THE MINERALOGICAL COLLECTION OF THE GEOMUSEUM, COLOGNE UNIVERSITY, GERMANY

Elena A. Borisova
Fersman Mineralogical Museum, Moscow, Russia, elborisminmusfer@mail.ru
Rolf Hollerbach
GeoMuseum of the Cologne University, BRD, Rolf.Hollerbach@uni-koeln.de

Mineralogical exhibits of the GeoMuseum, Cologne University, and the history of this collection are described. 17 figures, 3 references.

The history of this small museum is fairly old and not nearly simple, as it often happens with old collections. It begins upon a private collection, a mineral cabinet of the second half of the eighteenth century. Unfortunately, it was destroyed and broken almost entirely during the World War II; the registration books were burnt after the bombing in 1944, so it is impossible now to determine, which specimens have come from that historical collection and which ones appeared later. The only authentically known historical exhibit, the calcite (or aragonite) pseudomorph after the bird's nest, belonged to Ferdinand Franz Wallraf (1748–1824) who was the first Cologne honorary inhabitant. Another remarkable museum of the city is bound with his name too. F.F. Wallraf, the son of a Cologne tailor, pulled himself up thanks to his own labor, graduated several faculties at the Cologne University – medical, theological, became canonic, Doctor of medicine and Doctor of philosophy and, later, Professor of history and fine sciences. In 1793, he was elected the University Rector. Yet collecting was his favorite occupation. He collected whatever pertaining to the history of Cologne.

Besides the natural-historical collection, the Wallraf's assemblage contained archeological finds dated by the Roman Empire as well as paintings, sculptures, religious relics and works of art, and historical weapons. At the Napoleon times, when the French bossed in the town and the University has been closed (it was only opened more than one hundred years later, in 1919), he was protecting, as far as was possible, church valuable exhibits from plunder and spoiling. After Wallraf's death and with the assistance of Johann Heinrich Richartz, a Cologne merchant, a museum was established on the base of his collection. The Museum was opened for visitors on 1 July 1861 and was named, in honor of these two prominent persons, the Wallraf-Richartz Museum. Today, this is one of the greatest classic pictorial art galleries in Germany.

As was noted, there was a great natural-historical collection in the assemblage of F.F. Wallraf, a naturalist and a teacher, and some part of the GeoMuseum's specimens was apparently linked with this first university collection. Having been saved at the turn of the eighteenth and nineteenth centuries, it unfortunately met with a grievous loss in the twentieth century, and the lost attribution cannot be restored.

The mentioned historical specimen, calcite (or aragonite) pseudomorph after a bird's nest, was more lucky: it is excellently preserved (Fig 1). It was demonstrated not only at the GeoMuseum itself but at various temporal exhibitions, including the joint exhibition of Cologne museums, 1995–96. In this exhibition catalogue (Kier, Zehnder, 1995) it is registered under No 397 as the exhibit from the Wallraf's collection where it is registered as "Inlay". It should be emphasized that in the Western literature the sense of the latter term is somewhat wider than what is accepted in Russia and means, particularly, some crust or mineral cover on some alien matter, e.g., a rock (Tolkovyi slovar' angliiskikh geologicheskikh terminov, 1978).

As to the GeoMuseum collection in a whole, it consists nowadays of two large and formerly independent parts: from the 1960-ies, the Mineralogical Museum and the Museum of the Geological Institute of Cologne University were existing parallel; however, after establishing in 1999 the united Library of geology, mineralogy, crystallography, and geophysics, which needed special premises, they were united into a single museum that retained former dividing into mi-

Fig 1. Calcite (or aragonite) pseudomorph after a bird's nest, 10 cm high, 13 cm across, cavity diameter 5 cm. No 129e. Photo: E.A. Borisova.
Fig 2. The Cologne GeoMuseum exhibition hall. Photo: R. Hollerbach.

neralogical and geological (or geologically-paleontological) collections.

The geological collection also has its own history. Not entering into details, we have only to note that its most part was formerly staminal for the Cologne Natural-Historical Museum, the so-called Stapelhaus Sammlung. The unique exhibits like skeletons of ichthyosaurus — *Stenopterygius quadriscissus* and saltwater crocodile — *Steneosaurus bollensis*, both more than 2.5 meter long, found in the Lower Jurassic near Holzmaden (Wü rtemberg vicinities, Germany), as well as the skeleton of a cave bear, are the honor of this collection. Dr. Michael Grigo is now the curator of this part of collection.

The mineralogical collection is fairly diverse and counts more than 50 thousand showpieces. Some part of them, about one thousand of most interesting and attractive specimens, is exhibited in the museum hall directly (Fig 2). About 30 thousand specimens make up a systematic collection and are the museum funds off limits to public and only accessible for specialists and workers of the two institutes of the Cologne University, Institute for Crystallography and Institute for Geology and Mineralogy that are located within the same building. The systematic collection includes about 1500 mineral species.

Another small part, about two thousand specimens, is a petrographic collection. It is stored also separately in the Museum funds being used mainly for training. For the same aim, the special demonstration hall with the specimens of wide-spread minerals and ores is always open for students adjacently to the exhibition hall. As a rule, these specimens are of standard size and shape and arranged by one or another preferential principle. For example, some cases show physical properties of minerals such as hardness, color, luster etc. Some cases show aggregate shapes, mineral varieties and diversity of natural occurrences. The entire tutorial collection with its funds numbers about 20 thousand specimens. Of course, the advantage of such a training separate collection is its accessibility. While the main exposition hall is open for public only one day in a week (Wednesday) and one Sunday in a month, the students can visit the training hall, as mentioned above, practically at any day and at any time, it is always open if the Institute for Geology and Mineralogy in whose area it is situated is in operation. Besides, the mineral collections gathered by students at field trips can be demonstrated in special cases in the Institute hall, which is, too, very much useful for the educational process and forwards to engage the young people in the work with stone material.

Let us now contemplate the mineralogical expositions of the main exhibition hall in detail. They are divided into 8 topical exhibitions: Meteorites and Tektites, Gems and Precious Stones, some mineral groups (quartz varieties, agates, calcites, zeolites), Minerals from Cologne Vicinities, Russian Minerals, Mineral Prominent Finds from All-Over the World, Synthetic Crystals, New Aquisitions. Besides, two more cases are in the vestibule before the entrance to the exhibition hall: The Biogenic Mineral Formations and The Matter Crystalline and Non-Crystalline States. In the first one, you can enjoy corals, echinoid skeletons, shells; in the second one, quartz crystals, quartzite and quartz sand are placed at one side and, for comparison, amorphous natural (obsidian, tektites) and technical glasses — at the other side.

In the main hall the most interesting and various exhibits are presented in the exposition the

Fig 3. Rhodochrosite. Kalahari, South Africa. 9 by 17 cm. No number. From P. Ney collection. Photo: E.A. Borisova.
Fig 4. Rhodochrosite. Mina Capillitas, Argentina. Polished section 10 by 14 cm. No M5426/96. Photo: R. Hollerbach.

Fig 5. Stibnite, barite. Baia Sprie, Romania. 15 cm. No M3800/70. Photo: R. Hollerbach.

Most Valuable Mineral Findings from All-Over the World, as one can see from its title. One of the best specimens here is rhodochrosite from the Kalahari Desert (South Africa), which was collected personally by the former curator of mineralogical collection and Museum coordinator Prof. Paul Ney (beginning from 1988, Dr. Rolf Hollerbach is curator of mineralogical collection and coordinator of GeoMuseum). A dramatic story is tied with this rhodochrosite. Yet in Kalahari, after Ney has packed the specimen in his knapsack, several robbers attacked him to rob the valuable load; however, Ney did not lose courage and, using the knapsack like a sling, could struggle the assailants and escape. Unfortunately, the specimen was harmed, several crystals were damaged or broken. Nevertheless, the big, to 3 cm long, brownish-red, transparent rhodochrosite crystals are certainly the exhibition ornament (Fig 3). Another rhodochrosite specimen (from Capillitas*, Argentina) is pink radial aggregates (Fig 4), which attracts visitors' attention too.

The luxurious stibnite specimens from Baia-Sprie, Romania (Fig 5) as well as large, up to 4 cm across, native sulfur crystals on calcite from Racalmuto, Sicily, Italy are the GeoMuseum visiting cards. The big epidote crystal (20 cm long) from Knappenwand, Untersulzbachtal, Salzburg, Austria; orange-olivaceous crystals to 1 cm upon the brush of minor yellow-greenish-pink masses of the same famous pyromorphite from Bunker Hill, Kellog, Idaho, USA; blue crystals of linarite (up to 6 or 7 mm) from Blancher Mine, New Mexico, USA; wulfenite tabular crystals (up to 1.5 cm across) on galena from Schwarzenbach, Slovenia; as well as grossular white crystal (11 cm across) from Lago Jaco, Chihuahua, Mexico deserve to be marked. Very much spectacular are the tourmaline specimens, the zonar one from Anjanabonoina, Madagascar, and the pink transparent rubellite from Paprok, Nuristan, Afghanistan; apatite transparent and zonar crystals to 3 cm long from Panasqueira, Portugal; azurite wonderful rose, 10 cm in diameter, from China (Silu, Guangdong Province); azurite crystal group (with crystals to 4 cm) from Tsumeb, Namibia, as well as cavansite radiaxial aggregates on stilbite from Poona, India (Fig 6).

The native copper specimen from Lake Superior, Michigan, USA is impressive. The intergrowth of the two large translucent crystals of calcite and fluorite from Elmwood Mine, Tennessee, USA (Fig 7) is amazingly beautiful.

The pale pink rhodochrosite from Capnic, Romania; the two tourmaline splendid specimens — zonar crystal (30 by 10 cm across) in quartz (Caribib, Namibia) and the partly fibrous pink elbaite with lepidolite and quartz (Pederneira Mine, Minas Gerais, Brazil) as well as luxurious intergrowths of gypsum twins from Santa Eulalia, Chihuahua, Mexico should be marked amidst the major pieces.

The polished specimens of pale clay shales (or aleurolites) with bright brown stripes and patches due to iron oxide or hydroxide admixtures — the so called Zebra-Rocks from Kimberley, Australia (Fig 8) are the extraordinary in this exposition.

Minerals from Cologne vicinities (Siegerland) are presented at the exposition of the same name mainly with carbonates (rhodochrosite, siderite, calcite, dolomite), iron and manganese oxides and hydroxides (pyro-

* Geographic names are given according A.A. Evseev (Evseev, 2000).

lusite, limonite), sulfides and sulfosalts (pyrite, galena, chalcopyrite, fahlore, bournonite) and native copper with malachite.

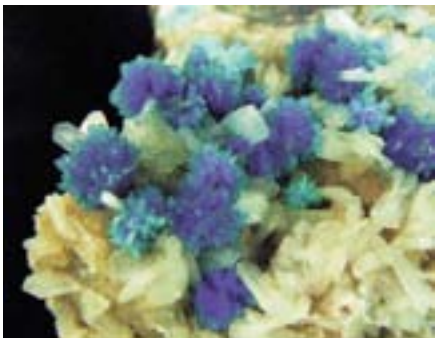
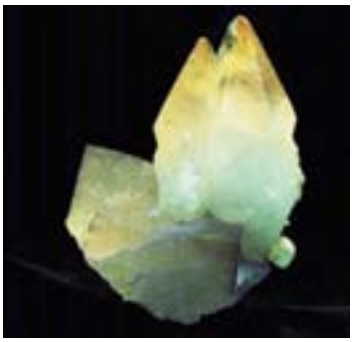
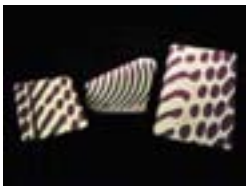
At the **Special Groups of Minerals exposition** the agates should be particularly marked. Their delicate patterns are well visible even from afar as the big agate plates are located at special mounts provided with booster-lights whereas the minor ones are opposite the windows. The large bluish grey agate from Brazil can be marked too.

The amethyst crystal, 12 cm long (Guanajuato, Mexico), and the split yellowish quartz crystal (9 cm long) from Tsumeb, Namibia, seem most attractive aesthetically in the Quartz Case while in the Calcite Case — pinkish-brown split crystal from the mining near Marl Huels, Ruhr Area, Germany (Fig 9). In the Zeolite Case, the creamy pink stilbite and natrolite from Poona, India (Fig 10) as well as the wonderful specimen of snow-white scolecite with laumontite from the same locality (Fig 11) seem to attract more than the other.

Besides Australian and African diamonds, polychrome tourmalines, rubies, sapphires, and various jewelry from these and other minerals, which are customary here, the excellent transparent twins and trillings of chrysoberyl from Sri Lanka (Fig 12) and the bluish faceted crystal (4 or 5 mm in size) from the Urals (Tokovaya River) are the rare decoration of the **Gems and Precious Stones exposition**.

In the **New Aquisitions** case, the beryl varieties should be emphasized: emerald crystals (4 cm long) from the Coscuez Mine, Boyacá, Columbia, and aquamarine from Erongo, Namibia (Fig 13). The big honey yellow scheelite crystal (6 cm) from China (Fig 14), purple-blue carletonite (Saint Hilaire Mountain, Quebec, Canada), and brownish-red corundum (7.5 by 4 cm) from Mysore, India (Fig 15). The combination of the orange-red vanadinite crys-

Fig 6. Cavansite aggregates (1 cm across) on stilbite. Poona, India. Fragment. Specimen 14 by 18 cm. No M5559/02.
Fig 7. Calcite, 17 cm, with fluorite, 14 cm. Elmwood Mine, Tennessee, USA.
Fig 8. "Zebra rocks". Kimberley, Western Australia. Specimens up to 10 by 7 cm. No number.
Fig 9. Calcite. Marl Huels, Ruhr Area, BRD. 7.5 cm. No number.
Fig 10. Natrolite. Poona, India. 7 cm. No M4167/73.
Fig 11. Scolecite with laumontite. 15.5 cm long. Poona, India. No M4303/80.
Photo: E.A. Borisova.


tals and black iron oxides from Mibladen, Morocco, looks somewhat unusual. The white, with a slight pink tint, microcline Manebach and Baveno twins from Morro Redondo, Minas Gerais, Brazil (Fig 16) as well as aragonite with native silver from Santa Eulalia, Chihuahua, Mexico (Fig 17) are very nice.

The topical exhibition **Russian Minerals** appeared in the GeoMuseum recently. Its origin depended on the wide stream of Russian mineral material that rushed in the Western markets in early 90-ies of the past century. Pieces from Siberia, Urals, and Kola Peninsula prevail here. The Ural minerals are most diverse: quartz phantom crystals, amethyst, citrine from the Nether-Polar Urals, Sarany uvarovite, Ilmen dark grey corundum (5 to 6 cm), Beryozovskii crocoite, pyrochlore from Vyshnevye Gory, malachite and native platinum from Nizhnii Taghil. The apatite blue transparent crystals (2 or 3 mm in size) on calcite, analcime (3 cm crystal) from the Nizhnaya Tunguska River, and sperrylite from Talnakh may be emphasized amongst Siberian minerals. Khibiny minerals are presented by eudialyte and astrophyllite. There are about 30 specimens available at the exposition.

Twenty various meteorites and tektites of six types make up the **Meteorites and Tektites** exposition. Among the first, the two findings dated eighteenth century should be mentioned in the first line. They were identified as meteorites later, though. The iron meteorite Toluca, Mexico, was found in 1776 but described as a meteorite only 80 years later, in 1856. The meteorite Rittersgruen, Steinbach, the iron one with silicate small inclusions, was found in 1724 in the Erzgebirge, Germany, and was not, too, immediately referred to cosmic objects. The palasite Brenham, Kansas, USA (1882) and octahedrite Canyon Diablo, Arizona, USA (1891) were found in the nineteenth century.

The falls of the nineteenth century are presented by the Ca-enriched achondrite Stannern, Iglau, Czechia (22.05.1808), olivine-hypersthene chondrites Zavid, Bosnia-Herzegovina (1897), and Mocs,

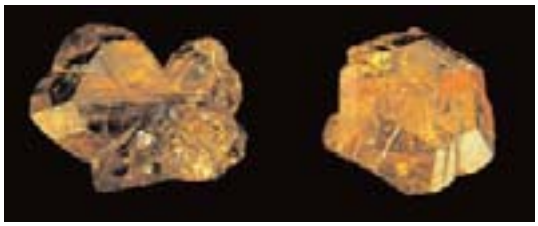


Fig 12. Chrysoberyl, 9 x 10 mm and 8 x 9 mm. Sri Lanka. No M5270/94.

Fig 13. Aquamarine, 4 cm long, with tourmaline and smoky quartz. Erongo, Namibia. No M5553/01.

Fig 14. Scheelite (6 cm) with muscovite. 6 by 10 cm. China. No M5445/97.

Fig 15. Corundum, 7.5 x 4 cm. Mysore, India. No M5278/94.

Photo: E.A. Borisova.

Fig 16. Microcline. Morro Redondo, Minas Gerais, Brazil. No number.
a – Manebach twinning, 7 by 8 by 6 cm.
b – Baveno twinning, 4 by 4 by 3.5 cm.
Fig 17. Aragonite with native silver and gypsum. 17 cm high. No M5446/97.

Photo: E.A. Borisova.

Romania (3.02.1882), olivine-bronzite chondrites from meteor showers Cronstad, RSA (19.11.1877), and Pultusk, Poland (30.01.1868). The rare specimen of carbonaceous chondrite is a part of the meteor shower Murchison, Victoria, Australia that has fallen on 28 September 1969. The entire mass of the fallen matter is estimated as nearly 100 kg, the Museum specimen weight is 143 g.

Tektites are presented by moldavites (Czechia), philippinites (Mindanao, the Philippines), indochinites (Thailand), bellitonites (Indonesia), australites (New South Wales), and specimens found in the Quarternary fluvial deposits of the Guangdong Province, China.

And, lastly, the **Synthetic Crystals** exposition exhibits the results of the works of the Institute for Crystallography, Cologne University, in the growth of various phases including both organic compositions (citric acid, dibensoil, formiates and oxalates of sodium, calcium and strontium) and inorganic ones (sulfates, phosphates, nitrates and iodates).

Therefore, the mineralogical collection of GeoMuseum, Cologne University, is traditional and well adapted to the needs of educational process, and is notable, at the same time, for wide diversity of aesthetically important pieces, large and rare crystals well presented in the exhibition hall open for public, which surely awakes echo in the hearts of stone connoisseurs and amateurs and attracts childish and young audience.

References

Evseev A.A. (**2000**): Geograficheskie nazvaniya v mineralogii. Kratkii ukazatel' (Geographic Names in Mineralogy. A Concise Index), Moscow: A.E. Fersman Mineralogical Museum RAS, part I 269 pp., part II 282 pp. (In Russ.).

Tolkovyi slovar' angliiskikh geologicheskikh terminov (A Glossary of English Geological Terms) (**1978**): Moscow: Mir, vol. 2, 588 pp. (In Russ.).

Kier H., Zehnder F.G. (**1995**): Lust und Verlust Koelner Sammler zwishen Trikolore und Preussenadler. Koeln: Museen der Stadt Koeln und Wienand Verlag Koeln. 695 s.