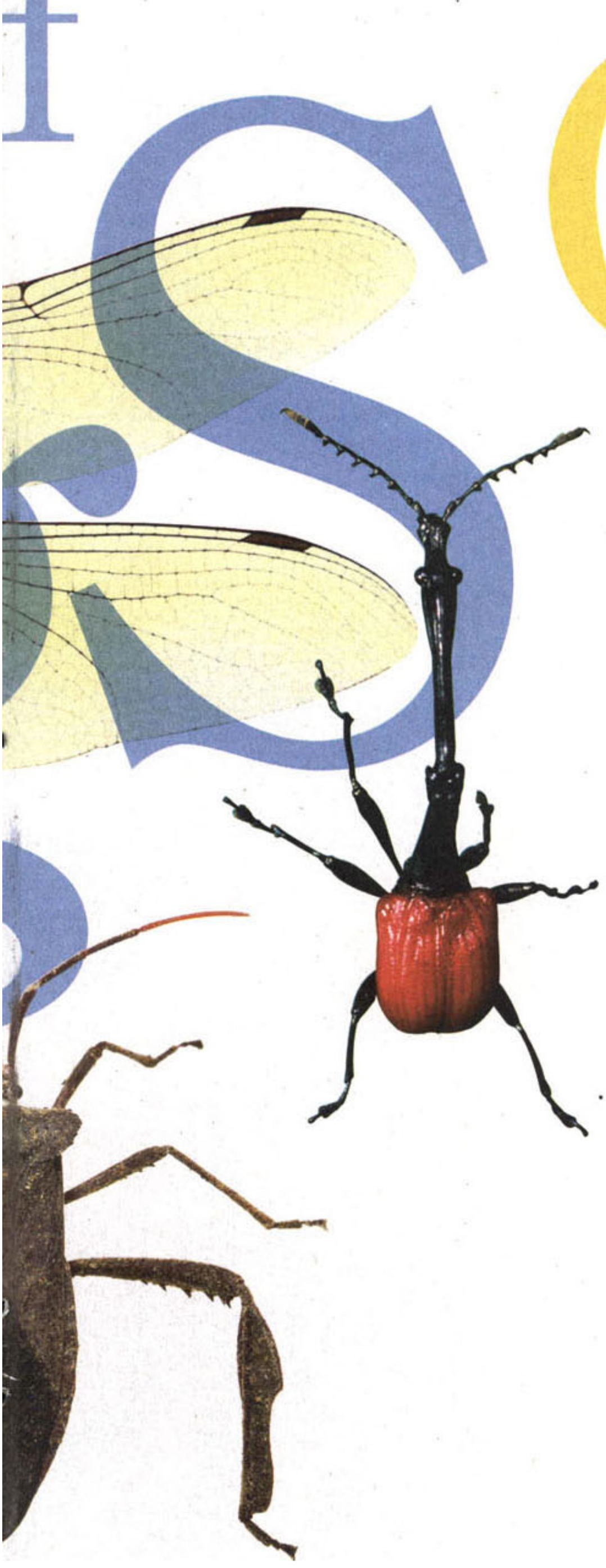
A Life of Bugs

BY DON VAUGHAN

Insects



One summer night last year, **Dr. Christine Miller** was walking through a swamp in Panama hunting for insects by lamplight. She was approached by a group of herpetologists (scientists specializing in reptiles) that said there might be a caiman nearby.

Miller saw nothing around her, but when she stepped off the mat she'd been standing on, the herpetologists pulled one of the toothy, alligator-like reptiles from beneath it.

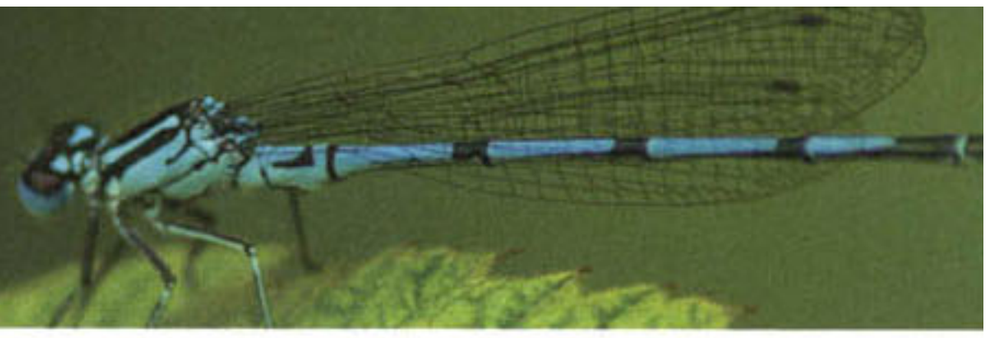
Miller had been standing *directly on top of it*.

INSECTS, IT IS

Such encounters are not uncommon for entomologists like Miller, whose job as an insect researcher at the University of Florida takes her around the world in search of bugs both common and bizarre.

"The research I do is really fun and interesting," Miller says. "I research insect ecology, behavior and evolution. I'm very interested in why insects do what they do and how they make the environment healthy by becoming food for other animals or breaking down waste."

Miller says her interest started when she was young, collecting insects and marveling at their unique characteristics. CONTINUED >



"I loved being out in nature," she says. "I found the whole thing fascinating and peaceful, a fun place to be."

Miller attended Wesleyan University, where she joined a research laboratory studying plant ecology and evolution. She soon realized insects were "more fun, and also fascinating, numerous and powerful for studying science."

BUGS, BUGS AND MORE BUGS

There are at least 3 million known insect species — but that number could be as high as 80 million.

"New insects are being discovered almost every day," Miller says, "and the fact is that we hardly know anything about insects. Once we start to understand them better, we can determine how they might benefit humans. We can make our lives better by learning more about insect behavior and how they do what they do. More research is needed, which is why we need more entomologists."

Insects are virtually everywhere. They live in our houses and in our yards. Insects pollinate essential crops, remove waste from the environment and eat harmful insects like mosquitoes. But insects can also destroy crops, damage infrastructure and spread disease.

With that in mind, it's easy to see just how important the work done by entomologists is.

"Insects are an essential part of our world," Miller says. "If we want to feed our growing population, we need to learn now to deal with insect pests. For example, right now armyworms are spreading through Africa eating maize. There is real concern that if we don't figure out how to stop them, that important crop will be ruined and people will starve."

MAKING IMPROVEMENTS

Entomologists have made a positive impact on society in a variety of ways. In the 1800s, for example, they introduced a species of ladybug to eliminate the scale pests that were devastating citrus crops in California. Today, they continue to monitor citrus farms for harmful fruit flies, establishing a protective quarantine when the flies are found to prevent them from spreading.

A recent example of entomology's good work is the elimination of the screwworm fly, whose larvae live in the flesh of deer, cattle and other animals. Entomologists successfully eliminated the pest in the United States by zapping male screwworm flies to make them sterile, and then releasing them into the wild. Unable to reproduce, the pests quickly disappeared.

ENTOMOLOGISTS ALSO WORK TO SAVE ENDANGERED INSECT SPECIES SUCH AS THE MONARCH BUTTERFLY AND THE HONEY BEE, BOTH OF WHICH HAVE SEEN A DRAMATIC DECLINE IN RECENT YEARS.

NOT WITHOUT DANGER — AND A YUCK FACTOR

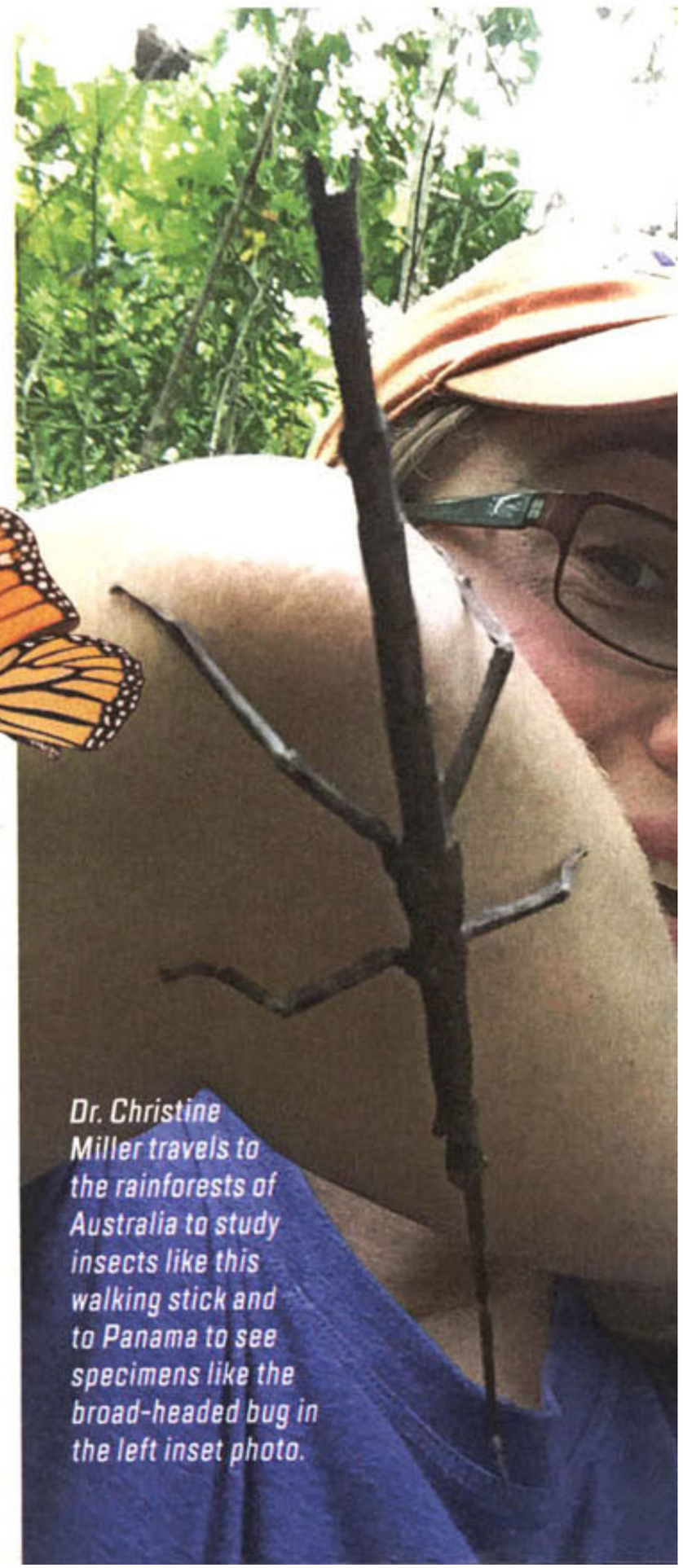
Because much of their work is done outside, entomologists face certain hazards. There is always the risk of being stung by a venomous insect or contracting an insect-borne illness such as malaria — or worse.

While working in Panama, Miller and her colleagues were concerned about contracting chagas disease, which is spread by kissing bugs, which suck blood from people's lips while they sleep.

"We were fine, but the bugs in the region where we were staying were tested a year or two later and found to carry chagas disease," Miller says.

Entomology is not for the squeamish. Though comfortable around most insects, Miller admits to being creeped out by maggots.

"That's something I haven't been able to get over," she says with a laugh. "Larvae make me as sick to my stomach as anyone." ⚜



Dr. Christine Miller travels to the rainforests of Australia to study insects like this walking stick and to Panama to see specimens like the broad-headed bug in the left inset photo.

DR. MILLER'S TOP 10 INSECTS

1. ALL LEAF-FOOTED BUGS. "This is the group on which my students and I focus nearly all our attention," Miller says. "I especially like *Acanthocephala declivis*, because it has amazing legs."

2. STALK-EYED FLIES. Here's why: **go.boyslife.org/stalkeyed**

3. ANTLER FLIES. "These flies grow antlers like elk and moose, and fight with them like the big mammals do," Miller says. "Even more amazing, some species of these flies fight for territory on shed elk antlers."

4. GIRAFFE WEEVILS. Here's why: **go.boyslife.org/giraffeweevils**

5. TREEHOPPERS. **go.boyslife.org/treehoppers**

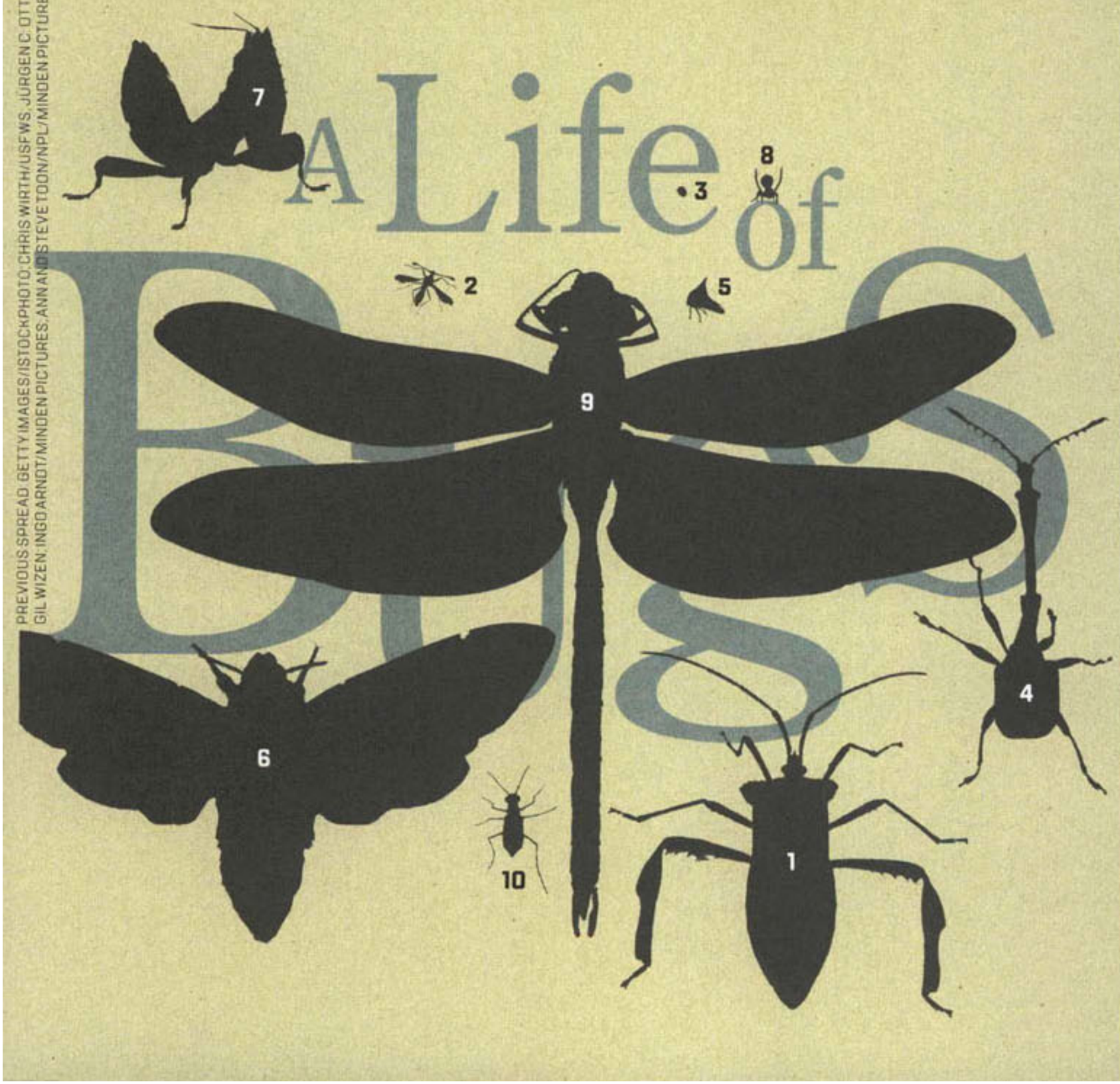
6. HAWKMOTHS. Many species look like little hummingbirds, Miller says.

7. ORCHID MANTIS. "Both beautiful and deadly."

8. PEACOCK SPIDER. Technically an arachnid rather than an insect (arachnids have eight legs; insects have six), the male peacock spider uses its brightly colored abdomen and a crazy dance to attract a mate. Take a look: **go.boyslife.org/peacockspider**

9. DRAGONFLIES. "These graceful hunters are also sometimes stunningly beautiful." Here's a video that explains how they fly: **go.boyslife.org/dragonflies**

10. TIGER BEETLES. These odd critters run so fast when chasing prey that they actually blind themselves. **go.boyslife.org/tigerbeetles**



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JOB FACTS:

Entomologist

WHAT TO EXPECT: Entomologists are scientists who study insects and their role in the world. Areas of research include how insects affect humans, how to eliminate destructive insects and how to protect insects that benefit us.

JOB OUTLOOK: Entomologists play an important role in many fields of study, so job opportunities are numerous. Those working at universities typically do field research as well as classwork, while those employed by the military and local/state/national governments are often tasked with solving insect-related problems specific to agriculture, veterinary medicine, human health and other fields. Museums of natural history and science often have entomologists on staff to conduct research and curate collections, while other specialists work in urban pest control.

EDUCATION AND EXPERIENCE: An undergraduate degree is satisfactory for most jobs, though a master's degree or doctorate is usually required to be a researcher, university instructor or museum curator. If you're interested, take as many science classes as you can, and shadow a working entomologist if the opportunity is available. Entomology programs are offered at only a handful of American colleges and universities, so you might have to go out of state if entomology is your career choice.

SALARY: A variety of factors determines how much an entomologist may make, including education, geographic location and field of study. Annual salaries range from $35,000 for community entomologists to $120,000 for those working in academia or at a prominent museum.

FOR MORE INFORMATION:

» The American Entomological Society
go.boyslife.org/aes

» The Entomological Society of America
go.boyslife.org/esa

» Entomology 101
go.boyslife.org/entomology