



Organisation  
der Vereinten Nationen  
für Bildung, Wissenschaft  
und Kultur



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

Landmark 7

# Kohnstein Hill



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

**Harz**



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Harz - Braunschweiger  
Land - Ostfalen  
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

South Harz Zechstein Belt

## Kohnstein Hill, Niedersachswerfen

On our tour of discovery through the Geopark we come from Ilfeld (in the area covered by Landmark **6**), either by car on the B4 or with the Harz Narrow Gauge Railway, to Niedersachswerfen. Both villages have belonged to the administrative district of Harztor since the beginning of 2012. On our way to Niedersachswerfen we followed the Bere, a 17 km long creek which rises near Thuringia's border with Saxony-Anhalt at 600 m above sea level. The Bere joins the Zorge in Thuringia at the foot of the 334.9 m high Kohnstein Hill. The source of the Zorge, on the other hand, is in Lower Saxony. It flows through Ellrich, Niedersachswerfen, and Nordhausen, and then into the River Helme northeast of Heringen. The area of the Geopark detailed in this pamphlet stretches along both sides of the Zorge. The pamphlet has been titled "Kohnstein Hill" because the hill is a landmark visible from far and wide in this area.



Excavation face, Kohnstein Hill

The hill's natural escarpment captivated people from ancient times on and the white extraction face of the anhydrite opencast pit can't be missed today. There is mention of lime kilns on Kohnstein Hill as early as 1368. From 1917 BASF (Badische Anilin & Soda-Fabrik) extracted sulphate rocks here on a grand scale for processing in its ammonia plant in Merseburg, and thus began the creation of an extensive system of man-made tunnels and caverns. By 1935 ca. 35 million tonnes of anhydrite had been extracted (both underground and from opencast pits) and crushed. The Kohnstein massif consists of 400 m thick deposits of anhydrite from the Werra sequence surrounded by a gypsum crust. In its highest sections it is enclosed by the remnants of the principal dolomites of the Stassfurt sequence. A variety of karst phenomena have developed in the gypsum crust of the Werra anhydrite.

A rampart – the Saxwerfe – once stood on Kohnstein Hill. It was first documented in 1208.

## 2

Memorial  
Mittelbau-Dora

A major expansion was made to the man-made cavern system in Kohnstein Hill when, in 1935, the Economic Research Company Ltd. (WiFo), a branch of the Reich Ministry of Economics, began to excavate an extensive system of tunnels. Today it is known that this work was, without question, part of the preparations for war. The planned fuel dump for the army had almost been completed by the late summer of 1943 when air strikes on Peenemuende made the relocation of rocket production facilities necessary. Therefore, at the end of August 1943, a satellite camp of the Buchenwald Concentration Camp was hurriedly constructed at Kohnstein Hill with the name 'Dora'. The SS sent people from the occupied territories to the camp near Nordhausen to work on its construction. The prisoners were confined to the tunnel system day and night and a great many fell victim to the murderous working



Former parade ground

and living conditions within just a few weeks of their arrival. It was only early in 1944 that barracks were built above ground. In October of that year the camp was made independent of Buchenwald and given the name 'Mittelbau'. It developed into the central location of a large network of camps, with more than 40 smaller camps and labour details throughout the Harz region. Of the 60,000 prisoners ca. 20,000 lost their lives.

The present-day Mittelbau-Dora Memorial is operated by the Buchenwald and Mittelbau-Dora Memorial Foundation, based in Weimar. As well as the permanent exhibition about the creation and functioning of the camp, tours of the grounds and the tunnel complex are also offered. The memorial may be reached by following the B4 toward Nordhausen and taking the signposted exit on the right.



**Opening times for the permanent exhibition (closed Mondays)**

**Mar. - Oct. 10 am – 6 pm, Nov. - Feb. 10 am – 4 pm**

**Group tours by arrangement**

**☎ 0049 3631 495820**

**[www.dora.de](http://www.dora.de)**

## 3

Karst

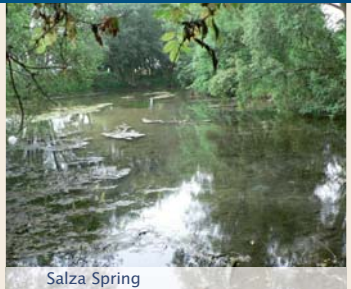
## Buchholz Sinkhole

On the edge of Buchholz in the direction of Stempeda is a geological disturbance. Surface water meets leachable Zechstein gypsum here. Infiltration created karstic cavities, which later caved in. Visual evidence of this process is the almost 30 m deep Buchholz sinkhole.

Karst landscapes are shaped by specific geological formations. Subterranean drainage is a prevalent feature and, as a result, river and stream beds are intermittently dry. This is due to the solubility of limestone, dolomite and gypsum, as well as halite and potash. In the majority of karst areas it is limestone which karstifies. Here in the South Harz area it is dolomite and, to a greater extent, gypsum which is leached away. Gypsum can be dissolved up to 100 times more easily than limestone: 2 g of gypsum can be dissolved in a single litre of water!



Buchholz sinkhole



Salza Spring

## 4

To the Karst Hiking Trail

## Salza Spring

We return now to the area south of Kohnstein Hill, to where the Salza has its source. The Salza flows parallel to the Zorge for 6 km before joining the Helme. The Salza Spring (Salzaquelle) is the defining hydrogeological element of underground water in the South Harz Zechstein Belt. With a mid-range discharge of 400 l/sec, the Salza Spring is one of the most significant karst springs in Germany and is reckoned to have the highest discharge of any spring in Thuringia. Today it is believed that the spring is not linked to a particular karst channel, but that it drains a subterranean catchment area within a Zechstein outcrop. As the spring water has an almost constant temperature of 9.5°C, even temperatures well below 0°C will not cause the Salza to freeze over. This fact was of the utmost importance for up to ten mills which stood along the Salza for many years.



## 5

## Walking the Karst Hiking Trail Kelle Cave, Werna

From the Salza Spring we head westward on the Karst Hiking Trail, along Hoerning Knoll through the Sattelkoepfe Nature Reserve. When the trail forks near Gudersleben we take the fork leading to Appenrode and come to a gypsum cave. The cave is called Kelle and was first cartographically recorded in 1589. The Kelle was originally an 85 m long cavern containing a lake with a small opening through which sunlight shone. Since around 1770 there has been considerable deterioration of the cave structure, so that today an impressive range of karst phenomena are displayed: a sinkhole divided by a natural bridge of stone bordered by a half-open grotto and the cave lake.

Up until the Reformation Kelle Cave was a destination for pilgrims.



Kelle Cave with grotto lake

A priest would dip a crucifix into the cave lake and call to the pilgrims: *“Come and look into the Kelle, then you won't go to Hell!”*

The origin of the cave lake and its name is detailed in an old saga: near Ellrich there once lived a poor orphan who gave her heart completely to her betrothed. Her fiancé betrayed her, however, and she ran off into the forest, where she cried bitterly, cursed her fate and wished for death. And because, in spring, all wishes come true, there suddenly rose up from out of nowhere a male figure. He carried the tools of a mason. Filled with compassion he looked upon the girl and then thrust his trowel, with all his might, into the ground such that it tore open and the girl fell into the depths. The opening then filled with water. A sad girl's face can still be seen now and then in the waters of the lake – or so the story goes.



## 6

## Ruedigsdorfer Schweiz Alabaster Quarry, Ruedigsdorf

Along the road from Krimderode to Ruedigsdorf, on the edge of a wide doline, there is a former quarry. The erstwhile gypsum quarry now enjoys protection as a natural monument and is part of the 'Ruedigsdorfer Schweiz' Landscape Conservation Area. The Landscape Conservation Area is known for its distinctive karst phenomena and its exceptional floral and faunal communities. In the quarry, gypsified anhydrite from the Werra sequence was extracted. The well-preserved extraction face gives insights into the internal formation of the stratigraphic sequence. The gypsum is finely layered. Clearly recognisable are the alternating deposits of thin layers of pure white gypsum – alabaster – and grey gypsum containing clay and carbonate impurities. These alternating layers are interstratified by layers formed of pieces of especially pure gypsum with diameters ranging from 20cm to 40cm. These are known as alabaster balls.



Alabaster balls



Border stone

## 7

## Historic Border Alter Stolberg

From Steigerthal, the road called Stempedaer Marktweg leads us directly to Stone Nr. 100. This is one of what were once 252 artistically worked and numbered border markers between the area around Birkenkopf Hill (in Landmark 6) and Alten Leipziger Strasse on the border between the sub-districts of Leimbach and Bielen. Placement of the stones along the border, which was first recorded in documents from the 15<sup>th</sup> century, was effected on the basis of legal resolutions agreed upon in Nordhausen on August 30<sup>th</sup>, 1735. These resolutions brought an end to long-standing conflicts between the Electorates of Hanover and Saxony over taxation liability and grazing rights in the area. Chiselled into the stones on the Hanoverian side is the House of Welf's rearing steed, and on the Saxonian side is a roaring lion – symbol of the Landgraviate of Thuringia. When we reach Stone Nr. 100 we are halfway to the end of our walk at the Hotel & Restaurant Kalkhuetten in Alten Stolberg.





## 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.

This map will help you plan your personal Geo-Route around one of the two cities in the Harz region which were Free Imperial Cities. Nordhausen was granted this status by KING FRIEDRICH II (1194-1250) on June 27, 1220. Later, the city became known for Nordhaeuser Korn - a grain alcohol liquor - which contributed significantly to the prosperity of the city and kept the name Nordhausen on people's lips during the time the city was part of the GDR. Indulging in this liquor, made from grain and with a minimum alcohol content of 37.5%, should be left until evening, however, so as not to cloud one's enjoyment of the beauty of the South Harz region!

Bestellung weiterer Faltblätter

*Order more leaflets in English*

*Information en français*

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



Legende:  
Karstwanderweg







## Trail of the Highest Quality The Karst Hiking Trail

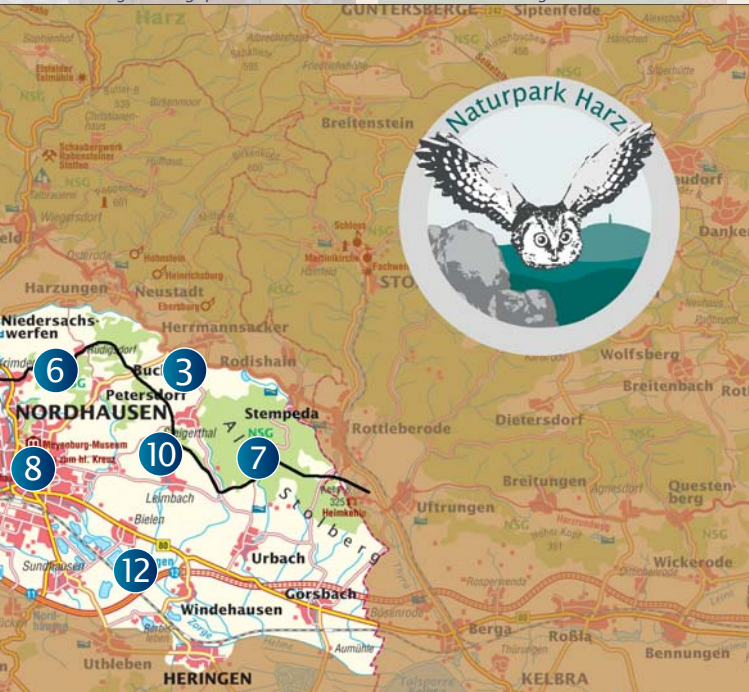
Two trails in the Harz region have been recognised as high-quality trails by the “Walkable Germany” programme of the German Hiking Association. They are the Harz Witches Trail (Harzer Hexen-Stieg) and the Karst Hiking Trail (Karstwanderweg). The latter traverses the ca. 100 km swathe of karst landscape on the southern edge of the Harz Mountains. The 235 km long trail connects Foerste, a village belonging to the township of Osterode am Harz in Lower Saxony (Landmark **5**), with Poelsfeld, belonging to the township of Allstedt in Saxony-Anhalt (Landmark **12**). Between Foerste and Kleinen Steinberg Hill (located between Gudersleben and Maunderode), as the trail runs through Thuringia, it follows two separate, parallel routes. Along the trail there are ca. 200 information boards informing hikers about karst phenomena including caves, sink-holes and dolines, springs, streamsinks and infiltration points, karst cones, subterranean cavities and galls.



Karst Hiking Trail signpost



On the Karst Hiking Trail



## 8 City Walls, Gates ... Nordhausen

Constant feuding with the Earls of Hohnstein, Stolberg, and Schwarzburg necessitated, from the Middle Ages through to the Modern era, continual upgrading of the walls and defensive towers that made up Nordhausen's fortifications. Access to the town centre of Nordhausen – a Free Imperial City until the end of Imperial immediacy in 1802 – could be gained via the four main gates: Toepfer Gate, Rauten Gate, Neuweg Gate and Barfuesser Gate. The stones to build the fortifications were supplied by the surrounding villages. Dolomite quarried on Kohnstein Hill made up the majority of the stone used. An air raid shortly before the end of the Second World War, on April 4<sup>th</sup>, 1945, destroyed more than 70% of the city. This is part of the reason why only 1,600 m of the city wall is still standing for visitors to see. Geology and city history are vividly presented in the Flohburg Museum on Barfuesserstrasse.



Flohburg Museum, Nordhausen



Wernaer Gate, Ellrich

## 9 ... and Towers Ellrich

Also well worth seeing is the city wall of Ellrich, which was first recorded in 1315 in a document issued by the Hohnstein Earls. Ellrich had already been referred to as 'civitas' – a town – some years earlier, in 1292. Under the rule of the Earls of Hohnstein, Ellrich was given the right to mint and issue coins in 1332. The city wall is constructed of two natural stone walls on either side of a cavity that was packed with filler material. It has a mean thickness of 90 cm and broadens markedly over the inverted arch foundation. Dolomite, in combination with anhydrite, was also used as construction material here. A visit to the oldest half-timbered houses in Ellrich – in Hospitalstrasse – is highly recommended. There you can also find the local museum and, right next-door, St. Spiritus Chapel, which dates to the 16<sup>th</sup> century. A wonderful view over the city and its surrounds can be had from the Ravensturm Tower.

**Flohburg Museum, Nordhausen**  
Tues. - Sun., 10 am – 5 pm  
☎ 0049 3631 – 4725680

**Local History Museum (Heimatismuseum),  
Ellrich – Sunday, 2 pm – 4 pm**  
☎ 0049 36332 – 260

10

## Atonement Cross I Bell Stones, Steigerthal

We take another side-trip now, to the western edge of the Alten Stolberg Hills, a small range of Harz foothills. Here, on the old military road to Magdeburg, lies the village of Steigerthal. It was first recorded in a document issued in Walkenried in 1288 as 'Villa stegerdal'. From 1414 the village was part of the territory of the Stolberg Earls. Prior to that, from 1345, it was under the control of the Ilfeld Monastery. About 1 km southwest of Steigerthal, on Haard Hill, stands a group of stones. According to the legend, the cross of porphyry and the stones on either side of it, serve as reminders that a bell founder from Stolberg murdered his journeyman here, because the journeyman had cast a bell better than the bell founder himself. The exact age of the stones is unknown. An atonement cross is placed as a memorial and to prompt passers-by to pray for the soul of those killed.



Bell Stones, Steigerthal



Stone cross, Suelzhayn

11

## Atonement Cross II Stone Cross, Suelzhayn

We return to the area surrounding the township of Ellrich, into which Suelzhayn was integrated in 1994. Suelzhayn belonged to the Kingdom of Hanover until 1866 and is idyllically located in an area where, historically, three lands met: the Kingdom of Hanover, the Duchy of Braunschweig and Prussia. This location brought with it serious problems when Germany was divided into East and West. Suelzhayn suddenly found itself in an exclusion zone. The town, once known as 'the Davos of the north', was now only accessible to those with an entry permit. The climatic spa town, once home to many large sanatoria, has only tentatively flourished since 1990. Vernacular stories about the stone cross on Hohen Strasse near Suelzhayn tell us that it was placed here as a memorial to a monk that was killed on the spot. He was murdered during a robbery in 1774 as he was returning to Walkenried Monastery with the profits from selling products manufactured there.

## 12

Gravel Mining &amp; Summer Fun

## Goldene Aue Valley, Nordhausen

As a result of the emergence of the Harz Mountains and the intensive salt leaching during the Tertiary period 2.6mya, a depression was formed parallel to the southern edge of the Harz Mountains, bordered to the south by the Windleite and Kyffhaeuser ranges of hills. The Zorge flowed through this zone as early as 400,000 years ago during the Pleistocene epoch. It was the Zorge which deposited material eroded in the Harz Mountains here in Goldene Aue Valley. Groundwater flows through the deposited gravel formations and, consequently, gravel extraction creates lakes. These lakes characterise the landscape of Goldene Aue Valley between the Zorge and Helme Rivers, the former flowing into the latter near Heringen. Some of the newly-formed lakes have been named: Bielener and Sundhaeuser Lakes, Forellen (Trout) and Moewen (Gull) Lakes. Meanwhile, attractive anchorages have been created.



Sundhaeuser Lake



Information Centre, Werna

## 13

Functional Model

## Geopark Information Centre, Werna

At the very end of our tour through the karst landscape of the southern Harz foreland we head back northward along the B4. In Niedersachswerfen a road branches off and leads through Appenrode and Werna to Ellrich. To finish up our journey of discovery we want to visit the Geopark Information Centre in Werna, which is found in the supervisor's house of a former manor. The impressive half-timbered manor was built at the instruction of Baron ERNST LUDWIG CHRISTOF VON SPIEGEL ZUM DESEMBERG (1711-1785). The grounds include an extensive park with old oaks and a water-lily pond. The central attraction of the exhibition, which includes a traditional parlour and kitchen, is a model of the karst landscape. It shows surface and subterranean water flow. Another theme of the museum is historical border marker-stones from the South Harz region.



**Opening times, Geopark Information Centre:**  
Mon. – Fri., 11 am – 4 pm and by arrangement

☎ 0049 36332 – 72257



**NBW**  
Nordhäringer  
Baustoffwerke GmbH



## Formation of Exceptional Natural Resources Geological Development

In the time period from 300 to 150 mya, the last supercontinent existed. The well-known polar expert and geophysicist ALFRED WEGENER (1880-1930), who studied the formation of the continents and oceans, named it Pangaea. 255 mya, the central European region of today – part of the supercontinent – was located at a similar latitude to present-day north Africa. This low-lying land was repeatedly flooded by the Zechstein Sea. Sand and pebbles were washed up on the coast. These materials were compressed to form sandstone which may be found today on the southern border of the Harz as Zechstein conglomerate. As the sea gradually advanced and became deeper, black silt was deposited: present-day copper shale. Later the seas became shallower once more and calcareous deposits were formed.

As the area further developed, the sea's connection to the open ocean was intermittently cut off and, due to the prevailing climatic conditions of the period, the water gradually evaporated. The salt content of the evaporated water settled to the sea floor. This process was repeated many times and resulted in the creation of dolomite layers as well as the thick gypsum and anhydrite layers in the South Harz Zechstein Belt, not to mention the halite and potash in the Thuringian Basin. All stones from the Zechstein were and are of great economic interest. Copper shale was already being exploited during the Bronze Age. Dolomite was used in the construction of massive masonry projects, like the city wall of Nordhausen.

The great thickness and variegated formations of the anhydrite and gypsum layers means they have been sought-after raw materials since the Middle Ages. We find gypsum used in mortar in structures dating as far back as the Middle Ages. As a building material it was used for, among other things, the construction of village churches. Furthermore, the gypsum known as alabaster was used in artistic works until late into the 20<sup>th</sup> century. Anhydrite, as a raw material in the production of sulphuric acid, was extracted until 1990. Both gypsum and anhydrite still play an important role as raw materials today, principally in the production of building materials (e.g. gypsum plasterboard).



Selected Points of Information

## Restaurants and Accommodation



**A** Hotel & Restaurant Kalkhütte  
Urbach – Alter Stolberg  
[www.kalkhuette.com](http://www.kalkhuette.com)  
☎ **0049 36333 - 60870**



**B** Pension "Rüdigsdorfer Schweiz"  
Nordhausen, OT Rüdigsdorf  
[www.forst-ruedigsdorf.de](http://www.forst-ruedigsdorf.de)  
☎ **0049 3631 - 47580**



**C** Ferienhotel "Wolfsmühle"  
Nordhausen, OT Rodishain  
[www.wolfsmuehle.de](http://www.wolfsmuehle.de)  
☎ **0049 34653 - 348**



## 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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