

A full agreement was also found in Tenthredinidæ, Vespidæ and Apidæ—the Honey-bee (*Apis mellifica*) being the species particularly examined in the latter family. In the case of the latter two families the terminal seventh and eighth segments and parts of ovipositor with supports are entirely enclosed and concealed in the so-called terminal sixth segment, which forms a sort of hood or cloaca over them.

We may naturally expect, therefore, to find this structure of ovipositor to be uniform in the Hymenoptera, and it is the writer's intention to study and figure these parts in representatives of all the families of this order for some future paper.

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Professor Riley remarked on the homology of the parts described, stating that he had given the subject considerable attention in earlier years. The parts figured indicated, he said, very clearly the nine joints and subjoints of a typical insect abdomen.

The paper was also briefly discussed by Messrs. Howard and Ashmead.

Mr. Ashmead presented a paper, of which he has furnished the following abstract :

#### THE INSECT COLLECTIONS IN THE BERLIN MUSEUM.

BY WM. H. ASHMEAD.

The Royal Berlin Museum, or "Königliches Museum für Naturkunde zu Berlin," is a large, substantially built, stone, fireproof building, three stories high, and occupying nearly a square of ground, situated on the north side of Invaliden Strasse, almost diagonally opposite Louisen Strasse and the Neuer Thor.

The style of architecture is not remarkable except for its simplicity and good taste. The building is situated some distance back from the street, with a small flower garden in front, with plaster or cement walks, and separated from the street by a high iron-railed fence, the entrance being through three large iron gates, one in the middle and one on each side. At the right side of the Museum is a High School, at the left the Geological and Mineralogical Institute, the back portion of the Museum extending back of both of these buildings in the form of wings, the left wing being occupied by the Zoological Institute, under the direction of Dr. Schulze, the right wing by offices, a library, laboratories, and the insect collections.

Naturally, the Museum is well filled with Natural History specimens usually found in such places: stuffed animals, birds, alcoholic specimens of fish, reptiles, and amphibia, and mineralogical, geological, paleontological and ethnological specimens, *et cetera*, and those interested in such things will find here one of the largest collections in the world, but which I cannot treat of here, as the object of my paper is to give some idea of the insect collections.

The Director of the Royal Berlin Museum is Prof. Dr. K. Möbius, a distinguished savant, a good manager, and a most amiable and agreeable gentleman, who, after reading my letter of introduction from Dr. Riley, showed me every possible attention and virtually placed the collection at my disposal. He introduced me to the custodian, Dr. Karsch, and his assistant, Dr. Kolbe, and I was at once admitted to the collections *ad libitum*.

The insect collections are contained in two large, well-lighted rooms, each 86 feet long by 53 feet wide, on the second and third floors in the left hand wing of the building; the one on the second floor being for the display collection for the public, arranged according to the different orders, in large glass show cases, in which are displayed some of the larger and more showy exotic insects, somewhat similar to the display collection in our National Museum. On this floor, contiguous to this collection, are the office of Dr. Möbius, the library, and the offices of other officials.

The systematic collection, the offices of the custodian Dr. Karsch, his assistant Dr. Kolbe, and others are on the floor above, and to which no one is admitted without special permission. The room occupied by the systematic collections in the different orders, contains several hundred thousand specimens, and one can imagine my wonder and delight on viewing, for the first time, so large and wonderful a collection of exotic insects.

Down the center of this room is a row of pillars against which are built, a short distance apart, iron show cases with large glass doors, in which are shelves of thick glass, upon which is placed the biologic and alcoholic material, viz., lepidopterous, coleopterous, dipterous larvæ, pupæ, eggs, etc.; also, the collections of Arachnida (spiders and scorpions) and the Myriopoda. They certainly make a beautiful display on the glass shelves.

On either side of these cases are the wooden cases containing the systematic collections, arranged in the following order:

Right side—Lepidoptera, Hymenoptera, Diptera, and Hemiptera.

Left side—Coleoptera, Neuroptera, and Orthoptera.

All are arranged in the same size drawers, about 50 by 21 centimetres, or about the size Dr. Riley has adopted for the

arrangement of the Lepidoptera in the National Museum, only they are much more cheaply made, being of white pine, and costing, with glass cover, but five marks (\$1.25).

The Lepidoptera begin with the *Papilionidæ* and end with the *Tineidæ*, and fill many hundred cases, the species being from all parts of the world; those from Madagascar, Africa, and Brazil being especially handsome and the most gorgeous I have ever seen.

The collection had been greatly increased recently by the Peter Maassen collection, valued at several thousand dollars. It contained many rare North American species, besides all the types described by Maassen and Weyner in their recent beautiful work, "Lepidopteren gessammelt auf einer Reise durch Colombia, Ecuador, Peru, Brasilien, Argentinien und Bolivien in den Jahren, 1868-'77, von Alphons Stübel."

The Hymenoptera are well represented, except in the families *Chalcididæ* and *Proctotrypidæ*, although I found some very interesting forms among them. All of Klug's types are here, and many from Westwood, Haliday, Walker, Förster, and others.

I saw a ♀ *Dichthadia glaberrima* Gerst. pinned with a ♂ *Dorylus*, evidently captured *in coitu*, and proving these are sexes of the same species. *Dichthadia* is a large wingless ant, not unlike *Thynnus*, and I think the females of our *Labidus* will yet be found to be something similar, and not the female ant *Eciton*, as suggested by Dr. Mayr.

Two species of the genus *Megalyra* seen here and described from New Holland, lead me to differ from the authorities in placing it with the *Evaniidæ*. It appears to me to be a Braconid, exhibiting strong affinities with the *Oryssidæ*.

Among the unnamed material in the *Chalcididæ* and *Proctotrypidæ*, it was my good fortune to recognize some very rare and interesting species, only a few of which can be mentioned here.

I found *Chalcis denticornis* Fonsc. placed as the ♀ of *Hippota pectinicornis* Labr., recognized *Thysanus ater* Hal., *Tetracnemus diversicornis* Westw., and *Hybothorax Graffii* Ratzeb. *T. diversicornis* Westw. has not before been reported on the continent, while *H. Graffii* Ratz. is not in the British Museum. Kirby, in speaking of the genus *Hybothorax*, in his revision of the subfamily Chalcidinae, says:

"Further observations are much wanted on this curious genus, which is parasitic on Myrmeleon; the peculiar form of its metathorax might appear to indicate some affinity to *Dirrhinus*, but it is difficult to form any opinion in the absence of either specimen or figure." The genus is, however, nearer to *Halticella*, but is easily distinguished from it by the lateral

projections of the metathorax, *the unusually short tarsal joints* and in venation; *the submarginal vein is clavate* and does not reach the costal edge; the marginal vein is therefore absent.

Another rare Chalcid which I was charmed at discovering was *Eunotus cretaceus* Walk. Walker described it in the Entomological Magazine (vol. ii, p. 298) and placed it with the *Pteromalinæ*. Ratzeburg in Forstinsecten, Band iii, p. 227, 1852, redescribed it under the name *Tritypus areolatus*, from a specimen reared from a Coccid on *Salix aurita*. Förster, in his Entomologische Studien, 1856, ii, p. 63, rechristened it under the name *Megapelle*, as the name *Eunotus* had been given previously by Dejean to a genus of beetles, and briefly described what he supposed was a new species under the name *Megapelle nigridavus* reared from *Coccus vitis*. Sixteen years later (1872) Walker in his Notes on Chalcididæ, pt. v, p. 100, restores the name *Eunotus*, and briefly dismisses the subject by saying: "*Megapelle* Först. is another name for *Eunotus* which has also been named *Tritiphus* and is an example of a small but distinct family."

After a careful study of the species I have arrived at a different conclusion from these authorities. I believe there is but a single species, and it is neither a Pteromalid nor the type of a new family but falls naturally in the subfamily *Aphelininæ*, although in its cephalic, antennal and scutellar characters it shows a strong affinity with the Encyrtinæ. It is a closely connecting link between these two groups with the antennæ of an Encyrtid, but with the weak middle tibial spur and the mesonotal furrows of an Aphelinid.

Förster evidently saw its relationship to this group and probably excluded it only because it had 11-jointed antennæ for he remarks: "Nicht blos die elf-gliedrigen Fühler sondern auch die Kopf und Hinterleibsbildung geben ihr ein eigenthümliches Gepräge. Der ganze Habitus erinnert nicht un- deutlich an *Agonioneurus* Westw. (= *Myina* Nees)."

Walker also as early as 1847 (Annals of Mag. Nat. Hist., p. 229) said that it was allied to *Choreius ineptus* Dalm. and *Encyrtus eucopiformis* Kollar.

At some other time I shall probably give additional notes on the Hymenoptera.

Just behind the Hymenoptera are the Diptera, all well arranged and containing many thousand named species, as well as a large amount of new and unworked material awaiting the specialist.

The Hemiptera, except in three or four families, are badly arranged, and a large portion is still unnamed, especially in the Homoptera. Dr. Karsch is making strenuous efforts to bring all into systematic order, but with his other work it

moves on slowly. He has arranged the *Cicadidæ* and *Fulgoridæ*, and these giants of the order make a most beautiful display; some of the tropical forms being really superb. The collection contains over 600 species of Cicadas.

On the opposite side of the room the cases begin with the Coleoptera, and they take up more room than the Lepidoptera. They are entirely under the care of Dr. Kolbe, are well arranged and determined, and in the number of the species lead all the orders, there being over 50,000 species. The most attractive were the longicorns, in which the collection is exceedingly rich. Dr. Horn had recently added to the collection by donating a large series of his types.

Next to the Coleoptera are the Neuroptera, and as this was the first large collection of this order I had ever seen, it was particularly attractive, the African forms being especially fine and showy. It is inexplicable why we have so few students of this order in America.

These were followed by the Orthoptera, and to thoroughly appreciate the great complexity of forms in this order one must visit the Berlin Museum, where unique forms are brought together from all parts of the world, monsters of deformity and no doubt of depravity.

All the families are well represented, especially in the *Phasmidæ*, *Mantidæ*, *Acrididæ*, and *Locustidæ*. There are pretty Katydid with ocellated hind wings, cockroaches from Africa that strikingly recall the fossil trilobites, grasshoppers that look as though a big spider (*Gasteracantha*) were being carried about on their backs, and other oddities that would require a Scudder or a Bruner to describe.

It would pay any one to visit the Museum, and I regret I have not a more facile pen to describe the wonderful richness of the collections.

In conclusion, I give below the number of species in the different orders in the Museum as furnished to me by the custodian, Dr. Karsch :

Lepidoptera .....	30,000
Coleoptera .....	50,000
Hymenoptera ..	25,000
Diptera.....	16,000
Orthoptera.....	10,000
Hemiptera .....	10,000
Myriopoda .....	2,000
Arachnida.....	8,000
Total .....	15,100