

Program: Oct. 14, 2015, 7 p.m.
Manhattan Public Library Auditorium

Pocketbooks, Pistolgrips and Pigtoes
by Dru Clarke

*"Freshwater mussels are the most endangered
faunal group in North America."*

Have you seen them in the streams of Kansas and wondered about them? Dru Clarke has agreed to share her knowledge of mussels with us, and she has much to share!

Get a preview by reading her story in this issue (page 3).

Northern Flint Hills Audubon Society,
P.O. Box 1932, Manhattan, KS 66505-1932



prairie falcon

Northern Flint Hills Audubon Society Newsletter

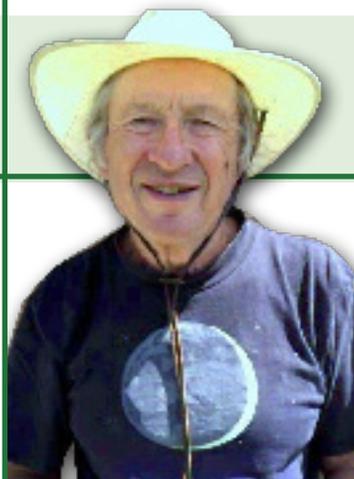
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Upcoming Events

- Oct 1 - Board Meeting 6 p.m.**
Home of Tom & MJ Morgan
- Oct 2-4 Kansas Ornithological Meeting**
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- Oct 10 - Saturday Birding**
Sojourner Truth Park 8 a.m.
- Oct 14 - Program: Mussels by Dru Clarke**
Manhattan Public Library 7 p.m.
- Nov 5 - Board Meeting 6 p.m.**
Home of Tom & MJ Morgan
- Nov 14 - Saturday Birding**
Sojourner Truth Park 8 a.m.



Skylight plus

Pete Cohen

Shoo fly, don't bother me

Shoo fly, don't bother m

Shoo fly. don't bother me.

I belong to somebody, or to Company G, or etc.

...he died and the jury wondered why;

the verdict was the blue tail fly.

The songs these verses come from were commonly heard on a variety of radio programs and juke boxes when I was younger, though they date from the mid 1800s. The first may have originated in response to the insect-borne fevers that were endemic then, and the latter seems one of the songs coming out of slavery that can be taken either as a wry comment or serious lament. In any case flies have long been a pestoration, though in the long run they may as food for more appreciated creatures have a redeeming feature.

A similar question is arising with the literal rising and buzzing of inanimate flies, the drones. They have been cited as a great danger to other aircraft, and one has been shot down for hovering, intentionally or not, over a sun-bathing daughter. One of the good potential uses that's been mentioned is in wildlife management: making population surveys, invader species control, etc. much easier and better. But from two University of Minnesota researchers, Mark Ditmer and John Vincent, comes a caveat.

While bears have been collared and tracked by radio for years without any apparent effect upon the bears, initial tracking by drones has produced some heads-up results. The telemetry showing from seventeen forays that came no closer than 40 or 50 feet, showed the bears'--adults and cubs--heart rates shot up by 4 (from near 40 to almost 170 beats per minute). There was significant instant stress. However except in two cases the bears remained in

place and their rates subsided to normal as the drones departed. In one of the exceptions the bear went into an apparent all out dash for an unspecified distance. The other took off for about five miles into another bear's territory. What happened after that is not reported.

With such a small sampling one can't be sure whether or not these specific exceptions represent a broader norm. But it's another suggestion that with drones, too, there can be unintended and unpredictable consequences, and if for bears, why not for other creatures, human included?

The sky creatures, of course, will not likely be bothered. This month the main show will be for early risers and during the first ten nights. The Old Farmer's Almanac forecasts a special vertical arrangement on the 1st of (from the top down) Venus, Leo's bright Regulus, Mars, and Jupiter.

StarDate prefers to highlight performances on the 8th and 9th predawn with Regulus topping Mars and Jupiter, and a waxing crescent Moon sliding close by. Mercury will be adding in upper left of the Moon the 11th and be best visible the 15th. Jupiter and Venus will be having duet early on the 25th.

Evening offerings include Saturn (yellowish) and Antares (reddish), in Scorpio, dancing about the Moon the 15th-16th, and Aldebaran, the red eye of Taurus, rising near to the Moon mid-evening on the 29th. Moon is new the 12th at 7p06, full the 27th at 7a05.

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Pocketbooks, Pistolgrips and Pigtoes

Dru Clarke



The kids had moved upstream out of our study area, drawn by the unknown reach of the creek. We had obtained almost all of the physical data we had set out to get that day— stream dimensions, substrate (bottom materials), varying depths, rate and volume of flow - so there was time for some random exploration. Suddenly, I heard an excited shout: “C’m ‘ere! Quick! Look what we found!” My imagination raced as I made my way to where they were ankle deep in water. We were in a heavily forested riparian area of Wildcat Creek, deeply hidden from the urban landscape, and it was an attractive place for all sorts of nefarious acts. Did they find a stash of drugs? A body? At their feet was a deposit of shingle rocks and some gravel, and tucked in between was a bed of heelsplitter mussels, buried up to their hinges. Downstream, on a bar, we had found some empty shells about the size of lunch plates. We knew that raccoons would dig them up and move them to high, dry spots, where they would relax their muscles as they died and the shells were easy to pry open. But these were alive, pumping water in and out of their siphons, filtering several gallons a day.

Mussels’ common names are reminiscent of objects they resemble. This species, the white heelsplitter, has a blade-like hinge on a narrow dorsal surface that can inflict a nasty cut if stepped on. (I always insisted that my kids where old shoes when wading.) Pistolgrips resemble a shiny amber handgun, and pigtoes look like the smooth hoof of a hog. The pocketbook is dimorphic, the female being more inflated than the male to accommodate her brood of eggs in gill pouches: Her appearance is like an overstuffed handbag.

The reproduction of mussels is nothing short of remarkable. Eggs fertilized by sperm released into the water by the males are siphoned into the female’s gills and retained by her until the glochidia, the larvae, are mature enough to glom onto a fish’s gills or fin. In some mussels, host fish are lured in by elaborate mimics of prey that have evolved on the edges of the mantle of the female: the tatters look like fins and tails, and pigmented spots, like eyes. Other species produce conglutinates, tailed packets of glochidia, the female shoots into the water through her excurrent siphon. The tails are sticky and adhere to rocks or pebbles, and waving in the current, entice fish to eat them. the glochidia explode from the packet and grab hold of a gill filament where they mature into juvenile mussels.

In most species, very specific host fishes for the glochidia must exist in the same environment as the spawning adults. For the heelsplitter, these species may be the banded killifish, common carp, green sunfish, orange-spotted sunfish, largemouth bass and white crappie. Others may need species of darters, others, just shiners.

Freshwater mussels are the most endangered faunal group in North America, and the reasons for their decline are complex and interrelated. Many enormous prehistoric middens of their shells are misleading: one would think that mussels provided a major source of nutrition for native peoples. But a study by Parmalee* et al (Uv. of Illinois) analyzed the caloric and protein content of mussels: having collected 792 specimens representing 39 species, they concluded, after assaying the flesh, that an average prehistoric family of five would have had to have eaten between 300 to 450 muckets (one species) per day in order to survive. In 1860, historian John Lawson wrote that “mussels are eaten by Indians after five or six hours boiling to make them tender, and then are good for nothing.” It seems that mussels were a supplement, not a staple, in native peoples’ diets. After having a stable population for 5000 years, there was a precipitous drop, about 1000 years ago, in the numbers of one species, *Epioblasma*, or the snuffbox. About this time there was a rise of corn and bean cultivation in the Southeast: did increased runoff from agricultural fields add sediment and silt that spelled disaster for this species? It also has only one known fish host, the logperch, which could seriously limit its reproductive success. The snuffbox has been extirpated in Kansas, but still exists elsewhere in riffles and runs with swift currents, rubble bottoms, and clean water.

Impoundments, created by dams, prevent movement of mussels from one patch to another, the corridor through which they might migrate, fragmented. Dams would also prevent the movement of host fishes

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Elemental

Eric Maatta

2

He

Helium

Everything substantial in our material world is also elemental, being composed from the fundamental and distinct building blocks that we know as elements.¹ The number of known elements is somewhere between 114 and 118. On Earth, a well-traveled person might encounter 75% of those different building blocks; our bodies house perhaps 25% of them, most often in combinations that have been fashioned into more elaborate molecules that carry out exquisite functions. Some elements are within us in huge amounts, while others are present in minute quantities that are vital, or potentially damaging, or might be “just passing through”.

Let’s take a look at Helium. It’s the second most abundant element in the Universe, but it is relatively rare on Earth (coming in somewhere around #71). It isn’t an essential element for life, yet it is crucial and Helium’s story winds throughout Kansas.

Helium was discovered as a component of the sun before it was known on Earth. While viewing the solar eclipse of August 1868 from India, the French astronomer Pierre Janssen used a prism to separate the corona’s light into different components and he noticed a yellow line at a previously unknown wavelength.² His observation was confirmed later that year in London by the chemist Edward Frankland and the astronomer Norman Lockyer, who proposed the existence of a new element and offered the name Helium (Helios, the Titan sun god of Greek myth). Unsurprisingly, this claim met with skepticism and derision, and it took nearly 30 years before Helium’s presence on Earth was established. In 1895 several laboratories discovered that when uranium ores were dissolved in acid, gas bubbles would appear; analysis of the contents of those bubbles confirmed that Helium was present. Lockyer and Janssen were correct.

Finding Helium in uranium ores gives a clue to why it is present there: naturally-occurring radioactive elements such as uranium, thorium and radon emit α -particles, among other things, as they decay. The α -particle is simply the positively-charged core (or nucleus) of the Helium atom that lacks two (negatively-charged) electrons, which it can pick up readily underground. This radioactive decay process is the source of the Earth’s supply of Helium. We now know that Helium is found in many of the same geologic formations that hold natural gas, such as the huge Hugoton Gas Field in SW Kansas from where it is piped to the National Helium Reserve in Amarillo, TX. Just how we know that is the result of another KS connection.

In 1903, an oil exploration near Dexter, KS (in Cowley Co.) hit upon a huge gas geyser; plans were made for a community event to light up the night by tossing burning hay bales onto the shrieking escaping gas, but . . . the gas wouldn’t ignite. Not only that: the bales were extinguished! The townsfolk were no doubt disappointed but the KS State Geologist, Erasmus Howard, was intrigued: he collected a sample of the gas and brought it to KU to analyze, in the newly-constructed laboratories of Profs. Hamaly Cady and David McFarland. They determined that the gas was mostly nitrogen (72%) with only 15% methane (the main compound in our natural gas fuel); that explained why neither the eruption nor the hay bales would burn. Among the other components, they identified Helium by its yellow line spectrum, in a concentration of about 2%. In tribute to this important discovery, the American Chemical Society in 2000 recognized the “Discovery of Helium in Natural Gas at the University of Kansas” in Lawrence as a National Historic Chemical Landmark.

In the early 20th century, the identification of Helium was merely a “scientific curiosity”: there weren’t uses or economic benefits to be derived from it, as is so often the case when doing fundamental research. That soon changed . . . during WWI, the British government requested supplies of helium to inflate lighter-than-air blimps for both reconnaissance and defense from enemy aircraft, and the US quickly followed suit by establishing the Helium Reserve.

Today, liquefied Helium is widely used as a cryogen: liquid He is so cold that it boils at -452 °F, just 4 degrees above “absolute zero”. Many different medical and scientific instruments have components- “superconducting magnets”- that need to be chilled to such a low temperature in order to function; perhaps the most familiar one is the MRI scanner at the hospital.

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from one reach of a waterway to another. One spring we witnessed, in the same creek where we found the mussel bed, a thrashing mass of underslung-mouthed behemoths, most probably blue suckers, in the riffles. Later inspection revealed eggs glued to the shingle-like rocks in the creek bed. We wondered if these fish served, too, as hosts for the heelsplitter mussels.

In another study, shaded reaches of streams seem to harbor more beds of mussels than unshaded ones. Shade would keep the water temperature more constant and cool, and would be provided by forested riparian zones.

One day, when I was wading in the Kansas River during a particularly dry period and exploring exposed bars, I saw a peculiar track in the sand that resembled a thin rope that had been tossed, then retrieved, its imprint left like a spoor. It wound for about twenty feet, then disappeared at the water's edge. Probing with a stick I uncovered a pondhorn mussel that, in its efforts to survive, had set out on a long journey from its personal desert on the sand bar to find life-giving water. This tenacious species goes dormant and burrows deep in dry conditions, conserving water by plugging its siphons with mucus. It is one of a few species that can be found in Southwest Kansas.

I have a collection of mussel shells that were given to me by the U.S. Fish and Wildlife Service local office to use for educational purposes. I keep them in a shotgun case that gives some folks pause when I haul it out of my pickup truck. When I open it, they initially back up, then, seeing the contents, move in to handle the cool, hard valves of a mapleleaf, monkeyface, or wartyback. All immediately recognize the pistolgrip. I wish them to know how much more beautiful, remarkable, and valuable they are, alive, in their natural environments. Keeping our streams pure and unimpeded, meandering and not channelized, shaded, with banks intact, may just give mussels the edge they need to survive into the future. Keep this in mind as you wade, with shoes on, into your favorite creek.

* Parmalee, in his 1974 article, thanks our own Donna Roper for help with computer programming assistance! Thanks from me to Ed Miller, Jim Mason and Karen Couch for putting together the pocket guide of "Kansas Freshwater Mussels." May their interest long endure!

Dru Clarke, © March 20, 2015

Elemental

Eric Maatta
continued

Helium is expensive, and its price is increasing rapidly. In 2012, the cost of one liter of liquid He was around \$7; today, that same tiny amount goes for about \$17. Even a modest-sized lab doing research at a clinic or university easily requires 150 liters each month: more than \$30,000 each year! The price of helium is so high because it is a finite resource: unlike hydrogen, it forms no compounds from which it can be extracted. Once helium escapes captivity, it is on its way into space- never to return. So . . . the next time that a birthday or another special event rolls around: cupcakes or cards might serve even better than a cluster of balloons.

¹According to NASA and many other credible sources, observable "ordinary" matter makes up less than 5% of the Universe, with the inexplicable remainder assumed to be mysterious "Dark Energy" (68%) and "Dark Matter" (27%).

²When energized, different elements emit light at characteristic wavelengths (as in fireworks); these distinctive colors can ID an element, just as fingerprints or DNA can ID us.

Eric A Maatta, Department Head- Chemistry, E-mail: eam@k-state.edu

An Amazing Conehead

Tom Morgan

On August 28th, my wife, MJ, said, "I saw the most amazing grasshopper. It was extremely large. Its hind legs were like pieces of straw. It didn't move while I was looking at it. I wonder whether it's still there on the eggplant leaf."

When I got close with my camera, it remained motionless. I noticed an ovipositor underneath her translucent wings. As I positioned my camera, she reacted by stretching higher on her long, hind legs. I noticed that her narrow forehead projected forward at an upward angle, so I said, "She might be a conehead. No, not an alien conehead on a late night show, Saturday Night Live. She has a cone-like forehead. She's drowsy. Perhaps she's nocturnal."

After reading webpages, I concluded she was a robust conehead katydid (*Neoconocephalus robustus*). She's one of the many "false katydids," but that only means she can't sing the syllables of the word, katydid. I hoped she wouldn't buzz loudly, being female. A male robust conehead sings loudly enough that humans cover their ears and grimace, if they happen to be in the neighborhood. He can be heard from over three hundred yards away.

This species must be nocturnal, I thought, as I watched her at sunset, making lithe movements, like any animate being. She had never left her leaf as long as daylight lasted, but was not to be found the following day. She feeds on grass seeds in moist areas, in edge habitat. Well, that's what we have here, edge habitat. Perhaps she was attracted by a clump of non-native pampas grass. She will lay eggs under the sheath of lower blades, near the underground roots, where the eggs overwinter, and become members of the single generation of next year's coneheads.

I distinctly remember the posture that seemed to warn away predators, but that was an impression in my human mind. She usually resides on grasses, and her folded wings point upward, like a blade of grass. Yes, a blade of grass, a remnant of prairie, an edge of moist habitat that's enriched with an animate blade. I remember reading that a bee is not separate from a flower. And a grasshopper is not separate from the grass. It's a blade that lifts off, flying strongly, and finally settling onto a stem besides the other blades.

You may read about coneheads at websites, such as ... <http://songsofinsects.com/katydids/robust-conehead> .





67th Meeting of Kansas Ornithological Society

October 2 - 4, 2015

Emporia State University, Emporia, Kansas

Friday, October 2

7- 9 p.m. Social at ESU's Ross Natural History Reservation

Saturday, October 3 (times tentative)

Guest speaker: Noppadol Paothong is a staff photographer at the Missouri Department of Conservation (MDC). Nop spent 12 years photographing grassland grouse. This work is documented in the award winning book, "Save The Last Dance". You can view some of Nop's work at <http://www.nopnatureimages.com/> You will find Nop's presentation to be stunning and entertaining yet somewhat poignant as he discusses the sad state of declining grassland grouse numbers.

Registration

The meeting registration fee is \$25. The Saturday evening banquet is \$20. The Sunday box lunch is \$8. Registration fee is waived for students 25 and under. Registrations must be received by September 25th to be included in meal counts. No refunds for cancellations after September 25th. Registration form and more information can be found at the following website.

http://www.ksbirds.org/kos/Fall2015/2015_KOS_Fall.htm

When the Well Runs Dry

Film screening, commentary by the filmmaker and K- State faculty members, and audience discussion

Thursday, October 22, 5:30 pm

UMB Theater, Gallery Level

Marianna Kistler Beach Museum of Art

701 Beach Lane at 14th & Anderson

Manhattan, KS 66506

When the Well Runs Dry is a 31 minute film directed by Lawrence filmmaker Steve Lerner, and award winning Los Angeles documentary filmmaker Reuben Aaronson. Other members of the production team are Jim Jewell, and Greg Allen.

This short documentary tenderly portrays the vital connection that rural Kansans have with water, our most precious resource. Ranchers, farmers, and residents of small Kansas towns tell us their heartfelt, personal stories about water, including the ongoing threats they face to the availability of the water on which they depend.

Director Steve Lerner, Jesse Nippert (Biology), Matthew Sanderson (Sociology), and Steve Wolgast (Journalism) will offer commentary and respond to audience questions and comments. A live stream connection with Seward County Community College/Area Technical School in Liberal, KS will allow audiences at the two sites to interact.



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Alsoop bird sanctuary update: I was advised that October planting is too late so we will concentrate on installing the stone pathway this fall instead.

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Membership Information: Introductory memberships - \$20/yr., then basic, renewal membership is \$35/yr. When you join the National Audubon Society, you automatically become a member of the Northern Flint Hills Audubon Society. You will receive the bimonthly Audubon magazine in addition to the Prairie Falcon newsletter. New membership applications should be sent to **National Audubon Society, PO Box 422250, Palm Coast, FL 32142-2250**. Make checks payable to the National Audubon Society and include the **code C4ZJ040Z**. Questions about membership? Call 1-800-274-4201 or email the National Audubon Society join@audubon.org. Website is www.audubon.org.

Subscription Information: If you do not want to receive the national magazine, but still want to be involved in NFHAS local activities, you may subscribe to the Prairie Falcon newsletter for \$15/yr. Make checks payable to the Northern Flint Hills Audubon Society, and mail to: Treasurer, NFHAS, P.O. Box 1932, Manhattan, KS, 66505-1932

RARE BIRD HOTLINE: For information on Kansas Birds, subscribe to the Kansas Bird Listserve. Send this message <subscribe KSBIRD-L> to <list_serve@ksu.edu> and join in the discussions.

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