THE BRODIE CLUB

Established 1921

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

THE 1,087th MEETING OF THE BRODIE CLUB

The 1,087th meeting of the Brodie Club was held on Tuesday, 17 November, 2015 in Room 432 of the Ramsay Wright Laboratories of the University of Toronto.

Chair: Jean Iron
Secretary: George Bryant

The meeting was called to order at 7:33 pm and was attended by 21 members and 2 guests.

Roll Call:

Present: R. Addison, Beadle, Bertin, Bryant, Currie, Daniels, Dunn, Eadie, A. Falls, B. Falls, Hussell, Iron, Johnson, A. Juhola, H. Juhola, Martyn, Peck, Pittaway, Rapley, Reading, T. Rising

Guests: Aleta Karsted (T. Rising), Justin Peter (B. Falls)

Regrets: Abraham, E. Addison, J. Bendell, Y. Bendell, Carley, Crins, Curry, Larsen, Machin, McAndrews, Obbard, J. Rising, Slessor, Sutherland, Zoladeski.

Minutes: Approval of past minutes, following correction of spelling of Aarne Juhola's name, was moved by Oliver Bertin, seconded by Helen Juhola, and approved.

Committee Reports:

AV Committee: Rose Addison advised that this had been added to the annual meeting minutes post hoc. Jeremy Hussell and Ricky Dunn handle AV most weeks, and perhaps someone could be added to look after the equipment if Jeremy is absent.

Program: Bruce Falls advised that programs are in place until March. The December meeting will be the annual celebration with members asked to contribute seasonal cheer.

Archives: Sandra Eadie has done a further re-organization, reminding members that much of the Brodie history is now on-line. She had a few sets of duplicate old minutes for distribution.

SPEAKER: Marc Johnson introduced Christoph Richter, Department of Biology, U of T, Mississauga, who spoke on: Whale Family Units and Codas: How Science Peeks into the Lives of Whales**.**

Dr. Richter discussed how much and how little we know about whales and what technology now exists to study them. Humans were initially terrorized by dead whales as illustrated by a sketch from 1570. Exploitation followed shortly thereafter. Whales were used for baleen for umbrellas and corset stays, oil for lighting. Our first serious study of whales came from the Townsend Whaling Charts, 1935, four

charts showing the distribution of 50,000 captured whales. The first tool used to study whale movement was an aluminum tube shot into the whale. When the whale was killed, you had the location of the two end points and an idea of the scale of movements. This procedure always ended badly for whale. Early research was slap-dash; e.g., condoms were used to water-proof underwater microphones.

Two species of whales have become poster-children for studies of whale distribution. The underside of Humpback Whale flukes are as distinctively patterned as fingerprints, so individuals can be identified from photos of the flukes when the whales dive (samples above). One humpback from the Gulf of Maine has now been monitored for several decades. Sperm Whales have distinctive notches on the edges of their flukes that also allow individual identification.

During early studies of whales, darts were used to remove a piece of flesh to analyse for heavy metals and pesticides. Now we use satellite tracking of digital tags to obtain detailed records of whale movements and behaviour.

Recordings of whale vocalizations have produced fascinating information. Dr. Richter played a Humpback Whale recording and then sped it up ten times. Sped up songs sound like birds. There is structure in the vocalizations, with repeating phrases, which makes them songs. Only the males sing and only on the breeding grounds. All humpbacks in one area sing the same song, and we have no idea how they do this. Blue Whales songs can be as low as 10 Hertz, way below our hearing range, and can travel great distances. Theoretically Blue Whales could hear each other across the globe.

Killer Whales are family animals, often staying in one place. By the shape of pale patches on their backs we can identify each individual. We have records of individuals going back for decades.

Some packs of Killer Whales differ in every respect from others. For example, the West Coast Killer Whale feeds on salmon, is resident and has specific vocalizations. Other groups are transient, move up and the coast, feed exclusively on marine mammals and sound very different. A third group, Off-Shore Killer Whales, feed mainly on sharks but otherwise we know very little about them. These groups never interbreed. They are so variable we may be dealing with different species: for now we call them different eco-types.

Drones are now producing beautiful pictures of whales, documenting behaviour never before seen, and allowing young to be observed.

The Sperm Whale is the biggest predator on earth. Herman Melville suggested that males dominate females. Wrong. Satellites tags now record any time the whale surfaces, providing records of whale movements for weeks. They tracked a Gulf of Mexico Sperm Whale which exited the gulf for some time—no one knew they did this. Presently we have no idea how Sperm Whales catch squid, their prey. But we do know how they sleep. A whale cannot drown as the blow hole closes under water. But they can asphyxiate, so must rise to the surface to breathe. Two separate scientific teams independently observed sperm whales floating vertically in the water, close to the surface. This was sleeping behaviour, observed for the first time.

Sperm Whales are global in distribution, but separated by sex. The females and offspring are tropical, while males leave the tropical oceans and migrate to Polar Regions

We heard further whale calls. These are "codas," or family signatures, just like our family names. There are three clans in the Galapagos but they all keep separate from each other. Codas are not inherited but picked up culturally. This has created outcries of "Whales cannot have culture."

Sperm Whale adults have no enemies, but calves do—Killer Whales and large sharks. Any member of a group will look after a calf while its parents are diving, a behaviour known as allo-parenting. Similar to Killer Whales, Sperm Whales have cultural differences that isolate the various groups.

What is our impact on whales? Whale-watching is the biggest and fastest-growing aspect of natural history tourism. Studies off Kaikoura, New Zealand, where whale watching is a major industry, have shown that some whales are sensitive to boats. However, Humpback Whale reproduction could not be correlated with whale-watching and calving did not seem to be impacted. At night the Gulf of Mexico is lit up by oil and gas wells. Whether this impacts whales is not known. Measuring glucocorticoid levels from whale poop can determine stress levels, and this shows that whales are clearly stressed by ship noises. Floating plastic which looks like squid can kill whales that consume it. We know that with climate change, arctic seals and polar bears will be affected, so possibly whales will be as well. However, it is not all doom and gloom for whales. In 2003 shipping lanes off the east coast were moved to minimize impacts on whale concentrations. We protected the Gully (a marine canyon off the coast of Nova Scotia) for Bottlenose Whales, and their population numbers have since increased.

<u>Questions</u>

Bruce Falls asked whether song playback would work for whales as it does for birds. This has been tried unsuccessfully—you can't produce the necessary volume.

George Peck asked how long whales live. The bigger the animal, the longer the life. Harbour Porpoises live only three-four years; Killer Whales for several decades. Sperm Whale teeth have been aged to 60 years, but after that the teeth are too worn for aging. Recently Inuit began hunting Bowhead Whales again. They killed a bowhead that was found to be embedded with a stone harpoon, a weapon not used for 100 years. Composition of fluids in the eye change with age, and study of this has indicated that some whales may live up to 200 years old.

Sid Daniels was surprised Sperm Whales could use the shallow Gulf of Mexico. Actually the Gulf of Mexico can be 1,000 feet deep and although Sperm Whales can make dives up to 2500 metres, they seem to manage fine in the Gulf. They do avoid the shallower portions, however.

Sandra Eadie asked about separate populations of Killer Whales off Vancouver Island. How many individuals are there? The three resident populations of the resident ecotype have 77, 400 and 1400 members respectively, so there are about 2000 members of what may or may not be a "species."

Sid Daniels thanked the speaker.

FIELD OBSERVATIONS

Most mornings on his way to work Jeremy Hussell has noted a Muskrat in a small pond. Recently he saw a Mink swimming in the pond which appeared to go into a muskrat burrow. (Mink do eat muskrat on occasion.)

George Bryant has recently seen two species he had long sought to observe in the field: Muskellunge and Red-breasted Goose.

Hugh Currie noted incursions of Cave Swallows and Franklins' Gulls from the west, something which hasn't been seen in the past few years.

Bill Rapley was delighted to report that the zoo's baby pandas are doing very well. Worldwide there are 400 pandas in captivity, 1864 in the wild and in 67 reserves, and re-introductions are now being considered. This is all very exciting.

Marc Johnston reported on recent studies which showed that plants adapt to urban environments. The farther you go from the city, the greater the chemical defenses in plants.

Bruce Falls noted that Mary Boswell's member bio was printed in the last newsletter, following her death. He added the information that he and Ann were responsible for bringing Mary into the club, after meeting her on a nature tour.

NEXT MEETING:

The next meeting will be on Tuesday, 15 December, and members are reminded to bring an edible contribution towards Christmas cheer. The speaker will be David Evans, speaking on dinosaurs.

The meeting adjourned at 9:15.

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