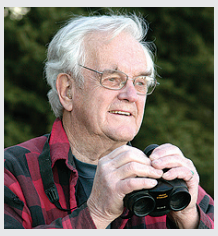

Tales from a
Sisters Naturalist
by Jim Anderson

How the moth became a butterfly – maybe

It is said that millions of years ago the buckeye on Bela Chladek's nose was a moth. Bela's not cross-eyed today, and the buckeyes are also still with us.

I've created this story for students who are looking forward to college and taking the time to look at this Earth in more detail. I've met a lot of them in Central Oregon and I hope many of these bright kids are already into higher education. But just in case…

This story started in a scientific journal and begins with "Once upon a time…" That was a little worrisome, but did seem appropriate as the "facts" in the story seemed worthy of discussion.

The gist of it is that a group of very bright researchers at the Florida Museum of Natural History — while using DNA and protein sequences from living insects — came up with the idea of how moths evolved into butterflies.

Apparently, what got it all going was a head-bumping battle between scientists on what was happening millions of years ago in the evolutionary goings-on between moths and bats.

It is a fact that today bats use sound to locate moths at night and that moths use sound to avoid bats. People who have studied this agree that moths slowly adapted to bats preying on them and evolved ways to survive.

The bats got onto these changes and did their own adapting, which forced the moths to shout, "Hey! Cut that out!"

This is where the struggle to understand the change gets thicker than toothpaste. The bats apparently had begun to use different frequencies to find moths.

But then new moths came into the picture and responded by jamming the bats' sonar. They actually sent sound pulses that somehow told the bats they were not where the bats thought they were and told the bats the moths' tissues are poisonous.

To further complicate this fantastic battle for survival, many millions of years ago a group of moths decided to give up flying at night to escape the bats preying on them. They changed their wing structure and began flying in daylight to become today's butterflies.

Wow! Darwin had that one right by the face — adapt or die!

The Florida Museum of Natural History study team had opened quite a door: moths changing to butterflies. The scientists are telling us the ancestral moth emerged some 300 million years ago, which is well before the oldest moth fossil of some 200 million years old.

Dr. Kawahara, who is leading the team at the Florida museum, found that only 240 million years ago, most moths ceased to have chewing mouth parts in exchange for a tube-like mouth part capable of sucking up sap and water.

Then the team determined that the earliest butterflies appeared on Earth some 98 million years ago. Echolocating bats emerged much later, some 50 million years ago. Hmmm, something other than bats must have been the reason butterflies became daytime insects…ya' think?

The team believed this was possible because natural selection was making the nectar produced by plants accessible to these new fragile-wing butterflies that had better success in daylight than dark.

They also stated that these new moths-who-became butterflies dropped their night time coloring and began to develop bright and variable colors for daytime movements, useful for telling predators, "Hey you! I'm not good to eat. I'll make you sick and you'll die."

PHOTO BY JIM ANDERSON

These new DNA samples taken from all major butterfly families and moths have apparently helped the team from Florida to develop new thoughts regarding evolutionary history.

The group's research demonstrated that moths have developed specialized hearing at least nine different times.

It is interesting that Dr. Kawahara considers his work to be a fulfillment of a childhood dream while growing up in Japan and the U.S.A. His passion was to learn more about butterflies and moths.

While all this work sheds new light on the evolutionary development of bats, moths and butterflies, Dr. Maia Heikkila, an evolutionary biologist at the University of Helsinki in Finland said, "The dates derived from DNA and fossils are likely to be revised in the future, and a new story may emerge."

OK guys and gals, now's the time. Get yourself together and start collecting butterflies and moths from the radiator of your family car or camper. Push your science/biology teachers into taking you into the voyage of DNA research. Contact professors of evolutionary biology in the schools you hope to attend. Get your energy going in the direction you want to go.

It would be a supreme honor for me to write a story from your dissertation on YOUR discoveries of how, when and why moths and butterflies appeared on this beautiful old Earth of ours.