

THE BRODIE CLUB



Established 1921

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

THE 1,090th MEETING OF THE BRODIE CLUB

The 1,090th meeting of the Brodie Club was held on Tuesday, 16 February, 2016 in Room 432 of the Ramsay Wright Laboratories of the University of Toronto.

Chair: Glenda Slessor

Secretary: Ed Addison

The meeting was called to order at 7:30 pm and was attended by 30 members and 3 guests.

Roll Call:

Present: E. Addison, R. Addison, Aird, Bertin, Carley, Coady, Currie, Curry, Daniels, Dunn, Eadie, A. Falls, B. Falls, Hussell, Iron, Johnson, A. Juhola, H. Juhola, Kotanen, Machin, Martyn, McAndrews, Peter, Pittaway, Rapley, J. Rising, T. Rising, Seymour, Slessor, Zoladeski

Guests: Heather Speakman (guest of Bertin), Carolyn King (A. Falls), Sharon Hick (McAndrews).

Regrets: Abraham, Bryant, Obbard, Peck, Riley, Speakman, Sutherland

Minutes: John Riley was added to list of those attending, and spelling of guest Dengler's name was corrected. Approval of the corrected minutes was moved by T. Rising; seconded by K. Martyn.

Committee Reports:

Ontario Nature: Bob Curry reported that donations towards sponsoring an attendee at The Youth Summit totaled \$280 to date and a full sponsorship was \$350. Additional donations during the meeting resulted in a total in excess of \$350.

Field Trip and Picnic: Bob Curry and Bill Rapley reported on behalf of the Field Events Committee. The suggested date for the annual field trip is June 25 at the Metro Toronto Zoo.

Membership: A. Falls welcomed Justin Peter as a new member and announced that bios for two more people will appear in this newsletter.

Program: At the March meeting (March 15) Martyn Obbard will speak on "Is there a tipping point for polar bears?" On April 19, John Casselman will address the club about lake sturgeon and on May 17 Andrew Peregrine of the University of Guelph will speak about Lyme disease.

SPEAKER: Marc Johnson introduced Peter Kotanen. Peter is a scientist with ecological studies on a wide variety of both plants and animals. Peter grew up in southern Ontario and furthered an already strong interest in natural history by spending four summers as a naturalist in Algonquin Park. He completed both B.Sc. and M.Sc. degrees at University of Toronto and pursued his Ph.D. at Berkeley in California. Following postdoctoral studies at the University of Chicago, Peter returned

to U of T where he is a professor of ecology on the Mississauga campus. Peter is a leader in the biology of invasive species.



DO INVADING PLANTS ESCAPE THEIR NATURAL ENEMIES?

Approximately 25% of Canadian plants are exotic, if not to Canada then to a particular region of the country. Some of the exotics are invasive species, characterized by rapid expansion in distribution and abundance that cause problems from the human point of view.

One of the hypotheses for what cause a species to become invasive is the Enemy Release Hypothesis (ERH), which proposes that plants lose natural enemies in expanding to a new area, and thereby obtain an advantage over indigenous plant species that have not escaped their enemies.



Peter and his students have been testing this hypothesis. One of the study species is Ragweed (*Ambrosia artemisiifolia*), which is native to North America but invasive throughout most of the remaining temperate world (e.g. China, Europe). Plants in Europe experience limited damage as compared to here in Ontario. Enemies of ragweed in Ontario include species from the families Tingidae, Chrysomelidae and Noctuidae in addition to carabids, snails, white rust and more.

Peter has students conducting research at the Koffler Reserve in King Township. There are 450 native and 180 non-native plant species on the site. Here they have asked the question ‘Do the non-natives suffer less damage than the native species?’ Generally non-natives suffered less damage although some [e.g. common plantain (*Plantago major*)] suffer extensively. Conversely, another exotic, the dog-strangling vine (*Vincetoxicum rossicum*) experiences little to no damage.

Taxonomic Proximity

Exotics may carry natural enemies with them when they are introduced and can also acquire new ones. In some cases, the likelihood of being damaged by new enemies is greater if the exotic is taxonomically close to native plants in the new range. This was tested in a controlled garden habitat where species differing in phylogenetic distance to the local flora were planted together. In a 2009 paper (Hill and Kotanen *Oecologia* 161: 581-590), a direct relationship was demonstrated between proportion of leaf damage of an exotic and the taxonomic distance to native relatives planted nearby. Although the same relationship likely occurs in the wild, Peter’s group could not demonstrate the effect in uncontrolled field situations, likely because of the confounding effects of other factors.

Spatial Isolation

Seed damage, like leaf damage, is influenced by distance from conspecifics. When ragweed is planted as little as 100m away from active populations, insect damage decreases by about 1/3. The reduction in damage from being 100m from other plants can be greater than that experienced by an exotic moving across an ocean.

Ragweed is extremely successful in pioneering onto new sites, reducing damage by distance, but new populations thrive for only about five years. This depends on a number of interacting ecological considerations. In addition to insect enemies, there are lots of enemies in soil (e.g. nematodes, bacteria, fungi). Damage to ragweed was compared between plants cultivated in soil from existing populations, soil from further away and sterile soil. When the soil was from an existing ragweed site, plant growth was reduced significantly within 3 generations. Thus, if ragweed moves 100m, it loses most of its soil enemies, but the latter soon accumulate.

Canada thistle is similar to ragweed in that planting specimens 100m away from others leads to a reduction in leaf damage.

One reason that many invasives are successful is that by being excellent dispersers they keep leaving their local enemies behind.

Latitudinal Considerations



In the Koffler Reserve, 28% of flora are exotics, whereas on Akimiski Island in James Bay less than 2% of species are exotic. There would be fewer modes of transmission to northern than to southern Ontario, but it is also thought that herbivory declines the further the distance from the equator. As one moves further north, are there indeed fewer enemies of plants?

Burdock (*Arctium minus*) is common in the south, uncommon in Moose Factory/ Moosonee. This is interesting because burdock experiences lots of damage by enemies in the south. Burdock seed heads are attacked by the moth *Metzneria lappella*. The lower the latitude the higher the proportion of seed herbivory on burdock. Similarly, leaf miner damage of burdock is high in southern Ontario but limited to the north in Algonquin Park. Leaf hole damage is also much lower in the north, and burdock plants in Moosonee/Moose Factory are the biggest and healthiest Peter has seen. Differences in genotype of the plants does not explain the regional variation in damage. The relationship of latitude to damage might result from decreased densities of burdock in the north making it harder for enemies to find it. As well, some enemies may have greater weather related restrictions on them in the north.



While burdock appears to escape seed eating enemies in the north, net damage to seeds of Canada thistle (*Cirsium arvense*) is just as high in the north as in the south. An enemy of Canada thistle stems is *Urophora cardui*, while enemies of the seeds include *Larinus planus* and *Terellia ruficauda* and leaves are attacked by *Cassida rubiginosa*.

Questions:

R. Dunn. To what extent do native plants escape their enemies in the north?

We're looking at that now and are starting to see similar patterns as with exotics.

J. Hussell. Ragweed cultivated in soil from existing colonies appeared to be bigger in the first year than those in new soil without soil-borne enemies.

Ragweed is a micorrhizal plant, and boosted initial growth is due to some of that being in the 'used' soil, while it is absent from sterilized soil.

B. Curry. I had always thought that plants in the north were thriving because of the longer daylight during the growing season.

Yes, this likely is another factor affecting performance.

G. Coady. There are huge burdock at 415 (on Cape Henrietta Maria on Hudson Bay).

Peter had not had a chance to get there and suspects that with the unusual climate on the Cape that evaporative or other climatic features would also be significant considerations in that ecosystem.

S. Daniels. Were purple loosestrife populations in decline before introduction of insects to control them?

I am not the best person to answer that question. There is a debate about the relative timing of the decline and the introduction of control measures.

J. Peter. If burdock in Moose Factory are escaping seed enemies, why is the plant not more abundant?

Burdock is quite common there, but it likes disturbed sites and perhaps is limited by availability.

E. Addison. Weather factors affect distribution of ticks. Might the same not be true for some of the insect enemies of plants?

Yes that could be true. We need to know more about factors limiting insect enemies, but temperature is likely more important than relative humidity.

B. Rapley. Are you studying enemies of dog-strangling vine (DSV)?

Release of noctuid moths has been attempted in some areas. Many biocontrol releases fail. In some cases the cause may not be using the wrong species for successful control, but rather the wrong genotype. There are few taxonomically close relatives to DSV in our local ecosystems, with milkweed perhaps being the closest.

J. Peter. Does “empty niche” theory apply to exotics that become invasives?

Yes, there are many studies of this – but an empty niche is not a prerequisite. Smooth brome, for example, is invading native grassland. At Pelee each spring people are actively uprooting garlic mustard. However, this increases open disturbed sites attractive to garlic mustard whereas native species such as May apple and others are competing with garlic mustard where the sites have not been disturbed.

C. Zoladeski thanked the speaker.

FIELD OBSERVATIONS AND LITERATURE REVIEWS

B. Rapley noted shared perching by black and turkey vultures on a church in Lewiston NY.

B. Rapley reported that two captive ravens at the Metro Toronto Zoo are being visited by free ranging wild ravens, and the captives are feeding the visitors through the fence. A black vulture also visited the captive ravens. It was not seen to be begging for food and seemed fit. It was captured and is being held for observation and perhaps subsequent release.

J. McAndrews. Just back from Grenada where despite no Boston fern being observed, its spores were found in a layer of mud from up to 4000 yrs. prior.

J. Carley reported that the “Mushrooms of Toronto” book in the City of Toronto Biodiversity Series is printed and he had copies for club members.

S. Daniels noted that Valentine's Day 2016 was the coldest Valentine's Day on record while the average temperature for January was 5°C above the long term average. He also noted that Einstein's prediction made 100 years ago of the presence of gravitational waves has been confirmed.

S. Eadie commented that when living in New Brunswick years ago she experienced a rapid greater than 30° change in the air temperature coincident with the arrival of a near hurricane.

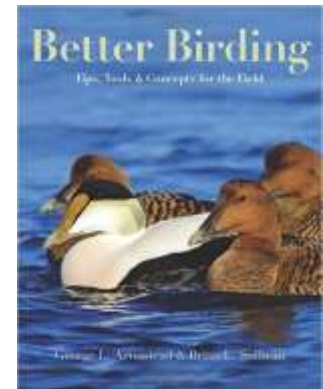
O. Bertin recommended "Sisters in the Wilderness," an excellent biography of Catharine Parr Traill and her sister Susanna Moodie, written by Charlotte Gray. As well as being a diarist, Traill was a very good amateur botanist with many publications and museum collections to her credit. She was particularly concerned by the loss of native species as the early pioneers cut the original forest and planted invasive species and crops. A quote from this book (Penguin, p. 290) reads: "But she [Traill] also tried to alert others to the slow erosion of native Canadian species. In 1852, she



protested to the editor of the *Genesee Farmer* that in the rush to clear land, stock greenhouses and cultivate annuals for gardens, indigenous forest plants were disappearing. 'Man has altered the face of the soil,' she wrote with despair. 'The giants of the forest are gone, and the lowly shrub, the lovely flower, the ferns and mosses that flourished beneath their shade have departed with them... Where now are the lilies of the woods, the lovely and fragrant *Pyrolas*, the Blood-root, the delicate sweet scented *Michella repens*? Not on the newly cleared ground, where the forest once stood.'

Michella repens - Partridge berry

H. Currie recommended "Better Birding Tips, Tools and Concepts for the Field" by Armistead and Sullivan (ISBN: 9780691129662). The book has lots of photos, is prepared carefully and intelligently and has numerous pieces discussing identification of pairs of species that are difficult to distinguish from one another.



C. Zoladeski brought attention to the book "Climate Change, The Facts" (ISBN: 978-0-9863983-0-8). The book is a collection of essays and is edited by Alan Moran.

The meeting adjourned at 9:08 PM

NEXT MEETING: The next meeting will be on Tuesday, 15 March.

CORRESPONDENCE

Harry Lumsden is the lead author on a paper published recently in the Canadian Field Naturalist (Vol. 129, No. 4, 2015): Response of wild Trumpeter Swan (*Cygnus buccinator*) broods to wetland drawdown and changes in food abundance. Here's the abstract:

A brief period of drawdown can stimulate wetland productivity and enhance the attractiveness of a site for breeding Trumpeter Swans (*Cygnus buccinator*) by providing a nutrient pulse. Drawdown of a pond in Aurora, Ontario, lasting about 8 weeks in late summer and fall 2009 followed by re-flooding increased the abundance of invertebrates, especially snails, in the following year. This response was ephemeral, lasting 1 year. Wild Trumpeter Swans and their cygnets responded by selective feeding the year after drawdown, despite the risk of predation by Snapping Turtles (*Chelydra serpentina*). There was a strong correlation between the feeding activity of two cygnets and the local abundance of snails in the pond in 2010. The nutritional content, especially protein, calcium, phosphorus, and magnesium, of a variety of abundant foods satisfied the requirements for skeletal growth and development and was higher than that of available commercial duck grower rations. The responsive feeding behaviours of the cygnets are typical of specific appetitive behaviour and suggest that swans rapidly exploit unpredictable nutrient fluxes in their local environment.

Note from Oliver Bertin:

Brodie Club members often ask why there is always a ‘-30-’ code at the end of the newsletter. This was started by Oliver Bertin during his long service as Brodie Club Secretary, starting a tradition that continues today. Oliver explains:

‘30’ was first used by Western Union telegraphists in 1859, before the U.S. Civil War, as a sign-off code in Morse code transmissions. Number codes were used as shorthand for common phrases, such as ‘Do you understand?’ ‘Priority, very important,’ and even ‘Love and kisses.’ The number ‘30’ was the code for ‘no more – the end,’ signifying end of transmission or simply ‘time to lean back and have a smoke.’ The number 30 in Morse code actually consists of three dots and 7 dashes, but telegraphists would sometimes get lazy, type out 3 dots and a few dashes and then go home.

Western Union used the codes for efficiency of communication, and the 30 code was adopted by newspaper journalists for similar reasons--as a simple way to say: ‘end of story’. That was particularly useful in the typewriter days when we often filed a story ‘take by take’ or page by page. The editor would rip the ‘take’ out of your typewriter on deadline stories, run down to the compositor with it and then come back for more. This would continue until he saw a -30- code at the bottom of the page. Fun days.

For a while, I used to put a line drawing of a fulmar or a Brodie logo at the end of my newsletters. Same thing; same purpose.

PS: I plan to put a ‘-30-’ on my gravestone if I’m still around to do so. [*Editor’s note: Oliver didn’t explain how he intended to accomplish this feat!*]



PROPOSED NEW MEMBERS

Nancy Dengler

Born: San Francisco, California, 1942

Interests:

- General natural history
- Ornithology from bird watching perspective, including systematics, ecology and behavior
- Programs and organizations that support an appreciation and protection of nature locally and globally.



Education and work interests:

- B.Sc. (University of California, Santa Barbara), M.Sc. and Ph.D. (UC Davis)
- Professor, former Department of Botany (now Ecology & Evolutionary Biology and Cell & Systems Biology) 1968-2005; now Professor Emeritus
- Research interests in plant anatomy and development, centering on the developmental basis of leaf shape, including the large pleated leaves of palms and perforated leaves of aroids; also internal tissue differentiation, including formation of leaf vein systems and evolution and differentiation of photosynthetic tissues in species having the C4 photosynthetic pathway.
- Strong interest in natural history, with travel throughout North America, Australia and many locations in South America, with shorter trips to southern and western Africa, India, Borneo and Europe. The focus of these trips was bird- and plant-watching.
- Active volunteer with Toronto Field Naturalists (president, 2014-16); also has served on boards of the Nature Conservancy of Canada (Ontario region), the Toronto Botanical Garden, and Ontario Nature (when Federation of Ontario Naturalists).

Key influences:

- The California landscape and opportunities for outdoor exploration, including the dramatic spring wildflower displays.
- Katherine Esau, professor at UC Santa Barbara, initially inspired research in plant microscopic structure and development.
- Rudolf Grah (father) a forester with an interest in natural history and experience in the Amazon and Herbert Dengler (father-in-law) an expert naturalist in the San Francisco area.
- Colleagues at the University of Toronto, including Spencer Barrett, Jim Eckenwalder, and Tim Dickinson.

Carolyn King

Born: Toronto, Ontario, 1949

Early Life: Grew up in the rural countryside north of Woodbridge, spending most of my time exploring nature.

Interests:

- All facets of nature, as long as I can remember, especially wildflowers, butterflies, birds, mushrooms, nature photography
- Particular interest in botany, butterflies, dragonflies, moths and spiders; a developing interest in rocks and fossils.
- Have led walks on wildflowers, butterflies, dragonflies, moths (moth nights) for Carden Nature Festival, Rondeau Provincial Park, Rouge National Urban Park, Tommy Thompson Park Butterfly Festival, the Toronto Entomologists' Association, the Canadian Wildflower Society, the Toronto Wildflower Society and Pickering Naturalists

- Participated in the four Toronto area BioBlitzes, as a nature specialist on butterflies, dragonflies, moths and botany
- Have judged regional, national and international photo competitions, mainly specializing in nature
- Photography
- Organized Wildflower Garden Tours in Toronto and the Kitchener-Waterloo area for the Canadian Wildflower Society for 10 years.

Key Influences:

- My parents, particularly my English mother, who taught me the birds and the wildflowers, and started my brother and I on our butterfly collection.
- Paul McGaw (deceased 2000), who had a passion for all flora and fauna, particularly wildflowers, birds and moths.

Organisations:

- Toronto Field Naturalists – since 1983
- Mycological Society of Toronto – many years
- Field Botanists of Ontario – many years
- Canadian Wildflower Society – Board of Directors 1991- 1999
- Toronto Wildflower Society – on executive 10 years
- Scarborough Camera Club – 1984-2001, 3 executive positions including President
- Toronto Entomologists' Association – since 1983, on Board of Directors since 1991
- Pickering Naturalists – since 2004, Programs Coordinator since 2004
- Gem & Mineral Club of Scarborough – since 2010

Education and work history:

- B.A. in Geography, York University
- Several cartographic jobs in private mapping companies
- Cartographer in Department of Geography, York University, since 1972