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Note

The Ries Crater Museum in Nördlingen, Bavaria, Germany

Since the recognition of the Ries in the early 1960s as the site of a 15-Ma-old impact structure in southern Germany, Julius Kavasch, a local teacher and amateur geologist, had a vision of establishing a museum that would educate the public about the unique geological characteristics of the area. After Julius Kavasch passed away in 1978, his vision lived on and was promoted with the same enthusiasm by his son, Dr. Wulf-Dietrich Kavasch, a veterinarian and amateur geologist. On the occasion of the award of the first Rieser Kulturpreis (Cultural Award of the Ries region) in 1983 to prominent Ries scientists Professors E. M. Shoemaker, E. C. T. Chao, and R. Dehm, Wulf-Dietrich Kavasch communicated the vision of a Ries crater museum project to professionals. Many of them, including Dieter Stöffler, offered their support in this endeavor. Wulf-Dietrich Kavasch also managed to communicate his enthusiasm for a Ries crater museum to Oberburgermeister Paul Kling and the city council of the town of Nördlingen, who collectively agreed to establish the Ries Crater Museum. An ideal location for the Ries Crater Museum was found in the restored Holzhofstadel (woodyard-barn) that was built in 1503 in Nördlingen's medieval town center (Fig. 1). In the presence of such distinguished and renowned guests as Gene and Carolyn Shoemaker and Ed Chao, the museum (Fig. 2) opened its doors to the public on May 6, 1990.

Fig. 1. The Holzhofstadel (woodyard-barn). Photo by Foto Hirsch, Nördlingen.

Fig. 2. The Ries Crater Museum at Nördlingen today. Photo by Stadtbauamt, Nördlingen.

MUSEUM EXHIBITS

In addition to the specifics of the processes that created the Ries crater, themes of the Ries Crater Museum cover other cosmic and terrestrial aspects of asteroid impact, including their geomorphological and environmental effects. Firewalls installed in the museum building divide it into six rooms, each of which addresses a major impact geological topic.

Maps, aerial photographs, and a topographic relief model in Room A (the entrance area) introduce the visitor to the geography and geomorphology of the Ries area. Room B focuses on cosmic aspects of the Ries crater and other impact structures in our solar system (Fig. 3). In addition to crater geometries on the various planets, an illuminated model shows the respective orbits of planets, asteroids, and comets, as well as the regions in space where asteroids and comets originate. An interactive display allows the visitor to determine the locations, sizes, and ages of fifty different terrestrial meteorite craters and see them on a GIS-based projection. A video also demonstrates the fundamental importance of impact events throughout the evolution of the solar system, while meteorite samples allow the visitor to become familiar with the actual cosmic matter. Room C explains the pre-impact geology of the Ries area and the basics of impact cratering. Large rock slabs reveal the pre-impact stratigraphy, its associated fossil record, and

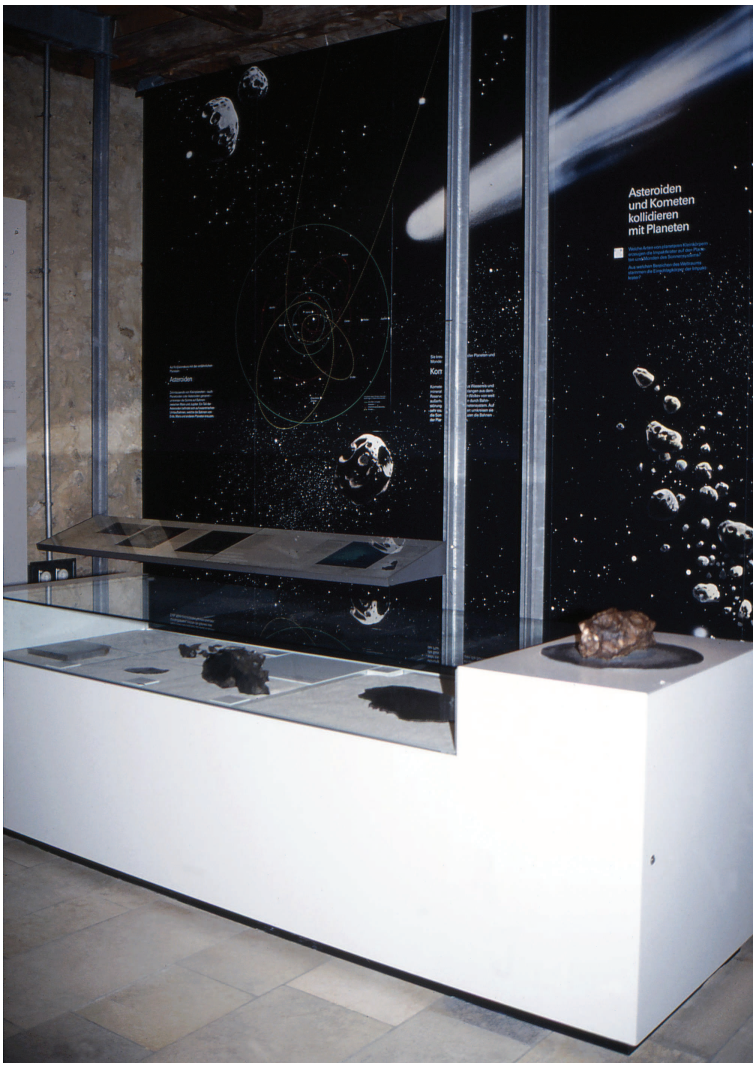

Fig. 3. Room B of the Ries Crater Museum focuses on cosmic aspect of impact cratering.

respective environmental conditions. The stages in the formation of the Barringer crater in Arizona can be compared to a video demonstrating impact cratering in the laboratory.

Room D is the spatial and the thematic center of the museum (Fig. 4). Here, a multimedia show vividly demonstrates the effects of the Ries event as seen by a visitor witnessing the event while sitting on the crater's rim. Blocks of various rock types are distributed in the room and labelled with the distance they travelled during the cratering event. This allows the visitor to appreciate the forces associated with the Ries impact. Post-impact recolonization of the crater by life forms and more recent utilization of the Ries area are the topics displayed in Room E. Fossils and rock samples educate the visitor about the post-impact environment of the Ries crater when it was filled with water. The fossil record, in particular, demonstrates the changes from a subtropical climate shortly after the catastrophe to a colder climate in Pleistocene times. The tour around the museum ends in Room F, which is dedicated to the more than 200-year-long history of research in the Ries area. Rival hypotheses explaining the origin of the Ries crater range from volcanism, activity of glaciers and water vapor explosions to the impact hypothesis accepted today. The formation of the Ries crater by impact is manifested by the presence of coesite and stishovite, which were identified in Ries rocks by Gene Shoemaker and Ed Chaoin. A 165 g lunar sample from the Apollo 16 mission, which is on permanent loan from NASA, is the final—but one of the most impressive—exhibits of the Ries Crater Museum in Nördlingen.

THE IMPORTANCE OF DIETER STÖFFLER TO THE RIES CRATER MUSEUM

In 1958, Wolf von Engelhardt, Professor of Mineralogy at Tübingen University in Germany, introduced Dieter Stöffler to the Ries crater. Dieter has been scientifically active at the Ries ever since and, based on his research at this crater, he established the principles of progressive shock

Fig 4. Room D of the Ries Crater Museum displays different rock types that were ejected during impact cratering of the Ries area.

metamorphism. Together with Professor von Engelhardt and Drs. Hörz and McEwen of NASA, he instructed the astronauts of the Apollo 14 and 17 missions during their field training at the Ries crater (see Fig. 4 in Keil, this issue). His in-depth knowledge of the geology of the Ries and his planetological scientific approach have been vital in establishing the Ries Crater Museum. Not only did he provide a large number of the museum exhibit texts, as well as reviewing all of the texts, he also acquired many of the display items. Also, his professional relationships with geological and astro-scientific institutions within Germany and outside it prompted many of these institutions to provide invaluable support to the Ries Crater Museum. Planned changes in the exhibits of the Ries Crater Museum are largely based on his scientific input. They include new exhibits that will address the Chicxulub impact structure in Mexico, as well as the changing paradigm in geosciences, the so-called "Copernican revolution," as it has been dubbed by Professor von Engelhardt.

Based on an idea by Dieter Stöffler, the Center for Ries Crater and Impact Research (ZERIN) was founded in 1998 and established next to the Ries Crater Museum. This research facility is managed largely by the Institute of Mineralogy at the Museum of Natural History, Humboldt-Universität Berlin, where Dieter Stöffler was the director. The ZERIN provides an opportunity for visiting scientists to combine theoretical and field-based studies on the Ries crater, as well as general aspects of impact research.

To honor his scientific achievements related to the Ries crater and his exceptional support to the Ries Crater Museum, Dieter Stöffler was awarded the Ehrenbrief (Honors Certificate) of the City of Nördlingen in 1991. Further honors were bestowed on Dieter Stöffler in 2003, when he was awarded the Rieser Kulturpreis (Cultural Award of the Ries area), which is awarded to those who have made outstanding contributions to the Ries area. The staff and friends of the Ries Crater Museum wish to take this opportunity to thank Dieter Stöffler for his continuous support and activity in developing the unique exhibits of the museum. Dieter's efforts in this respect have significantly contributed to the success of the Ries Crater Museum, which has received more than 700,000 visitors since its opening in 1990.

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