THE 974th MEETING OF THE BRODIE CLUB

The 974th meeting of the Brodie Club was held on March 18, 2003 in Room 432 of the Ramsay Wright Zoological Laboratories of the University of Toronto.

Chairman: George Bryant
Secretary: Oliver Bertin
Attendance: 15 members and three guests
Enid Machin, guest of Ann Fowle
Helen and Aarne Juhola, guests of Bryant

ANNOUNCEMENTS:

Bruce Falls suggested a moment of silence for Mary Tasker, a member and wife of Ron Tasker who died in the past month after a long illness. Mary was a long-time member, a naturalist and an artist who had been active until last fall. Falls wished condolences to her husband and children. The meeting started at 7:30, half an hour earlier than usual, as moved by Bryant at the *973,d* meeting. The next and subsequent meetings will also start at this time.

The minutes of the 973rd meeting were approved as written.

Program Committee:

Francine McCarthy of Brock University will speak on April 15 about the deep-sea drilling project. On May 20, member Harry Lumsden will tell us about his latest trip to Russia. The meetings will start promptly at 7:30 pm. The field trip has yet to be arranged.

Nominations Committee:

Subsequent to the meeting, Bryant nominated Helen and Aarne Juhola as members. Their biographies are attached.

Correspondence:

The Ontario Nest Records Scheme has written to the club inviting participation in the project.

The club has received two copies of Amphibian Voice, a publication sponsored

by the Toronto Zoo.

The Federation of Ontario Naturalists said the Brodie Club might like to participate in a form of liability insurance. After some discussion, it was decided that insurance was not necessary because the club has no property and only one field trip a year.

The Wye Marsh Wildlife Centre has contacted the club to discuss its programs.

The Essex Naturalists brought to the club's attention a publication titled Wildflowers of Canadian Erie Islands.

Members were informed of the Young Ornithologists' Workshop, a program for teenagers at Long Point bird observatory.

Christopher Risley of Peterborough has contacted the club to seek funding for the publication of a book by late member Howard Savage and Doug Sadler on birds found in Ontario archaeological sites. It was to be published some time ago by the Archaeological Society of Ontario but that arrangement has fallen through and Trent University is considering taking it over. The club responded to Risley some time ago seeking more information but has yet to receive a reply.

Newly annointed club archivist Sandra Eadie offered members a copy of a 1931 club publication by late member R.J. Rutter. In the monograph, Rutter rebutted an article by naturalist Jack Miner who claimed that hawks were taking an inordinate number of songbirds.

The Rutter monograph contained an amusing description of the Club:

What is the Brodie Club? The Brodie Club is a natural history organization with a limited membership composed of professional and amateur naturalists. Most of its members are in some degree scientific men; many of them are following some branch of natural science as a life-work; the spare-time naturalist members are selected because of their long-standing or close application to the observation of nature in one field or another. In addition to the resident Toronto members, the Club has a limited corresponding membership of the same type of nature students, principally in Ontario but to some extent throughout Canada.

SPEAKER:

Spencer Barrett took his undergraduate degree in botany at the University of Reading in England before moving to the University of California at Berkeley for his PhD. He joined the UofT Botany department in 1977 and now holds a Canadian Research Chair.

Genetic Modification of Plants and Biodiversity

In the late 1990s, Prof. Barrett was invited by the president of the Royal Society of Canada to take part in an expert panel that was to study issues in food biotechnology. He spent 1.5 years studying the subject and helped write a report that was published last year.

The report was titled Elements of Precaution: Recommendations for the regulation of food biotechnology in Canada. It is available on the society website www.rsc.ca.

The 245-page report was roundly condemned by Greenpeace and by the biotechnology industry "so I guess we got it about right." The focus of the investigation was genetically modified foods, which are a hot issue on environmental, biological and trade grounds. It is a very complicated area that crosses many disciplines, including Barrett's own field of evolutionary biology. He showed many slides of canola crops in full bloom, noting that these bucolic scenes are a battleground. New Zealand and many countries in the European Community have considered or enacted moratoria on GM crops and some have banned their use altogether. It is a complex scientific matter, but it is also an intensely emotional issue.

He believes the fundamental reason for the reaction is fear of the unknown. Many of the protesters are scientifically illiterate and fear a technology they know little about. The members of the expert RSC panel tried to assess the public's knowledge of GM and they were worried by what they found. "It is pretty stunning that so many people don't understand about genetics," he said.

To help elucidate the subject, he defined biotechnology as: The use of recombinant DNA technologies for the transfer of genes among unrelated species. A genetically modified organism, GMO or transgenic organism is an organism engineered using these techniques. This is a relatively new technology but, by the 1990s, scientists could locate genes and move them from one organism to another.

He explained the difference between traditional plant breeding and GM technology, an area of some confusion. In general, plant breeding is quite slow with conventional methods. It can take five to 10 years to develop a new plant that the geneticist is satisfied with. Traditional breeding

requires sexual compatibility, while GM technology does not. The two species must be related species, meaning that the available gene pool is quite restricted. It is hard to specify the desired genes with conventional methods, forcing breeders to take a shotgun approach. With GM methods, scientists can combine an unlimited range of genes from a wide range of species. Breeding is rapid, *it* does *not* require sexual *compatibility and* specific genes *can* be targetted. This means that GM technology has available a much wider gene pool, is far more efficient and much faster than traditional methods.

Given the degree of emotion in the debate, one of the panel's goals was to get good, hard data on GM crops. One issue that was studied was the degree to which GM genes can escape from a cultivated crop and interact with natural crops nearby, thereby interfering with natural biodiversity. But good data is sometimes hard to get. Several studies have been criticized because the funding came from GM companies, some experiments have been shown to be fallacious and the benefits are sometimes exaggerated. Sabotage *can* also be a problem. A group of British experimenters set up field trials in 2000, but two-thirds of the crop was destroyed by environmentalists, making it impossible to obtain any useful data. "The public denied us the ability to make an informed decision," he said.

The major concerns about GM crops are:

* Ethical and moral factors: Are scientists playing God with nature by moving genes between unrelated organisms? Barrett said he wasn't concerned about this issue.
* Political factors: Are we concentrating power in the hands of seven or eight multinational corporations that manufacture and distribute the seeds and the pesticides that are used to control them? He is worried by the power of the multinationals.
* Human health: Could GM crops affect the health of the people who consume them? He is not concerned about health issues.
* Environmental factors: Will GM genes escape, causing a form of genetic pollution? Yes, he does have concerns.

GM techniques are widely used in some crops in some countries. The techniques are most widely used for canola, corn, cotton, rice and soybeans in the United States, Canada, Argentina and China. He estimated that about 65 per cent of the R&D goes towards herbicide-resistant soybean crops. Scientists are also working on salt-resistant plants, allowing farmers to grow crops in soil that has been destroyed by poor irrigation practices. In addition, the Chinese have developed enriched rice and many pharmaceutical manufacturers use GM techniques, leading to the ironic situation where GM protestors use GM drugs but scorn GM foods.

GM proponents claim their foods produce better yields, are better protected against pests, are more nutritious and can be grown in saline and marginal land. However, it is sometimes hard to assess the validity of these claims.

GM technology may have benefits, but it also creates risks:

* One fear is that GM crops could invade traditional crops, effectively becoming a weed. Barrett believes it is extremely unlikely that putting one or two genes into a crop will nullify 10,000 years of evolution. Cultivated crops rarely become weeds because they tend to be poor at colonization, and GM techniques won't change that. However, some newly developed crops such as *canola and* sunflowers may be more likely to spread because they are still pollinated by wind or animals and the seeds are still distributed by natural methods;
* Transgenes could escape: Plants are promiscuous, allowing for easy movement of genes between related species. Genes could also escape to hybrid crops such as rice, oats, canola, carrots and corn. He noted that Indian scientists developed a coloured strain of cultivated rice to separate it from a similar weed species, but the coloured gene spread to the weeds within a few generations. Scientists found that genes moved up to one kilometer from GM sunflowers to traditional plants. There was evidence of gene flow in 33 per cent of the population.

  Loss of biodiversity of conventional plants. Barrett doubts that GM techniques will reduce the biodiversity of most crops because cultivated crops rarely survive in nature. An exception would be newly developed plants such as canola, or crops like hybrid corn which are

sometimes grown adjacent to the wild species. This could be a problem in Mexico where corn grows wild, but not in Canada. GM may indeed cause a loss of biodiversity, but Barrett said there is a lack of rigorous scientific evidence to assess the impact. The fact remains that biodiversity is more seriously threatened by the traditional problems of habitat destruction, *over-exploitation and* the invasion of exotic species.

The panel drew up several recommendations. They suggested that Agriculture Canada tighten the regulatory process on GM foods. Now, he said, the federal government has a conflict of interest because it both promotes and regulates GM foods. The panel would like better assessment of GM plants and it would like a moratorium on the "horrific" GM engineering used in fish farming.

Barrett concluded there was not enough long-term data to draw rigorous conclusions on GM technology. However, it is clear that GM has so many benefits that it is here to stay. "In 20 years, almost all crops will be GM crops," he said. "We'll have to learn to live with it."

QUESTIONS:

* There is huge interest in biotechnology in China, a country that is moving fast particularly with rice. The Chinese have so many mouths to feed that they tend to ignore environmental regulations. Barrett said China is starting to realize the need for regulations and is starting to introduce controls.
* Organic farmers may suffer from the transference of GM genes. An adequate separation distance is required because genes do move among crop species that still pollinate by *air* or by animal.
* Many Canadian crops are GM, including canola, corn, some wheat and some potatoes. The use of GM techniques has been banned in tomatoes in this country.
* GM techniques allow farmers to use saline lands that have been laid waste by poor irrigation practices. Barrett said it may be preferable to use GM-adapted crops rather than moving into virgin lands and destroying them with continued use of poor farming practices.
* Jock McAndrews has been able to grow potatoes that seem impervious to Colorado Beetles. He wondered whether they were GM potatoes.
* One *solution* to the spread of GM *foods is* to *include suicide* genes that produce *sterile* seeds.
* Some GM opponents object to the power of multinational corporations and their control over the distribution of seeds. Hybrid corn is one crop that worries the protestors.
* Multinationals can be arrogant. They don't realize the damage that can be caused by the spread of GM genes. They initially ignored gene escape as a problem, but it has become a huge issue in Europe.
* Food production is growing in India due to the Green Revolution rather than the cultivation of GM foods. South-east Asia is producing a lot of food using GM techniques, but this area has many *natural* disasters, such as *flooding,* which negate the *technological* advances. Barrett was highly critical of the situation in Latin America.
* China is still getting over its GM teething problems, but it is learning to use the technology with amazing success. Food production is up sharply.
* Round-up is a miracle herbicide that has done wonders *for* food production. But it may harm soil micro-organisms.
* GM opponents tend to ignore the bad practices used in traditional agriculture. Crops like cotton are sprayed with pesticides six or eight times a year, often using blanket spraying from airplanes. "Let's move to better agriculture but let's make sure we do it right," Barrett said.

The speaker was thanked by Bill Crins.

NOTES & OBSERVATIONS:

* John Speakman said his home on Lake Simcoe has been invaded by wild Turkeys. "It's amazing to see these big birds in the snow."

* Helen Juhola has seen an extraordinary number of ducks in Toronto harbour, including Long-tailed ducks (the new name for Oldsquaw), Redheads and Buffleheads.
* Bill Crins has seen several King Eiders in Lake Ontario, in Hamilton, Burlington and Stoney Creek.
* Jennifer Young saw a Solitary *Vireo* in Florida. She was told it has been renamed the Blue-headed *Vireo*. Fred Bodsworth noted that lumpers and splitters are fighting over the Vireos and the splitters are winning. They have divided the Solitary Vireo into four species.
* Bodsworth suggested that ducks are so abundant in Lake Ontario this spring because Lakes Erie, Huron and. of course. Lake Superior are completely frozen over this year. They could be seeking open water in Lake Ontario. He noted that spring has come with a real rush in the Toronto area after an abnormally cold winter. A large number of spring birds have suddenly appeared.
* Machin showed members a photograph of the Anhinga she spied at her summer cottage near Algonquin Park. Some members said it was hard to make a conclusive determination because the photograph was taken from some distance away.
* Norm Martin said spring may have come to Toronto, but not to the surrounding region. He saw very few spring birds on his drive down from Belleville, but there were many Common Crows.
* John Riley saw about 20 wild Turkeys in the southern part of Dufferin County. He has seen numerous Common Ravens in southern Ontario, indicating they really are moving south.
* Riley said all species of ash have died in the Windsor region because of an invasion of the emerald ash borer, an exotic species that came from China in shipping crates. The authorities are considering the removal of all the ash trees in a 1 O-kilometer wide swath around the city. He said 11 species of tree have been exterminated or threatened by exotic insects, including five species of ash, elm, the edible chestnut, butternut and beech. The brown longhorn beetle is threatening spruce trees and the Asian long-horned beetle is voracious on sugar maples. Other species are threatened by the beech bark blight and the butternut canker. Many previously unknown Asian insects have been found around Vancouver harbour.

Barrett said he recently noticed a skunk cabbage flowering in Etobicoke.

The meeting adjourned at 9:39 pm.

NEXT MEETING:

The next meeting will take place at 7:30 pm on April 15, 2003, in Room 432 of the Ramsay Wright Zoological Laboratories at UofT. The speaker will be Francine McCarthy from Brock University, who will talk on "The Deep Sea Drilling Project: Plumbing the depths to discover earth's deepest secrets." Members are invited to meet for dinner in the Faculty Club pub at 6 pm.

CLUB NOMINEES:

AARNE JUHOLA

Aarne Juhola BASc CA is a lifelong naturalist. The first recognition of this was in 1944 when he was elected President of the Junior Audubon Club at his public school. He graduated from the University of Toronto in geological engineering. Having graduated into a recession, he then graduated as a Chartered Accountant. He is a member of the Toronto Field Naturalists and for the past 20 years has served as secretary-treasurer. He currently serves on the boards of six

other non-profit corporations as an officer and director. Memberships include the Royal Canadian Institute, the Toronto Entomologists' Association, the Field Botanists of Ontario and a number of historical societies.

HELEN JUHOLA

Helen Juhola has been interested in natural history all her life, as was her family. She majored in zoology at the University of Toronto where she worked for several years with insects. This was followed by a number of years in textbook editing. Helen is a member of the Toronto Field Naturalists where she served as president from 1980 to 1982. She has been involved with the production of the club newsletter since 1976. She has also co-authored and published a number of natural history publications. Memberships include the Royal Canadian Institute, the Toronto Entomologists' Association and the Field Botanists of Ontario. She also belongs to a number of historical *societies.* Helen's *interest in* conservation began *with* family walks *in* the Don *Valley,* notably many were with Charles Sauriol and the Don *Valley* Conservation Association. Later she served as a director of Friends of the *Valley,* a group instrumental in encouraging the government to purchase the Don *Valley* Brick Works.

PROCEDURE for NOMINATING NEW MEMBERS:

Questions arose this month over the procedure for nominating new members. The membership Committee deemed it worthwhile to remind members of the club constitution as approved in October, 1960. The membership was originally limited to 35 Active Members, but at a meeting on March 21, 2000 the members voted to increase the limit to 50. Since many qualify to be Honorary Members, there is certainly room for new members.

Article III

Section II: The club shall be composed of Honorary, *Active, and Corresponding* Members.
Section III: Any naturalist living in the Toronto region who is in sympathy with the objects of the club and who has attended three or more meetings may be proposed for election to Active Membership.

Section *IV:* Every Active Member shall become an Honorary Member when he attains the age of 65, providing that he has been an Active Member for a period of at least three years.

Article V

Section IV: The *Membership Committee* shall *consider the qualifications* of *any naturalist* nominated for membership, and shall have the power to reject any nominee by unanimous vote of the committee. If the nominee is approved by the Committee his name shall be circulated to the currently active members of the club. Unless any Active Member objects in writing to a member of the Membership Committee within 25 days of the circulation of such a notice, the nominee shall be considered elected. If a member does so object, the nominee shall not be elected, but may be nominated again another year.

CONSTITUTION OF THE BRODIE CLUB

As approved at the 593rd meeting on Oct. 17, 1960

ARTICLE I The name of this club shall be The Brodie Club.

ARTICLE II The objects of the club shall be to afford occasion for the meeting together of naturalists at regular intervals for informal discussion; to create a museum headquarters for those interested in the subjects represented in the museum's collections; to

[Remainder of constitution not scanned – available in separate file.]