New England Botanical Club - Minutes of the 1000th Meeting
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The 773rd meeting of the New England Botanical Club, being the 1000th since its original organization, was held on Friday, October 1, 2004, at Broadmoor Wildlife Sanctuary, Natick, Massachusetts. There were 52 members and guests in attendance.

Members and guests arrived to plated hors d'oeuvres and displays of botanical art by club members Erika Sonder and Anita Sebastian. They then feasted on a catered buffet while a slideshow of images and documents from the NEBC archives was displayed on a large screen. After a lovely meal, President Art Gilman welcomed everyone and spoke briefly about the many great "Away" meetings the club has had in and around New England over the past few years. He noted that the club currently has more than 400 members, with 350 institutions more that subscribe to Rhodora.

Following Art, past NEBC President Lisa Standley introduced the evening's speaker, Dave Barrington. The club has had the honor of hearing Dave speak on several occasions. For the night's special anniversary meeting, his talk was titled "The Big Thaw: New England Flora in the Holocene" – for the thousandth meeting of a club that spends most of its time asking why plants grow where they do.

Dave noted that the mountaintops of New England captured the fascination of many of the first NEBC members. Ausable Chasm in Vermont serves as one striking lesson in the effects of time and change on flora and fauna. A deep and narrow divide almost a mile long, it was originally thought to have been formed in the Oligocene era, but actually developed during the last 10,000 years.

In 1846, a beluga whale was unearthed during the construction of a railroad in Vermont. The presence of such a creature, referred to as the "Charlotte Whale" after the town near where it was discovered, supports the idea that there was once an arm of the ocean in the Champlain Valley. E.C. Pielou, who studies flora from the Pleistocene glaciation, found that at maximum glaciation (18,000 years ago), ice covered much of the terrain. However, during this ice age a series of large sandy islands were exposed along the northeast coast. Lake Champlain was indeed at one time an arm of a giant sea whose land was compressed by the huge weight of ice.

Dave described the work of Norton Miller, who has studied the recovering New England flora of 12,000 to 13,000 years ago, specifically looking at when and where species were found. This work uses both pollen cores and macrofossils. Plants in portions of a species range that have the highest genetic diversity are thought to be those where populations have been around the longest, especially those that survived through the ice age in what are termed "refugia." For example, when looking at *Fagus sylvatica* in Europe, scientists have found that genetic diversity in this species is highest in the southernmost parts of its range. This is hypothesized to be because subsets of the southern populations were able to hide out in refugia through the ice age. Another example of this pattern is *Asclepias exaltata*, an eastern North American milkweed species that is very common in the South. In the North, it is rare and has low genetic variation as well.

Saxifraga oppositifolia is found at Smugglers Notch in Vermont on wet cliffs; a map of its species distribution suggests that the southern limit of this species is New England. A group headed by Dr. Abbott did a genetic study of this species, which was found to have spent the height of the Pleistocene era on exposed land in Siberia, where the highest genetic diversity is now found. The species then repopulated the Arctic through North America and through Eurasia. *Dryas integrifolia* is another Arctic species for which a set of refugia can be hypothesized from genetic data. There are many records of the pollen of this species as well as fossils in refugia, with two centers of diversity being the high Arctic and Beringia.

Pete Walker, a University of Vermont student working with Cathy Paris, has also looked at the sand dune genus *Ammophila* (beach grass). *Ammophila brevigulata* is widely distributed along the Atlantic coast and Great Lakes regions. However, plants found along Lake Champlain have been labeled as *A. champlainensis*. There has been some question as to whether this was a true species, though the Lake Champlain plants flower in a different month. Pete determined that the Great Lakes populations were actually morphologically intermediate between the North Atlantic and Lake Champlain populations. It is likely that the Lake Champlain plants arrived with the ancient Champlain Sea and separated from other populations since the salt waters receded 10,000 years ago. The North Atlantic populations have the highest genetic diversity, likely because there was plenty of exposed sand on the coast during the Pleistocene for a refugium. *Lathyrus japonica*, often a companion of beach grass, grows on both the Atlantic and Pacific coasts of North America. An isozyme study showed that Pacific alleles were most common in the north and dwindled in the south, while Atlantic alleles were found only in the Atlantic, suggesting that there are actually two endemic centers for this species.

Dave spent the latter part of his talk discussing several other interesting case studies of plant species that found refugia and managed to survive the Pleistocene era, including *Adiantum pedatum*. He mentioned *Hudsonia* as a candidate for future study of glacial refugia and Holocene migration. He then took several enthusiastic questions from the audience. The club finished the 1000th meeting celebration with an excellent dessert table and a sparkling cider toast.