

BOTANY

Northeastern Fern Identifier

By Richard S. Mitchell and Laurie Danaher. 1998. New York State Museum, Albany, New York. U.S. \$19.95.

This computerized guide to 70 fern species of north-eastern North America has been loosely based upon Eugene Ogden's *Field Guide to Northeastern Ferns*, published by the New York State Museum in 1981, one of the earliest publications to employ random-access keys in fern identification.

According to the introduction to the CD, "this package provides a menu-driven, fully color-illustrated guide and random-access key to ferns of the north-eastern United States and eastern Canada. With it, the user may identify a fern by merely matching its characteristics with illustrations on screens provided. This allows a beginner to proceed with the identification of a fern after learning about five simple terms indicated on the help screen. As each feature of the fern in question is chosen, a decreasing number is displayed on the main screen, indicating how many regional fern species share that combination of characters."

Unfortunately, the Northeastern Fern Identifier is a DOS-based program. Its approach to interacting with a computer's video card is not compatible with recent operating systems, and it will not function on most computers running Windows NT, 2000, or XP. It will function on older computers running Windows 95 or 98. This is a serious limitation that means the program cannot be used on the vast majority of current computers. I was unable to contact the author by e-mail to determine whether or not a version more compatible with more up to date operating systems is planned.

Once a sufficiently out-of-date computer was found using Windows 98, an analysis of the efficacy of the program on the CD was carried out. Generally, it was found that the random access method can be as efficient as the traditional dichotomous keying method of species identification. The program allows the selection of any one of 24 identification options, including position of sori, indusia, vein branching, leafy margins, vascular bundles, etc. It then becomes possible to eliminate possible choices of species after each option selection, resulting in a decreasing number of applicable species. However, many of the selections result in a rather high number of possibilities making the selection process somewhat difficult. For instance, the two position of sori choices (marginal or not marginal) brings up 30 possibilities for marginal and 42 for non-marginal sori positions.

The photographs of the various species, mostly taken from 35 mm slides, are generally good, both in colour and clarity. Each page includes the name and possible synonyms of the species, the distribution range, habitat and description of similar species. It also includes, where applicable, a small photograph of the sori positions.

In general, the concept of a CD presentation of species identification methods has good potential. However, the *Northeastern Fern Identifier* requires an updated version if it is to be accepted and widely used by amateur botanists.

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Flora of the Hudson Bay Lowland and its Postglacial Origins

By John L. Riley. 2003. National Research Council of Canada, Research Press, Ottawa, Ontario, Canada. \$49.95 (postage included).

The Hudson Bay Lowland is an area south and west of Hudson and James Bays measuring 325 000 square kilometers in northern Ontario, northeastern Manitoba and a small part of northwestern Quebec. In the introduction it is described as one of the Earth's largest more or less continuous wetland landscapes. The author describes its geology and glacial history, vegetation, soils, permafrost, and tree line, climate, climate change and other recent stresses and his objectives.

This flora is not like other floras such as *Vascular Plants of Continental Northwest Territories, Canada* by Porsild and Cody (1980) or *Flora of the Yukon Territory* by Cody (1996) which are organized in taxonomic sequence with keys, descriptions, habitat and range information in considerable detail. This book, however, does contain a wealth of information. In the Introduction section there is "Geology and glacial history information", "Descriptions of the vege-

tation, soils, permafrost and the tree line", "Climate, climate change, and other recent stresses" and "Objectives". This is followed by "Methods" which include a wealth of information under the titles "Data assembly and field surveys", "Data collection areas" and "Floristic analysis". Then Results information is provided under "Data collection areas", "Coincident distribution patterns" and "Floristic zonation". The next section entitled "Postglacial origins of the Flora" contains fine information and maps regarding "Early vegetation development", "Species migration", "Widespread species of the Hudson Bay Lowland", "Eastern species of the Hudson Bay Lowland", "Western species of the Hudson Bay Lowland", "Coastal species of the Hudson Bay Lowland", "Arctic species of the Hudson Bay Lowland", "Other themes in the flora of the Hudson Bay Lowland – including introduced and rare species". This is followed by Acknowledgments and References plus four pages which contain beautiful colour pictures of 32 species accompanied by four pages with pertinent information. All of the

above is to be found on the first 100 pages of the book.

The above is followed by Appendix A which is comprised of 148 most interesting distribution maps in alphabetical order by scientific name which, with combined dot maps with range-limit maps, provide precise distributional data from the Hudson Bay Lowland and related areas, while still indicating the broader distribution of the species. Appendix B entitled "Catalogue of the Vascular Plants of the Hudson Bay Lowland" is a summary of individual data collection areas in the Hudson Bay Lowland. This catalogue follows the order of families in Dalla Torre (1958) and

Verdoorn (1938), with the taxa organized alphabetically within families. Appendix C, Excluded Records, has an alphabetical list of scientific names that have been excluded because of redetermination or because relevant voucher material could not be found.

The author is to be congratulated for putting together this most informative study of the terrain, plants and historic literature related to this extremely interesting area.

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The War on Weeds in the Prairie West: An Environmental History

By Clinton L. Evans. 2002. University of Calgary Press. xvii + 309 pages. Paper \$29.95.

During recent history, weed eradication has been a constant battle, with the balance usually tipped against the farmer. Evans documents this battle in the Canadian prairies between 1800 and the 1950s. His objective is to "highlight the shortcomings of the current noxious-weed legislation and crop production systems on the Prairies." He argues that the main result of legislation and its accompanying agricultural bureaucracy was to perpetuate an "ecologically unsound, weed-friendly style of farming." By identifying weeds as an "enemy", attention was diverted from the "true enemy", which Evans sees as "the extensive system of grain farming" entrenched in the agricultural system, encouraged by "a style of agriculture that actively cultivates weeds". Evans contends that hitherto little attention has been paid to weeds in the history of the Canadian west. Yet he believes that "weeds are important", not least because of the immense costs of weed control, the huge losses caused by weed infestations, and the enormous human effort directed to weed eradication. Evans comments that historians have exhaustively analyzed social and political activities of prairie farmers, while paying little attention to utilitarian issues, "mundane, practical activities" like weed control, that dominated their daily lives.

Evans demonstrates that weed definitions are not biologically based but are founded on utilitarian concepts. Crops are "useful" plants. Hence, any plant that competes with the crop is a "non-useful" plant or weed. Many weed plants are doubly "out of place" in western Canada because they are exotic. The main "villains" include Russian thistle (*Salsola pestifer*), tumble mustard (*Sisymbrium altissimum*), pennycress (*Thlapsi arvense*), and Canada thistle (*Cirsium arvensis*). Evans lists the biological attributes that contribute to "weediness" and make a plant a successful weed. These include good seed dispersal characteristics, an ability to spread vegetatively, morphological plasticity, profuse seed production, annual habit, broad ecological tolerance and, sometimes, perhaps phyto-

toxicity. He points out that farming activities have exerted evolutionary pressures on weeds, often enhancing their "weedy" characteristics. Weeds are, therefore, "cultural artifacts" just like the social and agricultural systems within which they flourish.

Next, Evans sets the historical context by examining farming practices and weed management in the UK, beginning in 1500, when most major components of the weed flora were already established in Britain. Subsequent generations of farmers developed and modified strategies, often labour-intensive, to deal with them, including late sowing, planting clean seed, crop rotation, manual weeding, hoeing and ploughing, and livestock pasturing. Summer fallowing and tillage, later widely applied in Canada, developed from medieval farming. Immigrant farmers brought this weed knowledge and control experience to North America. The weed battalions that British farmers battled are similar to those that plagued Canadian agriculture. Indeed, many weed species also traveled as inadvertent immigrants to North America.

European-derived settled agricultural communities first developed in eastern Canada. Evans concentrates on the development of weed control strategies and policies between 1800 and 1867 in what is now Ontario, a region that mainly looked to Britain for its knowledge of agriculture. Weeds were a problem by the 1830s, with increasingly strident and vociferous fulminations against them in newspapers and commentaries. Ontario's weed flora was dominated by European plants, especially Canada thistle. Eastern North America before European settlement was mostly forested. Therefore, imported weeds, adapted to open disturbed landscapes, had a competitive advantage over native forbs when land was cleared. Evans points out that for many settlers the "war on trees" was more important than the "war on weeds" in the early years. Perhaps more significantly and subtly, European weeds, having co-evolved with European agriculture for centuries, were preadapted to take advantage of the ecological niches offered in cleared agricultural landscapes. Evans observes that early 19th cen-