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Harz - Braunschweiger
Land - Ostfalen
UNESCO
Global Geopark

Landmark 

Old Fortress Osterode



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

Harz



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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.

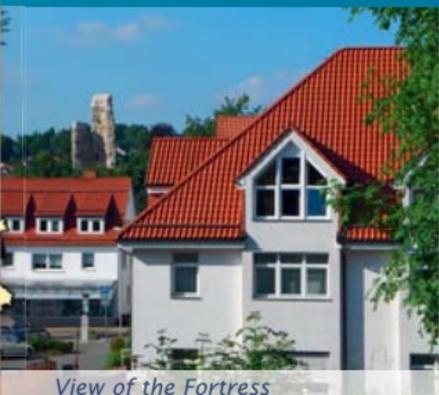


1

River Gravel & Gypsum Mortar

Old Fortress and Town Wall

Originally the „Alte Burg“ (“Old Fortress“) served to defend the crossing point over the Söse stream and the adjacent market settlement. Since its first documented mention in the 12th century it was in Welp possession. In the 14th/15th centuries it was therewith also the seat of the dukes who reigned over the principality of Grubenhagen and then, finally, it was the widows' residence. The last resident at the beginning of the 16th century was ELISABETH VON WALDECK (about 1455–1513), widow of ALBRECHT II., Duke of Brunswick-Lüneburg, who until his death was the ruling Prince of Brunswick-Grubenhagen. Deterioration of the ground upon which it was erected most probably forced the abandonment of the fortress. Remaining in a half-cylinder form is the original five-story Romanesque residential tower. The still mighty structure stands today in the midst of the town cemetery. The tower with a base diameter of



14.5 meters is one of the largest castle keeps to be found in Middle Europe. Composed of Söse gravels (for the most part large quartzite stones) held in gypsum mortar, the fortress stands as an example of both the construction and the territorial tradition of many fortresses of the High Middle Ages around the Harz. The gypsum was extracted from the nearby Kalkberge mountains. The high construction quality of this typical local building material enabled portions of the keep to survive. Of the former further fortress constructions only the foundation walls still exist. As the keep ruin was becoming increasingly endangered by weathering, in the 1990's it was secured from further deterioration by applying restoration mortar of remixed gypsum mortar, thereby maintaining the material identity.

The town wall, first documented in 1233, which at first enclosed the valley settlement only, was also constructed of large rough-hewn Söse gravels, majorly Lower Carboniferous quartzites of the Acker-Bruchberg region.



Osterode am Harz is accessible with public transport from Braunschweig, Hildesheim and Göttingen.

2

Museum and Town Hall

Ritterhaus and Harz Granary

Only a few steps from the restored portion of the town wall we reach an important building which takes its name „Ritterhaus“ (“Nobelman’s Manor”) from a wood carving on the corner post of the half-timber building. The building, originating from the second half of the 17th century, underwent alterations in 1784/85 for the woolen ware manufacturer JOHANN LUDOLPH GREVE. The ornamental rococo vestibule framework with the family coat of arms dates from the same time. The city museum has an impressive presentation of municipal and regional history on three floors and in a total of eleven divisions. In the “Rittersaal”, the large storage hall with leaded glass windows, special exhibits are presented regularly. In connection with the Geopark a visit to the permanent exhibits “Geology of the Harz and its Forelands”, “Gypsum” as well as “Prehistoric and Early History” (all in German) are particularly recommended.



Museum Ritterhaus ("Nobelman's Manor")



Harz Granary

The specimens range from the oldest fossils of the Silurian up to large mammals of the Ice Age. Ore deposit locations and rock quarries of the south Harz delivered scurrile and beautifully formed ore and mineral samples. On the bank of the Söse a storage barn to supply the mining localities in the Upper Harz was established between 1719–1722. The imposing building today houses the mayor’s official rooms and the city administration offices. Supported by a sturdy ground floor constructed majorly of quartzite stone is a tremendous oak half-timber upper story construction with brickwork using bricks from the former brickyard at Düna. For their production gray saliferous clay from the Zechstein formation was used. The window frames and sills as well as the magnificent gable pediment are made of Bunter sandstone from the Weserbergland. Above the portal stands, in gold letters, "Utilitate Hercyniae“ (“Serving the Harz”). Harz slate from the nearby Elbingerode (Samtgemeinde Hattorf am Harz) is used as roofing material.

Museum Osterode

☎ 0049 5522 - 919793

www.museum.osterode.de

3

Candid Shot of an Oceanic Flood Fuchshalle Outcrop

In Osterode, where the Breitenberg foot path branches off in a northeasterly direction from the Fuchshalle path, we discover this geo-scientifically important outcrop obscured in the woods. An explanatory information board has been installed here by the Regionalverband Harz.

The Harz area, uplifted to form a mountain range in the Carboniferous (360 – 300 million years ago), was mainland at the beginning of the Permian. Thereafter the mountain range was eroded extensively and the wide Germanic Basin developed. Later, still in Permian period, about 258 million years ago, sea water penetrated into this basin from the north. In today's southern Harz region the "Zechstein Sea" flowed in and met the shallows and ridges. The undersea deposit strata lay flat along the upper surface of the old folded mountain belt as they were formed. Today this "caught



Bread Grain Ration Card



Fuchshalle Exposure

in action shot" of an ocean flood, conserved for millions of years, provides an exemplary illustration in the Fuchshalle quarry: lying directly on the strata of the folded and fault plane interspersed substratum a reworked horizon – the Zechstein conglomerate – reveals the force of the fast-surging incoming water. Above that lies the copper shale. For thousands of years, particularly in the southern Harz and in Mansfelder Land, it was a highly valued raw material which was first exploited near the surface in small opencast mines until up into the 1990's when it was extracted in underground mines. Lying on this we discover Zechstein limestone. Within a hand's breadth these varying rocks tell the story of the origin and the differing development phases of an ocean at the end of the Permian. With them begins the nearly continuous layering of younger ocean sedimentation, the so-called overburden rock, on the old bedrock.



By decree of the County of Osterode am Harz, dated June 10, 2005, to ensure the protection of this natural monument all digging, scraping and prospecting is strictly forbidden!

4

Iron Ore Mining on the Upper Harz Diabase Zone Open Air Museum Lerbach

Following one of the Söse's secondary streams from Osterode's centre through the Freiheit district we arrive at the little village of Lerbach. According to legend a knight on his way to Clausthal wanted to water his horse in the river. But he found the riverbed dry due to a severe drought in the area at the time. Back at the castle the knight cursed, „Ei du verdammter leerer Bach!“ (“Oh you cursed empty stream!”). Lerbach can look back on a long mining history. About 2 million tons of ironstone were mined here from 1530 to 1887. The Lerbach iron ore lodes contain dense red ironstone. The miners called the silica-bound hard-to-smelt iron ore "red stone". The lime-bound ore was called "blue stone". It was much sought-after in the smelters. The ores are part of the "Oberharzer Diabaszug", a geological structure that stretches from Osterode 25 km via Altenau to



Open Air Museum Lerbach



Dennert Plate

Bad Harzburg. It includes heavily folded, partly steep oceanic deposits of the Devonian period to the Lower Carboniferous period (400 – 350 million years ago). The deformation is due to the position of the Diabas range between the mighty hard greywacke of the Sösemulde and the Clausthaler Kulmfaltenzone, during the collapse of the originally adjacent sea basins during the Harz folding in the Carboniferous period.

In the Open Air Museum Lerbach in the Mühltal, the mining and charcoal history comes alive. For example, here we can see what a charcoal stack looks like inside or how an adit entrance is built up. A hike on the iron ore nature trail gives amongst others insights into the geology of the Upper Harz diabase range, common and pastoral economy and forestry.



5

Greywacke

Round about the Söse Valley Reservoir

Massive intermixed layers of shale and greywacke as well as conglomerates of the Lower Carboniferous form the Söse Basin. In this geological structure lies the Söse River Valley Reservoir, completed in 1931. Below the dam is the waterworks. From there, long distance pipes transport drinking water up to Bremen (since 1934) and Göttingen. 400 m southeast of the dam bulkhead there is an old quarry. To supply material for dam construction, greywacke and a conglomerate were excavated. The term greywacke is an old miner's name used in the Harz region which is now used worldwide. Today it normally describes grey sandstone from the Paleozoic, formed during the erosion of mountains consisting majorly of coastal sediment masses. Devonian calcareous gravel stones found in the Söse conglomerate bear witness of the long lasting rebedding processes in the Paleozoic (about 550 – 300 million years ago).



Söse Reservoir



Talus Rock Formation

6

Talus Rock

Allertal Riefensbeek-Kamschlacken

Our tour begins at the Landhaus Meyer in Riefensbeek. A hiking trail takes us over the Ackerblick and the Hühnerkopf to the outdoor swimming pool at Kamschlacken. From there the four cliffs, the Aller- and the Wolfsklippen as well as the Siebenwochen- and the Ifenklippen can be combined in a circuitous hike. On the western slope of the high range „Auf dem Acker“ (geol. Acker-Bruchberg Range) lies the seam between its mighty and very hard quartzites and the softer rocks of the lower bedding plane of the Söse basin. Impressive witnesses of the youngest geologic past are the rock cliffs and talus rock assemblages east of Kamschlacken. During the Ice Age permafrost hard greywacke and quartzite layers formed steep high cliffs, from the under hang of which block-sized rocks were sprung loose by frost and gradually shifted position until eventually collecting in the valley as creeping rock.



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.

The map below will aid you with planning your own personal **Geo-Route** around the county town of Osterode am Harz. Among its known landmarks are the Alte Burg ("Old Fortress"), as well as the Market Church St. Aegidien. There in the crypt, the last Duke of Brunswick-Grubenhagen, PHILIPP II. (1533 – 1596), found his final resting place.

Bestellung weiterer Faltblätter

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Information en français

www.harzregion.de



7

Gypsum

Pipinsburg Fortress

Below Osterode's Old Town three iron ore smelters were established on the Söse at the end of the 16th century. Surrounding two of the smelters small settlements developed: Petershütte and Katzenstein. They have long since become incorporated in the townscape. There, where the Söse runs into the Osteroder Kalkberge, a mountain spur has survived gypsum leaching until today and on it the important archaeological site, the Pipinsburg, is located. An overgrown ravine (hollowed out trail) leads upwards from the Katzenstein. Above on the plateau, the Karst Trail leads quite near the fortress, of which today only the grass-covered walls are discernable. We cannot miss them, though, as an information board marks the history-laden location. The first documented mention of the fortress is from 1134. By 1365 it had already been destroyed. Among the findings from archaeological diggings are ceramics, jewellery and



View of the grass-overgrown fortress walls (left)

goods for day to day use from the Bronze Age, the Iron Age and the Middle Ages. The mountain stronghold's major function was securing the commercial routes.

The Osterode Kalkberge mountains ("Limestone Mountains") consist of gypsum. Formerly the only distinction made was between "carbonaceous limestone" (carbonate) and "sulfatic limestone" (gypsum). "Kalk" (limestone) was a collective terminology and has here survived as a geographical name. The steep, up to 80 m high gypsum cliffs in Osterode thank their existence to an old tradition in gypsum manufacture. Still today a manufacturing plant exists in the historic Osteroder Rathsmühle. The extracted raw gypsum stones are used majorly in gypsum production for the construction industry. In the lower areas the gypsum stones tend more toward waterless anhydrite, which is also extracted for the building and cement industries. The mineral depository belongs to the Zechstein, a subdivision of the earth's history.

Tourist information point Osterode am Harz

☎ 0049 5522 - 318333

www.osterode.de

8

Terrace Gravel Devil's Baths

East of the railway line between Osterode and Herzberg the Harz Border basin is particularly clearly delineated. The gypsum underground has long been involved in a dissolution process. Above deeply sunk river gravel lie up to 100 m of thick boggy deposits. The water-filled basin is fed by the "Teufelsloch" ("Devil's Hole"), a vigorous intermittent spring. In the active caved surface area a lake landscape, the Teufelsbäder ("Devil's Baths"), was formed. The Großes and Kleines Teufelsbad (Large and Small Devil's Baths) resulted from dams and now silted-up fish waters. Many kinds of birds find protected breeding places in the reed-filled silted up zone. The lake landscape of the Teufelsbäder is a beautiful hiking area. The terrace gravel in the underground is an Ice Age deposit. By the end of the 20th century the youngest gravel stratum, the lower terrace, had been extracted from a gravel pit between Eisdorf and Förste.



Teufelsbäder Lake Landscape



Beierstein

9

Karst Landscape compact Hainholz-Beierstein

From the car park west of Düna various paths can be combined into longer or shorter hiking routes through the nature protection area. The open Rotes Höhenvieh (a Harz cattle breed) grazing landscape opens up views over and into the karst landscape. The underground consists of Zechstein dolomite and claystone, in the woods gypsum rocks of the main anhydrite. In the rise further to the south red Bunter sandstone reveals itself. In close proximity typical phenomena of a karst landscape are obvious: collapsed sinks and dolines, 30 leaching and riverlet caves, ebbing streams and intermittent springs, karst ponds, shafts and karren fields with Ice Age rhinoceros and old Stone Age archaeological findings. Vanished stream water from Beierstein surfaces again in the springs of Förste, in Hainholz sinking water surfaces in the Rhume spring.

10

Treasure Chest of Prehistoric and Ancient History
Lichtenstein

Between Dorste and Förste the Lichtenstein region can be discerned from a far distance. Toward the west the gypsum area is bordered by the western Harz boundary fault. Imposing sinks and dolines as well as the typical gypsum karst flora and fauna today influence the appearance of the nature protection area. Along the south route of the Karst Trail we reach the area which has yielded proof in the form of fossils of a rich amount of Weichsel Ice Age (50,000 years ago) large mammal fauna.

Among the findings in a doline in the present day quarry are skeleton remains of such animals as the bison, woolly rhinoceros, horse, cave lion and giant deer. In the Ritterhaus Museum in Osterode the exhibit "Gipsindustrie" ("Gypsum Industry") displays, among other things, the head of a woolly rhinoceros.



Lichtenstein

Located on the knoll of the hill are the ruins of the medieval fortress Burg Lichtenstein. A well maintained fortress moat with the system of walls including the remains of the majorly gypsum block defence walls can be viewed.

The nearly impermeable knoll (Lower Bunter sandstone) lets rainwater drain off its sides. At the edges the water then runs into the soluble gypsum strata which lie below the Bunter sandstone. In this way imposing sink holes as leaching dolines and collapsed dolines could be formed. Of national importance is the 115 meter long Lichtenstein Cave on the northwest slope. In 1980, a completely intact, more than 2,700 year old cult and burial ground was discovered in this fossilized rising spring cave. The mortal remains were genetically investigated and compared to the DNA of present residents of the region. The descendants of the Bronze Age family clans of Lichtenstein have been identified! More regarding this can be found in the Bad Grund HöhlenErlebnisZentrum (Landmark **1**).

HöhlenErlebnisZentrum

Opening hours: Tues – Sun 10 a. m. – 5 p. m.

☎ **0049 5327 - 829391**

www.hoehlen-erlebnis-zentrum.de

11

Group of Springs
Förste

The proximity to Pipinsburg and the Lichtenstein Cave leaves room for speculation of medieval or even earlier salt mining having taken place here. A brook in the wide valley of the Söse is still today named the “Salza”. In the village of Förste itself, which was incorporated in the town of Osterode am Harz in 1972, we can count 35 springs. Before 1910, the Söse valley was flooded nearly every spring. Later the river was straightened. Beginning in 1931, the Söse Valley Dam successfully took over flood control. Förste lies on a geological fault zone. The rocks underlying the Ice Age scree of the Söse Valley have here been thrown against each other over a distance of about 1,000 meters. Water rises from both sides of this disruption zone: salt-laden sub-surface water from northerly and westerly directions as well as sulphate- and carbonate-laden near-surface karst groundwater from the east and the south.



In Förste



On the Karst Trail



Karstwanderweg Südharz (South Harz Karst Trail)

From Bad Grund in the west to Pölsfeld in Sachsen-Anhalt a 232 km long karst trail opens up the unique gypsum karst landscape of the counties of Göttingen, Nordhausen and Mansfeld-Südharz. In the western part are two parallel karst trails both beginning at the Förster Mühlteich. Following the northern route we arrive at Pipinsburg, passing through Osterode and the area of the Teufelsbäder, over Bad Lauterberg and on to Walkenried. Along the southern route the path leads past Lichtenstein and Beierstein to Herzberg, past Rhumequelle and further to Klettenberg in Thüringen. Only upon reaching the area between Mauderode and Gudersleben do the branches of the trail join, forming one single trail. It is an accredited Quality Trail of the “Wanderbares Deutschland” (“Hikable Germany”) trail system. The support society Förderverein Deutsches Gipsmuseum und Karstwanderweg organizes various events including guided Sunday hikes.



In the Beginning was the Ocean

Geological Development of the Region

From the Devonian up to about 300 million years ago the region was flooded, at times even a deep sea area. During and following the Devonian in the early Carboniferous mighty, sometimes fossil-bearing ocean deposits built up: limestones or sandstones, cherts of silicic acid micro-skeletons of unicellular organisms, argillaceous shales and slates as well as greywackes. The paleobasalts (diabases) of the "Oberharzer Diabase Zone" near Lerbach are lavas from undersea volcanoes.

In connection with them, hematite deposits developed. At the beginning of the Upper Carboniferous the plate tectonics-driven Variscan (Hercynian) orogenesis began in Europe. During this phase ore deposits built up in joints and fractures. The Harz region was intensively upthrust and then fell dry. Still during the Upper Carboniferous and at the beginning of the Permian this mountain range was to a great extent eroded. The reddish degradation debris gathered in the wide basin bordering a peneplain. 258 million years ago, in the Late Permian, the area of today's middle Europe was again flooded over. The deposits of the Zechstein sea, which follow along the southern Harz border for over 100 km, spread out flat on the folded strata of the broken-off mountain: first Zechstein conglomerate (surf debris) followed by copper shale (digestion sludge). Later repeated deposits of limestone rocks or, respectively, dolomites, argillaceous shales, gypsum and salts occurred. They are majorly chemical sediment rocks which were formed under extreme climatic conditions through evaporation of the ocean water. The climate was similar to that of today's Red Sea region. The shift to today's position in the north as well as the formation of the Atlantic Ocean go back to the displacement of the continental plates by plate tectonics. In the following Triassic and Jurassic the Harz was once again an ocean region. The deposition of the formations has been going on for approximately 100 million years. Remnants of the earth's middle age (Triassic, Jurassic and Cretaceous) no longer exist in the inner Harz, but can still be found in the Harz forelands. Since the Tertiary, about 65 million years ago, the region has again been uplifted. This in turn induced erosion and the cold phases of the following Quaternary period accelerated the erosion. The displaced rock material can today be found as river gravel in the Söse valley. The gypsum cliffs between Osterode and Badenhäusen have since then built a marked topographical bench. The region is karstified, as gypsum is a water soluble mineral and, as a result of underground drainage, hollow forms such as caves or sinks were formed and are still being formed.



Selected information points

Overnight accommodations



Hotel „Landhaus Meyer“
Osterode-Riefensbeek
www.hotel-landhaus-meyer.de
☎ 0049 5522 - 3837



Hotel „Zum Röddenberg“
Osterode am Harz
www.hotel-zum-roeddenberg.de
☎ 0049 5522 - 90540



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.

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