

New England Botanical Club – Minutes of the 933rd Meeting

5 December 1997 Prepared by Dr. Lisa A. Standley, Recording Secretary

The 706th meeting of the New England Botanical Club, Inc., being the 933rd since the original organization, met on Friday, Dec. 5, 1997 in the main lecture hall of the Biological Laboratories, Harvard University, with 42 members and guests present.

Following the reading of the minutes and introduction of guests President Hudson called for new or old business announcements and gossip. Les Mehrhoff announced the publication of a new book by Alice Tryon and Robbie Moran "The Ferns and Allied Plants of New England" published by the Massachusetts Audubon Society. Janet Sullivan announced that Don and Kathleen Padgett have successfully reproduced. Dave Conant described a new education and research facility established in southern Belize that can host classes or groups and will teach 2-week short courses. He has information on the facility. Lisa Standley asked for field trip ideas for 1998. Dave Conant also announced the annual "show and tell" scheduled for the January meeting and reminded members to bring slides.

Vice President Conant introduced Dr. Harlan Banks who spoke on "Sixty Years with Devonian Plants" - an enthusiastic review of his more than 60year-long romance with the early vascular plants of the Devonian. Dr. Banks received his undergraduate degree at Dartmouth College and his doctorate at Cornell University where he taught throughout his career. He has recently returned to New England where his native accent is more widely spoken. Dr. Banks provided a fascinating overview of the people, places, and fossil plants that have contributed to our current understanding of the early land plants.

The early land plants underwent a rapid and remarkable evolutionary radiation in the period from 400 to 350 million years ago and developed two major lineages early in the Devonian - the Psilopsida (leafless plants with terminal sporangia) and the Zosterophylloids. Dr. Banks' primary work has contributed to making sense of this diversification, particularly the Zosterophylls, the early ancestors of the lycopods. These plants had simple leaves with single unbranched vascular strands, sporangia on the surface of the leaves, and a unique xylem structure. They probably looked much like *Lycopodium* (aka *Huperzia*) *selago*.

People who have contributed to Dr. Banks' interest in this group and to our understanding of it include Diane Edwards in Wales, Suzanne Leclercq in Belgium, other researchers in Poland, former students Doug Grierson and Fran Hueber, former teachers William Patton, Lauren Petrie, and W.C. Darrah, and enthusiastic amateur fossil-hunters who made many of the initial discoveries. These researchers have revealed the three-dimensional structure, anatomy, and spores of the early zosterophylls using the most painstaking techniques of "degaging" - chipping rock away from a fossil grain by grain, thin-sectioning rock, and removing fossil plants whole by dissolving the rock matrix in hydrofluoric acid.

Dr. Banks, fortuitously, was based close to two of the most prolific Devonian fossil sites in North America - the shores of the Gaspé and southern New York, shore of the ancient Devonian sea. Devonian plants, however, once occurred world-wide, with the same fossils now found in

Wyoming, New York, China, and South America. The construction of new highways, dams, and quarries provided large quantities of fossil-bearing rock for study (Harlan noted that he got four PhD theses out of every new reservoir for New York City - his research maxim is "if you want good plants, you need to blow up the hillside").

The plants provide a fascinating view of diversity and Dr. Banks shared the thrill of each new discovery: the 3forked leaves of *Colpodexylon*, formerly thought to be spines; the discovery of sporangia on *Colpodexylon*, after 30 years of research; *Leclerqia*, with uniquely distinctive 5-forked leaves; other taxa with curved falcate leaves with broad deltoid bases; *Sawdonia*, from the Gaspé, the first of the Devonian zosterophylls demonstrated to have stomates on the leaves and sporangia borne directly on the sides of the stems; and *Psilophyton* from the Devonian of Wyoming, with clusters of terminal sporangia. The careful study of these plants has also provided evidence of Devonian arthropods, based on scars similar to those that result from chewing or sucking insects, and the earliest record of a spider based on fossil material trapped in the leaves of *Leclerqia*.

The meeting adjourned at 8 PM to look at specimens of these remarkable plants over refreshments.