

## Beetle Bits: A Day With Tomorrow's Entomologists

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If there's one thing that insect collectors enjoy doing more than working on their collection, it's showing it off to other people. Say what you want about its importance, either to the individual who assembled it or to the larger scientific community, an insect collection seems almost without purpose unless it can be viewed and appreciated by others. Of course, not everyone enjoys looking at insect collections, just as not everyone enjoys looking at collections of paintings, cars, or Hummel figurines. But there is one group of people who almost universally find insect collections fascinating beyond words—children! I learned this early on in my career, long before I became a parent, from nieces and nephews, my friend's children, and so on. It wasn't long before I was accepting invitations from local elementary schools to show my collection and talk about insects to the students. Although it took me a while to get used to being called "Mr. MacRae" (parenthood was still many years in the future for me), I've always enjoyed these sessions as much, I think, as the children, seeing the looks of awe, incredulity, and absolute delight on their faces as I show them different insects and tell stories about how they live. More than just an opportunity to show off my collection, I see these as valuable "outreach" opportunities that can help promote an appreciation for entomology in particular and for science in general.

Recently, I had an opportunity to do a series of presentations at Babler Elementary School in Wildwood, where my older daughter, Mollie, is in 2<sup>nd</sup> grade. Mollie is fascinated with insects (and, indeed, the entire natural world!), and while it's hard to discount my influence, I truly believe this interest would have developed regardless of whether her father was an entomologist or not. As a result, she has always been more than anxious for me to talk to her school classes, Brownie Troop, etc. She was ecstatic when her teacher asked me to present this year not only to her class, but to the entire 2<sup>nd</sup> grade class (six classes total, each with 20-25 students). I was more than happy to do this, since second-graders are one of my favorite age groups to talk to—old enough to behave, pay attention, and understand compli-

cated words like "thorax" and "metamorphosis," but still too young (usually) to be shackled by preconceptions about insects being "gross" or feelings of being "too cool" to be interested. Since they are still rather young, it's important to include close-up visual and hands on experiences in the presentation, so with this in mind, we decided I would do three sessions—each to two classes combined. This would keep things small enough to allow me to move through the class and allow the children to see and touch things as I spoke. Mollie was assigned the task of introducing me before each session, which she did so ever so proudly (I'm anxious to see if this remains the case once she enters Middle School!).

I believe the best way to teach children about insects is to not only show them insects that are visually striking, but to also tell stories about them—how they live, what makes them unique, why they're important in nature. When there's a story to go along with it, children are much more likely to remember the insect and what they learned than if they had just seen the insect alone. For example, a favorite prop of mine is a drawer containing two enormous beetles called *Megasoma actaeon*. This beetle is a member of the family Scarabaeidae (scarab beetles) and lives in the Amazon rain forest, where I was fortunate enough to visit some years ago with Phil Koenig. It is perhaps the largest beetle species in the New World—only the Goliath beetles of Africa are larger—imagine an insect the size of a child's fist and weighing more than a mouse! One of the beetles in the drawer is a male, a huge beast armed with vicious-looking horns on its head and thorax. The other is a female, much smaller than the male, rougher in appearance, and lacking any evidence of horns. First, I ask the children whether the two beetles are the same kind or not—they usually think they're not. Then I ask them if they think they're dangerous or not—they usually think they are! Then I explain to them that they are the same kind of beetle, but that only the males have horns. They use them to "wrestle" with other males in a sort of "king of the mountain" game, only in their case the "mountain" is a rotten log. If two males try to get on the same log, they use their horns to try to pry each other off. The winner gets to stay on the log and "have babies" with a female who gets on

the log—I gloss over the “having babies” part pretty quick with second-graders! The babies then feed inside the rotten log, eventually growing up to be adult beetles who fly off to find their own rotten log. The students learn several things here—an introduction to insect life cycles, the concept of sexual dimorphism and behavior, the role of an insect in the natural cycle of a tree, and—most importantly—that fearsome appearance does not necessarily make an insect dangerous to people. It’s an interesting story to the children which, combined with the visually stunning appearance of the beetles, they are unlikely to forget.

Another display I like to use is a drawer filled with different kinds of moths and butterflies. In addition to teaching children about the differences *between* major group of insects—“order” as they will later learn—I use it to teach them about differences *within* groups—in this case, how butterflies and moths differ from each other. I begin by pointing to certain specimens and asking them if it’s a butterfly or if it’s a moth. They correctly name the proper group as I point to a Zebra Swallowtail butterfly, then a Polyphemus Moth, then a Regal Fritillary (butterfly), and finally a modest sphinx moth. They even correctly assign the underwing moth, with its brightly-colored hind wings. Then I point to a spectacularly-colored specimen called a Peacock Moth, *Urania leilus*. This insect is a member of the family Uraniidae, a group of day-flying moths that for all intents and purposes look and act like butterflies but are actually more closely related to inchworms, family Geometridae. Of course, all the students shout “butterfly” when I point to it and are shocked when I tell them it’s actually a moth. Then I show them the different types of antennae, and how only butterflies have knobbed antennae. Moths may have their antennae in a variety of other forms, but never knobbed. If the antennae are knobbed, it’s a butterfly; if not, it’s a moth. Then I point to a few more specimens—it’s fun to watch the children looking closely at the antennae before they answer, regardless of how moth-like or butterfly-like the specimen appears.

Of course, nothing gets the students excited like live specimens—especially ones they can hold or touch. My colony of Madagascar hissing cockroaches (*Gromphadorhina portentosa*) never fails to cause a commotion, despite the

growing popularity of these docile, yet otherworldly-looking insects as elementary classroom pets. Getting the students to be quiet so they can hear the “hiss” can be challenging, and whatever calm I achieve is shattered once I begin passing them around to those who wish to hold one. Chaos quickly ensues as the students feel the “tickle” of the cockroaches’ feet on their hands and the initially shy sum up the courage to hold one, too. Even the teachers, who at first rarely would consider holding a cockroach, usually end up taking their turn once they see the children doing it. I usually bring other live material depending on what is available at the time, this time it was two giant millipedes—I know, they’re not really “insects”—that I had just brought back from a trip to western Texas—and to which Mollie had given the names “Millie” and “Willie.” I had planned to let two volunteers hold them while the other students pet them, but I forgot to acclimate them to human handling prior to the first session. When I gave them to Mollie and another student to hold, the millipedes defended themselves the only way they knew how—by defecating! Mollie and the other student quite understandably wanted nothing to do with that, so we put them back in their cage and passed the cage around to let the students get a close look at them. All was not lost, however. The experience provided an opportunity to talk about how insects and their relatives defend themselves, and I dare say the students are unlikely to forget that experience anytime soon, either.

Probably the most enjoyable part of these presentations is afterwards, when I receive an envelope full of thank you notes from the students. Often decorating them with drawings of insects, the students express their thanks and talk about the things they learned or enjoyed most. One student talked at great length about scarab beetles—how he liked them, wondering if I like them, where could he get some. Another wrote asking—pleading, actually—if I could come back next year and do the 3<sup>rd</sup> grade class. My own daughter, in her note, wrote, “I learned that millipedes defend themselves by pooping.” I still chuckle whenever I think of that one. One of my favorite notes was among the shortest, which simply said, “You rock!” Considering my close-to-50 years of age, I take that as quite a compliment! ♪