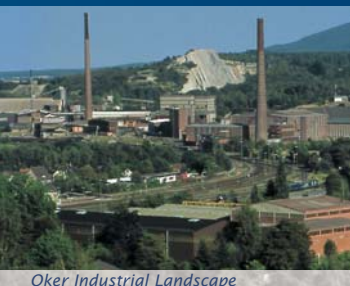
We drive further toward Oker and soon recognize the broad Sudmerberg hill with the antenna and observation tower. We turn off the B 498 to the left in the suburb of Sudmerberg, drive to the car park near the Schützenhaus and climb the forest path to the mountain top (354 m a. s. l.). The mountain, a formation of horizontally layered beds of Upper Cretaceous, reveals to the geologist on the basis of discordances (unconformities), that the last important movements in the Northern Harz Boundary Fault must have taken place around more than 83 million years ago. The strata consist of alternating layers of hard calcareous sandstone and soft clay. The yellowish colored sandstone in particular was quarried for use in many buildings in the Goslar region, including the construction of the observation tower.

5

Smelting Location

Industrial Landscape Oker Region

In the suburb of Oker we choose the B 498 turn-off into the Stadtstieg Street to reach the glider aviation field. From here we have the best view of the scenery (including the settling basins for the purification of acid pit water from the former Rammelsberg Mineworks). Oker developed into a center of smelting industry in the Harz region after the founding of the Frau-Marien-Hütte, a lead and copper smelting plant, in 1527 under HEINRICH II. OF BRAUNSCHWEIG-WOLFENBÜTTEL (1489–1568). In 1909 the zinc oxide smelting plant was established nearby in Oker and caused massive pollution. Where ore was formerly smelted, the Harz-Metall GmbH now produces an enriched zinc- and lead oxide-enriched dust as feedstock for the extraction of metallic zinc from recycling material. Today however the major employer in Oker is H. C. Starck GmbH, a chemical and metallurgic industry enterprise.



Oker Industrial Landscape



Limestone Quarry Langenberg

6

Recent Quarrying

Limestone Work Oker

From Oker we drive toward Harlingerode and about halfway there, turn into the limestone work of the Rohstoffbetriebe Oker GmbH & Co. We are at the west end of the Langenberg Hill. The enormous far-stretching quarry faces reveal the sharply tipped over and southward dipping partially dolomitic limestone and marl limestone of the Upper Jurassic (163–152 million years ago). The expansive exposure reveals a unique view of the strata sequence of the Northern Harz Boundary Fault. The limestone in particular is rich in fossils. The breast bone fragment of an *Europasaurus holgeri* found here is displayed on permanent loan in the exhibit of the Information Office of the Geopark in Quedlinburg. Before entering the quarry area prior permission must be obtained from the plant management for security reasons.

Opening hours Geopark-Information Quedlinburg

Hohe Straße 6

Mo – Thurs. 9 a. m. – 4 p. m.

Fri. 9 a. m. – 1 p. m.

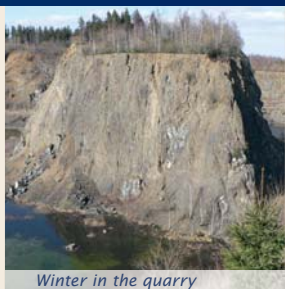
REGIONALVERBAND HARZ E.V.



7

Quarz Vein Elf Stone

Back on the Harzburger Straße, we continue eastwards and follow the signs to Silberbornbad. On foot we cross the horse racetrack grounds and the stud farm pastures which spread out over the Jurassic and Triassic strata hidden below. Here on the bicycle path R1 we discover large quartzite blocks. We follow along the edge of the Harz in the same direction and in a scant 600 meters continue through the Gläsecke Valley. There, on the right-hand side of the path, we reach a small quarry in which a thick vein of quartz has been exposed: the Elfenstein (Elf Stone Vein). It continues easterly upwards to the slope of the Elfenstein, where weathering has formed it into cliffs. This quartz vein, probably formed in the wake of the Oker granite, indicates that it might be of late Upper Carboniferous origins. So the Northern Harz Boundary Fault probably lies on a very old structure.



Winter in the quarry

8

Trace of Stones Diabase Quarry Wolfshagen

In order to embark on the Trace of Stones, an orbital route created in 2016 leading around the Diabase Quarry, we first head towards the Heimberg. It is not only the place where hikers of the Harzer Wandernadel can receive stamp no.109; information panels enframe the picturesque view into the renaturated quarry. Starting out as a manufacture in 1885, the quarry had transformed into a business with an annual extraction of roughly 1 mill. tons by the 1960's and 70's. Up until 1986, raw materials of high pressure and frost resistance were quarried here, qualities especially in demand for road construction. The greenish stone was created about 380 mill. years ago when submarine magmas penetrated clay mud. Thanks to regular maintenance, the open quarry is a unique environment for rare and protected animal and plant species.

➤ Glossary

Landmarks are points in the landscape or actual localities which are highly visible and well-known. They serve as an initial orientation in one of the largest Geoparks worldwide and give the specific areas their names. Every landmark area is represented in a special leaflet.

Geopoints are points of particular interest. At these points, the geological history of the area or the evolution of the cultural landscape are evident and can be conveyed to visitors. Geopoints are numbered in sequence within the region of a Landmark. They can be combined to constitute an individual Geo-Route. The Geopoint No. ① is always the place which has given its name to the Landmark.

This map will help you plan your own personal **Geo-Route** which, as described, begins with the former Free Imperial City of Goslar. In 1803 first Goslar became Prussian, followed in 1866 by the adjacent Hanover territories. Extensive portions of the Landmark region remained under Braunschweig authority until 1945.

Bestellung weiterer Falblätter

Order more leaflets

Information en français

www.harzregion.de



9

Bad Harzburg Burgberg ("Fortress Mountain")

Bad Harzburg (until 1892 Neustadt) was already a popular spa resort in the 19th century. The healing waters were supplied by salt brine springs. To increase the output, an 840 m deep well was bored in the spa park in 1964/65. It first penetrated layers of the Harz Paleozoic (360-250 million years ago), then the southerly sloping Northern Harz Boundary Fault, and under that finally the inverted-lying Upper Bunter sandstone and Muschelkalk limestone strata (250-237 million years ago). From the spa park a two-cabin funicular railway, in operation since 1929, travels to the Großer Burgberg plateau (485 m a. s. l.). The Canossa Column at the top is in remembrance of HEINRICH IV. (1050 – 1106) who fled here from the Imperial Palace in Goslar during the Saxon Revolt of 1073 and only very narrowly escaped.



View toward the Burgberg Mountain



10

Innerste River Tributary Grane Valley Reservoir

West of Goslar, a dam built in the 1960's retains the water of the Grane River. We first follow the B 82. Driving in the direction of Langelsheim, we are traversing the gravel landscape of the Haar. The thick Ice Age gravels are visibly layered. In the lowermost layer lies material from the Harz, over this lie Ice Age gravel deposits containing northern components transported by glaciers from Scandinavia to the Harz border area. Gravel to construct the dam was excavated here. We arrive at the community of Herzog-Julius-Hütte, where since the Middle Ages ore of the Rammelsberg was refined. At this location today germanium, indium and other rare metals are refined. Up the hill to the right we come to the Grane Waterworks. A visit to the exhibit and the large aquarium is worthwhile.



Grane Reservoir



Kanstein

11

Undercut Slope of the Innerste Kanstein near Langelsheim

We drive back to the B 82 and further westerly to the exit Langelsheim Ost. At the edge of town we turn right in the direction of Jerstedt. The small road brings us to the long geological profile of the Kanstein. The undercut slope of the Innerste River opened the strata sequence in the high bank to view. The Cretaceous profile begins with the Hils sandstone of the Lower Cretaceous (145-100 million years ago), which lies here discordant on 200 million years old clay. Thereafter follow thin strata of Minimus clay and gravelly, grey-yellow speckled Flammenmergel. These are followed by 100 million years old limestones and marls, upon which Rotpläner and Turonian limestone as well as Coniac strata follow. These are extracted in the Langelsheim quarry of the Rohstoffbetriebe Oker GmbH & Co. The strata which have up to here been steep to over-tilted, suddenly reveal a nearly horizontal layering in their continuation.



Opening hours Local History Museum Langelsheim:
 every 1st and 3rd Sunday of the month from 10.30 – 12 a. m.
 every 2nd and 4th Saturday of the month from 3 – 5 p. m.
 ☎ 0049 5326 1786

12

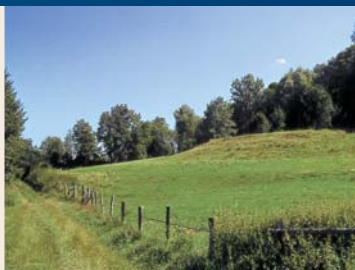
Battlefield Lutter am Barenberge

Lutter Basin

Back in Langelsheim, we continue in a westward direction and soon reach the Lutter Basin. Surrounding the basin to the east are ranges consisting predominately of Hils sandstone. Here it is particularly firm and was formerly quarried extensively near Ostlutter. The church in Lutter is an example of local stonemason artistry. The forested ridge on the western edge of the Lutter Saddle consists, in contrast, of hard limestone of the Lower Muschelkalk. To the south, the Harz Mountains close the Lutter Basin. Here the Northern Harz Boundary Fault disappears within a short distance. Lutter is known worldwide, because the Slaughter of Lutter am Barenberge took place here in 1626, in which the imperial army under Count TILLY (1559–1632) defeated the troops of the Danish King CHRISTIAN IV. (1577–1648).



Lutter Basin



Mine dams near Neuekrug

13

Copper schist

At the foundry Hahaussen

Near Hahaussen we leave the B 82 and drive along the B 248 in the direction of Seesen to the car park between Neuekrug and the junction of the county road to Bornhausen. We walk back along the bike path adjacent the road for 700 m, then left on the asphalt agricultural access road and just before the railroad bridge take the grass-overgrown pathway. Here we encounter the northernmost branch of the Zechstein Range, which accompanies the Harz along its southern side. Quite near the base of the Zechstein, copper shale occurs, a mining subject covered in the Landmark areas **12** and **17**. Spurred on by the economic success in the Mansfeld area, attempts were made to extract copper shale here, too. The geological situation as well as the minimal metal content led to the failure of the New Mansfeld Copper and Silver Mining Company. Only the mine dams are left.



Homeland Museum Lutter

Open by appointment

☎ 0049 5383 - 96010

www.sg-lutter.de

14

Seesen

Educational Waterway Path Winkelsmühle

Coming from Hahausen on the B 248 we turn off, shortly before reaching Seesen, in the direction of the Gasthaus Winkelsmühle. As the name “Mühle” indicates, it was formerly a mill powered by a water wheel. The educational path was installed on the occasion of Expo 2000. It leads through the beautiful sink hole and lake landscape to the 2.3 ha nature protection area of Silberhohl. The core of this area, under protection by order of the Brunswick regional government since 1977, is a funnel-shaped collapsed sink. Since its formation approximately 5,000 years ago, an 11 m deep bog has built up within it. In the same way as the Silberhohl, the other sinkholes were also formed through the local dissolution of the underlying Zechstein strata and the ensuing collapse of the overlying Bunter sandstone strata. Today many of the sinkholes are water-filled.



Pond Landscape Winkelsmühle



Museum Seesen

15

Museum Seesen

In the most westerly region of our excursion through the area of Landmark 3 we reach the end of the North Harz Border. In the Middle Ages Seesen belonged to the convent at Gandersheim and was called Sehuson or Seehausen (“Pond Settlement”). Today nearly all the former ponds within the town area are silted up. One remaining example of these water bodies, often caused by sinkholes, can be seen in the Schlossteich (Castle Pond) right behind the city museum. The building, today housing the 1964 founded local homeland museum, was formerly the paddock, then from mid-16th century on the hunting lodge and later the forester’s house. Alongside mining, geology and mineral exhibits, piano building is also featured, as the Steinweg family of piano constructors (Steinway & Sons) came from Wolfshagen and Seesen. In addition, the history of the local tin can production industry is documented. In 1886 the Harzklub Association was founded in Seesen.



Opening hours Museum Seesen:

Tues. – Fri. 11 a. m. – 5 p. m.,

Sa. + Sun. 2 – 5 p. m.

☎ 0049 5381 - 48891

www.seesen.de



Geological development of the area

The westerly North Harz Border area is deservedly referred to as the Classical Geological Square Mile because here nearly all the strata from the Paleozoic (earth age of more than 252 million years) up to the most recent sedimentations are revealed in closest proximity. A practically unbroken chain of evidence of nearly 400 million years of earth history is found here. The North Harz Border is characterized by a large tectonic fault line. Goslar lies in the middle of this line as well. Through the reverse faulting of the Harz over its foreland the sediment strata of the Mesozoic (252 to 66 million years ago) were drug vertically upright from their original horizontal position. Along the Harz Border the integral lithostratigraphic elements of Bunter sandstone, Muschelkalk and Keuper (German Triassic), as well as the chronostratigraphic systems of Jurassic and Cretaceous, are opened up like the pages of a book. The bedding sequence from the Mesozoic is visible on the face of the earth! West of Hahausen even copper shale, a metal-rich sediment of the Zechstein lithostratigraphic group (Paleozoic), reaches the earth's surface. Sedimentary strata rich in fossils have been exposed in numerous stone quarries, sand and clay pits. Particularly valuable is the collection in the Goslar Museum which provides an excellent overall view of the geological development of the North Harz. Also worthy of mention is the geology and mineral exhibit of the World Cultural Heritage Rammelsberg containing a multitude of examples from the mineral deposits of the Rammelsberg. Part of this collection can be viewed in the permanent exhibit "The Classical Geological Square Mile".

Between Goslar and Bad Harzburg, Devonian rocks butt into the Mesozoic rocks from the south. These build the broad structure of the Upper Harz Devonian Saddle, in the core of which Lower Devonian sandstone and quartzite (Kahleberg sandstone) stand. To the west it is joined by the Goslar Basin containing 1,000 m thick Middle Devonian slates with paleobasalts which provide evidence of former undersea volcanic activity. Between the saddle and the basin fissures broke open, in which metallic solutions rose up. They formed ore sludge on the ocean floor which later solidified and became the ore of the Rammelsberg.



Selected Points of Information

Restaurants and Accommodations



Hotel Winterberg
Bad Harzburg
www.solehotels.de
☎ 0049 5322 - 96880



Hotel Tannenhof
Bad Harzburg
www.solehotels.de
☎ 0049 5322 - 96880



Vitalhotel am Stadtpark
Bad Harzburg
www.vitalhotel-am-stadtpark.de
☎ 0049 5322 - 78090



PLUMBOHMS Bio-Suiten
Bad Harzburg
www.plumbohms.de
☎ 0049 5322 - 2323



REGIONALVERBAND HARZ E.V.

The Regionalverband Harz is a non-profit association. Its full members include the administrative districts of Goslar, Goettingen, Harz, Mansfeld-Suedharz and Nordhausen, as well as the World Heritage-listed city of Quedlinburg. The association's goals are the promotion of art and culture, the care and protection of historical monuments and environmental conservation and landscape management. It further aims to build tolerance in all areas of culture and foster international understanding among peoples and also to preserve local history and traditions. One way, among many, in which these goals are achieved is trusteeship of nature parks in the Harz region. The Regionalverband Harz, with the help of its 130 supporting members, is also responsible for the southern section of the UNESCO-Geopark, which covers an area of 6,202 km².

Publisher: Regionalverband Harz e. V., Hohe Straße 6, 06484 Quedlinburg
☎ 0049 3946 - 96410, E-Mail: rvh@harzregion.de
4th, revised edition, 15 – 20k
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Internet: www.harzregion.de

Authors: Dr. Klaus George & Dr. Friedhart Knolle

Translation: Holly Pankow, Dr. Friedhart Knolle

Photos: Dr. Klaus George

Design: Design Office Agentur für Kommunikation GmbH, Bad Harzburg

Printing: KOCH-DRUCK GmbH & Co. KG, Halberstadt

Kindly supported by:



Niedersachsen