THE BRODIE CLUB

Established 1921

THE 1,063rd MEETING OF THE BRODIE CLUB

The 1,063rd meeting of the Brodie Club was held at 7:30 pm on Tuesday, February 19, 2013 in Room 432 of the Ramsay Wright Laboratories of the University of Toronto.

Chair: Bill Rapley
Recording Secretary: Ricky Dunn

The meeting was attended by 29; 24 members and 5 guests.

Roll Call:
Present: Beadle, Bertin, Bryant, Carley, Coady, Currie, Dunn, Eadie, A. Falls, B. Falls, J. Hussell, Iron, Joos, H. Juhola, Kotanen, Lumsden, Machin, Martyn, McAndrews, Pittaway, Rapley, Seymour, Speakman, Tomlinson.

Regrets: Abraham, E. Addison, R. Addison, J. Bendell, Y. Bendell, Crins, Curry, D. Hussell, A. Juhola, Obbard, J. Rising, T. Rising, Slessor, Sutherland.

Guests: Bill Cole and Emily Drysek, guests of Ricky Dunn; Greg Stuart, guest of Kevin Seymour; Sid Daniels, guest of George Bryant; and Sharon Hick, guest of Jock McAndrews.

Minutes: Minutes of the January meeting were approved as written.

Reports of Committees

- **Program:** B. Falls: Speaker next month will be Rowan Sage of the Department of Ecology and Evolutionary Biology, speaking on the upsides of climate change on plants.
- **Archives:** Eadie noted that there are still extra copies of the minutes that were printed in annual volumes during the 1950s.
- **Field Trip and Picnic:** B. Falls reminded us that in March we should begin to make plans for this. Rapley said the Giant Panda exhibit at the Toronto Zoo would be opening in mid-May, and he would try to get us invited.

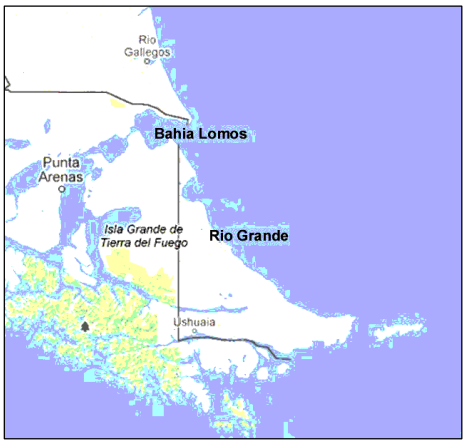
SPEAKER:

Bruce Falls introduced the speaker, **Allan Baker**. This Kiwi ornithologist came to Canada in 1972, and has been with the Royal Ontario Museum ever since. He is head of the ROM's Department of Natural History, and is a professor in the Department of Ecology and Evolutionary Biology. Renowned for his research in molecular evolution and avian systematics, he is also involved in the conservation of shorebirds on a global scale.

Snowbirds in the Land of Fire – Red Knots in Winter

Red Knots that breed in the Canadian Arctic spend the winter largely in South America, as far south as Tierra del Fuego. A separate group winters in Florida, but the bulk of the birds go much farther south.

In spring, knots nearly double their weight and enlarge their hearts. Tracking devices have shown some birds make a single, six to eight day flight direct to the Arctic, though many break their journey along the way. The Delaware-New Jersey area, where knots feed on eggs of spawning horseshoe crabs, is famous as one stopover. In other locations, mussels and clams -the usual non-breeding diet of knots- are swallowed whole and crushed in the gut to make up the bulk of the diet.



Baker has been working for many years at the town of Rio Grande (see map), where there was once a wintering population of about 7,000 birds. It has steadily declined, to a recent total of 32 individuals. This decrease is part of a world-wide trend in knots, usually caused by destruction of food sources. For example, in Rio Grande, some pollution and drying out of mussel beds resulted from changes in water flow that followed construction of a sewage plant. In New Jersey, horseshoe crabs have been overharvested. The Waddensee area of the Netherlands was almost entirely destroyed by commercial dredging for molluscs before conservation efforts kicked in. Massive loss of feeding areas in the Yellow Sea of China and in coastal areas of Korea has led to actual or probable future declines for several millions of shorebirds that use those sites.

Knot numbers in the Western Hemisphere have declined steadily over 30 years. Careful winter counts in the past several months indicated 4,300 birds in the south-eastern U.S. and the Caribbean, 10,000 in Tierra del Fuego, and 15,000 in coastal Brazil – the latter a surprise finding in the first good aerial coverage of this difficult-to-survey terrain. The total of nearly 30,000 knots is a huge reduction from counts of up to 100,000 in the 1980s.

In Rio Grande, there was little local interest in the plight of knots until the 1990s. Education, publicity and outreach by Baker and many others has led to big changes. Rio Grande residents now take an interest, have shorebird festival events, and even produced a play in which local actors played Allan Baker and his colleagues in starring roles. One locally-marked knot, with the leg flag "B95," has become famous around the world as a poster child for knots. This individual has made at least 17 round trips between the Arctic and Argentina.

Recently Baker and his crew moved operations to Bahia Lomos, across the border into Chile, where there are still about 10,000 wintering knots. These include a few marked birds that moved from Rio Grande, showing for the first time that there can be shifting among wintering sites. This meant that survival estimates had to be adjusted to account for emigration. Results of the new models indicate quite a high annual adult survival, fluctuating from 75 and 90%. Males survive less well than females in bad years (which are often related to weather pattern changes caused by the Arctic Oscillation). Females start migration right after hatch, while the males stay for another three weeks

to look after chicks. Because adult survival is good, the proximate cause of population decline must be poor recruitment of juveniles to the breeding population – but this is very hard to study.

QUESTIONS AND ANSWERS

Q. Falls: What's the current story on horseshoe crabs?
A. They're collected for fertilizer, and sold as bait for eel and crab traps. Some protections have been passed, but the state of Delaware keeps rescinding them.

Q. Does the whole knot population go through Delaware Bay?
A. This isn't certain. The Florida-wintering birds do, but so do others. Interestingly, there are more males than females. It isn't clear whether the females go elsewhere, or just stay a shorter time.

Q. Eadie: You use netting to catch birds for marking, and search by scope for re-sightings. Is the netting useful for recaptures, too?
A. Yes, but of course with more disturbance. More importantly, though, you get many more times observations through re-sightings, making it possible to build much better population models.

Q. Daniels: Does beach erosion affect horseshoe crab populations, or do they just go elsewhere?
A. Elsewhere, but they need sandy shores, and these aren't found just anywhere.

Q. Rapley: Are knots polygynous?
A. No.

Q. Cole: Are there any data on fledging success?
A. No. Within any one study area you'd be doing very well to find two or three nests because they are so spread out. The sample sizes aren't large enough to mean anything. Counting juvenile to adult ratios at fall stopover sites is probably the best means of assessing juvenile production. This has been tried on James Bay shores and Mingan Islands of Quebec, where different breeding populations have stopover sites.

The speaker was thanked by Iron.

OBSERVATIONS:

J. Hussell: A few weeks ago a crow was seen carrying something large and white. The bird dug a shallow pit with its beak, pressed the object in and covered it with grass and leaves. On hurrying out to see what was buried, Jeremy found a jelly-filled, sugar-dusted Timbit!

Speakman: Has heard a pair of Great Horned Owls duetting regularly near his home. The male has a higher pitch to its call. Speakman will watch for possible nesting and report back.

Cody: Had a pair of Common Ravens over his house, performing antics typical of mating behaviour. He noted that any confirmed nesting would expand the range south as far as Cranberry Marsh. Additional evidence that ravens are expanding their range was offered by *Bryant*, who saw one building a nest near Barrie, and *Rapley*, who reported that one came to the Toronto Zoo last year.

Pittaway: Has had both a Hoary Redpoll and a Yellow-rumped Warbler at his feeder: extreme northern and southern species at the same time. He has been providing special fat and meal mixes for the warbler, and it seems to be doing fine, having survived temperatures down to -21ºC.

Martyn: Recommended "Birds of Georgian Bay," by Bob Whittam, and showed a copy. Good photos and good writing.

Lumsden: Over 197 Trumpeter Swans have been observed at La Salle Park and 52 in Aurora at ponds on Frank Stronach's estate. The population is doing well.

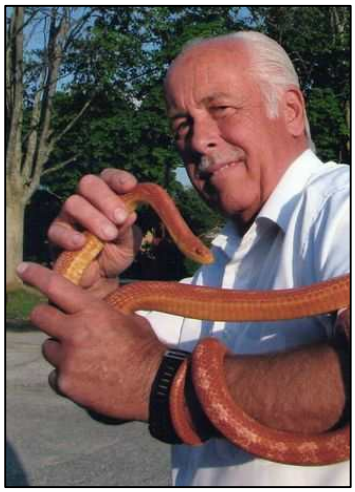
Dunn: An Oregon Junco spent two days at her bird feeders in Simcoe at end of January.

The meeting was adjourned at 8:56 and refreshments were enjoyed by all.

CORRESPONDENCE

The Membership Committee received an application for membership from Sid Daniels and has unanimously approved his nomination and forwarded Sid's bio for inclusion in these minutes. Sid was nominated by George Bryant. Following approval of club members, Sid will become a member of the Brodie Club at the next meeting he attends.

Sidney Murray Daniels
Born: Toronto, 1942



Education and Work History:

- B.A., U of T 1970
- M. Ed., U of T 1975
- 1963—1997—Toronto Board of Education
- Started as a public school science teacher and then principal for seventeen years in three schools

Natural History Interests:

- Reptiles, amphibians, butterflies, insects, fish, fishing, fossils, feeder birds, macro-photography, gardening, astronomy
- Founding member of Toronto Entomological Association (1963)—responsible for adding West Virginia White in Halton County to Ontario Endangered Species list
- Discovered significant populations of WVW in Frontenac thereby de-listing WVW!
- Has seen and photographed over 400 species and subspecies of North American reptiles and amphibians (~1000)
- Monitored population of Ontario's most elusive butterfly—Early Hairstreak for many decades
- As science teacher he maintained a white rat maze which encompassed the room from floor to ceiling and all walls

Claire Muller noted she "once helped Bill Carrick (more than 11 years ago) clean up his place and found quite a bit of Brodie Club material which he agreed to put in the Brodie Club archives. I think that may be the source of the old Brodie Club letterhead that was used as the source of the Club logo."

Clare "read with great interest the notes about David Rudkin's talk about the Horseshoe Crab" and sent along the following comment and illustration:
"The latest findings are that the adults ONLY come back to their place of birth and researchers have discovered that when Homo sapiens chronically invades a beach, that whole groups of crabs die out because they are afraid to breed there, so the numbers are falling."

Ken Abraham wrote on Feb. 1…"Some of the Brodie members may be interested in the Red Knot article in the Winter 2013 newsletter *(The All-Bird Bulletin)* of the U.S. North American Bird Conservation Initiative (NABCI) Committee which can be found on pages 5-7 at this link:" http://www.nabci-us.org/bulletin/bulletinwinter2013.pdf
To access the Adaptive Management Framework Report to the Atlantic States Marine Fisheries Commission, go the Commission's web site and look under Managed Species – Horseshoe Crab: http://www.asmfc.org/. To read more about the Red Knot, visit: http://www.fws.gov/northeast/redknot/.

Oliver Bertin E-mailed a condensed version of an article from the Toronto Star of Feb. 11, 2013.

Birds vs. mirrored buildings:
Environmental group loses case,
But wins important precedent

A landmark ruling on Monday (Feb 11, 2013) held good news and bad news for the migrating birds that suffer injury or death in collisions with GTA buildings with reflective windows.

The bad news: the owner of a north Toronto office complex once deemed "lethal" for birds was acquitted of all charges by Ontario Court Justice Melvyn Green, avoiding potentially hefty fines.

Green agreed that more than 800 birds were killed or injured between March and November 2010, after crashing into the mirror-like windows of Cadillac Fairview's Yonge Corporate Centre, near York Mills Rd. The windows, reflecting trees and sky, create the illusion of a clear flight path that ends in birds suffering serious trauma.

However, the judge ruled that the company did exercise "due diligence" in tackling the avoidable bird body count. Last summer, Cadillac Fairview applied an innovative window film to part of the office complex – a measure that has saved hundreds of birds.

The good news for bird advocates is that the meticulous ruling could set an important precedent under the Environmental Protection Act. "It's not a complete victory, but it's a huge victory," said lawyer Albert Koehl, who led the private prosecution of Cadillac Fairview for the environmental advocacy group Ecojustice.

"It means building owners are liable under the law for killing birds with reflective windows," he said. "It sends a strong message to building owners that they have to take action."

Ecojustice established that Cadillac Fairview could be charged under the EPA for "the discharge of a contaminant, namely radiation of light from reflective glass including windows that caused, or was likely to cause, an adverse effect, namely death or injury to birds," said Justice Green. That part of the ruling "means that the Ministry of Environment has to regulate the buildings for their discharge of reflective light that's killing birds," says Koehl.

The Toronto-based non-profit Fatal Light Awareness Program (FLAP) estimates that one million birds are killed by striking buildings in the GTA every year. The City of Toronto requires all buildings constructed after 2010 to include measures to reduce bird strikes.

NEXT MEETING

The next meeting will be held Tuesday, March 19 at 7:30 pm in Room 432 of the Ramsay Wright Zoological Laboratories. **Rowan Sage** of the Department of Ecology and Evolutionary Biology will look at **positive effects of climate change on plants.**

FROM THE ARCHIVES

February 1988: Bendell chased a Snowshoe Hare down the road by van. The hare ran at 30-40 km/hr for over a kilometre – but was then killed in collision with a school bus.

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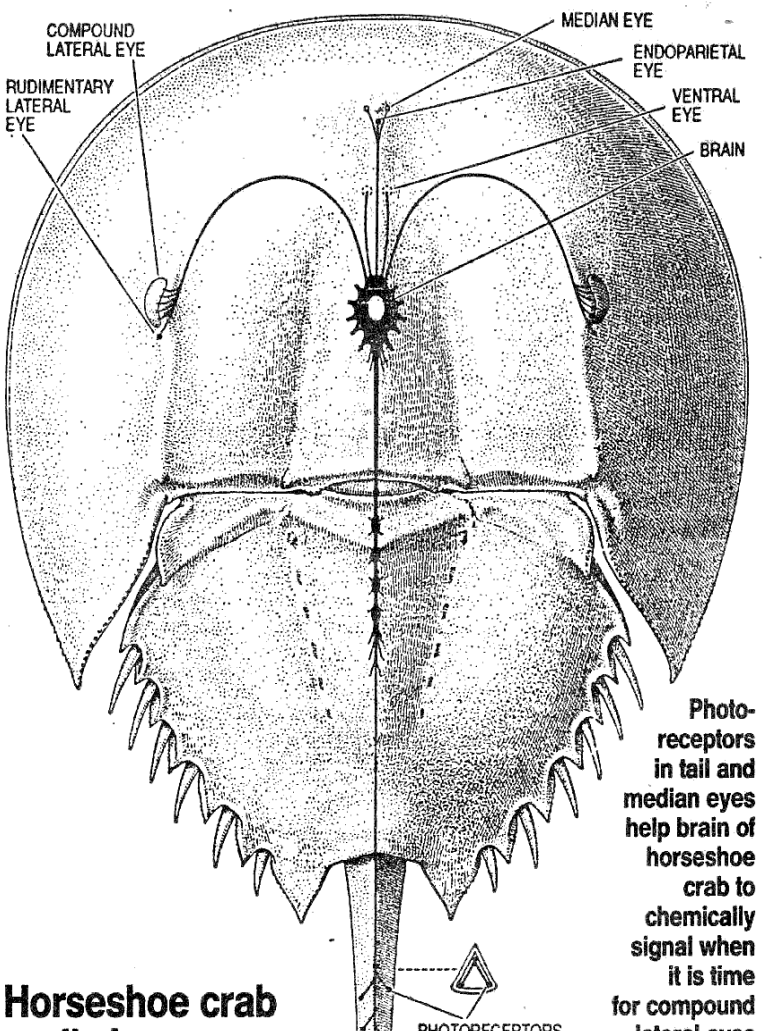

Photo-receptors in tail and median eyes help brain of horseshoe crab to chemically signal when it is time for compound lateral eyes to undergo changes.

Horseshoe crab really has an eye for change

The compound eyes of the horseshoe crab undergo vast cellular changes twice daily to adapt to the changing light conditions of day and night, according to a research professor of ophthalmology at the State University of New York Health Science Centre in Syracuse.

Robert Barlow, who has been studying the visual system of horseshoe crabs for 25 years, and colleagues say the circadian clock in the crab's brain causes chemical and cellular changes to eyes so that the crab can see as well in the dark as during the day.

It has long been known that the horseshoe crab's compound lateral eyes are extremely sensitive, but the Syracuse researchers found that the sensitivity can increase up to a million times, depending on the darkness. Photoreceptors in the tail tell the brain how much adjustment is needed. The median eyes at the front provide further refinement.

The brain sends chemical signals to the compound eyes that cause the photoreceptor cells to change shape and that cause the changing of ion channels. At night, the changes would be to greatly enhance the photoreceptor cell's ability to respond to photons, the basic energy-particles of light. New chemical signals cause the cells to be less sensitive, so that by dawn, the horseshoe crab's eyes are adjusted for daylight. The circadian clock is involved, the researchers found, because, when the crabs are left in darkness (this has been tested for up to a year), the cellular changes still take place on a daily cycle.

The scientists report details of their work in the April issue of Scientific American.