

What You Missed at the April Meeting

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Fifteen minutes into the presentation the screen froze. No amount of coaxing from the A/V gang made any difference and it looked as though Dan Krull would have to carry on without the aid of visuals. Which he did. He continued the talk with hardly a pause, throwing in a brief history of the other failures he'd experienced in the past. We eventually discovered the problem, or more correctly, Dan discovered the problem, and we were able to enjoy the rest of his talk as he had meant it to be experienced. It's no surprise that he handled it easily. Dan is an on-camera talent for Herp Nation Media (HerpNation.com) and hosts the Dan Krull Show on Herp Nation Radio. He's also a really good field herper and photographer, a captive breeder, environmental consultant, and videographer. His talk was titled "Citizen Science: A Volunteer Army."



Dan Krull. Photograph by Dick Buchholz.

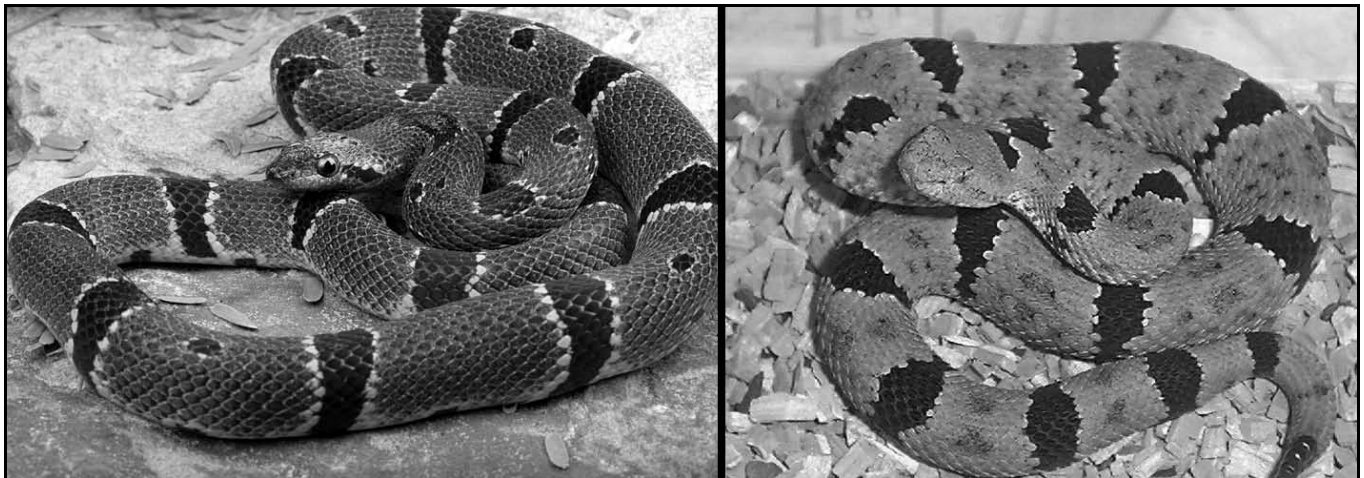
He first gave us a little history lesson. Side by side photographs of a coral snake next to a milksnake, a massasauga and western hognose, a bullsnake and rattlesnake, and a gray-banded kingsnake and rock rattlesnake were shown as he asked what we were looking at. Being a sharp audience, we answered Batesian mimicry. We saw a portrait of Henry Walter Bates flanked by *Heliconius* butterflies and their mimics, the animals that first led Bates to suggest that harmless species might mimic toxic or venomous species. We learned that when Bates arrived home after 11 years in the Amazon he had sent back over 14,712 species, 8,000 new to science. Dan related that Bates had no formal education, but studied and collected insects in his spare time. He supported his research in the Amazon by selling collected specimens to museums and individual collectors, a practice common in the 1800s. In spite of his extensive studies in the Amazon, Bates was not taken seriously by academics. He sold specimens, had no formal training, and frequently told the academics they were wrong, but gradually his views were accepted as they proved to be correct. Dan pointed out the huge

gap in knowledge that lies between observing animals in the field and observing a preserved specimen scooped from a jar. And he asked, "What is the point of scientific discovery?"

His answer was we don't know what we don't know. To demonstrate that point, he showed a slide of a virus and proceeded to relate the tale of a mysterious disease that killed 45 people over three years in the Four Corners area of the southwestern U.S.

In 1993 the Centers for Disease Control and Prevention (CDC) sent a team to discover the nature of this disease. They discovered the virus was a hantavirus and a member of that team, Terry Yates, found the vector for the virus was *Peromyscus*. Hantavirus had been circulating in the rodent population for many years, but this was the first time the virus had infected humans. The CDC wanted to know what caused the sudden jump to humans. If this virus had recently mutated so that it was infectious to humans, the results could be catastrophic. Fortunately, the U.S. Fish and Wildlife Service had been doing long-term studies of the rodent population in that area, including collecting and preserving specimens. Dan wanted to stress that these studies had no immediate or obvious payback as they were being conducted, but by analyzing the virus in the preserved specimens, the CDC confirmed that the virus had not mutated. The outbreak among humans was linked to an increase in the population of the rodents and the resulting greater contact between humans and the mice, or more exactly, the waste products of the mice. As a result, protocols were established that drastically decreased the incidence of the disease. Dan emphasized that without the seemingly pointless study of the *Peromyscus* in the first place, the CDC would have had a much more difficult time fighting the disease.

A slide of Darwin appeared on the screen and Dan used Darwin to illustrate the driving force behind most scientists,



Lampropeltis alterna and *Crotalus lepidus*. One of Dan Krull's examples of Batesian mimicry. Photographs by Dan Krull.



One of Dan's favorite discoveries. A huge central plains milksnake, *Lampropeltis triangulum gentilis*, one of only five found in Grant County, Kansas. Photograph by Dan Krull.

curiosity. But more than curiosity is needed; money is needed. The researcher of today usually needs an upper level degree, institutional affiliation, and funding for research, collecting of specimens, running DNA tests, lab work, and assistants. And still be able to eat and pay personal bills. All of that requires money, and if one is not personally wealthy as was Darwin or able to sell specimens like Bates, one has to find funding for basic research. The National Science Foundation is responsible for approximately 20% of federal funding going to research conducted by colleges and universities. The next slide showed an array of corporate logos from oil companies to drug manufacturers. Dan asked what they all had in common. His answer, illustrated by a slide he swore was two dogs playing and only looking like they were viciously assaulting one another, was that they all "had a dog in the fight." They need predictable and profitable results on a "hot" topic that is germane to their mission. They are not interested in science for science's sake.

So Dan had given us strong examples of amateurs doing real science, the need for conducting research that has no apparent payback, and the lack of funding for that type of research. Where was he headed? Photos of Joe Collins appeared, followed by the opening slide of Dan's talk, showing a crowd of people. Joe Collins is a hero of Dan's. Joe founded the Kansas Herpeto-

logical Society in 1972 and throughout his life spread his interest in reptiles and amphibians by his writings, talks and enthusiastic involvement of people in his passion. Dan expanded the view again and again until the photo encompassed about a hundred people that were on the 2012 spring field trip of the Kansas Herpetological Society. The crowd was 80–95% laypersons of all ages. They were participating in one of the two or three field trips that the KHS sponsors each year targeting specific understudied areas and collecting thousands of data points that are evaluated by researchers and presented as papers in an annual meeting of the KHS. Researchers provide direction, targets, tools, and interpret the data. The amateur herpers pay for gas, lodging, and food, and collect data and specimens. One result, Dan asserts, is one of the best, most complete state field guides in the country: *Amphibians, Reptiles, and Turtles in Kansas*.

Since 1972 the KHS has been conducting these trips and Dan said that as a result, no other state's herp population has been as thoroughly studied as Kansas's. While Dan encouraged us to participate in the KHS trips, he gave us other ways to participate in citizen science, providing two examples of amateur herpers who were able to pursue projects that had real impacts. One even led to a job doing herp research in Guatemala.

The term citizen science seems to be mentioned more and more often by our speakers. Will Bird and Phil Peak, Gerry Salmon, Dusty Rhoads, and Jeff Lemm are just a few who have mentioned the importance of citizen scientists. Using amateurs as data collectors and contributors to research can provide additional resources for chronically underfunded amphibian and reptile studies. Dan admitted that some professionals will never accept amateurs into their projects, but emphasized that for those that do, the returns are often generous. And for the amateurs the rewards can also be great, such as access to restricted areas, interactions with protected animals, and the chance to make a difference. Professionals that need bodies and funding and herpers who enjoy working with the animals, seems as though that's a formula which can lead to everyone being happier. Dan's message: get out there and participate. You're needed.