

# BRODIE CLUB



ROYAL ONTARIO  
MUSEUM OF ZOOLOGY

## THE 956th MEETING OF THE BRODIE CLUB MINUTES

The 956th meeting of the Brodie Club was held on March 20, 2001 in the Ramsay Wright Zoological Laboratories of the University of Toronto.

Chairman: John Riley

Recording Secretary: Oliver Bertin

Attendance: 20 members and nine guests

### GUESTS:

- Alison Hegarty, Joyce Peterson and Henri Selles. guests of Claire Muller;
- Carl and Paul Rothfels, guests of Marc Johnson;
- Ed Addison, guest of David Hussell;
- Aaron Dean, guest of Bill Crins;
- Paul Harpley, guest of Bill Rapley;
- Sharon Hick, guest of Jock McAndrews.

### ANNOUNCEMENTS:

Bruce Falls said John Speakman will talk on "An Arctic Retrospective" at the April 17th meeting and Harry Lumsden will speak on his recent trip to eastern Russia, the Sakhalin and the Kamchatka Peninsula on May 15. The annual field day will be in June and a members' meeting in September.

Hugh Currie said Kenn Kaufman will speak on his illustrated book on North American birds at the Toronto Ornithological Club at 7:30 pm on April 9. The photos are computer-generated to make them more useful to the field observer. The meeting will be held in the Cummings Auditorium of Women's College Hospital. He offered tickets to members who would like to attend.

Bill Carrick said Andrea Kettle has traded her position as co-ordinator of support services at the Federation of Ontario Naturalists for a new job as director of Lands [or Nature.

Lumsden offered members a collection of periodicals. He said the FON would hold a regional meeting on May 4, just north of Brighton, Ont. There will be a conference on "Woods Talk" in mid-June at York University, which continues from a previous conference on woodlands in southern Ontario.

Falls nominated Edward Addison for membership. Dr. Addison is a retired research scientist with the Ontario Ministry of Natural Resources who now runs Ecolink Science from his home. His biography is attached.

Johnson announced that he will be leaving on an around-the-world journey, not returning until next January.

Minutes of the previous meeting - the 955th - were approved with the change that McAndrews' guest was Jennifer Lea, not Thaler.

SPEAKER:

Falls introduced the speaker, member Bill Crins, a botanist with the Ministry of Natural Resources Parks Branch in Peterborough who adopted hover-flies as his hobby six years ago.

HOVER-FLIES (SYRPHIDAE) IN ONTARIO

Crins said he has been interested in insects since his days as a naturalist in Algonquin Park in the 1970s. He did some seasonal collecting in that area with a particular interest in fly and beetle diversity. He revived his interest in the mid-90s while a regional ecologist for MNR in Huntsville, and decided to adopt the family Syrphidae, a group of Dipterans that is commonly referred to as the hover-flies or flower-flies.

This is a large and economically important family of flies with a good literature and good keys. But there are few people working on them. There are two North American experts - J.R. Vockeroth, recently retired expert from the Central Experimental Farm in Ottawa and F.e. Thompson at the U.S. Department of Agriculture in Washington, D.e. He recommended an excellent resource, "The Insects and Arachnids of Canada" published by Agriculture Canada, one of the more thorough books on insects.

Flies are a large group of insects that include Crane flies and house flies. Insects have six legs, unlike arachnids or spiders that have eight. Flies have one pair of wings unlike other insects which have two pairs of wings, although the second pair are not always obvious. Many of the Syrphidae mimic bees and wasps, but they vary widely in size and morphology. They range in size from a few millimeters long to about two centimeters. Some have stout abdomens like a bumble bee, some have narrow waists like wasps and some have long, thin abdomens. Some hover-flies have feathered antennae, some don't. Some have brown patches on their wings and some have hairy legs.

The hover-flies can be most easily identified by a spurious vein down the length of their wings, which all hover-flies possess. No other group has this vein.

The morphology of this group is highly varied. They have varied head shapes and patterns, antennae of varying length and hairiness, and different colour patterns on their bodies and wings. Some species are very colourful with narrow waists and wings, clearly imitating wasps and bees. Hover-fly legs can vary widely in their hairiness and length, but given the size of these insects, identifying the correct species sometimes requires a microscope.

Like all flies, hover-flies have the characteristic agile, darting flight of that group. Wasps and bees may look similar, but they tend to fly in a different, more studied manner.

Allograpta obliqua -- few of the hover-flies have common names so Crins used the Latin -- are often seen feeding on white or yellow flowers. The host flowers tend to be small or flat because hover-flies lack the butterfly's proboscis. This species lays its eggs on plants near aphids which their larvae eat voraciously. Each larva can eat 800 aphids in their life cycle, making them an important control of this garden pest.

One large group of hover-flies -- the drone-flies and their relatives -- is a good indicator of stagnant water. It is commonly found near ditches and sloughs, often in very shallow areas. The larvae, rat-tailed maggots, are aquatic and have long breathing tubes on their abdomens which allow them to breathe while under water. This species is common in Ontario, but it is probably an introduced species that first appeared in Western Canada in about 1870. Crins believes it was an accidental introduction because there was no good reason to introduce it.

Other species of hover-fly nest in tree cavities, especially when they are wet. Presumably, they feed on detritus that often accumulates in these holes in trees. Another group is found in dark, damp forests, often under the bark of fallen, decaying trees, while another group of about 10 species inhabits ant colonies, scavenging or perhaps feeding on young ants. They have oval, rounded or cone-like larvae. One of the most common species is dark black in colour, with a fairly chunky body and big eyes.

Males appear to eat the nectar of the host flowers because they need quick energy to fly around, while females appear to prefer the pollen so they can build up the protein they need to breed. Crins believes hover-flies are an important plant pollinator and far more important in this regard than most people suspect.

A few genera of hover-fly eat the pollen of grasses and sedges. They are very small, with a complex speciation. Another group is often found on bulrush inflorescences, where they eat the pollen. The bulrushes have little barbs on their fruits that occasionally trap the flies. Crins has seen as many as 20 hover-flies on one bulrush inflorescence, all dead or dying.

The Spilomyia species is one of the most remarkable mimics. It resembles a white-faced hornet, a species that should be avoided because it has a very painful sting. This species is readily identifiable with binoculars and can be watched from a distance.

One species, Milesia, can be up to two centimetres long. But Milesia is rare and found only in Carolinian forests in the extreme southwest of the province.

The hover-flies are most famous for their ability to mimic bees and wasps. They are "amazing" mimics, he said, even as far as their behaviour, shape and colour. At least three genera mimic bumble bees, and some mimic honey bees. The big difference between the wasps and the hover-flies is their flying behaviour. The hover-flies are amazing fliers, which can dart to and fro or just hover while the bees and wasps tend to fly in straight lines.

While courting, the males tend to sit in the open or hover over plants, waiting for the female to come along and pick a mate. Some European species even appear to migrate although Crins wasn't sure how this behaviour could be verified.

Most of the hover-flies come out in the spring and early summer, April through to June. The larger species appear in late July to September, but some fly to freeze-up.

#### QUESTIONS:

- Some species of hover-fly lay their eggs on a plant's surface near aphid colonies. The larvae eat the aphids with great relish.
- Europeans have demonstrated that hover-flies do pollinate some plants, notably grasses and sedges, and white or yellow flowers.
- Hover-flies do not bite. Most are very docile, but some can be aggressive towards each other. They can be hard to catch because they are such good fliers. Some hover-flies have rasping mouth parts, which they use to chew, not to suck like a butterfly or bite like a beetle.

- Very few of the Canadian hover-flies were introduced, Crins believes. There are 6,000 species of hover-fly in the world, of which 4,000 are in the tropics. There are 500 to 600 in Canada and about 300 in Ontario. Only five or six of the Canadian species were introduced. Some species are circumpolar, some nearctic, but the greatest diversity is in the tropics.

- European entomologists have shown that some hover-flies migrate from northern Europe and Britain to the Mediterranean, to Spain and Portugal. In North America, some hover-flies overwinter as larvae and pupae, but others may migrate.

- Some North American insects do migrate, including damers and monarch butterflies.

- Hover-flies do have predators, notably bees, wasps and birds.

- Most hover-flies are diurnal, as far as Crins can tell. They are not caught in night-lights. Some prefer bright sun, while others inhabit forest openings or deep forest shade.

- Some hover-flies may be Batesian mimics, but each subfamily is different.

- Hover-flies are sometimes found co-habiting flowers with wasps and other hover-flies.

- Crins collects the hover-flies, pins, speciates and ships them to the University of Guelph for its insect collection.

- Species identification in some genera can be very difficult because some hover-flies are very small, with similar external morphology. The species can often be differentiated using a microscope to note differences in the leg hair and genitalia.

- They are easy to misidentify. Crins does a tentative identification, then looks at the whole group before going back to the problem species. If he still isn't sure, he puts the mystery species aside and checks it with the university collection in Guelph.

- Hover-flies are adept in the air. Most are able to hover, fly forwards, backwards and sideways.

- Some aquatic species have larvae with a long rat-tail that they use like a snorkel to breathe from under the surface of the water. These species often inhabit shallow, stagnant water. Some insect larvae have six-inch tails, but Crins said these are probably crane-flies.

- The life span of these flies is very short. Eggs typically hatch in two to seven days; larvae live for seven to 10 days and adults for 10 to 15 days. Migrating species presumably live considerably longer.

- Members noted that taxonomy went out of fashion as early as the 1920s, and was pretty well dead by the 1950s. Now DNA is everything.

- Crins noted that we have a very spotty knowledge of the insects. "We are only scratching the surface of insect biology," he said.

#### NOTES & OBSERVATIONS:

- Johnson has seen three species of thistle and catnip around the mouth of groundhog holes. He wondered whether the groundhogs were picking up seeds and carrying them back to their tunnels.

- Bertin saw a fox crossing the road near Woodbine and Gerrard in Toronto's Upper Beaches. This is the first one he has seen in the area. Hick has seen lots of foxes near the top of Spruce Hill Rd. in the Beaches.

- Addison saw his first skunk of the year, and several swans near Kincardine. He saw some crows on Feb. 25. They have now started to nest.

- Lumsden noted that opossums have reached his property in Aurora, Ont. Several years ago, he saw a dead opossum on the road in the hamlet of Snowball, just west of Aurora. Addison said an opossum was found hiding near a garage heater in Espanola on the north side of Manitoulin Island, while Fred Bodsworth said they have been seen as far north as Sault Ste. Marie. They suspect they came north in the back of a truck. Harpley has seen them south of Lake Simcoe, near Sutton. A friend later told Bertin that he has seen opossums several times on the country roads near Inglewood, about 20 km north of Brampton.

- Bertin added later that the Welland Canal opened for the shipping season in the last week of March, the earliest date in its history.

- Norma Martin said tree swallows returned to Belleville on March 16.

- Currie saw his first butterfly of the season on Scarborough Bluffs.

- Claire Muller saw a screech owl enter a tree near Leslie and Steeles in Toronto's northern suburbs.

The meeting concluded at 10: 10 pm.

NEXT MEETING:

The next meeting will be held at 8 pm on April 16 in Rm 432 of the Ramsay Wright Zoological Laboratories at the University of Toronto. Longstanding member John Speakman will talk on "An Arctic Retrospective."

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**Biographical Sketch**  
**Edward McAleese Addison**

I was born in November 1944 in Port Arthur, Ontario to parents who were naturalists and a forester. My 2 older brothers and I were exposed to natural systems throughout the year, making the usual butterfly and rock collections and photographing birds at their nests, wild flowers in bloom and snow drifts during winter storms. This continued after the family moved south to Richmond Hill in 1955. Winter and summer camping were significant parts of our lives.

Summer jobs during university were with researchers and included work on silviculture of silver maples and hard maples, life history of caribou (2 summers) in the West Patricias and Hudson Bay Lowlands of Ontario, and ecology of timber wolves (2 summers) in the French River and Algonquin Park areas.

I completed a B.Sc. at Toronto in 1966 and a M.Sc. (1969) and Ph.D. (1972) in Guelph. I worked for the Ontario Ministry of Natural Resources as a research scientist conducting studies on wildlife health from 1972 until I took an early retirement in 1998. I now work from my home business, Ecolink Science, as a consultant.

I married Rosemary Turland, a brilliant biologist *cum* teacher, from Kincardine, Ontario. We have two children: Emily graduating from Geography at Trent University and in Concurrent Education at Queen's and Peter, a second year biology student at Trent University and the fourth generation of my family to study biology in Algonquin Park.

My research experiences are varied. I have studied and published in taxonomy (describing species 'new' to the knowledge of mankind), growth and development, physiology, pharmacology, anatomy, behaviour, animal husbandry, environmental toxicology and parasitology of a variety of invertebrate and vertebrate taxa. Species or other taxa with which I have done considerable work include bacteria, cestodes, trematodes, nematodes, arachnids, mosquitoes, blackflies and other blood sucking Diptera, beaver, black bears, wolverine, moose, white-tailed deer, mink, otter, marten, fisher, lynx, ring-billed gulls, osprey and bald eagles.

In addition, I more recently worked with another scientist studying the impacts of logging and natural succession of Great Lakes-Si. Lawrence forests on changes in the structure and composition of wildlife habitats.

I am the author or co-author of more than 40 papers in scientific journals, have contributed to a number of chapters in books and have spent a great deal of time with public groups (hunters, trappers, naturalists, school children) explaining aspects of natural history and, in particular, aspects of resource management.

I am a past president of the Wildlife Disease Association and a recipient of that organization's Distinguished Service Award and Emeritus Award. I have served on the editorial boards of *Alces*, *The Journal of Parasitology*, and the *Journal of Wildlife Diseases*. I also review manuscripts for a variety of other journals. I have served on International Joint Commission science advisory committees working on cleanup of contaminants in Great Lakes ecosystems.

I am most intrigued as a naturalist by ecological linkages among components of ecosystems and the interactions of nested ecosystems at various spatial scales. For example, I consider it a privilege to have been dissecting the Malpighian tubules of blackflies on the same day that I perform necropsies on black bears, trap black bears, and pursue defining the strong ecological links between blackflies and their Malpighian tubules as ecosystems and the food habits and habitat selections of black bears. Biological interactions maintain my curiosity!