Chapter 39
MAINZ: Paleontological Collections of the University of Mainz (Geoscientific Collections)

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39.1 Historical Background

The Institute of Geosciences (University of Mainz) hosts several paleontological collections which are widely used for teaching and research purposes. Soon after the reopening of the University in the winter of 1946/47, the *Geologisch-Paläontologisches Institut* (Geological and Paleontological Institute) was established. At that time, no geoscientific collections existed at the institute. Most of the objects in today's collections were obtained during student field trips or during designated excavations organized by the Institute.

The founder of the paleontological collections, Univ.-Prof. Dr. Heinz Tobien, worked at the Institute from 1955 until 1978 (Falke et al. 1977). With a minimum of staff and financial resources, he established the Institute of Paleontology which today is one of eleven research groups of the Institute of Geosciences. During his time at the University of Mainz, Heinz Tobien continued to excavate the Höwenegg fossil site. In addition, a wealth of fossil material was obtained from western and southern Europe, Anatolia and Iran. Fossil material from the Rhine-Main area such as Messel, Mosbach and the Mainz Basin complemented the paleontological collections. They were further expanded with specimens from the Devonian and Permian by Tobien's successors, namely Univ.-Profs. Drs. Karlheinz Rothausen, Jürgen Boy, Dietrich Berg and Norbert Schmidt-Kittler. As such the paleontological collections

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reflect the research areas of the Institute of Geosciences (new name since 1977) during more than 65 years.

In 2006, the paleontological working group transformed from a vertebrate-dominated, taxonomic and palecological research into mollusk sclerochronological research focusing on paleoclimate and paleoenvironmental reconstructions, biomineralization and analysis of resource procurement strategies of indigenous people. Under the current head of the paleontological research team, Univ.-Prof. Dr. Bernd R. Schöne, the collection increases particularly by fossil and recent shells of bivalves and gastropods.

Material of completed research projects is predominantly of scientific or documentary value, but also used for teaching purposes. Prior to 2012, the fossil preparators were responsible for the collections. Since 2012, the University of Mainz provided several positions to coordinate the 30 university collections. One of these 50% positions is held by Apl.-Prof. Dr. Kirsten I. Grimm, who curates the geoscientific collections. The concept for the paleontological collections was established in 2012.

39.2 Recent Collections

Parts of the collections can be accessed via the web portal "Museum digital Rheinland-Pfalz" (www.museum-digital.de/rlp/). The portal shows 17 objects from the paleontological collections.

The paleontological collections houses more than 33,000 objects, mostly in very good condition, but the labeling and documentation is often inadequate (old incomplete inventory books and excerpt files in Excel format containing fragmentary information). With the help of students, we have started to digitize the information and re-inventorize the material. Up to now, nearly 50% are completed.

The collections can be subdivided into invertebrate and vertebrate collections as well as collections of the Mainz Basin, fossil plants, a general fossil collection and a historical geology collection mainly containing facies objects. Osteological material used for comparative purposes and mollusk sclerochronological samples complete the collections.

39.3 The Invertebrate Collection

Only a part of the invertebrate fossil collection is inventoried. For some taxonomic groups only rough estimates can be provided at this time. For example, the **Cephalopoda collection** contains ca. 600 specimens, the **Nattheim collection** more than 500 fossils (mainly corals). 478 objects of the fossil corals of Nattheim are inventoried, but it probably contains more than 800 objects. 292 objects are recorded within the **Paleozoic Brachiopoda collection** which amounts to about 700 brachiopods. The fossil **Echinodermata collection** is completely inventoried

and contains 541 objects. The same applies to the fossil **arthropod collection** with 925 objects. The **collection of fossil bivalves and gastropods** contains ca. 4000 series and comprises a collection of Roger Rey, a French abbot and fossil hunter (Figs. 39.1 and 39.2).

39.4 The Vertebrate Collection

The vertebrate collection contains ca. 2000 **Paleozoic and Tertiary fish** specimens (Fig. 39.3). The **Pleistocene collection** mainly comprises material from the Rhine gravel and contains 793 inventoried specimens. Another 1000 specimens belong to the **Tertiary vertebrate collection** including 237 specimens from Höwenegg which are already inventoried. Material from excavations in Chios and Marageh remain unprepared. The **Mainz Basin collection** (ca. 2500 specimens) consists mainly of mollusks, but also other invertebrates and vertebrate remains. More than half of the **collection of fossil plants**—about 600 species, mainly from the Permian and Carboniferous—is also inventoried. Another ca. 1000 different fossil remains including fossil reptiles are combined in a **general fossil collection**.

Furthermore, 579 inventoried rock samples showing different types of facies and about 300 non-inventoried rocks are stored in the **historical geology collection.** The **osteology collection** consists of 700 inventoried specimens which were mainly acquired from the University of Heidelberg during the 1960s and later supplemented by professors with own material. The **sclerochronology** collection contains about 5000 samples which are (and were) used in research projects and over 120 publications in peer-reviewed journals as well as in bachelor, master and PhD theses. This collection is currently the most rapidly expanding portion of the paleontological collections (Fig. 39.4).

39.5 Infrastructure of Paleontological Collections

The paleontological collections are stored in the basement of the Institute of Geosciences distributed over nearly 140 steel cabinets. A digital image processing laboratory is available offering the possibility to study the paleontological samples with transmitted and reflected-light research microscopes as well as a scanning electron microscope.

39.6 Research

The geosciences collections are used for both research and teaching purposes. The new sclerochronological collection provides the core material for the Applied and Analytical Paleontology research team (e.g., Füllenbach et al. 2015; Holland et al.

2014; Walliser et al. 2015, 2016). However, the remainder of the large collection is used by researchers from various different fields. For example, Gerald Mayr recently investigated fossil bird remains from the Mainz Basin collection and published the data in Mayr (2015).

39.7 Educational Work

Guided tours are offered on request showing the collection facilities. Collection material is used also in projects of the *junior campus* Mainz. Some material is exhibited in the foyer of the Natural Sciences Building. Some display cases are decorated by students as part of their assignments. During these courses, they become familiarized with the inventory system and preservation procedures.

39.8 Existing Collaborations

The present curator, Kirsten I. Grimm maintains close cooperation with the Mainz Natural History Museum, the German Gem Museum in Idar-Oberstein as well as the Pollichia Museum in Bad Dürkheim.

Fig. 39.1 Fossil coral, Nattheim collection. Foto S. Sämmer

Fig. 39.2 *Glycymeris planicostalis* (Lamarck 1819), Mainz Basin collection. Foto T. Hartmann

Fig. 39.3 Mammoth tooth, Pleistocene collection. Foto S. Sämmer

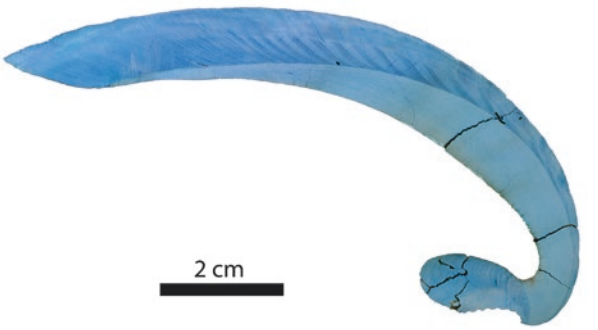

Fig. 39.4 *Glycymeris planicostalis* (Lamarck 1819), cross-section etched with Mutvei's solution, Sclerochronology collection. Foto E. Walliser

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