Chapter 15
BRAUNSCHWEIG: Staatliches Naturhistorisches Museum Braunschweig

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Abstract The Braunschweig State Natural History Museum, founded in 1753/1754, in the period of enlightenment, is one of the oldest museums worldwide. Its collections are of medium size, but they contain a considerable number of eighteenth- or nineteenth-century specimens of rare and even extinct species. The bird collection is especially remarkable. It contains about 60,000 specimens, representing about half of the world's bird species. The museum has been renovated recently. Current research activities center around vertebrates, focusing on reptiles, both recent and fossil.

Keywords Braunschweig • Bird collection • Reptile collection • Extinct species • Blasius • Enlightenment

15.1 History of the Museum and Its Collections

The Staatliches Naturhistorisches Museum in Braunschweig is the second oldest natural history museum on the European continent that was accessible for the public. It was founded in 1754 by Duke Carl I. of Braunschweig and Lüneburg (1713–1780) in the historical city center of Braunschweig, which Carl had recently predestined as the capital of his duchy (Ahrens 2004). It was a universal museum combining art and natural history collections. The museum is predated only by the foundation of the "Kunstkammer" in St. Petersburg, Russia, in 1724, which also holds natural history objects. The British Museum in London was founded in 1753 but opened in 1759. As in most natural history museums of the eighteenth century that are based on the cabinets of natural curiosities and fine arts of noblemen and aristocrats, also parts of the collections in Braunschweig are considerably older. They date back to the private cabinets of Duke Ferdinand Albrecht I. (1636–1687) at Bevern and Duke Anton Ulrich of Braunschweig and Lüneburg (1633–1714) at Salzdahlum, both located in the surrounding hinterland of Braunschweig. From this

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Fig. 15.1 Turtle carapace decorated with the dukes' of Braunschweig and Luneburg coat of arms (seventeenth or eighteenth century) (reproduced with permission from Staatliches Naturhistorisches Museum Braunschweig)

period of the mid-seventeenth century, single specimens are still present today. Among the oldest surviving specimens are, for instance, the skeleton and the shell of a European pond turtle (*Emys orbicularis*) that was kept by Ferdinand Albrecht I. as a pet. The carapace is decorated with the ducal coat of arms (Fig. 15.1). Since the amount of natural history and art items in the collection increased considerably during the first years of its existence, the museum was moved to new locations several times.

In 1857, however, the universal arts and natural history collections were separated following the general progress of the natural sciences and the specialization of institutions during the nineteenth century. In that year, the famous vertebrate taxonomist Johann Heinrich Blasius (1809–1870, Fig. 15.2) became director of the independent natural history museum. Since 1836, he was already appointed professor of natural sciences at the Collegium Carolinum, the predecessor institution of the current Technical University at Braunschweig, the Carolo-Wilhelmina. Under his directorship, the collections grew substantially due to his connections and exchange with scholars and collectors from around the world. When H. H. Blasius died, his younger son Wilhelm Blasius (1845–1912, Fig. 15.3) became professor for zoology and botany at the university and, consequently, also director of the natural history museum. Wilhelm Blasius continued the work of his father and further acquired many collections for the museum, mainly birds and their eggs. The most important ornithological collections that were gathered during his directorship were the voucher specimens from Carl Constantin Platen (1843–1899), who collected on various islands of the Indo-Australian Archipelago between 1878 and 1894.

After World War I, the future of the natural history museum was publicly discussed, and due to the political upheaval in Germany, space was now available in Braunschweig palace, the residence of Ernst August (1887–1953), the last reigning Duke of Braunschweig.

Fig. 15.2 Johann Heinrich Blasius (1809–1870) (reproduced with permission from Staatliches Naturhistorisches Museum Braunschweig)

Fig. 15.3 Wilhelm Blasius (1845–1912) (reproduced with permission from Staatliches Naturhistorisches Museum Braunschweig)

15.2 The Current Building

In 1933, director Gerhard von Frankenberg (1892–1969), a zoologist and politician, was dismissed. The museum was united with the institute for biology, and for both institutions, a new complex of buildings was erected in the Pockelsstraße, which until today houses the museum with its various collections and exhibitions (Fig. 15.4). During the years of World War II, the museum was spared from the bombings of Braunschweig, but parts of the collections and of the archives got lost. The plan of transforming it into a center for genetics and racial education was—luckily—never realized. In the early 1950s, the natural history museum became an independent institution again and gained more space at the building since the zoological institute moved out. Together with the general economic boom in Germany, also the natural history museum flourished. New positions were opened, and the equipment of offices, carpentry, and the taxidermic and paleontological

Fig. 15.4 The actual museum building, completed 1937 (reproduced with permission from Staatliches Naturhistorisches Museum Braunschweig)

ateliers improved considerably. Also the store rooms under the roof of the museum were reorganized and offered more space and better conditions for the collections.

The modern concept of the museum is inspired by its traditional role as a "museum of enlightenment." As in the period of enlightenment in the eighteenth century, its main goal is to teach the general public about nature and natural history, with emphasis on evolution and biodiversity, thereby using mainly original specimens for display. Another principle is that all services without public participation have to leave the museum building, in order to gain more space for public exhibition. Recently, this space has been significantly enlarged by moving magazines and offices to other buildings.

15.3 The Exhibitions of the Museum

15.3.1 The Dioramas

On the occasion of the 200th anniversary of the museum, the construction of a new series of *dioramas* was commenced in 1954, while the first of such showcases had already been finished in the late 1930s. Today, 25 of the historical dioramas are still extant. Four were only recently dismantled in the course of the rearrangement and enlargement of the entrance hall of the museum. All dioramas show exclusively native mammals and birds in their natural or human-influenced habitats. Often they have a close relation to Braunschweig and its hinterlands, such as the once last lynx of the Harz Mountains that was shot in 1818 (Fig. 15.5). Since the year 2000, lynxes are native to the Harz again due to a successful resettlement project.

15.3.2 A Time Journey Through the Collections

Since 2015, the new exhibitions at the ground floor offering 240 m^2 more space are accessible to the visitors, while a first room was already opened in December 2013. The new concept realizes a time journey through the collections and the history of the museum from its very beginnings to the twenty-first century. The first room, the *treasure hall* ("Schatzkammer"), houses some of the oldest and most valuable objects from the cabinets of curiosities of the Braunschweig dukes. Among these valuables are, for instance, richly ornamented shells of mussels, nautilus, and turtles and the world's only pair of stockings made of golden mussel silk from the noble pen shell (*Pinna nobilis*). A fluid-preserved embryo of a Ceylonese elephant (*Elephas maximus*) from the eighteenth century arouse such a broad attention at that time that even Johann Wolfgang von Goethe (1749–1832), the polymath, wanted to examine the specimen for his comparative anatomical studies (Fig. 15.6). The planned dissection, however, never took place.

The next room represents—in a modern transcription—a *traditional storeroom* of the nineteenth century displaying more than 500 specimens, representing the diversity of the museum's natural history collections of animals from colorful beetles to a taxidermy replica of the famous Brunswick Lion, a Romanesque statue of a lion which was built in 1166 during the reign of Henry the Lion (1129/1130–1195), Duke of Bavaria and Saxony, as a symbol of his ducal authority and jurisdiction. The huge showcases also demonstrate the different kinds of preservation from dried specimens of insects, corals, and shells to the alcohol-based wet collections mainly for other invertebrates, fish, amphibians, and reptiles, to stuffed specimens of mammals and birds (Fig. 15.7). The most prominent specimen is a skeleton of the extinct aurochs (*Bos primigenius*) found in 1870. Another remarkable specimen on display is the historical name-bearing holotype of the bird *Mergus anatarius*, which was scientifically described by the former museum inspector

Fig. 15.5 Last lynx of the Harz mts. (shot in 1818) (reproduced with permission from Staatliches Naturhistorisches Museum Braunschweig)

Fig. 15.6 "Goethe's elephant embryo" (first mentioned 1783) (reproduced with permission from Staatliches Naturhistorisches Museum Braunschweig)

Friedrich Eimbeck in 1829 (Fig. 15.8). Later, it turned out that the specimen is a rare hybrid between the goldeneye duck (*Bucephala clangula*) and the smew (*Mergus albellus*) (Blasius 1887). Two multimedia screens in the middle of the room provide detailed information about each individual on display.

The third room at the ground floor is a *discovery hall* with many interactive museum educational elements which are a pleasure not only for children. One issue treated is animals' teeth with their enormous variation in size, shape, and function. Furthermore, mimicry and camouflage are easily explained with the aid of several taxidermic specimens. The discovery hall is dominated by a 13-m-long showcase which demonstrates life above and below the ground (Fig. 15.9). It is corresponding with the historical dioramas which border the showroom.

15.3.3 Paleontology and Extinct Animals

Another highlight of the exhibitions is the *dinosaur hall*. Here, a 13-m-long skeleton and a life-sized reconstruction of the African sauropod *Spinophorosaurus nigerensis* are shown, a new genus discovered in 2006 during an expedition of

Fig. 15.7 Modern version of a traditional show and store room (reproduced with permission from Staatliches Naturhistorisches Museum Braunschweig)

Fig. 15.8 "*Mergus anatarius*", a hybrid bird (shot in 1829) (reproduced with permission from Staatliches Naturhistorisches Museum Braunschweig)

museum members and later scientifically described (Remes et al. 2009; Fig. 15.10). In modern computer-based animations, the extinct giants are revived, and aspects of their extraordinary biology are visualized for the visitors. The successful paleontological project of the natural history museum in Braunschweig was the first German dinosaur expedition to Africa since nearly a hundred years, and further

Fig. 15.9 Partial view of the large showcase in the discovery hall (reproduced with permission from Staatliches Naturhistorisches Museum Braunschweig)

expeditions to the Republic of Niger were conducted the following years. In a *second paleontological hall*, the geological histories of the Braunschweig area and the Harz Mountains are illustrated and explained. Among the many fossils exhibited are also some excellently preserved ichthyosaurs (note that 175 million years ago northern Germany was covered by a Jurassic sea) that were found and excavated near Braunschweig by scientists of the natural history museum.

Special treasures of the scientific collections are on display in the *great light hall* on the second floor of the museum's building. There, specimens of iconic and now extinct species, such as the great auk (*Alca impennis*) and Steller's sea cow (*Hydrodamalis gigas*), are shown (Fig. 15.11). Of the latter species, which was already extirpated by seafarers in the eighteenth century, only few complete skeletons still exist today.

Further key issues of the great exhibition hall are the Pleistocene fauna of the Harz Mountains, as well as the evolution of our own species, *Homo sapiens*. Visitors are especially fascinated by the lifelike replica of a Neanderthal man.

15.3.4 The Aquarium

Next to taxidermically preserved specimens, the natural history museum also has living animals on display since more than 50 years. Hence, in 1968 an aquarium was opened in the basement of the museum's building. Also several terraria for amphibians and reptiles were constructed, which, until today, show a variety of tropical aquatic and terrestrial habitats, such as coral reefs and the Amazonian

Fig. 15.10 Reconstructed skeleton of the sauropod *Spinophorosaurus nigerensis*, discovered in 2006 (reproduced with permission from Staatliches Naturhistorisches Museum Braunschweig)

Fig. 15.11 Front view of the skeleton of Steller's Sea cow (*Hydrodamalis gigas*) (reproduced with permission from Staatliches Naturhistorisches Museum Braunschweig)

rainforest with their characteristic fauna and flora. Due to its naturalistic and attractive enclosures, the aquarium, which was modernized in 1991, is one of the highlights of the exhibitions. For many years, several species, such as the white-blotched river stingray (*Potamotrygon leopoldi*) from South America or the green tree python (*Morelia viridis*) from New Guinea, have regularly been bred at the museum. In addition, a colony of honeybees can be observed by the visitors in the insect room on the first floor.

15.4 The Scientific Collections

15.4.1 Vertebrates

The collections of the natural history museum in Braunschweig amount to nearly 500,000 specimens in total. Those collections of international importance are the *ornithological* and the paleontological section.

The former is also the largest vertebrate collection of the museum with more than 62,000 specimens, 10,300 of which are eggs. This is the largest bird collection in Lower Saxony and one of the most comprehensive collections in Germany. About half of the world's known bird species are represented in the Braunschweig collection. The oldest specimens date back to the foundation of the museum in the mid-eighteenth century. Noteworthy is the high number of specimens of extinct bird species, such as great auk (*Alca impennis*), passenger pigeon (*Ectopistes migratorius*), laughing owl (*Sceloglaux albifacies*), and Carolina parakeet (*Conuropsis carolinensis*). Another rare specimen is the Faroese white-speckled raven, a color aberration of the extinct Faroese raven (*Corvus corax varius*), of which merely 26 specimens still persist in natural history collections worldwide (van Grouw and Bloch 2015). The Braunschweig specimen is probably the oldest of them and was collected before 1755.

The *mammal collection* contains more than 8000 specimens, about half of which are skulls and skeletons (not counting the bone collection from Pleistocene caves, also amounting to the thousands). The most valuable specimen is the skeleton of Steller's sea cow (*Hydrodamalis gigas*), described by famous Braunschweig scientist F. A. W. Zimmermann (1783). It is the most complete skeleton of this iconic extinct species outside of Russia.

The natural history museum keeps the only noteworthy *herpetological* collection in Lower Saxony. It comprises reptiles from all around the world. As in the other sections of the museum, the oldest specimens are from the seventeenth and eighteenth century. Among these historical specimens are, for instance, a water monitor lizard (*Varanus salvator*) from Southeast Asia and some turtles (see above). In the nineteenth century, the collection was increased by snakes gathered by J. H. Blasius in southern Europe. Around the turn to the twentieth century, further specimens from the German colony of Cameroon and from Madagascar came to Braunschweig. In addition, Fritz Grabowsky (1857–1929) collected amphibians and

reptiles on Borneo between 1880 and 1884. Among the specimens was also a new snake species, *Calamaria grabowskyi* (Fischer 1885). In recent years the collection has been enlarged with specimens from Northern Africa and the Middle East by the museum's director Ulrich Joger.

Although the smallest vertebrate collection, the *ichthyology section* has a worldwide scope. It comprises about 1700 specimens including 12 historical type specimens of five fish species collected during the German Deep Sea Expedition in 1898–1899 (Fricke 1991). The ichthyological collection originated in the eighteenth century as is evident from the first catalogue of the cabinet that was written in 1754, which mentions several unlabeled alcohol-preserved and a few dried specimens like a diodontid porcupinefish.

15.4.2 Invertebrates

The invertebrate collections are the most numerous of the museum. In total, they comprise about 200,000 insects and 100,000 mollusks and other invertebrates such as spiders.

The insect collections have a regional emphasis and were mainly acquired during the twentieth century (Hevers 2006). The oldest entomological collections in town, however, namely, those by Johann Hellwig (1743–1831) and Hermann von Heinemann (1812–1871), did not reach the natural history museum in Braunschweig but were sold to the respective institutions in Berlin and Hannover. Especially the latter collection of Microlepidoptera contained many type specimens.

The oldest parts of the malacological collection date back to the cabinets of natural curiosities of the dukes of Brunswick due to the fascinating variety in form and colors of their shells and their good suitability for long-term preservation. Hence even today, painted shells of mussels and nautilus from the seventeenth century still persist in the museum. Indigenous mollusks were mainly collected by Victor von Koch (1840–1915). His voucher specimens are important historical documents since they reflect the ecological situation 100 years ago.

15.4.3 Paleontology

Next to the bird collection, the paleontological section houses the most important collection of the museum with about 45,000 specimens. They are mainly fossil reptiles of the Mesozoic era. Another focus is Pleistocene mammal remains from the Rübeland caves in the Harz Mountains and from (Salzgitter-)Thiede only about 12 km from Braunschweig. These are the oldest paleontological specimens in the collection; some were already described in the early nineteenth century and belong to the earliest paleontological collections worldwide. In addition, one of the most

species-rich collections of fossil sea urchins in Germany belongs to the museum. About 3000 specimens were only recently donated in 2003.

Notably, the museum in Braunschweig is the first German natural history museum to conduct paleontological excavations for dinosaur fossils in Africa after World War I. The huge dinosaurs found are on display in the exhibition (see above). There are, however, also regional fossils of remarkable scientific notice in the collection. Since a few years, excavations are conducted in Cremlingen, Hondelange, and Schandelah, where well-preserved ichthyosaur remains were found.

15.4.4 Type Specimens

According to Hevers (2005), the museum houses 184 type specimens of 76 taxa. They are mostly ornithological specimens described by J. H. Blasius (Europe), W. Blasius (South East Asia), and Eugen Ferdinand von Homeyer (1809–1889; Palaearctic region), whose collection was acquired for the museum after his death. This number of original type specimens, however, represents an underestimation of the museum's holdings since more and more historical name-bearing type specimens have been discovered in recent years.

15.4.5 Infrastructure

The museum has a permanent staff of four scientists, two educators, and nine technicians. Nonpermanent positions amount to about equal numbers. Volunteers are mainly active in the paleontology department. Administration and public relations are shared with two other museums, which together amount to a staff of about 120 persons in the administrative unit "Niedersächsische Landesmuseen Braunschweig" (www.3landesmuseen.de). This is the largest museum unit in Lower Saxony, totaling more than 120 employees, an annual budget of about 8 million euros and using more than 10 buildings. The State Natural History Museum alone spreads over five buildings in town. Three of them are collection magazines. There are workshops for taxidermy and for paleontological preparation, a graphics atelier, and a 3-D scanning unit. Molecular genetic work is not done in own laboratories, but at Braunschweig Technical University. The museum has its own library and produces a scientific periodical, "Braunschweiger Naturkundliche Schriften", enabling a regular exchange with about 300 other institutions.

15.5 Scientific Research

Research is done at the State Natural History Museum in three different fields:

(A) Vertebrate paleontology. The dinosaur bones collected in Niger (see above) are still being examined, actually for pathological effects such as deformations. This is done in collaboration with the Berlin Museum für Naturkunde (Witzmann et al. 2016).
Newly discovered Jurassic fossils from the Braunschweig region such as dinosaurs, ichthyosaurs, and pterosaurs are also being studied.
The enormous collection of Pleistocene mammal bones is used for paleogenetic and paleoecological studies, in cooperation with universities and other museums.

(B) Vertebrate zoology. The current focus of research is on reptiles and amphibians from North Africa, the Middle East, and Europe. There is a collection of frozen samples which is continuously enlarged during expeditions and which is the basis for molecular genetic studies in order to reconstruct phylogenetic trees, phylogeographic patterns, and speciation processes. This is done in collaboration with the Institute of Zoology at Braunschweig Technical University and with foreign partners (e.g., Stümpel and Joger 2009; Vences et al. 2014). The large bird collection is also often in the focus of research activities, nowadays with molecular genetic methodology, too.

(C) Entomology and research on collection data base management. There is an ongoing research project led by the Braunschweig Natural History Museum but with four other nature museums as partners, all of which pursue the goal of linking their entomological collection data into a single network of metadata. This is executed with the collections of Coleoptera first. The partners are fully aware that this is the most numerous group—both in species and in individuals—the magnitude of data is the special challenge of this pioneering project. The metadata will also be accessible via GBIF.

It is a principle of the museum that scientific research and public exhibitions do not simply coexist, but one is the basis of the other. Therefore, many temporary exhibitions (on mammoths, dinosaurs, snakes, and other subjects) have been designed by incorporating own research. Visitors are thus enabled to follow up and understand the progress in scientific work.

15.6 Educational Work

Cooperation with schools is based on the pedagogic program of the museum offering diverse courses which have been designed to meet the biology curricula of different grades of schools. Materials needed for those courses (which the schools do not have) are being produced in the workshops of the museum and are designed to fit the specific requirements, respectively. This includes modern IT-based approaches.

For many schools in the region, a regular visit to the Natural History Museum is obligatory. Pupils are also accepted in the museum for executing project work.

Special teachers focus on the integration of disabled pupils and immigrants. Other programs are designed for elderly people. The programs developed for these groups are welcomed very well.

There is also a program of seminars for teachers.

The *didactic concept of the museum* is primarily based on enthusiasm which should be developed in all visitors and participants of didactic programs. This is achieved by working with original objects of nature. Esthetics play a dominant role in awaking sympathy for nature. The traditional dioramas, the aquarium, and the giant showcase in the new "discovery hall" (Fig. 15.7) mediate a positive emotional approach to biology and encourage to spend time to discover nature's secrets in its amazing details. In addition to the pedagogic team, the scientists also offer insights into their work.

As part of the "3landesmuseen", the State Natural History Museum is present on Facebook, Twitter, and Wikipedia.

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