

## TERRA MINERALIA: A TRIP ACROSS THE WORLD OF MINERALS

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### ABSTRACT

A Mineralogical Museum containing an outstanding collection of about 3,500 precious stones, minerals, meteorites, and rock samples from around the world has been opened in 2008 in Freiberg, Germany. The collection has been selected for its aesthetical perfection.

**KEY WORDS:** Museum, minerals, movable geological heritage, Freiberg, Germany.

### RESUMEN

Se presenta un museo mineralógico que alberga una importante colección de aproximadamente 3.500 minerales, gemas, meteoritos y rocas de todo el mundo. Esta exposición se abrió en 2008 en Freiberg, Alemania y su colección fue seleccionada siguiendo criterios estéticos.

**PALABRAS CLAVE:** Museo, minerales, patrimonio geológico mueble, Freiberg, Alemania.

### INTRODUCTION

On October 23 2008, the Exhibition *Terra Mineralia*, located in Freudenstein Castle in Freiberg, Germany was opened - a fascinating world trip through the collection of selected minerals, one of the world's largest and most beautiful private collections. This collection belonged to Dr Erika Pohl-Ströher, a Swiss lady who collected minerals for more than 60 years - - aesthetical criteria were the most important to her. She entrusted her collection to the Pohl-Ströher Mineral Foundation in order to give it on a permanent loan to Freiberg *Technical University Bergakademie* the new name for the Freiberg Bergakademie founded in 1765.

The Foundation intends to secure the unity of this manifold as well as scientifically important collection. In addition, the collection should be scientifically attended and is open to public and to youth in particular. Therefore, the exhibition *Terra Mineralia* does not only present minerals but also informs. The exhibition is open to all audience and is part of the classical *Bildungsgut* (established part of one's general education) of German society.

In the meantime, *Terra Mineralia* has become known beyond the country's frontiers. More than 200,000

guests have already visited this excellent *Point of Interest* and training facilities as well as presentations are popular with visitors in particular. About 3,500 precious stones, minerals, meteorites, and rock samples from around the world are fascinating over and over again. People usually are astonished at the beauty of the minerals and aesthetical perfection.

### MINING AND ACADEMIC TRAINING IN FREIBERG

Mining in Europe is rich in tradition since people early won gold, silver, copper, tin, lead, and iron. However, non-metallic resources, e.g. salt, native sulphur, stones and earths, asphalt, coal, and mineral oil became significant. Today, there are many areas, e.g., Harz Mountains, the Erzgebirge (Ore Mountains), Black Forest, Silesia, Bohemia, Moravia, the Balkans, Transylvania, the Alps, and Slovakia that are remind us of their great past. The Free State of Saxony, which is situated in eastern part of Germany, became particularly world-famous of its silver mining. Today, this is shown by arts and culture at many places of this magnificent region. Figure 1 shows the structural sketch map of ore lodes in the Freiberg district

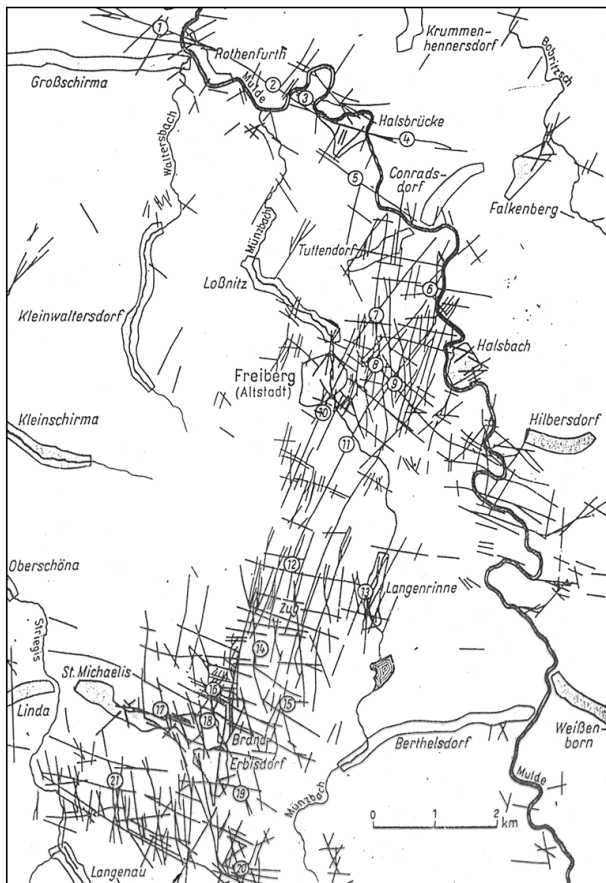


Figure 1. Structural sketch map of ore lodes in the Freiberg district.

This remarkable development has its origin in 1168. People stumbled on first silver resources in what later became known as later Freiberg an important mining town in Saxony and situated in the *Erzgebirge*. At the beginning of the 15<sup>th</sup> century, other ore deposits were discovered in the region and, therefore, mining there has an 800-year-old history.

Mining as well as metallurgy could not be empirically practise any more and the Saxon State early ensured opportunities for a technical training. So in 1702 the so-called *Stipendienkasse*, i.e., Scholarship Fund was established by the Saxon State to offer special candidates regular lessons in mining. The most famous foreign candidate was Michael V. Lomonosov (1711-1765), the Russian scientist. About 50 years later, it was time to establish a specific technical academy in order to guarantee a high standard training in mining and metallurgy. Hence, the Freiberg *Bergakademie* was established in 1765, which is the world's oldest technical university.

The *Bergakademie* evolved into an excellent educational institution particularly since prominent tutors as Abraham Gottlob Werner (1749-1817) (Figure 2), Bernhard von Cotta (1808-1879), and Friedrich August Breihaupt (1791-1873) passionately set the stage for a technical training. In view of the forthcoming anniversary in 2015, people will proudly look back at 250-year-

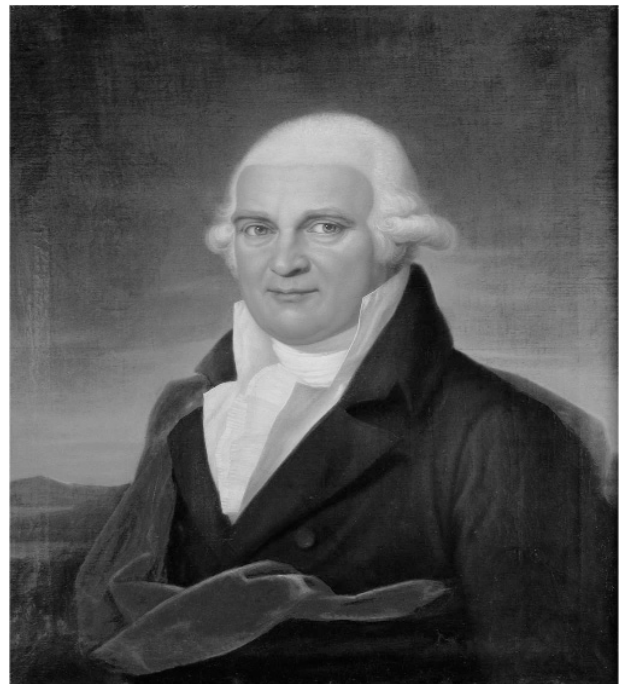


Figure 2. Abraham Gottlob Werner (1749 - 1817), one of the distinguished teachers of the Bergakademie.

old technical training. In addition, achievements on the subjects of mining, metallurgy, earth sciences, and natural sciences, (mechanical) engineering and other technical sciences will be acknowledged.

There are many subjects at Freiberg University today, e.g., mathematics, natural sciences, earth sciences, as well as earth engineering, engineering, economics and history (industrial archaeology). Further, there are more than 5,000 (enrolled) students at the *TU Bergakademie*.

## GEOSCIENTIFIC COLLECTIONS

Mineralogy (oryctognosis) and geology (geognosis) were very significant for developing science in Freiberg. Abraham G. Werner was responsible for making such subjects internationally known. One of his pupils was the famous scientist Alexander von Humboldt (1769-1859). Practical schooling, important for training, did not only happen below ground but also included practices regarding minerals and rocks. Apart from the establishment of the Book Collection or the Chamber of Models, a collection of minerals was organized. The aim was to collect a broad range of minerals since 'young' sciences were actually imparted this way. After Werner had sold the large part of his private collection to the *Bergakademie*, teachers and graduates were responsible for accumulating inventories. Eventually, an extensive international exchange network was set up in order to acquire best quality samples from all over the world. Today, the Mineralogical Collection of the *TU Bergakademie* consists of 80,000 inventoried samples. In addition, both the Ore Deposit Collection (120,000 inventoried proofs) and the Petrological Collection (16,000 proofs) are significant. Figure 3 shows a contemporary image of an early cabinet for the display of minerals.

Since subjects within earth sciences were extended, other specific collections were arranged by other disciplines. So, the Palaeontological Collection consists of more than 114,000 macro fossils and almost one million micro fossils. Further, the Stratigraphic Collection has more than 70,000 macro fossils as well as 12,000 micro fossils, 15,000 rock samples and 14,000 compounds and thin sections. Eventually, the Collection of Fuels Geology has more than 30,000 proofs and 30,000 compounds and thin sections. This huge fund grew over the years and is important for fulfilling demanding tasks regarding teaching and research. This is a challenging task since such extensive collections need special maintenance. New deposits as well as minerals are permanently exploited worldwide and, therefore, working on diverse collections is challenging as well. Figure 4 shows the Mineralogical Institute (Abraham-Gottlob-Werner-Building) today.

### THE POHL-STRÖHER MINERAL FOUNDATION

Collecting - in the sector of nature in particular - does not only have a scientific background but also is passion. Johann Wolfgang Goethe, who had an affection for mineralogy and geology, seemed to hear the voice of the “softly speaking nature” and he praised ardently “empires of the world and their glory”. While Goethe was dealing with the history of the earth and the earth’s

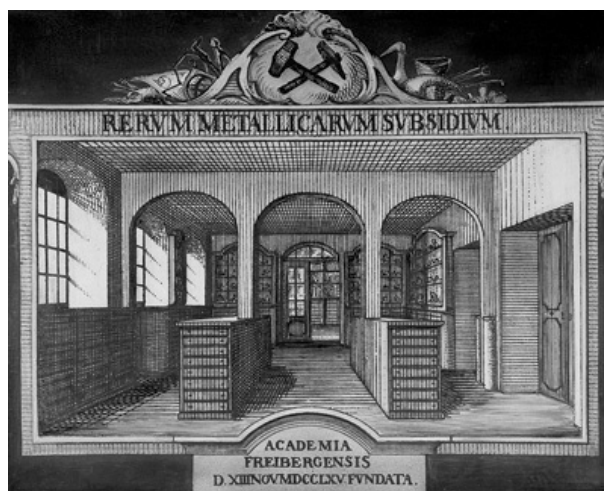


Figure 3. Contemporary image of an early cabinet for the display of minerals.

development, he loved collecting minerals and rocks. In addition, aesthetics was important to him. While Erika Ströher, born in 1919, was studying chemistry and biology at the University of Jena as well as doing a doctorate in biology there, she discovered a rage for mineralogy. Dr Erika Pohl-Ströher, who lives in Switzerland today, is still collecting. According to this fact, a Foundation of the successful cosmetics company, the ‘Wella Group’, by her grandparents Franz and Marie Ströher in 1880, was always a financial basis. So, Dr Erika Pohl-Ströher was successful in collecting more than 80,000 minerals in over 60 years. In addition, while she was collecting, she was not only oriented towards aesthetics



Figure 4. Mineralogical Institute (Abraham-Gottlob-Werner-Building) today.



Figure 5. Dr. Pohl-Stroeher signing the book concerning the handing-over of the private collection to the TU Bergakademie.

but also the world as such was in focus of her interest. Figure 5 shows Dr. Pohl-Stroeher signing the book concerning the handing-over of the private collection to the TU Bergakademie.

Eventually, the founder's old age was the reason for thinking about the location of this unique collection in future. A consideration to give this collection to the United States did not go through. In addition, because of a lack of space, a museum in Hesse in the Federal Republic of Germany was ineligible. The famous town Freiberg came to memory not only known for mining tradition but also for her 250-year-old mineral collection. Thus, the private collection of minerals was considered to be located there. According to this arrangement Rainer Bode, Dr. Olaf Medenbach (photographer), and the former Rector of the *TU Bergakademie* Dr. Georg Unland, a collector of minerals as well, played a significant role.

The granting of a suitable space and the establishment of a Foundation was important for taking over the collection. The Pohl-Ströher Mineral Foundation, which is based in Ferpicloz in Swiss Canton of Fribourg, was established on June 23 2004. The handing-over of the collection (as per contract), a permanent loan, to the *TU Bergakademie* happened later on. So, this answered all the founder's wishes particularly since this decision guaranteed that the mineral collection found the way to Saxony where she was born.

Such a generosity had to be rewarded. So, in October 2004, the prize "Stein im Brett" of the Professional Association of German Earth Scientists went to the founder Dr Erika Pohl-Ströher. Every year, the Professional Association of German Earth Scientists bestows honour upon personalities who support popularization of earth sciences in public. In addition, in November 2005,

the Free State of Saxony conferred its greatest decoration on Dr Erika Pohl-Ströher, the Saxon Order of Merit of the Free State of Saxony. Later on, she took the greatest honour of the *TU Bergakademie*, the *Ehrensätorenwürde*. Therefore, Dr Erika Pohl-Ströher is one of deserving personalities who put the institution back on the map.

## FREUDENSTEIN CASTLE - NEW HOME TO THE SWISS COLLECTION

In search of an appropriate location, people stumbled on the Freudenstein Castle (Figure 6) - - an unused building. At the same time, the Saxon mining archives had a space problem and, therefore, the City of Freiberg purchased the Castle, which had been in private hands. This building was strongly associated with Saxon history for centuries. In the 16<sup>th</sup> century, Duke Henry the Pious, who decided that Freiberg cathedral 'St Marien' became a Wettin burial place, resided there. Both Moritz and August succeeded Duke Henry as territorial lords. In addition, August was responsible for the reconstruction of Freudenstein Castle. In 1711, Tsar Peter I of Russia stayed in the Castle during his visit to acquire appropriate Saxon experts for Russian mining. When Government affairs moved to Dresden residence the Castle fell into ruin. Eventually, the building was used as granary, *Bergmagazin*, and administrative centre. Takeover of the mineral collection and removal of the mining archives was a great idea since Freudenstein Castle was called into being again.

Financial status had to be clarified in the first place since renovating operations required 36 million euro.



Figure 6. Freudenstein Castle - new home to the Swiss Collection.

Freudenstein Castle was then municipalized. In addition, the symbolic laying of the foundation stone and reconstruction took place. After that, the Opening Ceremony took place on April 2007. Finally, there was the ceremonial key delivery to primary users namely the *TU Bergakademie* and Saxon Public Record Office and Mining Archives.

At the same time, a working team emerged in order to specify plans and worked out an exhibition concept. There were many stages to realize the vision of a “Mineralogical World Trip”. In the meantime, people agreed on an outstanding name, which could make the collection’s uniqueness internationally known: *Terra Mineralia*. Following workings were taken over by Dr. Gerhard Heide, Professor of Mineralogy, and he brought the concept to a successful conclusion. The former Rector of the *TU Bergakademie*, Prof. Dr. Georg Unland, the acting Saxon Secretary of the Treasury, made a major contribution to this success story. He was responsible for this gigantic project. Until today, Prof Unland is closely associated with *Terra Mineralia*. October 23 2008, was a great day since the exhibition *Terra Mineralia* welcomed its first guests.

### THE CONCEPT OF *TERRA MINERALIA*

Minerals, the ‘miracles of nature’, beautifully reveal themselves and there are many opportunities to present them so that minerals come alive. In general, classical collections are arranged according to chemical or crystallographic principles. However, *Terra Mineralia* presents a trip around a mineralogical world, across habitats, regions and continents. So, there are slabs of gran-



Figure 7. A view to the “treasury”.



Figure 8. A view of the room America.

ite at the courtyard, which are modelled on crystal faces and they are seen in exhibition rooms, chairs, tables, on walls and souvenirs (Figure 7).

According to *Terra Mineralia*, there are four rooms on two floors, an exhibition area of 1,500 square metres. Every single room is arranged according to continents and there is space for about 5,000 minerals. Every room is heteromorphic and show cases are designed differently as well. The treasury, situated on the ground floor, is a highlight since the largest and most beautiful minerals are presented there. From there, via a great staircase in Renaissance style, people get to exhibition areas: Europe, Africa, Asia, Australia, and America (Figure 8) situated upstairs.

Apart from the world trip, visitors can take other thematic travels - there is the 'time travel' in the room of Africa, 'Gulliver's travel' in the room of Asia (guests discover the structure of a mineral), the 'journey into light' in the room of America and Europe houses the 'journey to origin' and the so-called

'Forschungsreise', i.e., Research Trip. 'America' is particularly fascinating since the Hall of Mirrors is projecting the beauty of minerals ad infinitum. In addition, 'America' has a darkened room where fluorescent minerals are shown.

There is a separate scientific observation platform as well - the aim is to make microscopic and crystallo-

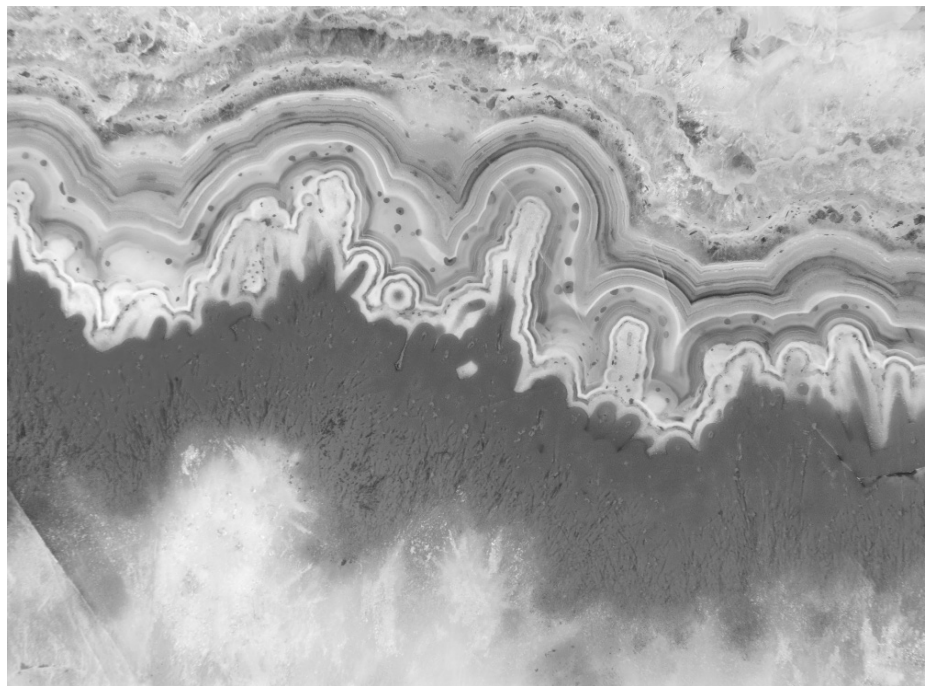


Figure 9. Mineral agate (Germany, Freiberg).

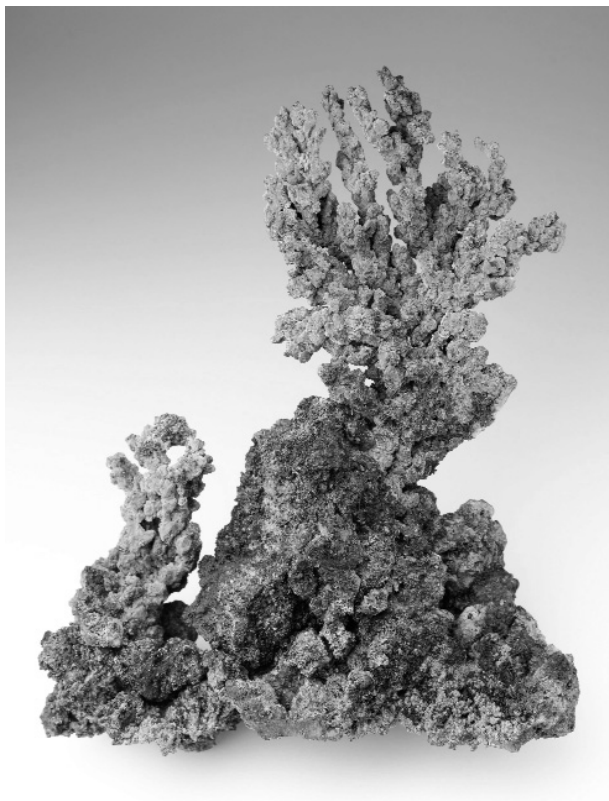


Figure 10. Mineral cupper (Hungary, Rudabánya).

graphic analysis possible. In addition, minerals, which visitors can bring in, are identified. Modern computers, special microscopes, as well as the scanning electron microscope make elemental analysis possible. In addition, professional literature regarding mineralogy and geology is available. On request, there are specialists for all audiences - children, youth, collectors of minerals, or scientists and tourists. Figures 9 to 13 show some of the special samples in the collection.

Relating to the exhibition *Terra Mineralia* there is a bounteously designed world map, showing important habitats and their minerals at that level. Another observation platform situated upstairs provides extra information on special regions by the virtual globe 'Google Earth'. In addition, special video animations simplify the access to the world of minerals. The fascinating mineralogical journey around the world ends with technical mineralogy. There are synthetic diamonds for drill bits and polishing, a silicon mono-crystal for producing chips in semiconductor industries, and a fluorite mono-crystal high-powered object lens.



Figure 11. Mineral crocoite (Australia, Tasmania).



Figure 12. Antimonite (China, Guangxi).

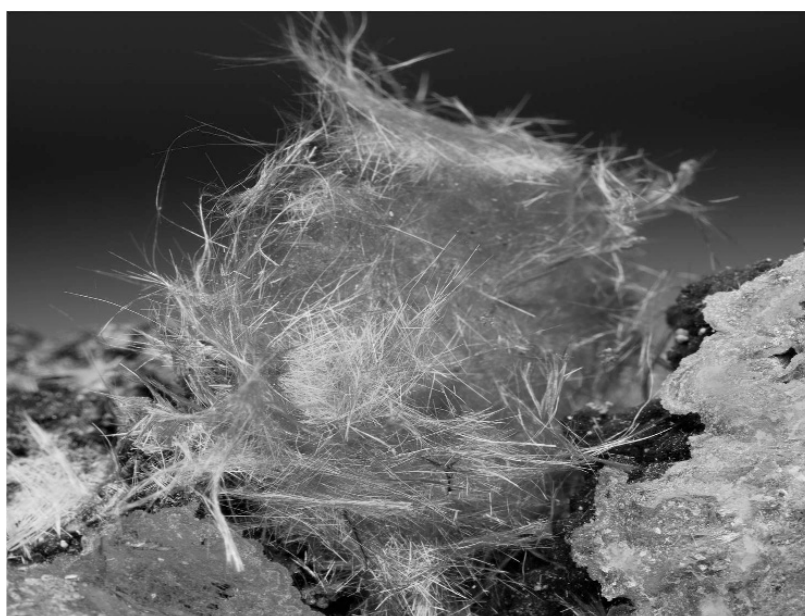


Figure 13. Cuprite (China, Jiangxi).

