KAS BULLETIN

NEWSLETTER OF THE KANSAS ACADEMY OF SCIENCE

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151st ANNUAL MEETING OF THE KANSAS ACADEMY OF SCIENCE

March 29th -30th, 2019
Johnson County Community College
Overland Park, Kansas

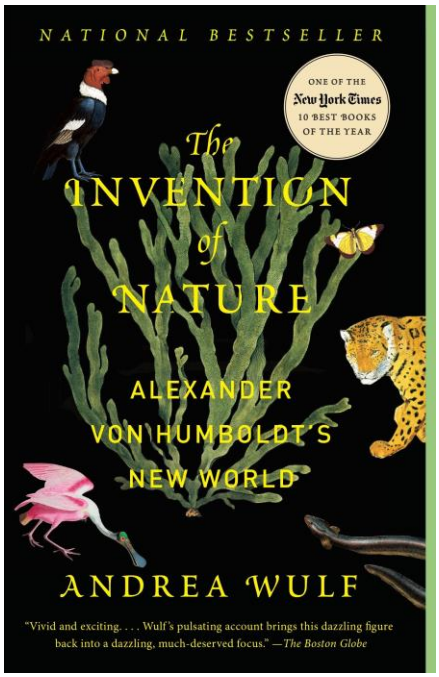
Monarch Larva on Milkweed

The 151st annual meeting of the Kansas Academy of Science was held on March 29th & 30th, 2019, at Johnson County Community College in Overland Park, Kansas. The meeting began Friday, with a field trip to Linda Hall Library, and a second field trip of the Campus as a Learning Lab at the JCCC Open Petal Farm & Center for Sustainability. After greeting friends and colleagues and registering for the meeting, we enjoyed a sumptuous banquet. Keynote speaker, Dr.Kasey Fowler-Finn gave an enlightening talk entitled: *Good vibrations: the (not so) secret world of insect vibrational communication*. With sophisticated equipment, we eavesdropped on insect sounds transmitted through plants they rested upon. Many of these sounds were mating calls.

The following day offered concurrent oral presentations on topics ranging from paleontology, animal behavior, ecology and organismal biology, entomology, geology, and molecular biology. During the luncheon, the keynote speaker was Dr. Orley (Chip) Taylor, an expert on Monarch butterflies. His thoughtful, animated presentation showed the gradual decline of the species over the past twenty years. Favorable climatic conditions as well as the presence of suitable habitat are crucial to its survival. He emphasized the importance of appropriate habitat, and is currently working with the Department of Transportation and Native American tribes to plant patches of milkweed. During coffee breaks, posters were examined the in the lobby. An account of the annual meeting can be found online and in the Transactions Spring 2019 issue.

BOOK REVIEW: "The Invention of Nature, Alexander von Humboldt's New World"
by Andrea Wulf. 2015. Alfred A. Knopf, 473 p.

I am very pleased to add this wonderful book to my library. The author is a superb writer who has extensively used primary sources to create a picture of the great explorer, Alexander von Humboldt. Many of us may be aware of Humboldt, knowing that he made extensive maps of the New World, and that his name is associated with a number of towns and rivers around the globe. However, this informative biography has taken our understanding of this great man to a much higher level.



Although the term "ecology" had not yet been invented, Humboldt can be considered the first great ecologist. He was born in 1769, and lived to the age of 89. In 1800, he first developed the theory of human-caused climate change by examining Lake Valencia in Venezuela. The lake level was greatly reduced after the colonists chopped down the surrounding forests. The exposed, bare soil could not retain water from the torrential rains that washed it away. This left the land dry and crop harvests suffered. As Humboldt observed this pattern again and again across the globe, he described "how humankind was changing the climate, and he unwittingly became the father of the environmental movement."

Humboldt also developed the theory of a "keystone species." He "observed with astonishment, how many things are connected with the existence of a single plant." In the Llanos of Venezuela, the Mauritia palm tree's fruits attracted birds, the leaves reduced the wind, and soil accumulated around its base, providing moisture and habitat for a variety of insects and worms.

Humboldt's botanizing along the coasts of South America and Africa led him to believe that these two continents were connected in the past. His ideas were a foreshadowing of the theory of plate tectonics, developed two centuries later.

As he climbed Mt. Chimborazo in the Andes, Humboldt realized the connection of all things in nature when he compared the plants and rock formations of other mountains around the globe with what he was seeing in the Andes. He produced an elaborate chart identifying different vegetation zones from the base to the top of various mountains, and linked them to his temperature and humidity measurements. He was impressed by the similarity of these zones in South America, Europe, and elsewhere in the world.

Humboldt was interested in the whole of nature, from the macroscopic to the microscopic, and believed that nature was an organism with life force, not merely a machine. He meticulously recorded scientific data, but presented his findings through the prism of his emotions and the effect his explorations had upon his internal state of mind. Science and poetry were combined into a sacred whole. As he produced volume upon volume describing his discoveries, he became the first "modern" nature writer, and inspired Charles Darwin and Henry David Thoreau.

Humboldt's unique personality was larger than life. He connected with most of the major scientists and poets of his day, and shared information and money with aspiring scientists and would-be explorers. He became friends with Simon Bolivar and Thomas Jefferson, and lived through the French Revolution and Napoleon's eventual downfall. Humboldt had a liberal ideology and, although he was a chamberlain of the King of Prussia, he was firmly against slavery and colonialism for the harm perpetrated upon people and the rest of nature.

This delightful book has described how Humboldt became a "keystone human," and clearly shows the far-reaching influence of this great man.

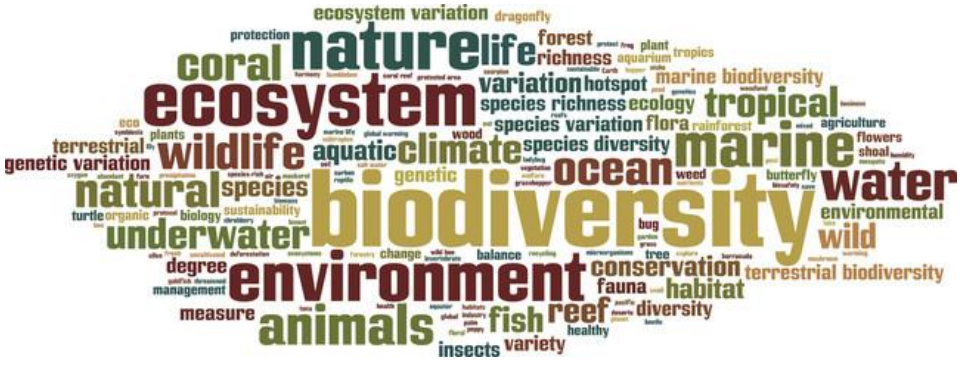
ALPHA TAXONOMY IS ALIVE AND WELL

by Hank Guarisco, editor

Members of the public as well as a substantial number of scientists believe that the discovery and description of plants and animals that are new to science (alpha taxonomy) is an antiquarian activity that was finished several hundred years ago, during the "age of discovery." Except for the occasional unknown tropical monkey or bird hidden in the vast tropical jungles of southeastern Asia or Africa, the consensus is that alpha taxonomy is dead. Biochemistry and genetics are the purview of "true science," while museum collections and herbariums which house a countless number of dead creatures are more akin to stamp collections, and have limited value in our modern age.

This perception, however, is grossly inaccurate. It is similar to people who believe that libraries are becoming obsolete, since everything can be found online. Just ask Google, or Cortana or Siri and the answer will come quickly, with no ambiguity. Although there is a great deal of information online, and the myriad of advances in biochemistry and genetics that cannot be denied, we must not relegate the "deep knowledge" contained in libraries and museum collections to the broom closet. These institutions house the primary sources upon which Google, etc. rely to produce facile, unambiguous answers to our questions.

There are still many undescribed species of insects and spiders here, under our very noses, in North America that await discovery. For example, trapdoor spiders of the genus *Ummidia* are ancient arachnids that construct silk-lined burrows, each sealed with a hinged, wafer-like lid. They occur widely throughout the United States. This genus is currently being revised by Rebecca Godwin, a PhD graduate student at the University of California, Davis. Her detailed examination of museum specimens has revealed the presence of forty-five species in this genus, thirty-five of which she will describe as new



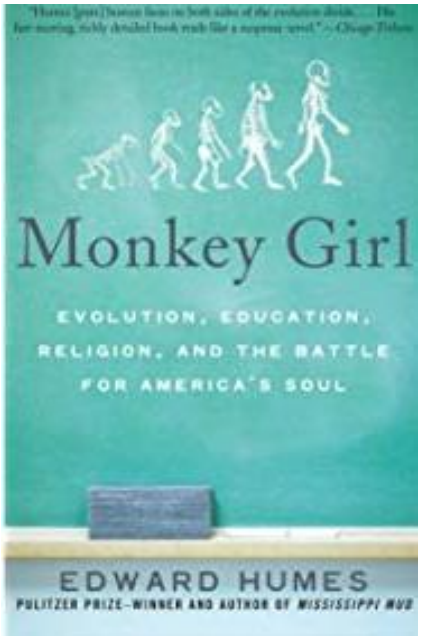
species. This means 78% of the species in this genus were unknown to science before her investigation. There are many other examples.

Rather than being musty old relics of a former age, museums are libraries that house the biodiversity of life on earth. We currently live in a world undergoing the sixth great extinction, mainly due to the destruction and pollution of the planet – byproducts of our modern lifestyles. Now, more than ever, we need to rely on our libraries and museums to truly understand the changing distribution of plants and animals across the globe. Therefore, we must value the primary sources that museums and other libraries contain, and spend the money needed to preserve them as we face the challenges of the future.

BOOK REVIEW: "Monkey Girl, Evolution, Education, Religion, and the Battle for American's Soul."

by Edward Humes. 2007. HarperCollins 380 p.

Although this book was published twelve years ago, and consequently is not a new book, I want to bring it to the attention of our readership. Many of us can remember the days of controversy in Kansas and across the nation concerning attempts to insert creationism or intelligent design (ID) into science classrooms. This book does a wonderful job of presenting an in-depth, historical presentation and discussion of the events surrounding this controversy. Many science teachers, some of whom had a limited understanding of evolution as a scientific discipline, often chose to ignore the subject or gave it perfunctory treatment in class, mainly to avoid unpleasant discussions with those whose religious beliefs precluded the acceptance of evolution.



The author presents thorough arguments of both positions, explores the "how" and "why" these positions were promulgated, and the legal consequences of actions taken by school boards regarding the teaching of evolution, creation, and intelligent design. There is a chapter on the events in Kansas, but most of the book centers on the events and subsequent trial in Dover, Pennsylvania. What I found most compelling was the author's inclusion of verbatim statements made by school board members, the community, and participants in the trial.

The trial centered upon complaints by parents concerning the Dover school board's insistence that the following statement be read to students:

"The Pennsylvania Academic Standards require students to learn about Darwin's Theory of Evolution and eventually to take a standardized test of which evolution is a part. Because Darwin's Theory is a theory, it is still being tested as new evidence is discovered. The Theory is not a fact. Gaps in the theory exist for which there is no evidence. A theory is defined as a well-tested explanation that unifies a broad range of observations. Intelligent Design [ID] is an explanation of the origin of life that differs from Darwin's view. The reference book, *Of Pandas and People*, is available for students who might be interested in gaining an understanding of what Intelligent Design actually involves. With

respect to any theory, students are encouraged to keep an open mind. The school leaves the discussion of the origins of life to individual students and their families. As a standards-driven district, class instruction focuses upon preparing students to achieve proficiency on standards-based assessments."

Several glaring misunderstandings become immediately apparent in the above statement. A scientist's view of a theory is much different than the layperson's understanding of the same term. "It is just a theory, not a fact," is often stated to indicate it is just a guess, like anyone else's guess, so why not "teach the controversy." Intelligent design proponents have often stated that there was some kind of scientific controversy concerning evolution. There was not.

Science is concerned with natural explanations and precludes supernatural ones, as ID implies. Therefore ID is not a scientific theory and does not belong in a science classroom. Extensive testimony in the trial showed that the proponents of the schoolboard's controversial statement were indeed intending to insert thinly veiled religious beliefs into the curriculum.

Another important point to recognize is that evolution does not deal with the origin of life, as the school board's statement implied. Evolution deals with subsequent changes due to natural selection once life has begun. Therefore, as judge Jones concluded, "Both defendants and many of the leading proponents of ID make a bedrock assumption which is utterly false. Their presupposition is that evolutionary theory is antithetical to a belief in the existence of a supreme being and to religion in general. Repeatedly in this trial, plaintiffs' scientific experts testified that the theory of evolution represents good science, is overwhelmingly accepted by the scientific community, and that it in no way conflicts with, nor does it deny, the existence of a divine creator."

The most unfortunate reality is that many members of the general population have not been adequately educated in scientific theory and evolution, and also lack fundamental skills of logical thinking. Therefore, it is easy for them to uncritically accept ideas that coincide with their conditioned beliefs. I highly recommend this book because it contains a wealth of information, and can be used as a reference text when exploring important questions such as: "What is science?" "What is evolution, creationism and intelligent design?"

Attention Students:

The student research grant application deadline for **undergraduate** students is **October 4, 2019**.

The application deadline for **graduate** students is **February 3, 2020**.

See the KAS website for more information:
http://www.kansasacademyscience.org/

KANSAS ACADEMY OF SCIENCE
ATTN: Sam Leung
Stoffer Science Hall Room 312C
1700 SW College Ave
Washburn University
Topeka, KS 66621-1117

MAIL TO:

The 152nd Annual Meeting of the Kansas Academy of Science will be held on

April 3-4, 2020

at Baker University, Baldwin City, Kansas