New England Botanical Club - Minutes of the 988th Meeting
2 May 2003 Jennifer Forman, Recording Secretary

The 761st meeting of the New England Botanical Club, being the 988th since its original organization, met on Friday, 2 May 2003, in the Education Building of the New England Wild Flower Society's Garden in the Woods, Framingham, MA. There were 56 members and guests in attendance.

Following a picnic supper and the opportunity to walk around the gardens, President Paul Somers called the meeting to order, noting that this was the first time the NEBC had ever met at the NEWFS Garden in the Woods. NEWFS staff expressed hope that this was the "First Annual NEBC meeting at Garden in the Woods." One new NEBC member was announced, as were several items of news and gossip. Les Mehrhoff and Janet Sullivan then announced the club's first Merritt Lyndon Fernald Award, which honors Fernald's exemplary contributions to the botany of northeastern North America by recognizing an author of a paper in a volume of *Rhodora*. The award certificate and a check were presented to Dr. Robert I. Bertin for his article "Losses of native plant species in Worcester, Massachusetts." [*Rhodora* Autumn 2002 vol. 104 (920): 325-349.] Robert took a moment to address the audience and say that he hopes to inspire others to do research projects that include field research in local habitats.

Karen Searcy then introduced the night's speaker, Dr. Peter Alpert from the University of Massachusetts, Amherst. Peter, who was inspired very early in his life to study plants, spoke about "Clonal plants and invasive species: Combining curiosity-driven and problem-directed research." Peter has done several investigative studies of clonal plant reproduction, using the aquatic herb *Eichhornia crassipes* (water hyacinth). *Eichhornia crassipes* is a South American species that was first introduced to North America in the late nineteenth century and is now invasive in many parts of the world. While known for its pale purple inflorescences, the species can also quickly and easily produce new clones via horizontal stems known as stolons. Peter noted that the advantages of clonal reproduction include the opportunity to control placement of offspring, the ability to share resources via nutrient transport, and the ability to signal attached clones to instigate plastic responses to environmental conditions. To test whether *E. crassipes* uses any of these mechanisms to succeed, Peter set up experiments exposing populations to combinations of sun and shade. When parent plants were shaded, but their clonal offspring were in the light, new stolons from the parent plant grew longer before touching the water and growing into new offspring. Speculating that awareness of the wavelengths of light and whether a plant is producing the shade could help *E. crassipes* avoid self-competition, Peter noted that plants in the center of a mat of clones tended not to produce stolons and to grow taller than their neighbors.

Peter also works with *Fragaria chiloensis* (beach strawberry), one of the wild progenitors of cultivated strawberries. *Fragaria chiloensis* also reproduces by stolons, producing a new plant at every other stolon node. Using populations at Año Nuevo State Reserve in California, Peter demonstrated the transport of carbon and nitrogen between attached plants using radioactive and heavy isotopes of those key nutrients. Tests also showed that if a plant was not watered but remained attached to a watered plant, it grew as well as if it had been watered itself.

To test what could be controlling the transfer of nutrients between clonal individuals of *F. chiloensis*, Peter looked closely at hormonal signals. Following the application of auxin, only the plants that started out with low concentrations of nitrogen or carbon increased the import of those nutrients. Also, data are currently being analyzed to see if there is a division of labor among attached plants within clones to make populations as a whole more efficient.

As a further investigation of the signals that occur between clonal plants, Peter looked at plant response to herbivore attack. The two-spotted spider mite (*Tetranychus urticae*) commonly infests commercial strawberry plants. The mites were first released on one *F. chiloensis* plant, then later released on an attached clonal plant. While the initial clones showed much herbivore damage following the release of the mites, the clones that were attacked later were somehow "warned," making them better able to defend themselves against the mites, and to keep the number of mites per plant down. Finally, Peter demonstrated that attached *F. chiloensis* plants are better able to avoid competition from each other than separated clones. Two clonal plants were grown in the same pot, and were dyed either red or green to distinguish the two. Attached plants had clear root segregation between clones, while unattached clones did not. Another experiment that further prevented competition between root systems suggested that root segregation enables clones to reduce root competition and increase clonal performance.

Following the talk, Peter answered several questions about both *E. crassipes* and *F. chiloensis*, as well as a query about whether a virus would be transferred between attached clones. The meeting adjourned to refreshments and conversation.