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

Landmark 6

# Poppenberg Tower



 **GEO PARK**<sup>®</sup>  
Harz . Braunschweiger Land . Ostfalen

**Harz**



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UNESCO  
Global Geopark

On the 17th of November, 2015 in the course of the 38<sup>th</sup> General Assembly of the UNESCO, the 195 members of the United Nations organization agreed to introduce a new

label of distinction. Under this label Geoparks can be designated as UNESCO Global Geoparks. The Geopark Harz · Braunschweiger Land · Ostfalen is amongst the first of 120 UNESCO Global Geoparks worldwide in 33 countries to be awarded this title.

UNESCO-Geoparks are clearly defined, unique areas in which sites and landscapes of international geological significance can be found. Each is supported by an institution responsible for the protection of this geological heritage, for environmental education and for sustainability in regional development which takes into account the interests of the local population.



Already in 2002, two associations, one of them the Regionalverband Harz, founded the Geopark Harz · Braunschweiger Land · Ostfalen as a partnership under civil jurisdiction.

In the year 2004, 17 European and eight Chinese Geoparks founded the Global Geoparks Network (GGN) under the auspices of the UNESCO. The Geopark Harz · Braunschweiger Land · Ostfalen was incorporated in the same year. In the meantime, there are various regional networks, among them the European Geoparks Network (EGN). The regional networks coordinate international cooperation.

The summary map above shows the position of all landmarks in the UNESCO Global Geopark Harz · Braunschweiger Land · Ostfalen.

## 1

## The Poppenberg near Ilfeld

Along the southern margin of the Harz the Poppenberg rises up north-east of Ilfeld (600 m above sea level). We can reach the summit by walking either from Ilfeld (about 4 km), from Neustadt (about 1,5 km), from the train station “Netzkatener” (about 3.7 km) or from the parking area designated as “Tisch” (table) at the northern slope of the Poppenberg (about 1,5 km). The Poppenberg is composed of sediments and volcanic rocks from the Rotliegend Formation. Because of the varying hardness of the rock beds that provide resistance to the forces of weathering, the hill mounts up over its surroundings in step-like morphologies, particularly obvious in the ascent up its southern slope. At the base, a distinct coal-bed from the Rotliegend Formation crops out along the northern slope, initiating mining activities at various sites in the past. On the way to the summit, we traverse beds of sandstone and



Details of the Tower



Brocken View

claystone as well as the “Ilfeld Melaphyr”, an almost black, effusive (volcanic) rock type. The hill top is composed of red-brown rhyolite, the so-called “Ilfeld Porphyrite”. Even today, this nearly 300 m thick lava bed covers an area of about 55 km<sup>2</sup>. At the uppermost point of the hill, the Poppenberg Tower is located, constructed in 1897 as a steel grid construction and entirely rebuilt in 1994. From the tower, which is open to all without cost, we have a scenic view of the entire expanse of the lower Harz up to the Brocken Massif. When the weather conditions are favorable, the Inselsberg in the Thuringian Forest can be seen. From the Bielsteine or from the location of the Ilfeld Weathervane, one also has beautiful views of Ilfeld, Niedersachswerfen and the Kohnstein (Landmark **7**).

The Ilfeld Weathervane, about 3 km distant from the Poppenberg Tower, was built in 1872 and reconstructed in 1998. There is a distance of only 1.5 km from here to the Gänseschnabelfelsen (Goose Beak Cliff) (Geo-point **6**).



## 2

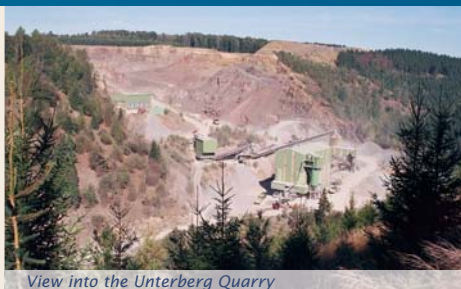
## Greywacke – Base of the Rotliegend Formation The Unterberg Quarry

Starting at the train station “Eisfelder Talmühle”, we reach via a 2.5 km long hiking trail the “Kellertalskopf” in the monastery forest of Ilfeld. Here one has a magnificent view of the large, modern quarry of the “Hartsteinwerke Unterberg” where greywacke is exploited.

In Devonian times, about 400 million years ago, the central German region was situated near the equator and was part of an ocean where sediments derived from neighboring continents were deposited. At the end of the Devonian, the area of the Mid-German Crystalline Rise between the Kyffhäuser Massif and the tectonic structure of Ruhla was lifted up from the sea at the beginning of the Variscan orogeny. At the same time, the adjacent marine basins subsided. Huge accumulations of debris were transported seaward. These



*Train Loading*



*View into the Unterberg Quarry*

accumulations we now encounter as slate and greywacke. Induced by earthquakes, landslides of unlithified sediment masses glided down along the steep continental slopes. Older lithified rock bodies were also transported in these processes. These mud flows resulted in the transportation and redepositing of entire rock formations up to a distance of 25 km northwest of the Mid-German Crystalline Rise. As part of such a gliding mass, the “Südharz Greywacke” Formation reached a thickness of up to 400 to 500 m. Greywacke is a sandstone-like rock composed of a large amount of rock-fragments and fragments of the mineral feldspar. In the past, greywacke was exploited in numerous small quarries. Today the greywacke mined in the large, open-cast pit at the Unterberg is used in the production of high grade mineral construction material, such as crushed sand, grit and gravel.

### 3

## Coal Mining

# The Rabenstein Mine

The only hard coal mine of the Harz, the Rabenstein Mine, is directly located at the “Netzkater” train station of the Harzer Schmalspurbahnen.

Mining of the coal bed began in 1737. From its very inception, the exploitation of coal here was confronted with problems and came to a halt, only to be reactivated a number of times. Mining periods took place between 1737 and 1880. In contrast to the better known German and European occurrences of hard coal, which are of late Carboniferous age, the hard coal of the Harz was formed during the Permian period.

After the mountain building processes of the Variscan orogeny, the young mountain range was characterized about 300 million years ago in the Permian by a warm and dry climate. Forces of weathering started their



Visitor's Mine Rabensteiner Stollen

work of destruction immediately after the uplift of the mountain range from the marine environment at the end of the Carboniferous. The resulting erosional debris – stones, gravel, sand, grit and clay – accumulated in the center and at the margins of large mountain basins, which slowly sank deeper and deeper.

Because of the predominant red colors of these sediments, the lower part of the Permian period is designated as “Rotliegend”. One of these sedimentary troughs is the Ilfeld Basin. Here, at the beginning of the Permian period, warm and humid climates generated extensive growth of vegetation. As the plants died off, their remains were soon covered by muddy sediments, and, under the exclusion of air, were slowly altered to coal. On the old stock piles, one can still find excellent imprints of remains from the Permian vegetation, such as fern leaves and horsetail plants in the former mud deposits, which are now claystones.



## 4

## Cliff Formations and Coal Mining

## The Cliff Gate of Neustadt

The cliff gate is situated not far from the Löns garden park east of the climatic spa resort of Neustadt. It can be reached on foot from the parking area at the “Zapfkuhle”, a picnic and barbecue site. As a result of the weathering of porphyrite lithologies with varying levels of resistance, spectacular cliff formations developed. The porphyrite cliffs block a wide valley descending from the Harz, leaving a narrow passageway free. Via this gate, we are able to enter the coal mining district of Neustadt. Coal was discovered here in the year 1571. Mining began in 1720 with small scale, open pit mines. By the middle of the 18<sup>th</sup> century, subsurface mining was carried out in tunnels and up to 80 m deep shafts. For 100 years, the coal exploited was delivered to salt production plants. During the second phase of extraction, beginning in the year 1840, major clients were the distilleries of Nordhausen. In the Neustadt district, as in the area of the Rabenstein, coal-bearing beds



*Cliff Gate near Neustadt*



*“Altes Tor” Neustadt*

of the Permian were of mining interest. This source consisted of three coal beds ranging in thickness from 25 to 70 cm. The final continuous phase of operation lasted until 1862. Mining was then closed down for various reasons: expensive drainage and lack of capital for investments as well as the depletion of resources. Starting from the “Löns” park, a circular hiking trail designated as an educational nature tour traverses evidences of mining, such as the “Stollenborn” – an element of the former drainage system of the coal mining area. The site is situated near the barbecue area “Zapfkuhle”. Other locations along the hiking trail are hollowed-out paths to the former adit entrances and to the one-time open cast pits at the south-eastern slope of the Vaterstein. Today, the open cast mines can be identified as 3.5 m deep depressions. The final section of the circular hiking trail leads towards Neustadt. Similar to the Hohnstein Castle, dark, red brown porphyrite was used as construction material for the “Altes Tor” (old gate). Not far from the “Altes Tor”, a morphological barrier marks the passage into the Zechstein area of the southern foreland of the Harz.



## 5

Manganese Ore Mining District Ilfeld

## Learning Trail "Kleiner Möncheberg"

Starting from Ilfeld, a 3.5 km long sign-posted hiking trail leads to the "Braunsteinhaus". The location can be reached by car on a field road which branches off from the connecting road between Ilfeld and Appenrode. The "Braunsteinhaus" is the former colliery's house for manganese ore mining, which was probably already taking place in the Middle Ages. It began to be carried out professionally at the beginning of the 18<sup>th</sup> century. "Braunstein" is the old mining term for unrefined black-brownish manganese ores. Already in medieval times, manganese was a raw material in demand. The "Venetian Tales" recounted throughout the Harz can be traced back to prospectors (experts exploring natural resources) from Venice who carried out their search for "Braunstein" of very high quality here. Since the early middle ages, Venice had been the center of European glass manufacturing. One of the well-kept secrets in



At "Kleiner Möncheberg"



The Braunsteinhaus (former colliery's house)

Venice was a process of producing colorless glassware which required the addition of manganese oxide. Along with manganese ores, iron ore was excavated in the "Gräflich Stolberg-Hohnsteinschen Forst" (the forest of the Duke of Stolberg-Hohnstein). Manganese ore was mined here until 1890, when the operations were terminated because of depletion of the deposit. A second mining period followed, beginning in 1916. Manganese mining in the area of Ilfeld was closed down in 1922.

From the "Braunsteinhaus", we begin our circular hiking tour along the 2 km long educational trail beginning in the former manganese mining district. Twelve stations exhibit relics of former mining processes such as stockpiles, open mining pits with steep slopes, shaft remains and collapsed adit entrances. These artifacts have their origin for the most part in the last period of operation during World War I.



## Glossary

**Landmarks** are geographical points visible over a wide distance or especially well-known localities. They provide orientation here in one of the most extensive Geoparks of the world. All individual areas of the Geopark surrounding the landmarks are described in a special leaflet.

**Geopoints** are sites of particular interest. The geological history of a region and the cultural developments associated with this particular landscape can be pointed out and explained to visitors. In the areas around the individual landmarks, geopoints are continuously numbered and can be linked together to create specific geo-routes. Geopoint No. 1 always represents the site which has been chosen as a name for the landmark.

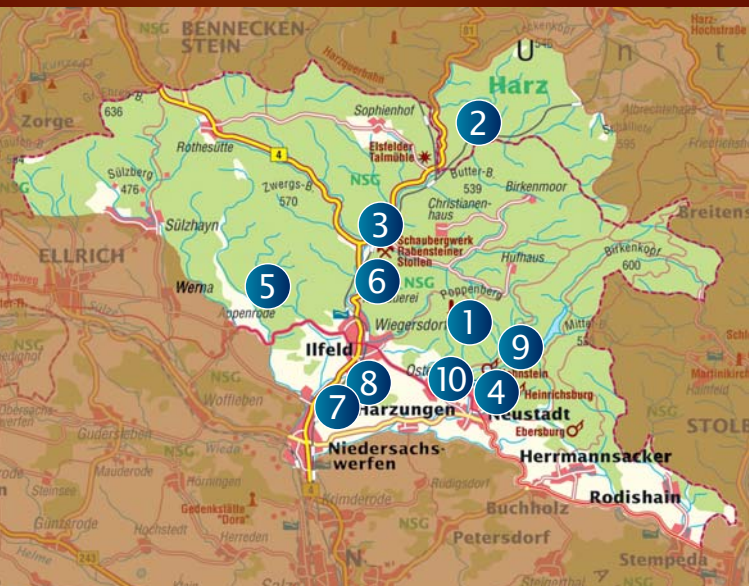
The map section will help planning your personal geo-route around landmark no. 6. In the middle of the 12<sup>th</sup> century, ELGER II. of Ilfeld called himself "Count of Hohnstein" after the castle situated up above Osterode and Neustadt. He founded what was to become the most powerful dynasty of counts of the 14<sup>th</sup> century in the southern Harz. Eventually, the castle and the dominion became a property of the Counts of Stolberg in 1417. The Prussian district of "Nordhausen", founded in 1816, was designated in 1888 as the district "County of Hohenstein".

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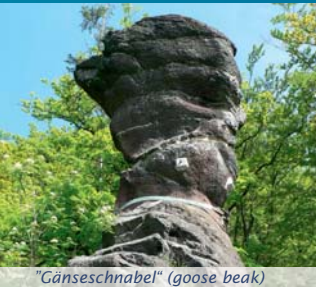
[www.harzregion.de](http://www.harzregion.de)





## “Gänseschnabel”, “Mönch”, “Nadelöhr”

The reddish-brown Ilfeld porphyrite is a rock type with various degrees of hardness. The material is, in part, very crumbly and weathers rather quickly down to a residue. In close proximity to such occurrences, the same lithologies can be very resistant against the forces of weathering and occasionally form bizarre cliffs. Because of their strange morphologies, these forms have inspired people to find their own names for the most spectacular rock formations. The most remarkable cliffs of the Ilfeld valley are “Gänseschnabel” (the goose beak), “Mönch” (the monk) and “Nadelöhr” (the needle’s eye). The name “Needle’s Eye” was given because the cliff is distinguished by a narrow fissure. According to the legend, all cart-drivers who wanted to enter the Harz had to get past this cliff. Newcomers were required to creep through this fissure. In case they got stuck, the others “assisted” with their whips.



“Gänseschnabel” (goose beak)



“Mönch” (monk)

There was, of course, also the possibility of freeing oneself from these exertions by paying a thaler as ransom fee. The rock cliffs are lined up along the Bere valley. Following the hiking trail towards “Netzkater”, we encounter a narrowed passageway through the valley where the river Bere had to find its way through an accumulation of giant rock debris. The river has its source not far from the historical “Drei-Länder-Eck” between “Große Harzhöhe” (599 m above sea level) and “Birnenkopf” (600 m above sea level) and marks the state border of Thuringia and Sachsen-Anhalt up to the “Eisfelder Talmühle”. Originally, the borders of Anhalt, Braunschweig and Prussia met in the source area. In the lower section, the Bere connects the villages of Ilfeld and Niedersachswerfen as parts of the newly founded municipality “Harztor”.

## 7

## At the Bottom of the Zechstein Sea

## The Exposure “Lange Wand” (Long Wall)

The “Lange Wand”, located south of Ilfeld, can be reached via a municipal road from the railway stop of the Harzquerbahn “Ilfeld Scheibenwiese”. The steep slope along the left bank of the river Bere is a classical geological exposure where magmatic rocks (Ilfeld porphyrite) from the Rotliegend are overlain by deposits of the Zechstein marine environment. 300 million years ago, when the Harz was lifted up as a mountain range during Permian times, thick lava beds resulted from volcanic activity. Later, the continent was leveled by perpetually active forces of weathering. At the beginning of Zechstein times, 255 million years ago, the continent was flooded again. On the shores of the Zechstein Sea, sand and gravel were deposited. The water steadily penetrated further inland, progressively becoming deeper, and black shale developed, containing valuable metals such as copper



National Geotop: “Lange Wand” near Ilfeld

and silver. Fish living in the sea sank to its bottom after their death and were deposited in the mud. The marine basin was transformed into a shallow sea. Organisms living in warm waters left accumulations of calcareous skeletal material. Further development of the Zechstein marine basin resulted in an immense formation of gypsum and anhydrite deposits as well as halite and potassium salts in the center of the Thuringian basin.

At the “Lange Wand” outcrop, we are positioned exactly at the boundary between the leveled continental surface and the Zechstein deposits. We recognize the porphyrite, which is bleached by sea waters, and beach sediments, now lithified as sandstone (and Zechstein conglomerate). This is overlain by thin layered shale, the former black mud which is designated as “Kupferschiefer”, followed by calcareous deposits which are lithified as “Zechstein-Kalk”.

## 8

## Mining of Copper Shale

## Visitor's Mine: "Lange Wand" (Long Wall)

The mine to be visited, "Lange Wand", is also located along the left banks of the river Bere. At the "Lange Wand" exposure, we first peered through a "window of earth history" and won insights into Permian times. We now can observe aspects of the interior of the earth as it was seen by the miners.

Mining activities here probably go back to the 16<sup>th</sup> century. Initially, cobalt ore and barite ("heavy spar") were mined in several tunnels, later to be followed by the excavation of copper shale. At the end of 1860, mining activities were finally terminated. There had been no real economic success during any of the operational periods. Today, however, thanks to this activity in the past, we are able to observe well developed occurrences of cobalt ore with the so-called "Erz-Rücken" (ore ridge), along with copper ore in the



Association of Miners



In the Visitor's Mine

"Kupferschieferflöz" (copper shale layer). We also can view different mining technologies side by side (mining of dikes and mining of ore beds).

Processing of the copper and cobalt ores mined in the "Lange Wand" pit took place in two metallurgical plants. The older factory was located near the present paper mill. The second plant, "Johanneshütte", was built on the territory of the present hotel "Zur Tanne". A circular hiking trail, starting at the mine, invites us to discover nature. Be it a weather station, a gold panning site or other interesting offers: there is sure to be something for everyone! School classes in particular make use of the circular hiking trail as a "green classroom". On request, typical miner's food/"Scherpermeals" are offered in the "Kleiner Saal" (Small Dining Room) of the visitor's mine.

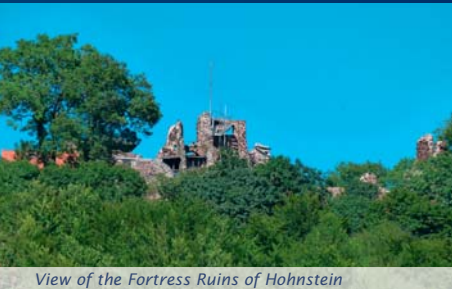


## 9

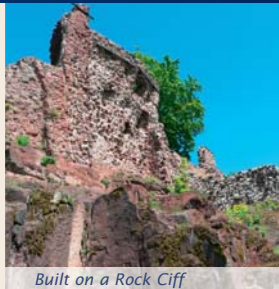
Porphyrite

## The Ruins of the Hohnstein Castle

Above the climatic spa of Neustadt, the ruins of the former castle of Hohnstein are to be found. Built at the beginning of the 12<sup>th</sup> century, the castle was devastated during the 30 Years War. Nevertheless, today it still remains one of the largest and most impressive historical fortresses in the Harz region. The castle is located in the center of the area of the Ilfeld rhyolite occurrence ("porphyrite") on the top of a rocky cliff. The red-brown porphyrite to be found here was the material preferred for construction. The natural subsurface - the "grown stone" - and the man-made structure consist almost entirely of the same material. The walls and building remains give the appearance of being a natural continuation of the underlying rock formations. In addition to the porphyrite, various other rock types were used as construction material, in particular the local gypsum. It is of significance in its use as the



*View of the Fortress Ruins of Hohnstein*

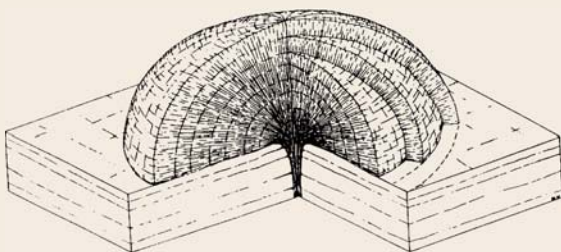


*Built on a Rock Cliff*

mortar which can be found as white joint fillings. This contrast of white joints to the dark brown porphyrite lends an interesting aspect to the castle. Burnt gypsum, or plaster, was also widely used for the production of plaster stone flooring. Remains of these floors are to be found at numerous points in the castle. Occasionally, gypsum (alabaster) also served as a workstone for the production of delicate structures. In addition, almost all rock types of the surrounding area were appropriated to a limited extent for the construction and preservation of the castle.

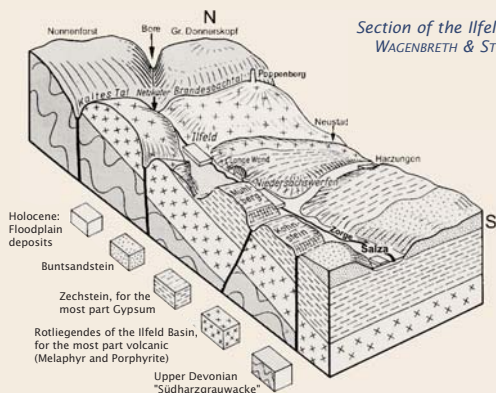
On a walk across the castle site, it is not only the old walls that are of interest. From the castle yard, or even better from the castle keep, we are offered a panoramic view of extensive portions of the old dutchy. On a clear day, the hill sites of the Kyffhäuser, the Hainleite, the Eichsfeld and the Ravensberg are visible.

This former municipal quarry is located in the northeastern edge of the Osterode district of the municipality of Neustadt/Harz and belongs to the geological structure designated as the "Ilfeld Basin". This basin represents the largest occurrence of the Rotliegend Formation in the Harz and covers an area of about 120 km<sup>2</sup>. In the area of Ilfeld-Neustadt, it is characterized by thick, rhyolitic volcanic sequences. This volcanic complex, called the "Ilfeld Porphyrit" in earlier literature, extends over an area of 50 km<sup>2</sup>. However, very few volcanic vents, or centers of lava production, are known in the complex. The exposure at the Bornberg presents a center of lava production which developed as a cupola of stagnation with ideal structural configuration.



*Idealized Section of the Cupola of Stagnation Bornberg (BUTHE, 1996)*

Here, the rhyolitic lava penetrated previously deposited but not yet lithified ash flow sediments, forming, in the course of several phases, a dome-like structure. Because of its hardness specifically characteristic for the area, the volcanic rock designated as rhyolite ("Ilfeld Porphyrit") was excavated at this site. As a result, the inner structure of the cupola of stagnation was rendered visible. Impressions of the flow activity in the course of the Rotliegend volcanism are quite vivid here.



*Section of the Ilfeld Basin (after WAGENBRETH & STEINER, 1990)*



Selected Points of Information

## Restaurants and Accommodation



**A** Hotel "Hohnstein"  
Neustadt/Südharz  
[www.hotel-hohnstein.de](http://www.hotel-hohnstein.de)  
☎ **0049 36331 - 46718**



**B** Hotel "Neustädter Hof"  
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## REGIONALVERBAND HARZ E.V.

The Regionalverband Harz is a non-profit association incorporating the counties of Goslar, Harz, Mansfeld-Südharz, Nordhausen and Osterode am Harz. It supports the protection of nature and environment as well as the cultural heritage of the Harz through the assistance of its sponsoring members. Its aims are achieved in part through the patronage of Nature Parks in the Harz region. As a partner in the Geopark Harz · Braunschweiger Land · Ostfalen GbR, founded in the year 2004, the Regionalverband is responsible for the southern portion of the UNESCO Global Geopark Harz · Braunschweiger Land · Ostfalen. Its partner association located in Königslutter is responsible for the northern portion. Since the year 2004, the Geopark Harz · Braunschweiger Land · Ostfalen GbR has been a member of the European Geoparks Network.

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