

# Chapter 2

## Germany's Zoological Collections: An International and Personal View on an Important Historical and Contemporary Scientific Resource

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**Abstract** Germany's zoological collections are among the oldest, most diverse, and historically most interesting natural history collections. From the perspective of three herpetologists with particular interest in taxonomy, we recount how invaluable visits to German collections have been to our own research efforts. Not only have we been able to use our findings in multiple publications, we also list examples of how we discovered new species and rediscovered specimens long thought lost, and we see in these experiences reasons to believe that many treasures in Germany's herpetological collections remain to be discovered. We also provide a brief historical overview of how Central Europe's and Germany's political structures in the seventeenth and eighteenth centuries led to a more diverse pattern for the formation of natural history collections than elsewhere, and we comment on the effects that the Second World War had on the well-being and continuity of collections. At the beginning of the twenty-first century, German zoological collections are a nexus for zoological research and a globally important scientific treasure.

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The three of us are systematists with geographically broad research interests in amphibians and reptiles, and because of this specific expertise, our knowledge of German zoological collections has a herpetological bias that informs this presentation. As in many other zoological disciplines, our research often requires the examination of reference specimens in historical zoological collections, and this has naturally involved visits to the nexus of European museum collections: Germany. We do not use the term “nexus” lightly: Germany is where the confluence of history has produced multiple zoological collections of significance that have endured despite the ravages of war and the decades-long influence of the Iron Curtain. However, while simply the age of a scientific establishment may be considered a testament to its success and longevity, it is through its place in the continuum of scientific research across the years where its importance is best documented.

German zoological collections, which generally originated as cabinets of curiosity that served as showpieces on the estates of aristocrats, wealthy merchants, physicians, or pharmacists—the wealthiest individuals in their day, with an interest in tangible oddities from nature’s stores—have had a perennial presence in the scientific panoply and have stood out in the scientific literature since at least the early 1800s. Our purpose in these brief comments is to provide a review from three “outsiders,” who have different backgrounds but share the experience of working with and in German zoological collections, with a focus on herpetology. HK is German-American who never studied in Germany but has been visiting German zoological collections and colleagues as part of his research. AMB collected data for his dissertation at the Zoologisches Forschungsmuseum Alexander Koenig in Bonn, has worked extensively on the history and type specimens of the Museum für Naturkunde in Berlin, and has visited most of the large and small herpetological collections in Germany. GRZ is curator emeritus at the US National Museum of Natural History, one of America’s most venerable zoological collections, and has six decades of experience in the curation of museum specimens; his research and travels have included several German collections. What follows is part historical review and personal history, to showcase the importance of German zoological collections to zoological research today.

One of the reasons why German zoological collections stand out in a global perspective is their diversity. There exist not only several large, “living,” and growing collections of importance, but there is also a number of smaller historical collections. Unlike the development of major collections in imperial Britain or France, for example, collection building in Germany took a different trajectory due

to the country's politically fragmented nature until unification in the late nineteenth century. As a consequence, instead of forming a single, dominant museum alongside relatively inconsequential provincial collections, Germany experienced the growth of numerous substantial collections, representing the diversity of kingdoms, principalities, and free cities.

Whereas early German collections in some cities grew in importance as a result of their location in a political power base, there are other interesting collections of historical status. Among the largest and oldest herpetological (and zoological) collections are those in Berlin, Frankfurt, and München (Munich in English), all of which are rich in type material. These collections were already important by the early nineteenth century and they eventually employed some of Germany's best and most prolific herpetologists. As the capital of a unified Germany, Berlin in particular benefited from a flood of material that arrived from the German colonial territories in the time between unification in the 1870s and the First World War. In addition, Waldenburg, a collection seeded by the seventeenth-century curiosity cabinet of the Linck family, is home to what has been considered the world's oldest surviving collection of fluid-preserved herpetological specimens (Fig. 2.1; Bauer and Wahlgren 2013; Böhme 2014). The collection in Halle, from the same time, had its origin as one of the earliest examples of a teaching collection in an instructional complex at the local orphanage.

The Second World War was a critical period in the history of German natural history collections (Crumly 1984). While the large collections survived, often through the extraordinary efforts of curators and staff, many other collections were destroyed or so severely damaged that their roles as major research centers were permanently compromised. Examples of this include the museums of Dresden, Magdeburg, Wiesbaden, and Breslau (modern Wrocław, Poland). With the partition of Germany in the Cold War era, the Berlin collection ended up in the German Democratic Republic, with no serious competition as a leading museum. However, whereas Dresden had been destroyed, the collection made a new beginning and developed once again into an important herpetological collection driven by motivated individuals, especially under the leadership of Fritz Jürgen Obst. These collections, however, were poorly known to researchers in the West, and they remained underfunded, understaffed, and underused for decades. In the West, the Senckenberg Museum, with a herpetology section given continuity and leadership by Robert Mertens, retained its prewar prestige. Other important collections, like München and Hamburg, also retained their significance. Although the university museum in Bonn was destroyed, the postwar era saw the meteoric rise of the Forschungsmuseum Alexander Koenig, previously a private, mostly ornithological collection (Böhme 2014). Under Wolfgang Böhme, the herpetological collection incorporated various other collections, including the historically rich Göttingen collection, as well as those from Kiel and Heidelberg, initiated aggressive student-driven collection growth, and has now grown to become one of the largest in Germany.



**Fig. 2.1** Specimen of *Boa constrictor* (I2013A3) from the Linck Collection in the Naturienkabinett Waldenburg. This specimen was figured in a plate by Scheuchzer in 1735 and is one of the oldest spirit-preserved reptiles in the world (see Bauer and Wahlgren 2013)

As a doctoral student, AMB came to Germany to collect data and examine types in a number of German collections, especially Bonn and Berlin. He was struck by a major difference between American and German collections. Having developed later in the nineteenth century than their German counterparts, American museums (with the exception of the Academy of Natural Sciences in Philadelphia), had mostly expanded within a context of modern, organized science, such that collections were often well studied by their collectors or by resident curators, within a short time of their arrival; as a consequence, collections grew in a relatively orderly fashion. As a result, most American collections are large by European standards, possess well-documented specimens, and provide few surprises. The murky past of older German collections, on the other hand, which often began as personal or royal collections and grew piecemeal through the early decades of the nineteenth century, continue to provide many opportunities for the rediscovery of lost types, historical specimens, and unrecognized new species.

The disruption of the Second World War imposed more significant disorder on the more orderly German collections of the twentieth century than in other parts of Europe. It was often assumed, and sometimes written (e.g., Taylor 1969; Frost 1985), that many, maybe even most, of the types in German herpetological collections had been destroyed. However, as AMB and HK discovered in Berlin, that number was almost negligible and not only hundreds of types, but even most of the foundational collection of Bloch, obtained by the museum at its inception in 1810, were still extant (Fig. 2.2; see also Bauer 1999). This sent AMB on a 30-year odyssey, exploring the oldest specimens in the collection, from skinks described by Bloch in 1776 (Bauer and Günther 2006) to geckos and lacertids collected by Pallas in his explorations of the Russian empire (Bauer and Günther 1991, 1995), to the African snakes and lizards sent to Lichtenstein by German apothecaries from the Cape region in the 1810s and 1820s (Bauer 2004). There are few collections worldwide with such a historic depth in terms of their collection.

GRZ has an entirely different perspective on German collections, rooted in a professional association with herpetological collections since 1958, beginning as a graduate student with time spent at the Florida Museum of Natural History, University of Florida (Gainesville), and the Museum of Zoology at the University of Michigan (Ann Arbor), before assuming a curatorship at the National Museum of Natural History (Washington, DC) in 1968. As a long advocate of visiting herpetological collections rather than borrowing, he has worked in the collections of most American museums at least briefly at some point in his career. His European collection sojourns began in 1975 with a visit to the Natural History Museum (London, United Kingdom), continuing with a trip to the Rijksmuseum van Natuurlijke Historie (now Naturalis; Leiden, the Netherlands) and the Zoological Collections at the University of Amsterdam. In the early 1990s, he visited German collections, including those in Frankfurt, Bonn, Berlin, and Munich, specifically to gather data for his various Pacific Islands lizard projects.

**Fig. 2.2** Syntype (ZMB 1276) of *Lacerta serpens* (syn. *Lygosoma quadrupes*), an Asian skink. The species was described by Marcus Bloch in 1776 and was part of the foundation collection of the Berlin Museum. A large number of Bloch's specimens have survived the centuries (see [Bauer 1999](#); [Bauer and Günther 2006](#))



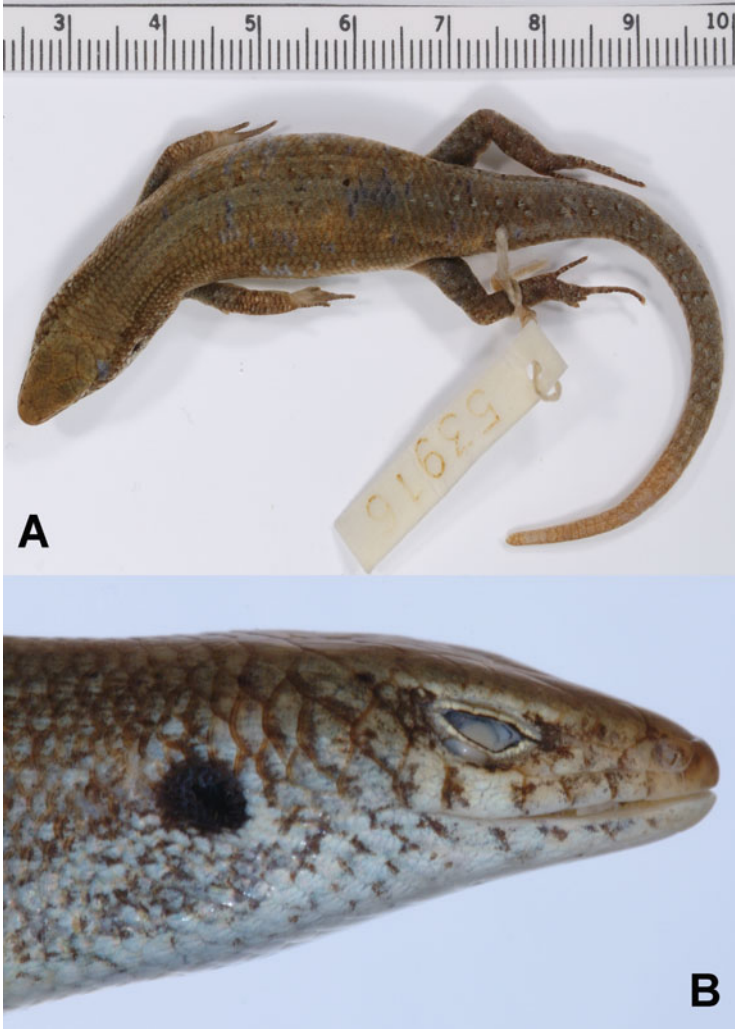
Compared to some of the work in American collections GRZ conducted, his experience with those in Germany was one accompanied by discovery and wonder. Working in research labs that carry the weight of history, tight places in historic buildings, on specimens that sometimes had lain unstudied for over a century, left a lasting, positive impression. It appeared that portions of the collections remained in a Sleeping Beauty slumber, not neglected but in stasis and awaiting renewed research activity. Remarkably, some of these collections even included guest researcher accommodations (as in Berlin and Bonn)! Beyond the age of collections, it also became apparent that many senior researchers from all over the globe began to discover the uniqueness and importance of German collections. One visit at the right time could result in lasting international collaborations.

To provide a glimpse of an extraordinary historic German herpetological collection, Berlin is a key example, and all three of us experienced it as it rose from the

ashes since the fall of the Berlin Wall in 1989. During visits in the early 1990s, we observed a mature tree growing in collapsed parts of the building and a collection that had basically retained its nineteenth-century atmosphere. Specimens were kept in the finest, made-to-order glass-stoppered bottles, identified only by labels floating on the inside or glued to the outside—but not attached to the specimen. Many specimens were in jars they obviously did not belong to, a remnant of the time when specimens from broken bottles simply needed to be saved in a wartime hurry. The collection catalog was still handwritten, with continuity since the earliest entries in Wilhelm Peters's finely inked cursive. In the old cellars, hundreds of plaster-covered fossils remained untouched since their arrival, some perhaps a century or more earlier. And nighttime security was provided by guards with three Doberman pinschers, which made for adventurous evening encounters for late-working visiting researchers billeted in the basement guest quarters. Today, the Museum für Naturkunde is a modern facility, whose herpetological collection is kept in an astonishing glass-walled facility amidst the public displays of the museum, a giant testament to German collections of yesteryear and their relevance today.

HK's appreciation for German herpetological collections is not native but was brought on by the need to examine historical specimens from the Caribbean. This led him and AMB to an as-yet unpublished listing of several hundred "lost" amphibian types and generated in him a fondness for a different type of "fieldwork," removed from the outdoors yet essentially just as productive when it comes to making discoveries. Lately, our collective museum "fieldwork" has led to the discovery of several new reptile species, from as far afield as the outer reaches of the Indonesian archipelago (Fig. 2.3; see Zug 2010), some from areas that nowadays may no longer be able to support wildlife.

There is no doubt that the last decade has seen an encouraging renaissance when it comes to the upgrading and use of German herpetological collections. And, with Snow White now fully awake, the true value of the collections is only now becoming apparent. Not only has type material been located and cataloged, it happens with some frequency that we find the unexpected in some of the older collections. Recent work in Berlin, Frankfurt, Dresden, and Munich has led to the discovery of several new species, as well as the rediscovery of valuable type specimens that had been considered lost (e.g., Fig. 2.4). Even with a concerted effort by curators and researchers over the years, the size and variety of German herpetological collections are still being unveiled. The inescapable conclusion is that in some of the world's oldest collections, there is still much that can be discovered and needs to be evaluated. As we strive to gain a more complete knowledge of the globe's zoological diversity, preservation of these collections, and especially their modernization and use, is imperative not only for the thousands of specimens but especially for the protection of the biodiversity they represent.



**Fig. 2.3** A recently described species of four-fingered skink, *Carlia nigrauris* Zug, 2010 from Tinjil Island, off the coast of Java, Indonesia. GRZ discovered specimens of this form in the Senckenberg collection, where they had been accessioned some four decades earlier. Robert Mertens, curator of herpetology at the museum at the time of their arrival, had recognized the uniqueness of these specimens in his 1957 report on the West Javan herpetofauna (Mertens 1957) but decided not to describe them owing to his limited knowledge of *Carlia* morphological variation. (a) Dorsal view of the body and (b) lateral view of the head of the holotype of *C. nigrauris* (SMF 53916)





**Fig. 2.4** Holotype (ZMB 2583) of *Coluber irregularis* (= *Boiga irregularis*). This specimen was originally part of the collection of Willem Janssen and had been studied by the famous zoologist Blasius Merrem at Marburg. It eventually reached the Berlin Museum in 1818. Despite being a common, widespread species as well as an important invasive species, its presence in the Berlin collection was not recognized until 2013 (Bauer and Günther 2013) (Photo: © with Frank Tillack)

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