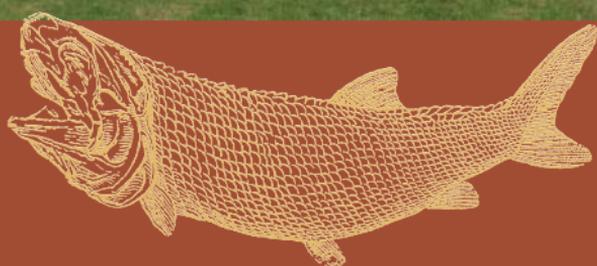


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Harz . Braunschweiger Land . Ostfalen



Landmark 16

Sachsenstein



www.harzregion.de



At the Edge of the "Eichsfeld Rise"

In the southern Harz, there is a small pass between the little towns of Barbis and Nüxei, the site of a distinctive "Branntweinseiche" (brandy oak). 330 meters above sea level, it constitutes the highest elevation along the Federal Road B 243 and is part of a low range of hills which extends from the Harz in a southwest direction, starting at the village of Steina and descending into the Thuringian region of the Eichsfeld. In geological terminology, this mountain range is designated as the "Eichsfeldschwelle" (Eichsfeld Rise). This elevation, which also represents the boundary of the landmark Sachsenstein in the west, is the watershed between the rivers Elbe and Weser. The western rivers of the Harz flow into the North Sea via the Rhume, Leine, Aller and Weser. Directly in the east, however, the Steina flows with a wide curve eastward around the Harz and reaches the North Sea via the Lichte, Helme, Unstrut, Saale and Elbe. The area is characterized by the transition from the Eichsfeld Rise into the "Südharzbecken" (the Southern Harz Basin) in a south-eastern direction. The basin contains thick gypsum deposits and, at deeper levels, fluvial gravel deposits from the ice ages: in geo-botanical regard, the Eichsfeld Rise separates floral communities of Atlantic, moderately humid climates of Western Europe, from the increasingly continental mid-German climates. Geologists can explain that, for the past 250 million years, the southern Harz has been influenced by this 20 kilometre wide range of hills, rising up several hundreds of meters above its surroundings. When at the beginning of the Zechstein period, about 260 million years ago, the area of the Harz and wide parts of Europe were flooded, the Eichsfeld Rise formed an elongated zone of marine shoals with numerous islands. The neighbouring basins were filled with copper shale and later with thick gypsum deposits, like that of the Sachsenstein. The figure shows a transversal section of these marine sediments along the southern Harz. The Eichsfeld Rise was rapidly flooded, but initially at a very shallow depth. Islands and shallow marine environments developed; these were the conditions that allowed for reef growth (see Römerstein ②). At that time, the southern Harz was located at 30° northern latitude, which is comparable to the modern geographic position of Cairo. Climates were similar to those around the Red Sea today. Dry climates, shallow water that allowed intense light penetration and high contents of dissolved material supported the development of reefs. These were formed by organic limestone and grew up to the sea level. When the reefs died, they were covered by sediments derived from the surroundings, for the most part dolomite and gypsum. Prior to this development, in early Permian times, volcanoes were formed in the southern Harz: the Ravensberg ③ and the Stauffenbüttel are examples of the volcanism, which has now long been extinct.

Legend for the geological transverse section across the Eichsfeld Rise along the southern Harz between Förste and Ilfeld.

Black: Zechstein reefs – Red: Volcanic formations – Green: Werra anhydrite – Yellow: Werra halite – Orange: Rotliegendes – Medium blue: Staßfurt dolomite/black shale – Dots: Shallow water deposits – Dark blue: Zechstein limestone – After J. PAUL, Göttingen

Anhydrite

The Sachsenstein between Bad Sachsa and Walkenried

1

Between Bad Sachsa and Walkenried, the “Sachsenstein” (Saxon Stone) stands as an imposing cliff of Werra anhydrite, which belongs to the oldest series of sediments from the so-called Zechstein, 260 million years of age. Zechstein and Rotliegendes together represent the Permian system in the earth's history. The Sachsenstein massif dips steeply to the north, to the west and to the south-west, forming cliffs that drop down to the Uffe Valley. The Uffe River is in permanent contact with the relatively soluble Werra anhydrite. The gypsum debris that falls from the cliff is rapidly dissolved, thus assuring that the rock face remains steep.



Gypsum quarry at Kranichstein restored to its natural state

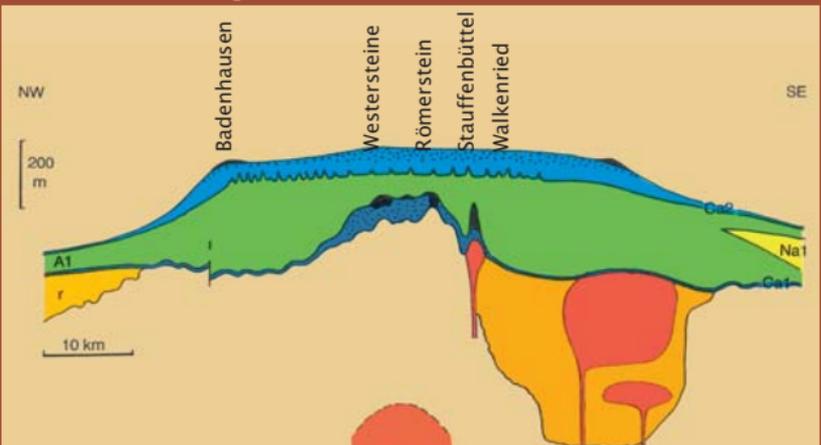


Entry to the village Neudorf

In addition, waters from the Uffe, which are transported in karst gullies, migrate under the Sachsenstein and contribute to the subterranean erosion of the steep slope.

The point of departure for a walk up to the Sachsenstein (Stamping Station Nr. 166 of the Harz Walking Needle Project) is the entrance to the village of Neuhof from the direction of Bad Sachsa. Here one finds information about a transport cable line that formerly connected the Kranichstein gypsum quarry to the gypsum factory of Kutzhütte in the years 1938 through 1962. The quarry has now been restored to its natural state. A hiker's hut offers the opportunity for a rest. The abandoned quarry can be reached on the karst hiking trail going west. A walk to this site offers considerable variety along the way. At the Eichenholzweg, there is a large playground for children and at the Unterer Kranichteich, diverse species of water birds can be observed.

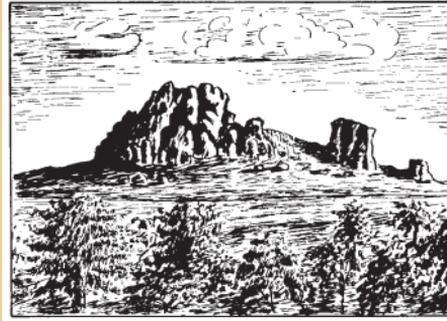
Transversal profile across the Eichfeld Rise



The Römerstein (N51°34.530'; E010°31.460') can best be reached from the parking area at the restaurant "Alter Grenzkrug" in Nüxei (at the Federal Road B 243 between Mackenrode and Osternhagen).

The imposing Römerstein consists of dolomite lithologies. The former reef presumably was formed on the top of a small volcano of Rotliegend age, a time at which it was covered by the Zechstein seas around 257 million years ago. In the reef there are manifold occurrences of bryozoans, bivalves and brachiopods. The original thickness of the conical reef was probably about 100 meters.

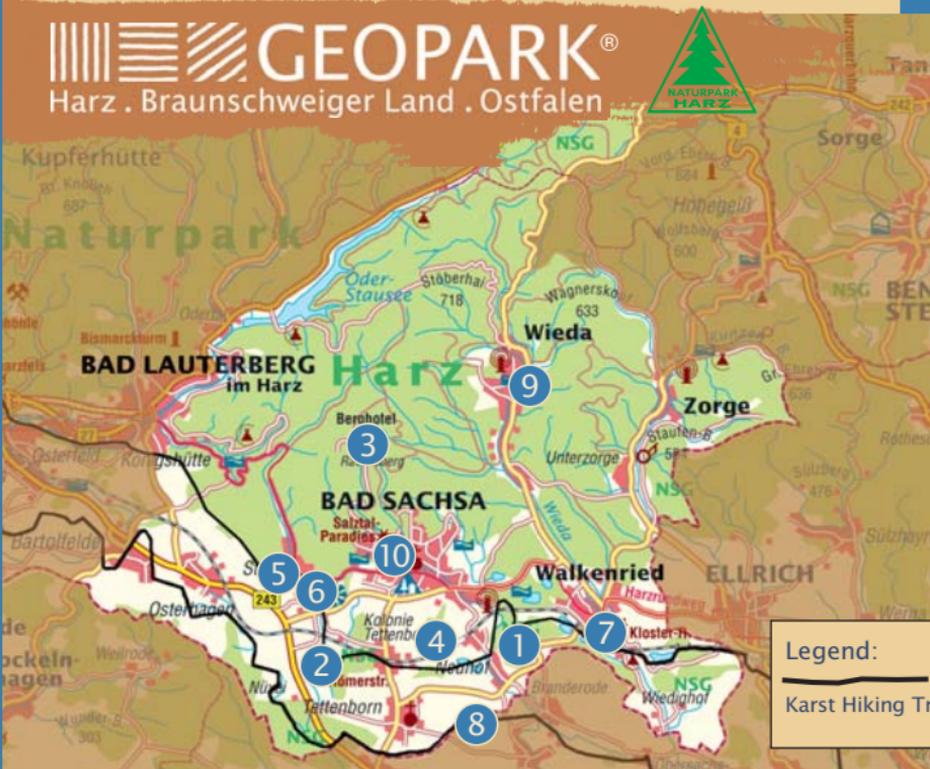
In the area south of the Römerstein, there are numerous indications of Stone Age human habitation. The name "Römerstein" probably goes back to the Germanic legendary figure "Romar".



Historical depiction of the Römerstein



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We wish you pleasant recreation and interesting glimpses into the geology and history of that portion of the Nature and Geopark Harz covered here!



The rhyolites (formerly designated as "porphyry" or "felsite porphyry") of the Ravensberg, like those of the Staufebüttel near Steina, consist of pink-coloured, dense volcanic rocks with very few larger crystals. The hill is 600 meters high and located at the western outskirts of Bad Sachsa. It indicates clearly the skiing centre of the spa. Chemical and x-ray investigations have shown that both the volcanic rocks as well as the Ilfeld rhyolite consist of magmas rich in silica which gradually turn into porphyry tuffs as one proceeds southward. Stratigraphically, the age of all of the three volcanites can be attributed to the Rotliegend period and dated between 290 and 298 million years in age.

Following the Katzentälstraße from Bad Sachsa to the summit of the Ravensberg, we pass the junction leading to the "Harz Falkenhof." Not far from here is the "Märchengrund", at the foot of the Katzenstein (N51°36.480'; E10°32.013') and sheltering one of the oldest fairy tale parks of Germany.

From the top of the Ravensberg, when the weather is clear, we have a magnificent view of the terrian of Landmark 16.



View from Tettenborn to the Ravensberg



On the Ravensberg



Borders

The "Dreiherrenstein"

Following the road up to the summit of the Ravensberg and beyond, we soon reach a geographic point (N51°37, 350; E10°31.795') where the borders of three German countries converge: Prussia and Hanover -both representing individual kingdoms - and the dukedom of Brunswick. The point is marked by a special stone: the "Dreiherrenstein" - stone of three sovereigns. The inscriptions on the "Prussian" side of the stone, "S", stands for Saxony; on the side of Hanover, "FG" for "Fürstenium Grubenhagen" and "L" for "Lauterberger Forst"; on the side of Brunswick, "W" for the "Stiftsamt Walkenried". The roman numerals indicate the sequential numbering of the series of border stones.



Hanover face of the "Dreiherrenstein"

The Schwiebach Valley near Bad Sachsa

At the train station of Bad Sachsa, a trail branches off from the road into the picturesque Schwiebach Valley (N57°35.020" E10°34.501') where numerous occurrences of copper shale can be discerned just below the surface.

At one thematic station along the educational hiking trail in the Schwiebachtal the

horizon of the copper shale is exposed. The copper shale developed 260 million years ago as a decomposing organic mud deposit (sapropel) in a tropical marine environment. The sedimentation of the 40 cm thick black interval comprising the shale horizon took place over a time span of about 50,000 years. The particular significance of the copper shale is its richness in metal ores and embedded fossils. Fossil fishes in a great variety of species abound here, amongst them the so-called "Mansfelder Hering" (herring of Mansfeld, or "Paleoniscus freieslebeni"), which is well known. The copper shale is important because of its metals. It contains up to 4% copper, also lead, zinc, silver and other heavy metals. Directly before the exposure, an information panel gives more detailed explanations about the development of the copper shale, the fossils and the mining history of the area. The exposure can best be reached by following the trajectory of the Schwiebach educational trail with its starting point at the train station of Bad Sachsa. Next to the spa garden of Bad Sachsa, the NatURZEIT-Museum **11** is located. This museum, with its exhibition of copper shale fossils from fish to saurian reptiles, demonstrates life 270 million years ago. In addition, geological processes involved with volcanism and the development of gypsum in the southern Harz are depicted and explained.

Romantic Schwiebach Valley



In the NatURZEIT Museum

More Information:

www.naturzeit-museum.de

+49(0)5523 300915
www.badsachsainfo.de

BAD SACHSA
DIE HARZER SONNENSEITE

The Glass Museum of Steina

In 1991, the site of former glassworks of Kronshagen was discovered. This discovery led to the establishment of a glass museum in Steina. Subsequent discoveries of the sites of other glass factories underscore the significance of glass production in the southwestern Harz in the 16th and 17th centuries.

"Waldglas", or forest glass, consists of quartz, limestone, potash and metals. Quartz is the actual agent producing the glass, limestone assures its durability, and potash (alkali-oxides) is used as a fluxing agent and a means of decreasing the melting temperature of quartz. The typical colour of forest glass is green, which can be attributed to the content of iron in the raw materials. This colouring, however, also corresponded to the taste of time. The glass factories produced a variety of products, from bull's eye's panes to bottles and drinking glasses as well as glass buttons.



Churchyard of Steina with the Glass Museum

The forest glass factories constitute their own special epoch in the history of glass. The glass masters came from the forest glass factories of Bohemia, the Bavarian Forest and from the Spessart. They lived in the forests and belonged to a strongly organized guild. The most important requirement for the glass industry was rich occurrences of wood. Deciduous wood was used for the firing of the furnaces and for the production of potash. The annual consumption of wood by one glass factory alone was from 2,000 to 3,000 solid cubic meters. As a result of the competition of the glass manufacturing factories with the mining and the smelting industries, the inventory of the forests rapidly declined. In the early 18th century, the last fires of the glass factories were extinguished. Very beautiful discoveries were made in the course of the excavations at the wine glass factory of Wieda. The glass museum of Steina preserves the memory of this old handcraft, which was of such importance in the southern Harz. It demonstrates that people were already able to produce glass more than 300 years ago.

Opening hours museum
Thu. - Sun. 3 p.m. - 5 p.m.
or on request

+49(0)5523 30 33 62



Seepage of the Steina Creek near Steina

Not far from the church of Steina, the mountain creek Steina disappears. Flowing down from the Harz, the Steina Creek reaches the karstic Zechstein beds at this point, and oozes away completely into the underground, a phenomenon which can be clearly observed at low water level. The dry creek bed can be followed 4 kilometres to the south where it meets the Ichte River south of



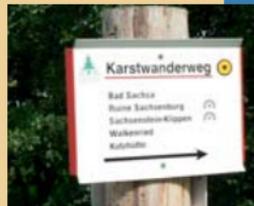
Dry creek bed of the Steina

Nüxei. At medium water levels, a portion of the water flows beyond the sink hole at the church, but seldom extends as far as the train tracks. Only at high water levels is the Steina Creek able to proceed beyond Nüxei southward. Originally, the Steina seems to have flooded the large Nußteich basin near Nüxei and then finally to have disappeared in a sink hole there. This process is indicated by occurrences of gravel in the vicinity of Steina below the Nußteich. Another special site is the Trogstein cave which contains the Fitzmühlen spring. From here, a little valley also goes on to end in the Nußteich. Parts of the water which have vanished flow on through the gravel beds. The water levels in the sink hole areas in the lower portion of the dry Steina bed have their source in this groundwater. The rest of the water continues flowing through crevices and fissures in gypsum and dolomite formations. These waters require about nine months for their subterranean passage before reaching the village of Salzaspring near Nordhausen. Trails along the rivers offer a hydro-geological circular hiking tour with special focus on the karst.

The „Karst Hiking Trail“



Along the southern slope of the Harz, between Forste to the west to Pölsfeld to the east (Landmark 12), a distance of about 100 kilometres, a chain of phenomena all linked to one another can be followed. These events are generated by the dissolving influence of water: caves, sink holes, dolines, karst springs, disappearing creeks, rivers that ooze away into subterranean depths, karst towers and pinnacles, karst pipes- or "geological organs"- cliffs with their white rock faces composed of gypsum, the most predominant lithology in the southern Harz. The "Karstwanderweg" - karst hiking trail - explores this unique landscape of "gypsum karst" in the area of the districts of Nordhausen and Sangerhausen. In the county of Osterode, two parallel karst hiking trails exist which can be easily combined into one round tour, similar to the hiking trails around Bad Sachsa. A multi-media guide of the karst hiking trail, available in the bookstores or in tourist information bureaus, contains selected recommendations for hiking activities. The association "Karstwanderweg Südharz" organizes events along this trail, such as the special guided hikes on Sundays.



The Walkenried Monastery

At the initiative of the Lower Rhenish abbey of Camp, the first monastery of the Cistercian order in Germany, a new monastery was established in Walkenried in the year 1129. Thanks to generous donations from its founder, Adelheid of Walkenried, and as well as from King Lothar III. (1085-1137) amongst others, the monastery became quite wealthy. Its success was also supported by lay brothers, a group composed of craftsmen, farmers, smelting workers and presumably of miners as well. In its heyday, the monastery was in possession of more than 3,000 acres of land (1 acre (morning) = 0,25 ha), numerous ore mines, vineyards as well as shares in salt dome mines in Lüneburg and mercantile estates in Göttingen, Goslar and Nordhausen. The monks can be credited with the initial cultivation of the "Goldene Aue" (see Landmark 7). They were also responsible for the founding of the monasteries of Pforta near Naumburg and Sittichenbach.

In the 13th century, the Romanesque monastery ensemble (N51 °34.990'; E010°37.723') was replaced by a magnificent Gothic cathedral along with an additional enclosure for monks living in seclusion. Dolomite freestone from the Zechstein formation and mortar from local gypsum occurrences were used as material for construction. Stones which could be finely sculpted - a prerequisite for the tracery, capitals etc. - were taken from the "Wolfskuhle". At this historic site between Nüxei and Osterhagen, thick-bedded dolomite rocks with lagoonal and finely layered internal structure were excavated.

The ruins still yield an impression of the imposing size and beauty of the former buildings. The 92 meter long Gothic structure with a five-aisled choir was one of the largest monastery churches in Lower Saxony.

In 1525, during the "Bauernkriege" (Peasants' Revolt), the monastery was subjected to damage. A total of 45 abbots governed Walkenried between the years 1229 to 1648. After the Thirty Years' War, the monastery was closed in 1648 and the monks dispersed. With the exception of the chapter house, which was used as the municipal church of Walkenried, the structure was abandoned to the elements. After 1972, the county administration of Osterode assumed trusteeship of the monastery complex. Intense efforts were undertaken to secure the building and to find an appropriate use for it. In 2006, the Cistercian Museum of Walkenried was opened, one of the largest monastery museums of Europe. In the interior of the completely preserved chapter houses from the 13th century, medieval times are brought back to life by acoustic and visual presentations.



Former Cistercian monastery of Walkenried

**Opening hours: Tue. – Sun. 10 a.m. – 5 p.m.
and on bank holidays; except 24. Dec.**

In the quarry of „Kranichstein" near NeuhoF, which is run by the Saint-Gobain Formula GmbH Walkenried, gypsum raw material has been excavated since the beginning of the 20th century. Gypsum from the Bad Sachsa - Walkenried area, which, in terms of the regional geology, belongs to the so-called Zechstein Belt of the southern Harz, can stratigraphically be attributed to the Werra anhydrite (see Sachsenstein ①). Compared to other raw materials, the gypsum from the "Kranichstein" quarry is extraordinarily pure and white. Consequently, it is predestined for special gypsum products (for example, moulding plaster for porcelain, sanitary and tile industries, and also for dental and orthopaedic use, etc.).

In order to re-convert the mining area of Kranichstein to its natural state, principles of re-cultivation were observed and measures for re-naturalisation were undertaken. Parts of the mining area were left untouched to encourage the development of natural successions, avoiding human influence after excavation. Early stages of this succession are known for their rich diversity in plants and animals and for the occurrence of very rare species not well adapted to survive in a more competitive environment.

The main goal in the re-establishment of a natural state was to create morphologies which are adapted to the karst landscape. Based on this principle, a deep depression with steep slopes was formed in order to imitate a sink-hole. Because of the fact that the marginal areas around the perimeter of the entire sink hole were not planted, observers keenly waited to see which floral and faunal associations would develop over the course of time, particularly in the region of the steep slopes to the west.

In close vicinity to the quarry, a reconstruction of a historical gypsum furnace can be visited. This furnace is part of the new educational trail, "Kranichteiche" (crane ponds). On Oct. 21, 2006 a first test firing was carried out in this shaft furnace at 800° C temperature. The result was a high quality product of intense firing which is especially valuable as foundation mortar for restoration purposes. One or two firings are now scheduled for each year.



Gypsum firing oven

Information:

Saint-Gobain Formula GmbH

☎ +49(0) 5525 203704

www.saintgobainformula.com

Guided tours on request

☎ +49(0)5523 3482

www.geotekt.de

Mining Museum of Wieda

The occurrences of hematite in the mining districts of the Kastental between Wieda and Zorge in combination with the rich forests and water reservoirs in the Harz offered the natural preconditions for a prosperous development of the mining village of Wieda in the second half of the 16th century. In the elongated Wieda valley, iron works were lined up one after another. Waters from the Wieda River were transported in ditches to propel the water wheels of the stamp mills, furnace blowers, bellows and hammers of the hammer mills as well as water mills. Occurrences of cinnabar in the Silberbachtal (Silver Creek Valley) were of importance for the region and beyond. This mercury-bearing mineral provided red colour pigments. The economic network that grew up around the central smelting plants guaranteed labour and bread for miners, charcoalburners, furnace workers, mould makers, stamp mill boys, workers at diverse forges, carters and donkey drovers and for their families. Up until the 1970's, the metallurgical plant of Wieda produced its famous stoves, which are still used by people today to warm their households.



Wrought iron stove from the Wieda

For more than 100 years, there were glass factories with more than 10 melting sites to the west and the north of Wieda. Glass makers moved to Wieda, the population increased and eventually the first church was erected. The village of Westerwieda developed as an independent settlement of glass makers.

The mining museum is located in the former town hall of Wieda. It presents mining, iron engineering and the art of glass fabrication. Wonderful finds have been made at excavation sites, especially that of the wine glass factory. The museum is the point of departure for excursions into the mining district of Zorge and to melting sites for glass and iron.



Wieda

Opening hours:

April - October

Wed. and Fri. 11.30 p.m. - 3 p.m. & Sun. 3 p.m. - 5 p.m.

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3 Jugend- und Bildungshaus
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4 Hotel Hannover Bad Sachsa
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The Geopark Harz . Braunschweiger Land . Ostfalen was founded in 2002. The Regionalverband Harz e. V. has taken responsibility for the Harz area. The Königsutter-based FEMO organisation is responsible for the adjacent northern area. The map of the area shows the locations of all of the Landmarks. Flyers like this one for each of the Landmarks can be helpful in planning your next visit to the Nature and Geopark Harz.

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Publisher: Regionalverband Harz e. V., Hohe Straße 6, 06484 Quedlinburg
Phone: +49(0)3946 - 9 64 10, Fax: +49(0)3946 - 96 41 42
1st English Edition

© Regionalverband Harz e. V., Quedlinburg 2010
www.harzregion.de

Internet:

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Autors: Dr. G. Dehne, Dipl.-Geol. F. Vladi, U. Bosse & Dr. K. George

Photos: Dehne, George, Junke, Pfeiffer, Vladi

Editors: Dr. K. George, Ch. Linke

Conception: Design Office Agentur für Kommunikation, Wernigerode

Printing: Koch-Druck, Halberstadt

Kindly supported by:

