



Organisation
der Vereinten Nationen
für Bildung, Wissenschaft
und Kultur



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

Landmark **13**

Baumann Cave



 **GEO PARK**®
Harz · Braunschweiger Land · Ostfalen

Harz



Organisation
der Vereinten Nationen
für Bildung, Wissenschaft
und Kultur



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**. Among the first 120 UNESCO Global Geoparks, spread throughout 33 countries around the world, is Geopark Harz · Braunschweiger Land · Ostfalen.

UNESCO-Geoparks are clearly defined, unique areas, in which locations and landscapes of international geological importance are found. They are operated by organisations which, with the involvement of the local population, campaign for the protection of geological heritage, for environmental education and for sustainable regional development.



As early as 2004, 25 Geoparks in Europe and China 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.

1

Stalactite Caves

Baumann Cave, Hermann Cave

The Baumann Cave is known as the oldest visitors' caves in Germany. Visitations were carried out here already in 1649. Even JOHANN WOLFGANG VON GOETHE (1749 – 1832) admired the beauty of the “Baumannshöhle” and is said to have visited it three times. Today the stalactites still retain their charm. The rich cave ornamentation consists of calcareous cones descending from the ceiling (stalagmites) precipitated from the dripping water, cones growing up from the floor of the cave (stalagmites) as well as combined cones (stalagnates) and terraces of calcareous crusts along the walls. A large cavern of 2,500 square-meters, designated as the Goethe-Saal, with an artificial lake – the “Wolfgangsee” – is a site for cave festivals. In the entrance building stands a small exhibition devoted to limestone.

The Hermann Cave is a striking example of the process by which a “river-cave” develops. Here we can see how



The Hermann Cave

cave formation originates in extended fissures (earthquake cracks) and how areas of broken material are accumulated in large caverns. A step-by-step deepening of the cave can also be observed; caverns were formed parallel to the deepening of the course of the Bode River with its source in the vicinity of the Brocken. A special area displays an exquisite, secondary formation of great rarity in which a carpet of several millimetre high calcite crystals has grown up at the bottom of a basin once filled with stagnant water. This carpet attests to the water stand. In a basin accessible for observation a population of male “Grottenolms” (*Proteus anguineus*) is to be found. They were imported from Slovenia decades ago. Both caves share their stalactite ornamentation, a constant temperature of 8 degrees throughout the year, high humidity, dripping waters and the fossil bones of pre-historical animals – above all, cave bears – as well as deposits left by inundations of clay.



Rübeländer Tropfsteinhöhlen

Opening hours: daily from 9 a. m.

(during off-season only one of the caves)

☎ 0049 39454-49132 · www.harzer-hoehlen.de

2

"Vacated" Water Blue Lake

From the parking space on the B 27 between Hüttenrode and Rübeland we reach a lake which is blue only in the spring time. The lake fills a small, 50 year-old abandoned limestone quarry into which ground water with dissolved calcium bi-carbonate flows. Evaporation enriches the dissolved material and each external particle can serve as a nucleus for crystallization. No life is possible in the lake. The calcareous mud that sinks to the bottom of the lake is white. Such "vacated" waters predominantly reflect a blue light. During the course of the year, the content of dissolved material recedes and causes all external particles to sink to the bottom. The lake then becomes green due to algal growth.

The limestone quarries in the area were built in 1886. Only the ruins of ring furnaces once used for burning the limestones still remain.



The Blue Lake



The Krockstein

3

"Marble" Quarry Krockstein Neuwerk

The steep path leading up to the quarry and stock piles of the Krockstein cliff begins between the houses at the point where the federal road B 27 and the Bode River diverge. Here "marble" has been excavated since the 12th century. It consists of a fossiliferous limestone from the Middle Devonian, coloured red by iron ores. The most intensive mining activity took place here between 1715 and 1889. Intense tectonic sheer movements of the sequences made production from the material possible only for smaller decorative elements (to be found, for example, in the Dome of Berlin). Close attention is required while descending the steep slopes down to the Bode. Directly at the bus stop (across from the bridge and parking lot) beneath the Krockstein, an excellent and impressive exposure of "Kulm"-greywacke is to be found.

4

Industrial history
Rothehütte

On older maps of the Harz, the town Königshütte is missing. In its place stands a Rothehütte. The earlier significance of this site can be explained by a look into the past.

Originally, the Harz was owned by the royalty. The noble family of the Liudolfinger (Ottonen) first ruled this important domain, rich in raw materials. It was inherited by the Salians, who tried to secure the Harz with a ring of castles. Unrest, however, was stirring in the empire. The princes gathered protesting rebels around them, and in 1114, HEINRICH V. was defeated by these forces in a battle at the „Welfesholz“ east of the Harz (Landmark 19). The central ruling power in the Harz was now broken.

Territorial fragmentation resulted from the competition between the dynasties of counts. All the while, iron ores were being excavated between



Columns and fragments of columns from the ironworks

Hüttenrode and Mandelholz in the Elbingerode Komplex. In order to extract the iron, the counts of Wernigerode erected smelting plants along the river Kalte Bode, among them the Rothehütte in 1679. At this point, the land was already ruled by the Guelfs. The area around Elbingerode went to the Hanover branch of the house of Braunschweig-Lüneburg. In 1747, the kingdom of Hanover took over the metallurgical plants, which originally had been leased. They were now managed by the Berghauptmannschaft Clausthal. At the beginning of the 19th century, the old Rothehütte was replaced by a new plant with two double blast furnaces, which, between 1819 and 1826, also replaced the metallurgical plants of the Schreiberhütte and the Hütte Lüdersdorf. The new Rothehütte was an impressive structure. Iron columns erected at this site recall the monumental building. In 1936, the villages of Königshof and Rothehütte were merged into one town, Königshütte.



5

On rails

Old station & industrial railway of Neuwerk

To the right of the B 27 between Rübeland and Hüttenrode the old railway station Rübeland is located. Closely behind the K 1349 diverts towards Neuwerk situated in the valley of the Bode. Like almost no other place in the Harz this hutment has preserved its originality. The cottage business had already stopped in 1875, whilst the Marble Mill (Marmormühle) still continued working until 1889. From 1869 - 1944 also a quarry for road building materials was run in the Kreuztal. This melaphyre-quarry can be visited. Melaphyre is a pre-permian alkaline rock and is classified as a diabase. On the western side of the quarry the remains of the iron ore deep mining can still be seen. Since 1887 the quarries were connected to the Rübeland Railway, Blankenburg-Tanne, by the Neuwerker industrial railway.



Tunnel



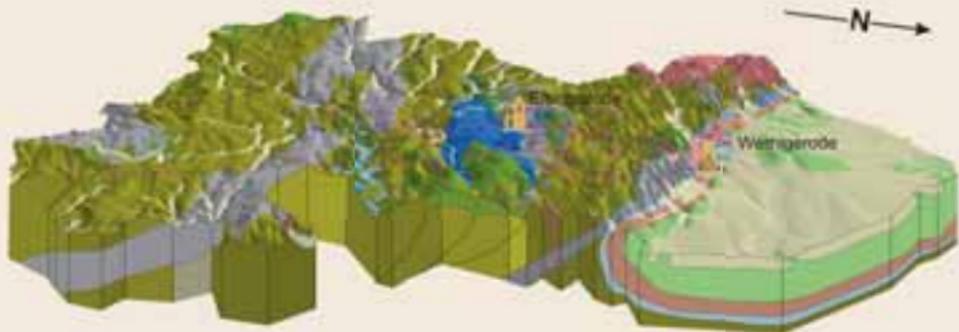
„MAMMUT“

The crucial factor for building the Rübeland Railway was the Cologne Bank J. L. Eltzbacher & Co. It had acquired possession of the ducally-brunswick iron mills and together with them also the former forge for axis in the Kreuztal. For more than 100 years electricity is generated there from hydropower. The Rübeland Railway originally used to be a rack railway. An exhibit from these times can be seen in the open-air site at the historic engine shed of the old Station Rübeland. The engine shed itself had been added on in 1935 to the station. Today it houses the legendary "MAMMUT" (mammoth). It is of the four so-called "animal-class" locomotives which were introduced to take over the rack railway system. During the first test drive in March 1920, the "MAMMUT" had proved her ability to master steep transport way connections imposingly.



Geological Overview of the Area

400 million years of the earth's history are manifested in the "Elbingeröder Komplex". After the deposit of a clayey mud-bed in the lower Devonian sea 380 million years ago, intense volcanic activity began, resulting in the formation of rock types such as Keratophyr and Spilit (Schalstein) in four underwater volcanoes. The volcanic rocks vary greatly; most have green colours, reddish lithologies are rare. They are dense, but also manifest "pseudo-bedding". After the main phase of volcanism, the formation of iron ore deposits took place. Submarine hot water streams released iron mineral precipitations on the lava surfaces. Depending on the local conditions, different iron minerals developed: magnetite, hematite, siderite and chlorite, together with quartz and limestone (precipitated from the sea water). For this reason, the composition of iron ores varies radically over short distances. The ore bodies are up to 30 meters thick and up to several hundred meters long. At the same time, coral limestones of great chemical purity were being deposited as sediments in the middle Devonian, reaching up to 600 meter thickness. Conditions for this phenomenon were an equatorial position during the Devonian, calcium supply from the volcanoes and a continual sinking of the sea floor, so that the corals were perpetually adapting their reef constructions to the life-essential water depth of a maximum of 60 meters. In the middle of the Elbingerode Complex, the waters were bearing not only iron but also sulphur, precipitating at the same time pyrite as a special mineral type, also in extractible quantities. After vulcanism and the deposition of limestone followed clay deposits resulting in slate. In a more recent Permian magmatic period, the middle Harz porphyry dyke system was formed between Wernigerode and Ilfeld. Most recent geological processes are associated with the uplift of the Harz as a mountain range, which generated cave formation through the karstification of limestones (Rübeländer Tropfsteinhöhlen) and the oxidation processes of the pyrite deposit to brown iron ore (Eisener Hut).



Cenozoic

Quaternary - Tertiary

Mesozoic

Cretaceous

Triassic

Paleozoic

Zechstein

Lower Carboniferous

Upper Carboniferous - Rotliegendes

Devonian

Igneous Rocks

Mafic volcanic rocks and plutonic rocks

Granitoids

Dykes



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 Nr. ① is always the place which has given its name to the Landmark.

This map will help you plan your own personal **Geo-Route** around the "Rübeland stalactite caves". Locals and visitors alike enjoy a ride on the 125-year old Rübeland railway. The Rübeland-trains are pulled by steam engines like the "Bergkönigin" or queen of the mountains.

Bestellung weiterer Faltblätter

Order leaflets in English

Information en français

www.harzregion.de



6

Limestone

Galgenberg (Gallows Hill)

East of Elbingerode along the Trail of Medieval German Emperors and Kings lies the Galgenberg (506 m a. s. l.) with its impressive cliffs soaring up above the flat meadow terrain. The cliffs consist of remains of an ancient coral reef. In the earlier days, the Galgenberg was a site at which judgements were passed, and, as of the 16th century, executions carried out. From this point, we have a scenic view over portions of the Elbingerode plateau with a thin calcareous soil layer which supports a rich flora: grass, herbs, even orchids, but few trees. To the south is a limestone quarry. Here, as on the other side of the town in the “new quarry” (see information panel), limestone is exploited. A steeply dipping sheet of slate inserted into the limestone occurrences can be distinguished by its dark colours.



Galgenberg



Vulcanite, or Schalstein, as building material

7

Schalstein (Green Mafic Volcanic Rock)

Bockberg near Königshütte

We drive further on the federal road B 27 towards Mandelholz. In Königshütte, the B 27 traverses the Teich valley immediately before the railroad bridge. Directly along the roadside stands a vertical rock wall of green mafic volcanic rocks (Schalstein). Here we can see how iron-bearing solutions from the middle Devonian have migrated upward through rock fissures towards the ocean floor. At some points, hematite ores (red), calcite (white and glittering) as well as quartz (milk-white) fill the joints. Immediately after the bridge comes a quarry with an artificial waterfall in a small park. Here is the source of the material for the outer façade of the Elbingerode church. Following the federal road B 27, we come after 300 meters on the right-hand side of the road to small buildings whose walls are built with almost all varieties of the volcanic rock (Schalstein) from the area.



Tourist-Information Elbingerode

☎ 0049 39454-89487

www.oberharzstadt.de

The Königsburg is located above the site where the Kalte Bode River meets the Warme Bode River. Large limestone boulders have been placed before the parking area as decorative elements. This particular limestone is characterized by intense occurrence of sparry calcite. The attractive stone from the new quarry is unusable for the production of Branntkalk (quicklime).

The tower of castle and the walls ruins consist of river gravel and stones from the immediate vicinity – slate, diabase, volcanic tuffs, granite, limestone, greywacke, Keratophyr, Flinz-Kalkstein and Wetzschiefer.

The road following the left bank of the Bode is flanked by the "Liegenden des Elbingerodekomplexes",



Königsburg Ruin



Dam of Königshütte

in the idiom of miners, those stones lying beneath the deposit sites. Where the Bode enters the reservoir, we encounter a granite dyke (Mittelharzer Granitgang) which is isolated as a hard, erosion-resistant cliff. Its line of contact (Salband) to the surrounding slate is irregular but still clearly recognizable. Various sized bodies of diabase have been repeatedly incorporated into the lower Devonian slate. The green diabase is characterized by white inclusions of feldspar. This type of morphology, which depends on the varying hardness of the rocks, characterizes the formation of the valley down to Rübeland.

If we wander from the dam in the direction of Elbingerode, we encounter after a brief ascent a shelter hut. From there we follow the hiking trail "Weg Deutscher Kaiser und Könige des Mittelalters" (Trail of Medieval German Emperors and Kings) further eastwards to the Susenburg.



9 Porphyry Susenburg

Very little is known about the age and the significance of the Susenburg. Possibly it is a never completed 167 meter long and 60 meter wide fortification complex on a cliff surrounded by the Bode River. The cliff is a porphyry dike (Mittelharzer Porphyrgang). A visit of the site is worthwhile thanks to its breath-taking view and the pervasive silence high above the Bode. Continuing along the Trail of Medieval German Emperors and Kings towards Rübeland, we cross the Bode River between Susenburg and Hahnenkopf and soon arrive at a towering stock pile of waste material from a quarry. Just before it, easy to overlook, is a small stock pile of slate, the remains of a brief period of slate extraction for roofing. The active mining period of this dark, blue-grey "Kulm" slate can be traced back to the 18th century. Final mining efforts took place in the post-war years 1946/47.



"Susenburg"



Kiln Construction

10 Charcoal Production in the Harz Stemberghaus near Hasselfelde

On the federal road B 81 between Hasselfelde and Blankenburg, the charcoal burning plant Stemberghaus is located. As in previous centuries, charcoal is produced in earthen charcoal kilns. In earlier times, charcoal was necessary for the local smelting of iron and non-ferrous metal ores until coke began to be used for this purpose. This change occurred in the 19th century as the train line was under construction, extending into the Harz. A small museum at the site provides interesting information about charcoal beyond its use for grills. It conveys an impression of the difficult working and living conditions of the charcoal burners, the forest workers and carters of bygone times. From April through October, the traditional charcoal kilns are built and then burned. 150 t of charcoal is produced every year in the charcoal plant from beech and oak wood. A trail consisting of 12 interesting sites connects the Stemberghaus with Hasselfelde.

11

Ore District Hasselfelde
Silber-Marie near Trautenstein

Below Trautenstein, to the right of the Rappbode, we find the adit entrance of the Silber-Marie mine. Here mining activity, often interrupted over the years, had probably already begun early in the 11th century. In the area of Hasselfelde, we find more relics of earlier and, in part, quite old mining activities. The town of Hasselfelde lies at the junction of significant trade routes. Sinter findings around Hasselfelde come from the middle of the 14th century. They attest to the early excavation of iron ores, even the tiniest occurrences. These activities can still be discerned in the morphological depressions, hills and overgrown mining shafts at the parking area "Radeweg". West of the ore mines, vein deposits were exploited for copper and the more precious silver to be found in the lead ores, such as those in the Silber-Marie mine and in the mines Nasser Wolf (Wet Wolf) and Gertrud.



Portal to the Silber-Marie



Druidenstein

12

Granitporphyry
The Druidenstein in Trautenstein

The cliff Druidenstein is located very close to the church in the village centre of Trautenstein. It is an imposing rigid dyke composed of granite porphyry from the Mittelharzer Gangschar. This volcanic vein system of the middle Harz traverses the Harz Mountains from Wernigerode southward to Ilfeld. Steeply dipping, cooling surfaces of this volcanic rock are clearly visible in the outcrop. Downstream next to a bridge across the Rappbode is an exposure of greywacke with inclusions not typical for this particular lithotype and fibrous quartz occurrences. The former quarry has been re-cultivated as a small park. The lithological term Grauwacke made its way into the geo-scientific world from the Harz. The commonly used name Wacke designates a rock of general composition.



The Rappbode Dam as the main barrage of the system is an impressive example of hydraulic engineering with a 415 meter long and 106 meter wide wall. At peak water level, contains a volume of 109 cubic meters with a water surface extending over an area of 390 hectares. Since 1958, the inhabitants of the region have rarely been threatened by flooding during the thawing period and after heavy rains. Since then, potable water has been delivered from the Rappbode reservoir great distances into the middle German regions. The reservoir system consists of the “pre-barrages” of the Rappbode and the Hassel, the transitional reservoir near Königshütte, the Mandelholz reservoir, the pump-storage plant of Wendefurth and the reservoir lake of Wendefurth, which has been made available for touristic use. In Wendefurth a road to the reservoir lake diverges to



View from the “Roter Stein” across the Rappbode Reservoir

the right from the B 81. Following the signs, we arrive at an information panel located directly before the dam. Tours through the control tunnels of the dam begin with an introductory video show explaining the Rappbode water storage system and other reservoirs in Sachsen-Anhalt. On the tour one can observe the lateral foundation of the dam in the Wissenbacher Schiefer, an early Devonian slate.

In the open area below the dam, a geological information site is located. It shows models of the course of the various source rivers of the Bode and of the water storage system. Typical rock types are documented as well as characteristic plant species for the region. An information panel demonstrates the path of the water through the rocks of the Harz. The information site is directly accessible from the parking area on the federal road B 81.



Selected Points of Information

Restaurants and Accommodations



Hotel-Restaurant-Café
„Grüne Tanne“, Elend
www.mandelholz.eu
☎ **0049 39454 - 460**



Hotel Restaurant Druidenstein
Trautenstein
www.hoteldruidenstein.de
☎ **0049 39459 - 739494**



Christliches Freizeit- und Erholungshaus
Tanne des DGD e. V., Elbingerode
www.neuvandsburg.de/harz.html
☎ **0049 39454 - 81350**



Pension Königshof
Königshütte
www.pension-koenigshof.de
☎ **0049 39454 - 52146**



REGIONALVERBAND HARZ E.V.



The Regionalverband Harz is a non-profit association incorporating the counties of Goslar, Göttingen, Harz, Mansfeld-Südharz and Nordhausen. 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, newly founded in the year 2016, 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 has been a member of the European Geoparks Network.

Publisher: Regionalverband Harz e. V., Hohe Straße 6, 06484 Quedlinburg
☎ 0049 3946 - 96410, E-Mail: rvh@harzregion.de
3rd, English Edition, 11 – 15 k
© Regionalverband Harz e. V.
Quedlinburg 2018. All rights reserved.

Internet: www.harzregion.de
Author: Dr. Klaus George & Dr. Horst Scheffler
Translation: Dr. Torsten Steiger & Dr. Harriett Watts
Photos: Dr. Klaus George, Christiane Linke & Ernst Schuhose
Conception: Design Office Agentur für Kommunikation GmbH
Printing: Quensen-Druck + Verlag GmbH

Kindly supported by:

