

THE BRODIE CLUB



Established 1921

Website: <http://thebrodieclub.eeb.utoronto.ca>

THE 1138th MEETING OF THE BRODIE CLUB

The 1138th meeting of the Brodie Club was held on Tuesday, 21 November, 2023 in Room 432 of the Ramsay Wright Laboratories of the University of Toronto.

Chair: Katie Thomas

Secretary: Kevin Seymour

The meeting was called to order at 7:40 pm and was attended 18: 14 members and 4 guests (including the speaker).

Roll Call:

Present: Bacher, Beadle, Bertin, N. Dengler, R. Dengler, Dunn, Eadie, Iron, Johnson, Larsen, Miller, Riley, Seymour, Thomas.

Guests: Chris Boccia (guest of Johnson), Yihang Zhao (guest Johnson), Mary-Lou Robinson (guest of Bacher), Meredith Swartwout (speaker).

Regrets: Abraham, E. Addison, R. Addison, Bell, DeMarco, Dickinson, Dunlop, Falls, Kortright, Lindsay, Moldowan, Rapley, Rising.

Minutes: Minutes of the October 2023 meeting were approved.

Committee Reports:

Program: The next meeting, on Tuesday, December 12, 2023 will be Justin Peter speaking on "Japan in Winter".

Ontario Nature: Thomas will contact Carolyn King, Brodie Club representative to Ontario Nature regarding the Nature Network form.

Membership: Al Hirsch was welcomed as a new member. Al is currently travelling and unable to make tonight's meeting. We will officially welcome him at our December 12th meeting.

Finance: Pay your dues at the next meeting if you haven't already. Nineteen members have renewed to date and the Bank balance is \$1821.

The Brodie Club received a very nice thank you letter from the FREED program for our donation, as follows:

"Thank you for your generous donation to FREED. We know that you have many choices when deciding where to allocate your donation funds and materials, and we really appreciate you choosing to partner with us! With your donation of field equipment, field guides, and research gear

we were able to support our event. In fact, some of the field gear was used as prizes during our scavenger hunt at the end of the week and is living a second life as one of our FREEDlings field gear.

As a cascade sponsor, you are entitled to several benefits, including our annual summary report, a list of ~10 photos (for use only in relation to FREED), sponsor recognition on our website and social media platforms, and access to other advertising opportunities to our network. I have linked our [annual report](#) that you are free to share within your agency. If you would like the photos, I can send you our photographer's licensing agreement to sign, followed by the link for access to the photos. In regards to advertising opportunities, please let us know if this is a benefit that you are interested in and we can discuss the details.

Thank you again for your support for FREED, it really makes a world of difference!

All the best, Rachel and the FREED Team (Aranya Iyer, Mariel Terebiznik, Reta Meng, Vanessa Nhan)"

New Business

Bruce Falls' 100th birthday is on December 18th. He is unable to attend our December 12th meeting, but Brodie Club members are welcome to drop in at his home, 14 Tottenham Rd., 2-4pm on Sunday, December 17, 2023. If anyone needs to talk to daughter Kathryn about the drop-in, her phone number is: 416-425-1977.

Riley reported that a collection of letters honoring Brodie member Ron Tasker upon his retirement (some from Brodie Club members), was published in book format by University of Toronto Press. The copy that he brought to the meeting has been donated to the ROM library.

Riley reported on an interesting article on the life of William Brodie, the club's namesake, including his dental practice, extensive natural history collections, influences on contemporaries Tom Thomson and E.T. Seton, and scientific contributions to entomology and botany, especially plant – insect interactions. Riley located a portrait of Brodie by Canadian artist Owen Staples, which has been donated to the Faculty of Dentistry, University of Toronto, to replace the one stolen. Thomas will circulate a copy of the article.

REMEMBER: To bring treats for all to enjoy as is our usual tradition for the December meeting!

SPEAKER: Dr. Meredith Swartwout is a Post-doctoral Fellow in the Rosalind Murray lab at University of Toronto Mississauga working on the impacts of urbanization on Jefferson salamanders. Her Ph.D. research focussed on ant predation on reptile eggs in Costa Rica and Arkansas. She was introduced by Chris Boccia, Ph.D. student at Queen's University who works on genomics of seabird populations in response to climate change.

All about eggs: Patterns of reproductive life history of North American snakes

Snakes are often misunderstood and have a negative public perception. Many are secretive and cryptic and others are active only during certain times of year. As ectotherms they need to adjust to their environment. There are three basic patterns of reproduction: Ovipary, or egg laying, Vivipary, or live birth and Ovovivipary, the retention of eggs so as to give "live birth" which for snakes is essentially the same as vivipary, so only the first two terms were used in this talk. There is a

reproductive tradeoff for ovipary: the larger the egg, the larger the hatchling but the fewer the eggs that can be laid. Many snakes participate in communal nesting sites and the guarding of eggs to try to enhance survivorship.

Generally, their slow life history, and the size of their geographic range and habitat preference can correlate with extinction risk. One of the main results of her work was discovering that the risk of predation on both eggs and hatchlings by ants, and in particular the invasive fire ant, was significant.

Of the 53 taxa of snakes in the USA, 9 genera are declining. She investigated whether these declines were correlated with any aspects of ecology or life history. Three features stood out: all xeric pine habitat specialists are declining, declining species do not show any adaptability to live in or near urban environments and most declining species are oviparous and fossorial, laying their eggs underground.

She then reviewed all 15 Ontario snake species, about half of which are oviparous. For these species, she gave size of egg, size of clutch (maximum and minimum), gave comments about nesting behaviour and had very nice photos of the snakes and the eggs of all these species (seven in total): Ring-necked, Smooth Green, Milk, Eastern (Blue) Racer, Eastern Rat, Eastern Hog-nosed and Eastern Fox. She did the same for the remaining Ontario snakes, which are viviparous (8 in total): Queen, Red-bellied, (Dekay's) Brown, Common Garter, Butler's Garter, Eastern Ribbon, Northern Water and Massasauga. She also mentioned the extirpated Timber Rattlesnake which hasn't been observed in Ontario since 1941. In general Ontario oviparous species are declining and all snakes are also vulnerable to introduced ant predation.

Questions following the presentation:

Miller: European red ants *Myrmica rubra* are present in Ontario. Do they have the same impact as the fire ants *Solenopsis invicta*?

- Iron: European red ants affect ground-nesting birds here in Ontario

Dunn: Do the ants pierce egg shells, or wait until pipping occurs?

- They can pierce even the calcified eggs of birds.

Dunn: Is any part of egg formed in viviparous prior to production of live young?

- A membrane is formed, but calcification of the egg does not occur.

Johnson: What is 'pipping'?

- Pipping is the first nick in the egg shell made by the hatchling. The period from pipping to hatching allows the hatchling to adjust to oxygen levels and absorb the rest of the yolk.

Johnson: Will any species be winners in response to climate change?

- Vivipary allows maternal parents to provide thermal protection for developing babies. So there are many potential winners but habitat loss continues to be the largest threat.

Dunn: Do hatchling snakes have a special tooth to pip the egg as bird do?

- Yes, the tooth falls off soon after pipping.

Bacher: Is there a predator for the invasive and problematic fire ant?

- Yes, a parasitic fly, however biological control is not necessarily the best approach due to impacts on other insects. Poisons are most commonly used.

Bacher: Roads seem to be the worst mortality factor for snakes in the Niagara region, do you find this is true for other areas?

- Possibly yes. Greater density of roads may contribute to the cryptic decline of several snake (and salamander) species.
- Several Brodie members mentioned annual road closures already in effect in Halton, Hamilton and other Ontario localities, with the aim of aiding salamanders as they move to their breeding locations.

Dengler: You mentioned that vivipary has arisen many times during snake evolutionary diversification. What is the driving force?

- Possible thermal protection, and potential reduction of egg predation (since there are no eggs).

Johnson thanked the speaker.

LITERATURE

Johnson recommended *Most Delicious Poison: The Study of nature's Toxins – from Spices to Vices* by Noah Whiteman 2023.

OBSERVATIONS

Dunn reported on a letter received from Brodie member Ken Reading describing changes in the vegetation in Keewatin District (NWT) over 35 years, specifically a switch during the past 15 years from groundcover bearberry to birch saplings that presumably has resulted from climate change.

Riley reported that 2023 numbers of monarchs in the Mono area appeared to be only 5% of the spectacular highs of recent years. In contrast, monarchs were 'booming' on Manitoulin Island.

Miller mentioned that monarchs were few early in the season in Toronto, but that numbers improved over the summer and milkweeds were lush.

Johnson: Chinook salmon were plentiful this year and were nesting farther downstream than before, apparently because of crowding on the usual spawning grounds.