New England Botanical Club – Minutes of the 956th Meeting

3 March 2000 Prepared by Don Hudson, Recording Secretary

The 729th meeting of the New England Botanical Club, being the 956th since its original organization, met on Friday, March 3, 2000 at the Biological Laboratories of Harvard University in Cambridge, Massachusetts with 55 members and guests present.

President David Conant called the meeting to order at 6:50 PM. Following a reading of the minutes of the previous meeting, President Conant asked that guests be introduced. Five new members to the club were then introduced, including Dorothy Allard, Chris Hoffman, Frédéric Coursol, Bart DeWolf, and Ray Abair. There followed the annual reports of several committees. Ray Angelo spoke for Treasurer, Harold Brotzman. Ray described the Council's review of the past 7 years of income and expenses and the preparation of the first budget in the modern memory of the Club. Ray remained standing to report on the activities of the Club's herbarium. The integration of the NEBC collection with that of the Harvard Herbaria continues apace, as well as does mounting and insertion of a backlog of new specimens. A total of 191 sheets were added to the collection during the past year, while 4 were released. Nancy Reid reported on the continuing work of the Non-vascular Plant Committee in cooperation with peers at the Farlow. Les Mehrhoff reported of the addition of several new books to the Club's library, which can be visited on the 3rd floor of the herbarium. Finally, Art Gilman reminded the assembled group of the upcoming special trip to the Gaspé Peninsula in July 2000, lead by George Newman. The business of the Annual Meeting concluded with the election of the slate of councillors and officers presented at the previous meeting and in the most recent meeting announcement.

The call for Old Business and New Business fell on deaf ears, and the meeting quickly moved to announcements and gossip. Pat Swain announced the opening of a couple of job opportunities in the Natural Heritage and Endangered Species Program. Hildy Ellis of the University of Maine has been selected the winner of the Eagle Hill Award. A new Club committee for special publication of local floras was announced. Sadly, the group noted the passing of long-time member and former Club Librarian Janet E. Woodward.

The gavel was next passed to Lisa Standley, who rose to introduce the evening's speaker, outgoing President **David Conant** to speak on "The Biology of Ferns." Lisa recognized David with both pleasure and sadness for his outstanding leadership. The Centennial Symposium was a special highlight, as was Dave's rescuing of ***Rhodora*** during a particular tough stretch for the Club's journal.

David traced his love of the ferns and field biology to an afternoon foray to New Hampshire's Bear Mountain with mentor Albion Hodgdon. Assaulted by yellow jackets, Hodgdon tumbled one hundred feet, head over heels, down a rocky slope and into the crook of a tree. Fearing the worst, David hurried to Albion's side. Notwithstanding the bites of dozens of yellow jackets, Albion rose to his feet to continue the plant hunt down the mountain. During refreshments at the bottom, David thought, "This is all right!" David happily cast his lot with Albion Hodgdon. A couple of false starts with the ferns of New Hampshire and flora of Sullivan

County preceded David's introduction to the tree ferns, and he has been a student of the group since the mid-1970's.

David traced the emergence through the 1980's of the use of tools like electrophoresis and analysis of chloroplast DNA in analyzing relationships among the ferns. Notably, the work of Japanese botanist Hasebe has confirmed many of the assumptions of our narrative phylogenies for the ferns with his analysis of the gene for the large subunit of the enzyme ribulose bisphosphate carboxylase (rbcL) that plucks CO_2 from the air to build glucose in the dark reactions of photosynthesis. He confirmed the ancient lineage of primitive ferns like the Osmundaceae, and sorted out the higher leptosporangiate ferns just as do the narrative phylogenies. As an aside, David said, if we are to recognize many orders of the "younger" flowering plants, this modern work with the ferns underscores abandonment of a single order, Filicales, for all the ferns. For his part, David took his work with the tree fern genus *Alsophila*, begun with Rolla Tryon in 1976, into the modern laboratory. The days of plant collecting with the aid of a converted mail van were followed by collaborations in biochemistry with Gillian Cooper-Driver of Boston University and Gus Demaggio of Dartmouth College. Analyses of flavonoid pigments and storage proteins were helpful, but not absolutely conclusive in sorting out the tree ferns. Together with Diana Stein of Mount Holyoke College, David moved next to analysis of chloroplast DNA. David jetted all over the New and Old World tropics to collect the ferns, shipping them back to Diana within two days for grinding. Countless southern blots later, David recounted the horrible experience of trying to make sense of it all, "like trying to put Humpty Dumpty back together again." The two scientists struggled with a number of molecular probes of the collected chloroplast DNAs, settling on ones derived from Christmas ferns to retrieve the clearest set of data.

After years of work, David and Diana produced a fresh picture of the tree ferns as three major groups centered on *Alsophila*, *Cyathea*, and *Sphaeropteris*. The *Cyathea* clade is not restricted to the New World tropics as previously believed, but linked through geological time to ferns found in Western Queensland and the Pacific. It appears that the Greater Antilles group of *Alsophila* is the most derived of the tree ferns.

David ended his presentation with striking images of hand-prepared sections of fern stems produced with the help of his students at Lyndon State College. David declared that there is "a lot to learn beyond who they (sic the ferns) are!"- a refreshing perspective on teaching and learning, indeed. Following questions, the meeting was adjourned to refreshments at 8:07 PM.