Figure 1. Naturhistorisches Museum, Vienna

A visit to the Vienna Museum with a brief history of the tachinid collection

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Introduction

Emperor Franz Josef I of Austria signed a decree on 20 December 1857 ordering the demolition of the old fortifications around the inner city of Vienna. The empty space created would be developed into the *Ringstrasse*, a grand boulevard along which troops could be moved quickly, if the need arose. The Emperor envisioned the *Ringstrasse* to be lined with the finest buildings imaginable, built in the Historicist style. He authorized the construction of museums and palaces, the Rathaus (City Hall), Parlament, Staatsoper (Opera House), and other famous buildings, interspersed with parks, statues, and fountains.

Today in a prominent position along the *Ringstrasse* is Maria-Theresien-Platz, a large square with two magnificent museums facing each across its manicured expanse. The museums are mirror images of each other: on the east side is the Kunsthistorisches Museum (Art History Museum) and on the west side is the Naturhistorisches Museum (Natural History Museum). The latter of these was my destination when I traveled to Vienna in late August 2012. But before I get to the purpose of my trip, I will give a brief history of the museum and its Tachinidae collection.

Naturhistorisches Museum

Construction of the Naturhistorisches Museum (Fig. 1) was overseen by famous German architect Gottfried Semper and lesser known Viennese architect Carl von Hasenauer. Work began in 1871 and conflict soon developed between the architects. This stressed relationship continued until the death of Semper in 1879, after which Hasenauer took over completion of the museum on his own. The exterior was finished in 1881 and then the interior in 1884. For another five years the museum remained closed as collections and displays were moved into their new quarters. Finally, on 10th August 1889, the Emperor himself presided over the grand opening of the Naturhistorisches Museum. Coincidentally and with less fanfare (at least outside the dipterological community), Friedrich Brauer and J. Edler von Bergenstamm of Vienna had just published a few months earlier the first of four parts on the Muscaria Schizometopa in their series *Die Zweiflügler des Kaiserlichen Museums zu Wien* ("Diptera of the Imperial Museum in Vienna"). Quite possibly the two dipterists were in attendance on that day in August when the Emperor officially opened the museum. Brauer had waited many years to move into his new office and continue his Diptera research within such grand surroundings. There could be no doubt as to the purpose of the museum for this was indelibly inscribed over the main entrance: "Dem Reiche der Natur und seiner Erforschung" ("For the Realm of Nature and its Exploration" – Emperor Franz Josef I, 1881).

Diptera collection of NHMW

The scientific collections now housed in the Naturhistorisches Museum (hereafter NHMW, regardless of the physical location of the insect collection through history) were started in the mid 1700s by Emperor Franz I Stephan, who had a keen interest in natural history. The insect collection grew slowly through the purchase of private collections and the funding of expeditions to distant lands. In 1848 a fire in the Imperial Library of the Hofburg Palace, where the insect collection was then kept, was started during the bombardment of Vienna in the Revolution of that year and much of the collection was destroyed. Among the Diptera lost were some specimens Meigen had borrowed, described, and returned (Herting 1972, Pont 1986). Fortunately, a large collection of insects accumulated during a long expedition to Brazil (1817–1836) was housed elsewhere and is still extant.

The insect collection of Wilhelm von Winthem (b.1799–d.1847) was purchased by NHMW in 1852. Winthem was a wealthy businessman and amateur entomologist who lived in Hamburg, Germany. He bought specimens from all over the world and built up the finest Diptera collection then in existence (Hagen 1844, Pont 1986, 1995). Both Johann W. Meigen (b.1764–d.1845) and Christian R.W. Wiedemann (b.1770–d.1840) described species from the Winthem material, with Meigen publishing on European Diptera (e.g., Meigen 1818–1838) and Wiedemann on exotic Diptera (e.g., Wiedemann 1828–1830). Meigen's collection was later sold to the Paris Museum but some types also stayed in the Winthem and Wiedemann collections. After Wiedemann's death his insect collection was purchased by Winthem. Winthem's collection was subsequently sold to NHMW after the death of its owner. The well-known tachinid genus *Winthemia* was named in Winthem's honour by Robineau-Desvoidy (1830: 173) when Winthem was still a young man.

Aldrich (1924, 1925a, 1925b, 1927) redescribed some of Wiedemann's New World species in his series on the "American muscoid Diptera in the collection of the Vienna Natural History Museum". Herting (1972) reported on the Meigen types of European Tachinidae in NHMW and Paris Museum.

A famous Austrian expedition to circumnavigate the world in the frigate *Novara* began in 1857. By the time the ship returned in 1859 it had visited such places as Brazil, Chile, South Africa, India, China, Australia, New Zealand, and Tahiti. The vessel returned with about 26,000 zoological specimens and these added considerable research value and national prestige to the expanding collection. Schiner (1868) published on the Diptera collected during the *Novara* voyage.

Two valuable collections containing Tachinidae were bequeathed to the Museum upon the deaths of Austrian dipterists Johann N.G. Egger (b.1804–d.1866) and J. Rudolph Schiner (b.1813–d.1873). Egger described about 40 nominal species of Tachinidae, all from Europe and primarily from Austria. Schiner published a number of important works but is best remembered for his Diptera contributions to *Fauna Austriaca* (Schiner 1860–1864) and his descriptions of exotic Diptera collected during the *Novara* voyage (Schiner 1868). Schiner described about 60 nominal species of Tachinidae. Aldrich (1925a, 1925b, 1927) redescribed a few of Schiner's New World species and Herting (1974) reported on the European tachinid types of both Egger and Schiner.

Friedrich M. Brauer (b.1832–d.1904, Fig. 2) was born in Vienna and lived most of his life there (Handlirsch 1905). He was interested in natural history at a young age and first became acquainted with professional entomologists as a teenager. He was hired by the Museum in 1861 as curator of the Mollusca collection, a position he held for 16 years. During this time he also studied insects, especially Neuroptera and Oestridae. In the early 1870s he completed studies towards a medical degree in order to qualify for a University appointment. He subsequently became a University professor and taught insect courses. He was appointed curator of the Museum's insect collection in 1876 and began devoting more time to the study of the rich Diptera collection (e.g., Brauer 1880). Brauer (1863) is credited with the division of the Diptera into Orthorrhapha and Cyclorrhapha (e.g., McAlpine 1989), and his detailed study of insect classification (Brauer 1885) has been hailed recently as a "substantial pioneering application of evolutionary thought to hexapod classification" (Engel & Kristensen 2013: 603). Interestingly, Brauer's contemporary, C.R. Osten Sacken, was no more enamoured with Brauer's ideas on classification than was Brauer with Osten Sacken's system of chaetotaxy (Osten Sacken 1903, Alexander 1969).

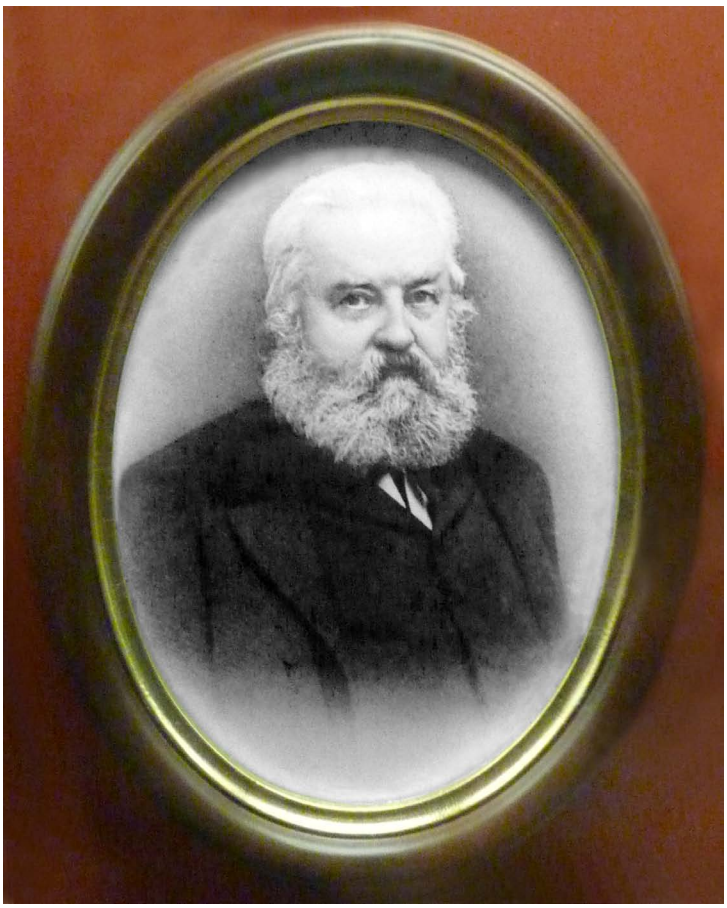

Figure 2. Portrait of Friedrich M. Brauer on display in NHMW.

Brauer began publishing his most ambitious work, *Die Zweiflügler des Kaiserlichen Museums zu Wien*, in 1880. This series eventually ran to seven volumes, the last four involving the Tachinidae and co-authored with J. Edler von Bergenstamm (b.1837–d.1896) (Brauer & Bergenstamm 1889–1895). Bergenstamm had an interest in entomology and developed a particular fondness for Diptera through his friendship with Schiner and Brauer (Brauer 1896). Bergenstamm was freed from the necessity of working for a living after receiving a generous inheritance. With time on his hands, he began to seriously pursue the collection and identification of flies. Thus began the collaboration between Brauer and Bergenstamm to coauthor four volumes of *Die Zweiflügler des Kaiserlichen Museums zu Wien* on the "Muscaria Schizometopa (exclusive Anthomyidae)" (Brauer 1896). Bergenstamm died the year after publication of the last volume of this large work and his collection was bequeathed to the Museum. Brauer was appointed head of the Museum's Zoological Department in 1898 and became director of the Museum sometime before his death in 1904.

Brauer and Bergenstamm's (1889–1895) *magnum opus* was met with mixed reviews. As a world treatment of a large and taxonomically difficult group, it was a tremendous achievement. It was well received by Townsend (1908), in part because the authors favoured a restricted view of genera as did Townsend. However, Wainwright's (1928: 140) view of the work was more popular among dipterists:

> "Unfortunately it has proved extremely difficult to utilise much of the information contained in this important work, owing to the complicated and confused manner in which it has been presented. It has, however, revolutionised the study of the group, owing to the attention called to many characters previously overlooked, and in particular those afforded by the head, its shape, and the relationship of the different parts, and its chaetotaxy. ... They, however, failed lamentably in their attempts to arrange the genera into larger groups, and never seem to have had any real grasp of the main lines upon which the classification of the family should proceed. In fact, although they added greatly to our knowledge, they failed to reduce that knowledge to order."

Villeneuve (1907) and Herting (1974) reported on the Brauer and Bergenstamm types of European Tachinidae in NHMW. Aldrich (1924, 1925a, 1925b, 1927) redescribed a number of Brauer and Bergenstamm's New World species. Brauer, or Brauer and Bergenstamm, described close to 250 nominal species of Tachinidae, with about 140 still valid today.

Josef Mik (b.1839–d.1900) was a teacher and respected dipterist leaving in Vienna. He described only about a dozen tachinid species but he amassed a considerable Diptera collection. This collection, consisting of 40,000 specimens, was purchased by NHMW after Mik's death (Contreras-Lichtenberg 2003).

French medical doctor Joseph Villeneuve (b.1868–d.1944) also has tachinid types in NHMW. Villeneuve was a prolific amateur dipterist who described close to 500 nominal species of Tachinidae (most still valid today) over a span of 45 years. He published a couple of influential papers on relationships among Oestroidea (Villeneuve 1924, 1933), but most of his papers were short and consisted of isolated species descriptions. He rarely published keys and even in an age when holotypes were routinely designated, he was lax in the recording of type data and depositories. Villeneuve's types are spread among many museums throughout the world. He visited NHMW at least once (Mesnil 1950) and very likely borrowed material and worked on it at his home in Rambouillet, France.

Figure 3. Peter Sehnal, current curator of Diptera.

Figure 4. Portion of Diptera collection.

My visit to NHMW

The current Diptera curator at NHMW is Peter Sehnal (Fig. 3). He kindly arranged accommodation for me in one of the Museum's guest rooms in the MuseumsQuartier across the street from the Kunsthistorisches and Naturhistorisches Museums. I was given space in an office next to the Diptera collection, a microscope, and an internet connection via the Museum's network. The Diptera collection is housed in a long room with a high painted ceiling and intricate crown mouldings. This ornate setting is in contrast to the modern compactor system that fills the room with row upon row of open shelving and glass-topped insect drawers (Fig. 4). Opening into this room are staff offices with high windows facing northwestward, offering natural light and a view of the Vienna skyline.

The Diptera collection is in various states of curation depending upon the family. The Tachinidae have been moved into foam-bottomed trays and neatly arranged by region and taxon. There are about 150 drawers, with about

2/3 devoted to the Palaearctic Region. Drawer numbers for the other regions are as follows: Neotropical, 20; Nearctic, 7; Afrotropical, 5; Australasian, 3; Oriental, 2; and unsorted about 10. In total this Tachinidae collection is not huge, but what it lacks in size is made for by its historical value and especially its abundance of name-bearing types.

Early authors (and even some later ones!) did not always mark their type specimens in collections in a manner that would permit their easy recognition later on. Thus, it has often fallen on resident curators and visiting specialists to sort out the types in a collection. Some years ago Peter Sehnal worked through the Neotropical tachinids in NHMW, determining the type status of specimens and drafting an unpublished document on the name-bearing types. This tedious work remains to be done for much of the rest of the tachinid collection.

My goals in visiting NHMW were twofold: (1) to locate, photograph and take data from name-bearing types of Afrotropical species for a catalogue of the Tachinidae of the Afrotropical Region that I am preparing with Pierfilippo Cerretti and Monty Wood, and (2) to do the same for as many additional tachinid types as possible, especially for New World species that are possibly misidentified. This second goal was in support of an ongoing project to database the names, types and distributions of world Tachinidae. I had from August 27th to September 7th to accomplish these goals. Little did I realize that the first goal would take most of my time.

I will confine myself here to the types of Afrotropical Tachinidae. I had a list of what I expected to find in NHMW: the name-bearing types of close to 40 nominal species. With only five drawers of Afrotropical Tachinidae to check, I thought I could work through my list in a matter of days – or the first week at most.

I began by working through the trays one by one. For each potential type I would check the specimen data against the information given in the original description. Ideally, one likes to see a data label with locality, date, and collector and a separate type label. Not surprising, older specimens usually bear a more cryptic combination of the desired information. There can be non-type specimens labelled as types and types without type labels. An hour can quickly slip by just deciding upon the status of a specimen; another hour might pass if an explanation about a tricky type situation must be written. After I verified each type I would photograph the labels as a group and take pictures of the specimen from several angles. I used the same lighting system as described for my online TachImage Gallery (http://www.nadsdiptera.org/Tach/Tachgallery/Tachgallerymethods.htm). The camera was a Sony NEX-C3 with a 30mm macro lens mounted on a mini tripod; not a professional camera but very portable. Images were then transferred to my computer and renamed according to species, author and type status. Copies of all images were left with Peter Sehnal.

My search for types of Afrotropical Tachinidae in NHMW can be summarized as follows by author and number of species (in brackets): Villeneuve (14), Wiedemann (7), Brauer and Bergenstamm (7), Bischof (3), Schiner (3), Curran (1), and Karsch (1). Names are not given here but all of them and associated type information will be published in the upcoming catalogue of Afrotropical Tachinidae (2014?).

I will conclude with some information about the labelling of types. Some labels were at first somewhat perplexing but with help from Peter and by reading through original descriptions I began to make sense of them. The old labels are undated but understanding the information on them can often set a date, or sometimes a minimum date, and thus help in determining whether a specimen is a type. I missed some types on my first pass through the Afrotropical drawers that I found on a second pass when I looked more carefully at all labels.

Figure 5. *Alophora capensis* Schiner.

***Alophora capensis* Schiner, 1868** [currently *Phasia nasuta* (Loew)] (Fig. 5). Schiner (1868: 337) described this species from "Ein Männchen vom Cap der guten Hoffnung" ["One male from Cape of Good Hope"]. The work of Schiner (1868) dealt with specimens collected during the voyage of the frigate *Novara*, 1857–1859. Although the specimen in Fig. 5 does not bear a type label (which in similar cases was

often added years later by someone else anyway), all data is consistent with this specimen being the holotype: the description fits the specimen, it has been labelled as *capensis* by Brauer and Bergenstamm, it was collected on the *Novara* voyage, and the locality is "Cap" (short for "Cap. b. sp." or "Cap Bonae Spei" = Cape of Good Hope, South Africa). Neither Peter nor I could determine with certainty the meaning of the capital "D" on the pink label; a similar label accompanies the other two Schiner (1868) types I examined. Perhaps it simply stands for "Diptera".

***Gonia bimaculata* Wiedemann, 1819** [currently valid] (Fig. 6). Wiedemann (1819: 25) described this species from an unspecified number of females from "Prom. bon sp. Decbr." (Latin for "Promontorium Bonae Spei [= Cape of Good Hope, SA], December"). Bernt W. Westermann collected at Cape of Good Hope prior to 1817. Most of the Westermann material studied by Wiedemann is in the Natural History Museum of Denmark in Copenhagen but this specimen must have stayed in the Wiedemann collection (which was purchased by Winthem, whose collection in turn was purchased by NHMW, as explained above). The "Typus" label is written in Villeneuve's hand on his distinctive blue paper and thus was added much later. The specimen is properly regarded as a syntype because there is a possibility that other type specimens exist.

Figure 6. *Gonia bimaculata* Wiedemann.

Figure 7. *Tachinomima expetens* Brauer & Bergenstamm.

***Tachinomima expetens* Brauer & Bergenstamm, 1891** [currently *Linnaemya longirostris* (Macquart)] (Fig. 7). This species was described by Brauer & Bergenstamm (1891: 79) from at least one male and one female from "Cap. b. sp." ("Cap Bonae Spei" = Cape of Good Hope, SA). This male from "Cap." appears to be an original syntype. There is also one female in NHMW that appears to be an original syntype. They are both from "Coll. Winthem", meaning they belonged to the Winthem Collection that was purchased in 1852. Townsend (1939: 215) cited a "Ht male" from Cape of Good Hope in NHMW and I regard this statement as a lectotype fixation for the male specimen shown here.

Figure 8. *Eupododexia festiva* Villeneuve.

***Eupododexia festiva* Villeneuve, 1915** [currently valid] (Fig. 8). Villeneuve (1915: 201) described this species from two males collected by Sikora from Andrangoloaka (Madagascar). The single male in NHMW bears Villeneuve's blue label with neatly handwritten data. Villeneuve would frequently label some but not all syntypes as "Typ."; he did not use "Typ." in the same sense as a holotype (or at least not consistently). Townsend (1938: 335) cited a "Ht male" from Andrangoloaka in NHMW and I regard this statement as a lectotype fixation for the male specimen in Fig. 8. The other male in the type series is in the Canadian National Collection of Insects in Ottawa.

Figure 9. The author enjoys a Sacher-Torte and glass of Austrian beer at Hotel Sacher after a day at the Museum.

Final Note

I was advised by colleagues to sample an original Sacher-Torte before leaving Vienna. I accepted this advice (Fig. 9) and here pass it along to other visitors. It is written on the Hotel Sacher website that the "Original Sacher-Torte has been the most famous cake in the world since 1832". I wonder if Egger, Schiner, Brauer and Bergenstamm all partook of this delicacy at Hotel Sacher more than one hundred years before I did?

Acknowledgements

I am especially grateful to Peter Sehnal for helping me with my travel arrangements, providing full access to the NHMW tachinid collection, and otherwise making my visit as memorable and successful as possible. Monty Wood passed along information and advice about the collection and its holdings based on his prior visits, and kindly commented on a draft of this article. Shannon Henderson also read and commented on an earlier draft.

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