THE BRODIE CLUB

ROYAL ONTARIO MUSEUM OF ZOOLOGY

THE 1011TH MEETING OF THE BRODIE CLUB

The 1,012th meeting of The Brodie Club was held at 7:30 p.m. on May 8, 2007 in the Ramsay Wright Zoological Laboratories of the University of Toronto.

Chairman: Helen Juhola
Secretary: Oliver Bertin
There were 15 members and one guest.

- Sharon Hick, guest of Fred Bodsworth

Bill Rapley moved adoption of the previous minutes, seconded by Bodsworth.

NEW BUSINESS:

- Ed Addison said a few kind words about **Karin Lumsden,** wife of Harry Lumsden, who died April 29 after a long battle with cancer. She was a unique person who was born in Greenland and raised in the Canadian Arctic, the daughter of a well-known botanist who traveled the Arctic studying Canada's vegetation. Harry is planning a wake in early June for a few close friends.

> LUMSDEN, Karin (nee Porsild)
> Wife of Harry, mother of Jennifer, Deborah, and Diana, grandmother of Christopher and Heather, valued friend to many, died much loved from a long life, on April 29, 2007 in the 84th year. A party will be held on Sunday June 10th between 1 and 4 P.M. at the house, 144 Hillview Road, Aurora. In lieu of flowers, a donation can be made in her name to The Yellow Brick House, PO Box 278, Aurora, L4G 3H4.

- **Marc Johnson**, a Brodie Club member and a recent PhD graduate from Anurag Agrawal's botany lab, has been awarded a prestigious **Governor General's Gold Medal** by the University of Toronto. This award honours academic excellence at the graduate level, and only three were awarded by the University. Gary Sprules, Associate Chair for Graduate Studies, Department of Ecology and Evolutionary Biology at UofT praised Johnson: "Those of you who knew Marc can testify to his high qualities as a scientist and his strong involvement in his department. Yet more evidence of the outstanding group of grads we have in our program."
- **Helen Juhola** has been awarded one of 14 **Outstanding Volunteer Awards** by the Ontario Government for her 30 years work preserving Toronto's natural areas and for her success educating the public.

- **Claire Muller** is busy tilting at the **86 wind turbine**s that are being planned for Wolfe Island at the eastern end of Lake Ontario, near Kingston. I have attached a note from her, and a response from my son, who built windmills in Australia a few summers ago, and has a job starting in July designing propeller blades for Vestas. There was considerable discussion about the turbines. This is just one of many wind farms that Canadian Hydro Developers is planning to build in Ontario. There are more than 60 turbines on the north shore of Lake Erie west of Turkey Point, and a considerable number in the Shelburne area. Rapley said some of the early towers had external steps that attracted perching birds, but later towers tend to be smooth-skinned. There is some evidence that turbines attract and kill bats, but the consensus was that they are far less dangerous to migrating birds than the lights in downtown office towers. (See below for additional notes.)
- **Jim Bendell** suggested we set up a small committee to look into a Brodie Club picnic/expedition to Ottawa at some point in the future. He suggests a four-day trip to give time to investigate the local Natural History Museum, Purdon Orchids, tulips, a calcite quarry, Burnt Lands Alvar (Paul Catling could be a leader), Gillies Grove White Pine, glacial features, original hardwood forest, sugar maple operation and museum, to say nothing of the Stanley Cup, which will be ensconced in Ottawa by then, he thinks.
- The **next meeting** will be a Members' Night – a show and tell where members can relate their adventures over the summer. It will be held – pending confirmation – on Sept. 18 at 7:30 pm in Room 432 of the Ramsay Wright Zoological Labs at UofT.
- **The annual field day and picnic** will be held at the Niagara Gorge on **Sunday June 3, starting at 10 am.** The host will be Robert Ritchie Jnr., son of corresponding member Dr. R.C. Ritchie, who now lives in Thorold, Ont. Ritchie Jnr. works for the Niagara Parks Commission and is well-placed to give members a tour of the Niagara Gorge, the Niagara Parks Butterfly Conservatory, the botanical gardens, exotic birds and the domestic species that frequent the area.

  Ritchie suggests we meet at 10 am in the parking lot of the Wintergreen Flats Picnic Area/Feather in the Glen building along the Niagara Parkway directly beside/above the Niagara Glen Nature Reserve area of the Niagara Gorge. Niagara Parks does not have a bird conservatory, per se. There is an aviary attraction, unaffiliated with Niagara Parks, a few miles away, closer to Niagara Falls.

  The Niagara Parks Botanical Gardens are about 0.5 km north of the Niagara Glen, and has a substantial parking area. When we are finished at the Glen, it's an easy drive over to the Gardens (with a nice, level, paved walking path for those who wish to walk over to the Gardens). As mentioned to Addison and Falls, the entrance stairway (a tower of eighty steps) to the Glen and the pathways below may be difficult for any one with bad knees or heart difficulties, so folks will have to use their own discretion about the trip down into the Glen. To get right down close to the Niagara River, we will be going down an elevation difference of about 200 feet, more or less. In this situation the *Reverse Law of Gravity* applies, namely, "What goes down must come back up!" The option for those who choose not to make the trip down into the Glen/Gorge is to go over to the Botanical Gardens, where everything is on level ground and there are many paved pathways. The Gardens are about 100 acres in total, about 50 acres being Arboretum, the balance more formal gardens.

After the Glen, Ritchie would be more than willing to guide folks around the Gardens.

There are many picnic tables at Wintergreen Flats Picnic Area, plus washroom facilities. There is a sit-down cafeteria-style restaurant at the Botanical Gardens (plus washroom facilities). The Butterfly Conservatory has washrooms, a gift shop and front-foyer exhibits all accessible without having to pay to get in; the main Butterfly Conservatory exhibit (tropical plants and tropical butterflies) has an entrance fee.

He will put together directions, and possibly a Google map. It's not difficult to get to the Gorge from Toronto, but allow about two hours, depending on traffic conditions.

It was suggested that members who intend to go communicate with each other in the next few weeks to confirm the location and time, and perhaps to arrange for a car pool. Interested members may contact Oliver Bertin at oliver.bertin@utoronto.ca until Bruce Falls (jbruce.falls@utoronto.ca) returns.

SPEAKER:

The speaker was Bob Johnson, a former student of zoology at UofT in the late 1960s and early 1970s, one of Bertin's classmates and a student of Falls, Rising and McAndrews.

After completing his BSc at UofT, he became a keeper at the Toronto Zoo, went on to become a curator-in-training and took his MSc at York University. He is now Curator of Amphibians and Reptiles at the zoo, where he oversees the collections, conservation and education programs related to these species.

Rapley said Johnson has made "a truly significant contribution to conservation." His projects have included *Adopt-A-Pond, Frogwatch Ontario, Pond Guardians, Turtle Tally,* the *Massasauga Rattlesnake* project in Ontario and many wetland projects that have engaged the public in the need for wetland conservation and emphasized the value of and protection of habitats and biodiversity.

More recently Johnson has headed up a number of species-recovery projects in Ontario, and has worked with the Canadian Wildlife Service, Parks Canada and a number of field and stewardship projects based from the Toronto Zoo.

Johnson and his staff recently held a *Roads and Ecopassages Conference* at the Toronto Zoo in partnership with Parks Canada. Internationally Johnson has been involved with many conservation projects, in particular a very successful collaborative project to save the Puerto Rican Crested Toad that involves many other zoos, NGOs and government agencies.

EMERGENT ISSUES IN AMPHIBIAN AND REPTILE CONSERVATION

An ardent conservationist, Johnson has mixed feelings about how much zoos can realistically do to meet conservation expectations. He is very much an advocate of the zoo, what it offers and what it stands for. But overcoming the restraints of dealing with animals in captivity, he promotes partnerships to preserve animals in the wild and link all exhibit animals to field conservation.

He sometimes sees zoos as arks where animals are saved two by two, although that concept is severely limited by space and resources. He also sees them as very powerful institutions that open networks around the world, that can be used to change thinking about conservation, that mobilize people to preserve species and, above all, to act as a fantastic resource for Restorative Ecology.

It is this concept of Restorative Ecology that Johnson talked about in his speech.

The zoo is a nexus of projects, he said, some nearby and some half a world away. The zoo led a project to preserve Morningside Creek, a local stream where big concrete blocks were put into the water to slow the water and create habitat for plants and animals.

Only last week, the zoo sponsored the *Roads and Ecopassages Forum,* a group that is trying to building animal pathways over and under highways. Members have built a turtle crossing in Florida, bridges over major highways for wolves and bears, and turtle tunnels under four-lane expressways.

A species of interest and concern is the Massasauga Rattlesnake, Ontario's only venomous snake. This snake used to be widespread in Ontario, but is now limited to two genetically separate populations, in the Bruce Peninsula and on the east side of Georgian Bay, north of Honey Harbour. The twinning of Hwy 69 threatens to bisect the eastern group and create a third population.

The zoo is working with the highway people to build an underpass under Hwy 69, with mixed success. Construction crews did indeed build a tunnel under the road, but they used a standard water culvert, and that is not something that a snake is likely to use.

Many snakes die after being run down on the surface of the road, even in Killbear Provincial Park, near Parry Sound, where Johnson photographed a sign that showed that 15 Massasauga Rattlers had already died that year.

"That is a big kill," he said. "It is very damaging to the population."

There is, in fact, a few other small groups of Massasauga Rattlers in Ontario. About 30 rattlers rescued from a local housing development were returned to the Lasalle area, near Windsor, to augment a small and threatened population that has managed to survive. This is the first return to the wild of a venomous snake in Ontario.

Like Lasalle, Wainfleet Bog, near Fort Erie, is also threatened by development. The original bog was drained for farming and peat extraction. The tile drains were removed, allowing the water levels to rise once more. But now, beavers have moved in and flooded the area, threatening the endemic rattlers once again.

Johnson is also trying to build hibernacula, or winter refuges, for garter snakes. Many of the traditional winter habitats used by garter snakes are being destroyed by developments and other forms of habitat change. One solution is to build something that is as close as possible to what we think the snakes need to survive the winter. There are plenty of hints. Garter snakes are often found near old wells, rock piles or house basements at the spring thaw, leading Johnson to believe that they like rock crevices that extend below the frost line and are damp enough to prevent dehydration.

One woman was getting tired of the many fox snakes that appeared to frequent her basement every winter and she suggested that Johnson build a hibernaculum behind her house. He dug a hole that went far below the frost line and filled it with cinder blocks, giving snakes plenty of choices for their winter habitat. He expects snakes to move into their winter home after three or four years.

Johnson has done similar projects for amphibians, including a vernal pool in the Rouge Valley behind the zoo.

A big part of his job is education, and he has had considerable success with lively symposia that are aimed at the general public. The previous weekend, he sponsored a *Spring Toad Festival* that was timed to coincide with the annual emergence of the local toads.

The *Adopt-a-Pond* program is designed to create interest in local pools and wetlands. That is a particularly vital project now because many municipalities and schools have filled in local stands of water to minimize the risk of West Nile virus. That may have reduced the mosquito population, but it also severely restricts the number of breeding habitats for amphibians.

In some cases, Johnson found amphibians are sometimes forced to lay their eggs in temporary wheel ruts, the only standing water that is still available for them. He dipped his hand into one of these ruts and showed some school children the toad tadpoles. They immediately took possession: "Nobody was allowed to touch that pond. Their toads were born there," he said. "It gave the kids a feeling of power."

A 12-year-old kid that he inspired went on to a degree of fame in his local community. He was so determined to save a wetland in Burlington that he took his case as far as the Ontario Municipal Board – and won.

By the by, those wheel ruts have allowed Johnson to demonstrate Amphibian plasticity to his students. In some water holes, tadpoles have developed long, muscular fish-like shapes so they can flee snakes; in other wet spots, they have bright-red tails to distract dragonflies. That shows, he said, how tadpoles have co-evolved with their predators.

Johnson's *Turtle Tally* is aimed at a variety of turtles including musk turtles and snappers. Using radio transmitters he was surprised to find that snappers often spend the winter in shallow seepage areas, well away from the summer pond or lake. And that just shows how important seemingly insignificant waters really are.

He catches Blandings turtles and Map turtles using basking traps – the turtle climbs onto a log to sun himself, and is tipped into a net. Radio transmitters show that some turtles travel 1.5 kilometres upstream to overwinter and double that to lay their eggs.

Johnson's position as curator of reptiles and amphibians has given him unique access to the world's zoos and the conservation work they are doing. In Wyoming, zoos are helping to preserve amphibians that have been extirpated in the wild. In Arizona, farmers are building pools in the desert that have saved local species from extinction. In Mexico City's Lake Xochimilco, he has helped preserve the rare and endangered axolotl.

The axolotl is a large salamander that lives in one spot, a former swamp that is now surrounded by Mexico City's 19 million people. The only source of water for the lake is now a sewage outflow laden with heavy metals, but that is a marked improvement over the previous water source, untreated sewage. The axolotl is also threatened by boaters, tourists, fishermen and wild carp.

One solution was to teach the local tour guides, the gondoliers and boatmen, about the natural history of the area. This made them appreciate the life around them, and made them more valuable to the tourists who hired their boats. It was a rare win-win situation. They helped preserve the axolotl, and their tips rose by 10 per cent.

Many other amphibians are threatened. In Puerto Rico, one of the toad species breeds in pools of water that are left by the hurricanes.

The last wild home for the Cricket Frog was Pelee Island, but it has disappeared from there too, leaving only one place for it to live in Canada, the local zoo. But zoologists have come across two isolated populations of the species in fish farms in Ohio, raisings hopes that the Cricket frog can be returned to the wild.

The future of amphibians is under very dark cloud because of two serious problems, habitat destruction and disease. Of the 5,743 species if amphibian, 168 species have gone extinct, 43 per cent are in decline and 32 per cent are threatened.

"A whole order of animals is threatened," Johnson said.

Habitat destruction is a familiar story. Disease is a new one. The chytrid fungus – perhaps introduced to North America by the medical researchers and their African clawed frogs – is slowly moving through Central America and Australia killing montane amphibians as it goes.

The first deaths came in about 1987 when the Golden Frog of Cost Rica started to disappear. By 1989, the species was extinct. The fungus has now moved down past Panama and into Columbia, upsetting the osmosis balance of the amphibians, killing everything as it goes.

There is no way to treat the animals. The only solution is to capture as many wild animals as possible and lock them into a temporary ark until the disease goes away. Bob concluded that as much as he questions the value of zoos as arks, this is now the reality for many species until we understand how to deal with emerging diseases.

<u>QUESTIONS:</u>

- Chytrid fungus is endemic in Ontario, but it has not apparently been a problem because cold winters limit its spread. But restaurateurs have nearly wiped out the bullfrog population in Ontario and around the world.
- The Leopard frog – the common frog of Alberta – is now limited to five populations.
- Ed Addison noted that isolated populations are not necessarily bad, given enough time. In Queensland, species have evolved in isolated populations, giving rise to new varieties and species. Fragmentation promotes evolution – time permitting. But Johnson warned that time may be a limiting factor because habitats are changing so fast that the local species cannot always keep up.
- The chytrid fungus has been around since the 1930s anyway. Nobody is quite sure why it has suddenly become a huge issue. Climate change may be one factor.
- Habitat destruction presents a constant battle for conservations. In Saskatchewan and some areas of Ontario, Johnson said, land must be drained – by law – to create more farmland.
- Frogs are so prolific that they can recover very fast, if given the opportunity. One frog can lay 50,000 eggs, giving good odds that a handful will survive to maturity.
- The axolotl is threatened on all sides. Trout and tilapia have been introduced into Lake Xochimilco, further endangering a threatened species.
- Mosquito spraying programs reduce the amount of food that is available to frogs. Another danger is the kind of pesticide used. In many countries, they still use DDT. In Winnipeg, they use Malathion, a very dangerous chemical.

The speaker was thanked by Bruce Falls.

NOTES & OBSERVATIONS:

- Enid Machin said a Pileated Woodpecker was destroying a white spruce tree on her property. The tree was healthy with no obvious insect infestation, giving her to question why the woodpecker was so busy pecking. Addison, Bodsworth and others suggested that the woodpecker was either after insects or marking its territory. It was unlikely that the bird would invest so much energy without a direct payback.
- Every April, Jock McAndrews sees garter snakes around a 137-year-old, 18-foot dug well on his property north of Brighton, Ont. He wondered whether the well acted as a hibernaculum or wintering ground for the snakes. Johnson said such wells are perfect snake habitats. The snake can go down below the frost line and hide in chinks in the walls where the dampness prevents dehydration, the second-most-serious cause of winter death, after the cold.
- Rapley found two Broad-winged Hawks last weekend nesting near Grimsby, and lots of Ospreys and Bald Eagles. Bald Eagles have really come back in southern Ontario, but they appear to live only nine or 10 years, well down from the traditional 25 years. He also saw a Merlin's nest near Sauble Beach, and heard of another nearby.
- Tasker saw three Sandhill Cranes flying over his garden in Rosedale, in downtown Toronto.
- Falls saw a Sharp-tailed Grouse near Gore Bay, on Manitoulin Island in early April, along with about 100 Rough-legged Hawks and two Red-tailed Hawks. He also came across Kestrels, Harriers and Short-tailed Hawks. Many raptors stop over on Manitoulin Island while migrating north.

ANNUAL FIELD DAY:

The annual field day and picnic will be held at the Niagara Gorge on **Sunday June 3, starting at 10 am, hosted by** Robert Ritchie Jnr., son of corresponding member Dr. R.C. Ritchie.

Ritchie suggests we meet at 10 am in the parking lot of the Wintergreen Flats Picnic Area/Feather in the Glen building along the Niagara Parkway directly beside/above the Niagara Glen Nature Reserve area of the Niagara Gorge.

Members who intend to go should contact Oliver Bertin at oliver.bertin@utoronto.ca as soon as possible to confirm attendance, to co-ordinate times and meeting place and perhaps to arrange a car pool.

Wolfe Island Wind Turbines
Pros and Cons

Claire Muller is a corresponding member on Wolfe Island, a small island at the eastern end of Lake Ontario, across the bay from Kingston

Claire Muller is a member of Wolfe Island Residents for the Environment (WIRE), one of a growing number of people on the island and in Kingston who are involved with the Wind Turbine issue on Wolfe Island. She asked me to distribute the following message to Club members:

It is felt that a complete Environmental Assessment is desperately needed. Some of the problems may be:

a) there may be a significant generator hum, and certainly a "swish, swish" noise of the blades;

b) that 86 turbines is far, far too many;

c) that the potential for adding more turbines is a real threat, in which case the whole island would become a sort of an industrial park;

d) the present ambiance might very well be lost;

e) that it might jeopardize the migratory flyway for birds, especially this waterfowl staging area;

e) it might discourage Tourism which is an essential on Wolfe Island for restaurants, hotels, B&Bs, stores etc.;

f) that real estate values might very well plummet;

g) the turbines would extend 300 feet into the air, far larger that at Shelburne (which some use as a reference);

h) the proponents promise "jobs" but once in place, only 10 people would be needed for maintenance;

i) the summer cottage residents might very well feel that Wolfe Island was no longer a cottage paradise.

WIRE believes that the very nature of Wolfe Island would be altered forever. Unlike other rural areas, Wolfe Island is sufficiently isolated that it escapes the mainstream of human activity. The atmosphere is one of peace and quiet in a pastoral setting, with woodlots, bits of forest, a vast marshy wetland and a tranquil village. WIRE thinks this would be lost. People refer to the turbine success stories in Holland, but Holland is not at all like Wolfe Island and the comparison does not apply.

WIRE members are NOT opposed to Wind Turbines; simply expressed, this is NOT the place to put them.

John Sparling continued: I am sorry to add to this discussion but there is much evidence that certain birds are vulnerable to turbine blade injury. In addition, recent research which has been published by the U.S. NRC indicate that bats in particular are vulnerable, far more so than birds. It appears that the high frequency noise from gearing and turbine blades may interfere with their echo location mechanism. In one study, 2,500 kills were recorded. The Eastern Red and Hoary Bats were most vulnerable contributing over half of the bat kills. Bats produce few young, would likely have low replacement rates, and so local populations may be at risk in areas close to large scale wind farms.

In addition there are often habitat removal and soil erosion issues in elevated sites such as exposed ridges that need to be considered. In sites I have examined the areas affected were often quite large, (access roads, storage and laydown areas etc.). The question is whether ecological values are completely considered in site selection.

Adrian Bertin sent the following response, an opposing view. He will start a job with Vestas on Britain's Isle of Wight in August after completing his PhD in carbon fibre structures. He spent the summer of 2001, building wind turbines near Adelaide, Australia.

Thanks for your email. It's interesting that your friend should mention the effect of wind farms on tourism. In fact, the opposite has been found to happen. Wind farms have actually turned out to be very popular with tourists, especially school groups, and wind farm developers are now often asked to include visitor centres in their plans. Delabole, the UK's first commercial wind farm apparently received 350 000 visitors during its first 10 years.

The other interesting outcome is that although wind farms are often opposed during planning phases, local communities usually end up being immensely proud of them. In fact, public perception studies of wind farms have found that the closer people live to a wind farm the more supportive they are of both the project and wind power in general. It has also been reported by RICS, the Royal Institute of Chartered Surveyors, that although real estate values sometimes decrease during wind farm planning applications, values recover after the farm is operational. The noise from wind farms has also been thoroughly studied and is about 40 dB(A) at 350m, about the same as ambient noise and effectively undetectable. In fact, wind turbines are usually quieter than the wind that turns them.

Studies have also found that migrating birds aren't affected by wind farms as they birds fly round the turbines which rotate at about 15rpm (once every 4 seconds). The idea of wind turbines as bird mincers stems from a very early wind farm in Altamont Pass, California where small, high speed turbines were mounted on lattice structures in the migratory route of a protected bird, resulting in 0.2 bird fatalities per turbine per year. This is, of course, unacceptable, although it should be noted that this number is unrecognisably small compared to the number of birds killed by cars, building and housecats. In any case, turbines aren't made like this any more and studies have found that they have minimal effect on birds.

I hope this helps to answer some of the concerns that your friend mentions in the email. It is quite correct that Wolfe Island isn't Holland, or Denmark, Australia or Scotland for that matter, but the concerns raised are the same. That these concerns have been found to be unjustified once the turbines are built should, I hope, put the minds of the residents of Wolfe Island at ease. I think it is a positive reflection of wind energy that the people who are most supportive of wind farms are the ones who live next to them.

References from Adrian:
http://www.bwea.com/ref/faq.html#noise
http://www.rics.org/Property/Residentialproperty/Residentialpropertymarket/wind%20farms%20hit%20house%20prices.htm
http://www.bwea.com/ref/noise.html
http://news.bbc.co.uk/1/hi/sci/tech/4072756.stm
http://environment.newscientist.com/channel/earth/energy-fuels/mg18624956.400

Young in Toronto

By Yorke Edwards
Our Western Correspondent

When I began going to the library for the books of Ernest Thompson Seton, they put natural history into my life. Later, I found some of his books in Yonge Street's second-hand book stores, all south of Bloor. Hunting there – and through many years in many places – I have found up to 15 of his books. (I found not long ago that he wrote 50 of them). His books are what started me to enjoy and learn about forests, birds and mammals and they soon put me deep into natural history.

At first, we young birders had no binoculars, but Bruce Falls, as I remember, soon had a small metal box with a little telescope in it, perhaps something used in the war. It was just after the war. When we saw a bird, Bruce looked first, then the telescope was passed down the line of others behind him. After a year or so, on one summer, I got money for my binoculars after painting the outside wooden parts of a house next door. On most weekends, we searched for birds, but after school-hours, I was usually playing baseball or football at school or on two lots of open ground across the street from our house.

In my first birding days at weekends, I often went first to Toronto's parks that had bits of forest, the best ones with streams. Often too, I walked to the fields a few blocks west from our home where there were huge areas of grassland with lines of trees along their edges, areas which had once been a farmer's field. Later still, at high school, I began to bird with John Crosby, who years later became Canada's best illustration painter of our birds. (We were both unable to go to war.)

Together we went searching on our bicycles to the places with good birding. Often, we cycled north beyond the city to a large flatland with tall grass and a small creek wandering across it. There were three ponds close together, mostly filled with reeds. In the largest pond, I once waded in to chest height and found many nests, mostly Red-winged Blackbirds. Some had eggs, a few had young ones, and many were old and empty ones. Near the pond's edge there was a Sora Rail's nest with seven eggs.

Nearer to home, I often walked into Hogg's Hollow with its little river. Going down, there were a few houses in the valley north of the flat city. The stream at the bottom went through a small bit of wet forest by a golf course. In the forest, I found a few forest birds and some mice, shrews, gray squirrels and once, at dusk, I watched flying squirrels near the houses and among many large trees. Some birds were living in that bit of wild wet forest that was then at the edge of the big city. Is it still there?

Later, with Bruce, we often searched for birds, cycling through the city to High Park, then to the Humber River's marshes. Sometimes, we went east through the noisy city to the shoreline at several good birding places. John often stayed home after school to paint pictures of birds. Later, he became Canada's best bird artist. Many paintings of our birds are in Ottawa's National Museum and in the museum's book, *Birds of Canada*.

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