THE PLANT PRESS

FIELD BOTANY IN ONTARIO



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CONTENTS

EDITOR'S PAGE	J. Kaiser	2
LETTERS	(J.K. Morton, J. & D. Gunn, E.G. Voss)	3
NOTES & REPORTS		
Pringle, J.S.	Nomenclature of the white cardinal flower, *Lobelia cardinalis* forma *alba* (CAMPANULACEAE)	4
Oldham, M.J.	Rare vascular plants of Pelee Island, Ontario	5
Runnells, J.A.	Frank's love grass (*Eragrostis frankii*), small-flowered galinsoga (*Galinsoga parviflora*) and purple sand grass (*Triplasis purpurea*) discovered in the vicinity of Hamilton, Ontario	9
Hamilton, P.B. & Wilson-Neish, L.	The occurrence of freshwater red algae in Ontario	11
Oldham, M.J.	Tall thoroughwort (*Eupatorium altissimum* L.) in Ontario	16
Pringle, J.S.	John Macoun's academic degrees	19
Moore, R.J.	Key to the bedstraws (*Galium*) in Canada	21
NEWS OF FIELD BOTANISTS		
Bradley, D.	In memory of John Arthur Runnells (1912 - 1988)	23
INFORMATION & REQUESTS		24
ONTARIO PLANTS IN PRINT		
Macdonald, I.D.	*Brittonia* references from 1980-1987	27
Cecile, C.	*Canadian Field-Naturalist* references from 1985	27
Reddoch, J.M.	*Le Naturaliste Canadien* references from 1984-1986	28
Brunton, D.F.	*Trail & Landscape* references from 1984-1986	28
Morton, J.K.	review of *A checklist of New York State plants* by R.E. Mitchell	29
Bowles, J.M.	review of *Orchids of Ontario: an illustrated guide* by R.E. Whiting and P.M. Catling	30
NEW AND RECENT PUBLICATIONS		30

Front page illustration: *Symplocarpus foetidus*, skunk cabbage, inflorescence and young leaves, by W. Schiffers

EDITORIAL

This page has enjoyed a phantom existence in the past four years. The editor would occasionally appear to introduce something important, to urge re-subscriptions, to plead discreetly for more money, to announce future plans. With this issue, the editor's appearance is being institutionalized. I will use this page to try to stimulate your intellect and curiosity on matters botanical or present some opinions on a significant botanical issue. However, all our "old" themes will be played once more before we strike up any new melodies.

We urge you to call the attention of a fellow botanist or naturalist or plant scientist to the existence of THE PLANT PRESS. We are always hungry for more subscribers. We realize that a centre-layout of orchid distribution by counties and districts (Vol. 2, No. 3) will never have the mass appeal of the assembled Sunshine girls for any given year, but we like to imagine that interest in field botany is growing among the general populace as more and more attention is focussed upon our dwindling natural botanical resources.

We continue to fund our operations from our subscriptions and donations. The journal is published by The Plant Press, Inc., a non-profit, registered charitable corporation and all donations are tax-deductible. More of both subscriptions and donations will help us maintain the quality of the journal in the face of ever-escalating costs. With a healthy injection of subscriptions and donations we may even find the temerity to clothe THE PLANT PRESS in a heavy-stock or glossy cover. Be still my beating heart....

THE PLANT PRESS eats words the way a teenager eats hamburgers. At each sitting, its appetite is enormous. And having fed the beast to its limit, it wakes up the morning after the quarterly mail-out as hungry as though it had never eaten. We need letters; we need notes; we need articles; we need information; we need requests. I would like to challenge every reader, at least every Ontario reader, to put pen to paper sometime in the next two years to drop a note to THE PLANT PRESS dealing with something other than your subscription renewal. This journal should be more than just a spectator sport for you. You should be sharing your botanical explorations with us, elaborating on your botanical discoveries--and, if nothing else, telling the editor where to get off and on. Feedback is of great value in identifying areas where THE PLANT PRESS can attempt to improve or extend its coverage, as tempered by our objectives and our reliance upon a volunteer staff.

We have no desire to sit back and wait for the mountain to come to us. Metaphorically speaking, we intend to go to the mountain.

Finally, there is the question of man- and womanpower for THE PLANT PRESS. We always have a need for one or two warm bodies who are willing to join the editor in the Augean stables, as it were, of the journal. Unfortunately, these warm bodies must do more than just breathe and radiate heat. As a result, though many may be called, few are likely to be chosen. (Didn't someone once say something to that effect?) Please don't hesitate to come forward. And if we say thanks but no thanks, don't think that we didn't appreciate the offer. We have some very particular and sometimes peculiar needs, often with a requirement that you live in a certain area.

Raising the field botany profile in Ontario

THE PLANT PRESS carries material dealing with field botany in Ontario. Hopefully, most of you have the opportunity and inclination to get out into the fields and woods during the spring, summer and autumn to make your own observations of plants and vegetation, and sometimes tie those observations to something you read in the journal. Or better still, perhaps THE PLANT PRESS has directed you to some area in search of this or that species of plant or community of plants.

For those who would like some guidance in the field and/or directions to and company at the province's botanical hot spots (and every natural area is a potential hot spot), the Field Botanists of Ontario (FBO) is the organization to call upon. Begun on the basis of the interest and activity that was manifest during the establishment of THE PLANT PRESS, the FBO is intended to give both active and would-be field botanists the opportunity to gain firsthand experience of the Ontario flora. It is also serving as a voice for field botanists in the matter of the conservation of Ontario's botanical resources and remnant natural areas. For those wishing to join ($8.00 for the year) or to obtain more information, write: Field Botanists of Ontario, 45 Massey St., Bramalea, Ontario L6S 2V8.

Jeff Kaiser, Editor

LETTERS

NOW WHY DIDN'T WE THINK OF THAT NAME?

"While in England last year, I discovered yet another publication calling itself 'Plant Press'. This is a recently launched newsletter of the Conservation Association of Botanical Societies (CABS), an umbrella organization for several British botanical societies including the phycologists, lichenologists, pteridologists, bryologists, and vascular plant botanists. The newsletter is subtitled 'Conservation news from CABS.' Volume 1, No. 1, was issued in the spring of 1987."

John Morton, University of Waterloo

[Ed. note: Three other publications called the "Plant Press" have been discovered, the newsletters of the Arizona Native Plant Society, the Minnesota Native Plant Society, and an in-house newsletter of the Smithsonian Institution botany associates. Obviously, the name has a certain attraction to field botanists.]

WHITE-FLOWERED WILD CRANE'S-BILL IN OAKVILLE

"We are always on the lookout for albino flower forms when we are botanizing and have sometimes travelled a good distance to photograph such flowers. On 18 May 1987 last spring, one of us (JLG) discovered two white-flowered plants of wild or spotted crane's-bill (Geranium maculatum L. forma albiflorum (Raf.) House) growing 10-15 cm apart on the edge of Holyrood Park, immediately adjacent to the edge of our back lawn. They were in a small woodland remnant where, until recently, the city maintenance staff had been cutting the grass and associated understory plants but the area has now been allowed to grow wild. A large population of pink-purple (normal) wild crane's-bill is now also growing in the area. The plants were photographed and copies of the pictures were filed with TRT.

"The canopy of the woods is moderately open. The soil is sandy but with a good surface layer of humus and duff. The ground layer plants are now flourishing. The white-flowered plants of G. maculatum were about 20 cm tall and the flowers were 2.5-3.0 cm across.

"The only other records of a white-flowered wild crane's-bill in Ontario that we could find were of one plant at Mallorytown Landing in Leeds County (specimen in TRT, date unknown) and one in Norfolk County (Monroe Landon, 1960:40, Vascular plants of Norfolk County, Ontario, published by the Big Creek Region Conservation Authority). A voucher specimen for Landon's record is in TRT.

"Other interesting plants growing with the wild crane's-bill population are Geum urbanum (wood avens), an introduced avens which appears to be spreading across most of southern Ontario, and Viola selkirkii (great spurred violet), a lovely blue woodland violet that is frequent in rich woods in southern Ontario."

Joan L. and Don Gunn, Oakville

CARL LUER AND Orchis rotundifolia var. lineata

"I must point out that on p. 131 [THE PLANT PRESS, Vol. 4, No. 4] is an absolutely incorrect statement by Vince Elliott that Luer, in his Native Orchids, credited me with the discovery of Orchis rotundifolia var. lineata in "Thunder Bay County in 1966." Anyone consulting Luer (p. 152) and the references he cites can read the facts: (1) Luer didn't credit anyone with the discovery; (2) I found the orchid in 1961, not 1966, and credited Elliott with its prior discovery at Sibley Provincial Park.

"What Luer did was to indicate that his photograph of this variant was taken in 1966 in "Thunder Bay Co." (i.e., District); he did not even mention Sibley, although that is the likely site. In the opposite corner of the same page, Luer also cited several names in the synonymy of Amerorchis rotundifolia (the name he used for the species), including Orchis rotundifolia f. lineata (Mousley) E.G. Voss, with the bibliographic reference to the place (Rhodora 68:462. 1966) where I published that transfer from the rank of variety to the rank of form. (Such references are good style in taxonomic contexts.) When I published that formal nomenclatural transfer, I added a note calling attention to Elliott's discovery published in the same journal in 1960 and citing my own 1961 collection from Sibley."

E.G. Voss, University of Michigan

NOTES & REPORTS

NOMENCLATURE OF THE WHITE CARDINAL FLOWER, *Lobelia cardinalis* forma *alba* (CAMPANULACEAE)

James S. Pringle, Royal Botanical Gardens, P.O. Box 399, Hamilton, Ontario L8N 3H8

Nelson & Dore (1987) have recently concluded that no legitimate epithet is available at the rank of forma for the eastern cardinal flower with white corollas, commonly known as *Lobelia cardinalis* L. forma *alba* (A. Eaton) St. John. Because *L. cardinalis* is a showy species, much admired but uncommon, there is undoubtedly a need for a scientific name by which this white form (Fig. 1) can be designated.

This form was first named *L. cardinalis* [var.] *alba* by James McNab (1835), who discovered it while he was en route from London to Goderich, Upper Canada (now Ontario), with Robert Brown in 1834. Nelson & Dore (1987) determined that the type locality was along the "Goderich Road," just north of the present site of Exeter in Huron County.

Amos Eaton made his first mention of *L. cardinalis* var. *alba* in 1836, in the seventh edition of his *Manual of botany for North America*. Eaton did not cite or otherwise mention the name of McNab in connection with this plant. Therefore, later authors, including St. John (1919) and Nelson & Dore (1987), assumed that Eaton had published *L. cardinalis* var. *alba* as a new name. Nelson & Dore assumed that it had been based on a different collection. St. John assigned the epithet to the rank of forma, as *L. cardinalis* forma *alba* (A. Eaton) St. John.

If, as assumed by Nelson & Dore, *L. cardinalis* [var.] *alba* McNab and *L. cardinalis* var. *alba* A. Eaton were based on different type specimens, the latter name would be illegitimate, being a later homonym, and any combination based on it would also be illegitimate. However, the combination at the rank of forma by St. John, although presumed to be illegitimate, was validly published, and therefore that publication would prevent the use of the same combination based on [var.] *alba* McNab, in the opinion of Nelson & Dore.

Eaton (1836) cited *L. cardinalis* var. *alba* only from "Goderich, U.C."; no other occurrences or specimens were mentioned. As of 1836, no one other than McNab and Brown had botanized anywhere near Goderich. Therefore, Eaton would have had no way of knowing what grew in that area except from McNab's 1835 paper. Eaton obviously knew of McNab and his expedition, as indicated by his reference to McNab as "a very intelligent young Scotch Botanist who collected plants in our Lake country, in 1834." Direct evidence of Eaton's familiarity with McNab's 1835 paper is presented by his inclusion of *Patrinia longifolia* McNab which had been named and described in the McNab paper, in the seventh edition of his *Manual*.

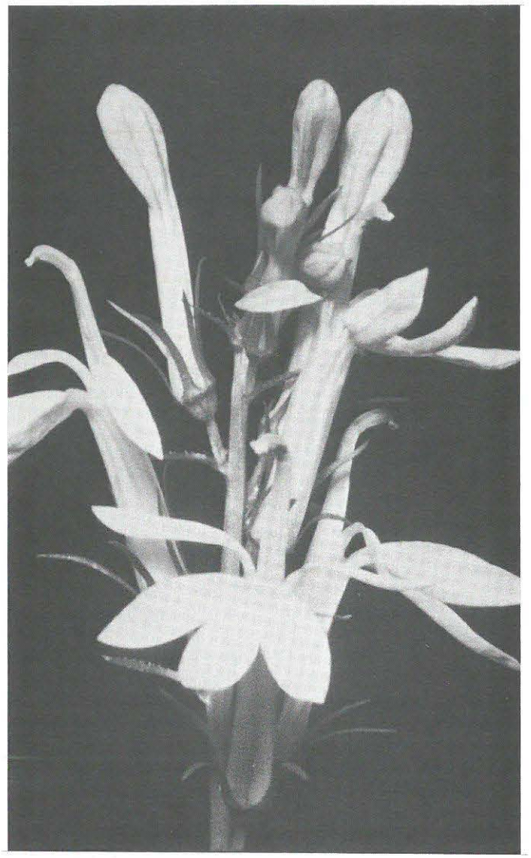


Figure 1. A white-flowered cardinal flower (*Lobelia cardinalis* L. forma *alba* McNab).

Eaton generally did not indicate the authorship of any varietal names, so the fact that he did not cite McNab as the author of the name *L. cardinalis* var. *alba* cannot be taken as evidence that he did not, in fact, consider McNab to be its author. On the contrary, Eaton's locality citation of "Goderich, U. C." clearly established the identity of the *L. cardinalis* var. *alba* in his *Manual* with the name *L. cardinalis* [var.] *alba* McNab published by McNab (1835). No new collection typified Eaton's use of this name, so neither his use of it nor the combination made by St. John is illegitimate. Such a situation is expressly covered by Article 33, Ex. 5, of the *International code of botanical nomenclature*, 1983 ("Sydney") edition. The attribution of the authorship of the basionym to Eaton is to be regarded merely as a "bibliographic error of citation," and "(A. Eaton) St. John" should simply be corrected to "(McNab) St. John," as in fact it was by the compilers of the *Gray Herbarium Index*.

The cardinal-flower complex is now generally treated as one species across its entire range of the eastern half of North America, north to about 45° N. (McVaugh 1936). Following the classification of McVaugh (1936), the full scientific name of the white-flowered eastern cardinal flower is *Lobelia cardinalis* L. subsp. *cardinalis* var. *cardinalis* forma *alba* (McNab) St. John.

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RARE VASCULAR PLANTS OF PELEE ISLAND, ONTARIO

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Since John Macoun's visit in 1892, Pelee Island (Fig. 1) has been known for a large number of rare plants. In recent years the island has become more accessible to field botanists through organized trips by groups such as the

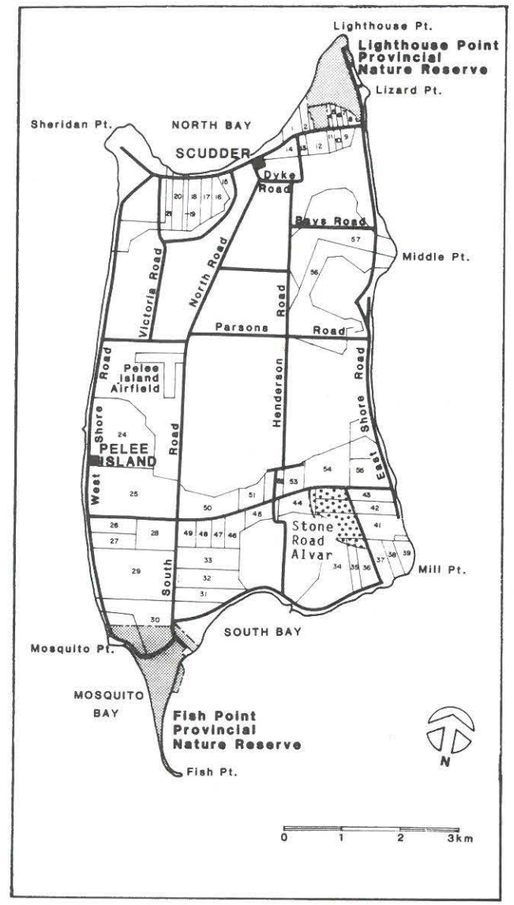


Figure 1. Pelee Island, Essex County, showing the nature reserve areas. (Figure courtesy of Ministry of Natural Resources.)

Table 1. Provincially rare vascular plants on Pelee Island, Ontario

SPECIES	STONE ROAD	FISH POINT	LIGHTHOUSE POINT
TREES			
Carya laciniosa (big shellbark hickory)		x	
Fraxinus quadrangulata (blue ash)	x	x	x
Gleditsia triacanthos (honey locust)		x	
Gymnocladus dioica (Kentucky coffee tree)	elsewhere on island		
Morus rubra (red mulberry)	x	x	x
Quercus palustris (pin oak)	elsewhere on island		
SMALL TREES, SHRUBS and VINES			
Amorpha fruticosa (false indigo)		x	
Campsis radicans (trumpet-creeper)		x	
Celtis tenuifolia (dwarf hackberry)		x	
Cercis canadensis (redbud)		x	
[a single specimen collected by Macoun in 1892 is the only native Canadian record]			
Cornus drummondii (rough-leaved dogwood)	x	x	x
Crataegus dissona (hawthorn)	x		
C. mollis var. gigantea (hawthorn)	x		x
Euonymus atropurpureus (burning bush)	x		
Ipomoea pandurata (wild potato-vine)		x	
Ptelea trifoliata (hop-tree)	x	x	x
Rosa setigera (prairie rose)	x	x	x
GRAMINOIDS			
Carex artitecta (sedge)		x	
[not seen since a 1939 specimen was collected]			
C. bicknellii (sedge)	x	x	
C. davisii (sedge)	x		
C. frankii (sedge)		x	
C. gracilescens (sedge)	x		
C. hyalinolepis (sedge)		x	
C. jamesii (sedge)		x	
C. leavenworthii (sedge)	x		
[only known Canadian location]			
C. meadii (sedge)	x		
C. muskingumensis (sedge)	x	x	
C. oligocarpa (sedge)	x	x	x
Cyperus erythrorhizos (cyperus)		x	x
Eleocharis engelmannii (spike-rush)			x
Panicum gattingeri (panic grass)	x		
Sphenopholis obtusata (early bunchgrass)		x	
FORBS			
Agrimonia parviflora (agrimony)	x		
Allium cernuum (nodding wild onion)	x	x	x
Ammannia robusta (long-leaved ammannia)			x
Arabis shortii (rock-cress)		x	
Asclepias purpurascens (purple milkweed)	x		
A. verticillata (whorled milkweed)	x		
A. viridiflora (green milkweed)		x	
[known only from a pre-1925 specimen]			
Aster shortii (Short's aster)	x	x	x
Blephilia ciliata (downy wood mint)	x		
[known in Ontario only from Pelee Island]			

Table 1. Provincially rare vascular plants on Pelee Island (continued)

SPECIES	STONE ROAD	FISH POINT	LIGHTHOUSE POINT
FORBS, continued			
Camassia scilloides (wild hyacinth)	x	x	
Cerastium velutinum (chickweed)	x	x	x
Chaerophyllum procumbens (creeping chervil)	x	x	x
Chenopodium foggii (goosefoot)		x	x
C. standleyanum (goosefoot)		x	x
Corydalis flavula (yellow corydalis)	x	x	x
Desmodium canescens (hoary tick-trefoil)		x	x
Draba reptans (whitlow-grass)		x	
Eupatorium purpureum (joe-pye weed)			x
[a sight record which requires confirmation]			
Euphorbia obtusata (blunt-lobed spurge)			x
Gaura biennis (gaura)	elsewhere on island		
Geum vernum (spring avens)	x	x	x
Heuchera americana (alum-root)	x		
Hibiscus laevis (halberd-leaved rose-mallow)	elsewhere on island		
[known in Canada only from a 1904 Pelee Island collection]			
H. moscheutos (swamp rose-mallow)		x	x
Hydrophyllum appendiculatum (appendaged waterleaf)	x	x	
Iris brevicaulis (leafy blue flag)		x	
Justicia americana (water-willow)		x	x
Lactuca floridana (blue lettuce)	x	x	x
Leucospora multifida (conobea)	x	x	x
[known in Canada only from Pelee Island]			
Lippia lanceolata (frog fruit)		x	
Lithospermum incisum (puccoon)		x	
Ludwigia polycarpa (ludwigia)		x	
Lycopus virginicus (water-horehound)		x	
Lythrum alatum (winged loosestrife)	x		
Myosotis macrosperma (scorpion-grass)	x	x	
Nuphar advena (yellow water-lily)		x	x
Opuntia humifusa (prickly pear)		x	
Phacelia purshii (Miami-mist)	x		
[known in Canada only from the Erie Islands]			
Polygonum erectum (knotweed)	elsewhere on island		
Potentilla paradoxa (bushy cinquefoil)		x	x
Ratibida pinnata (gray-headed coneflower)	x		
Senecio glabellus (cress-leaved ragwort)	elsewhere on island		
[known in Canada only from Pelee Island]			
Spiranthes magnicamporum (great plains ladies' tresses)	x		
Strophostyles helvola (wild bean)		x	x
Thalictrum revolutum (waxy meadow-rue)	x		
Thaspium barbinode (meadow-parsnip)	x		
T. trifoliatum (meadow-parsnip)	x		
Triosteum angustifolium (feverwort)	x		
[known in Canada only from Stone Road]			
Valerianella umbilicata (corn-salad)	x		
[known in Canada only from Stone Road]			
Vernonia gigantea (ironweed)	elsewhere on island		
[Pelee Island record is a Macoun specimen, 1892]			
Viola rafinesquii (field pansy)	x		x

Field Botanists of Ontario and the Federation of Ontario Naturalists. A list of the rare vascular plants from the island (Table 1) has been prepared to assist visiting botanists and naturalists. Rare species included in this compilation are those contained in the Atlas of the Rare Vascular Plants of Ontario (Argus & Keddy 1984; Argus & White 1982, 1983; Pryer & Argus, 1988. Kathleen Pryer, Botany Division, National Museum of Natural Sciences, kindly provided information included in Part 4 of the Atlas, in advance of publication.)

In Table 1, I have indicated the occurrence of rare plants at three relatively well-known sites on Pelee Island: Fish Point, Lighthouse Point and the Stone Road Alvar. The first two sites are Provincial Nature Reserves owned by the Ontario Ministry of Natural Resources. The Stone Road Alvar refers to the property recently purchased by the Federation of Ontario Naturalists (Jacques & Kirk 1986). To date, 83 provincially rare plant species have been found on the island, 49 at Fish Point, 42 at the Stone Road alvar, and 29 at Lighthouse Point. All species included in this list are verified by collected specimens or, rarely by a reliable sight record, unless otherwise indicated. I would appreciate additions or corrections to this list and would be happy to provide additional information on these rare plants on Pelee Island.

One species that should be considered for inclusion in the list of rare plants on Pelee Island, though not included in the Ontario rare plant atlas, is Eupatorium altissimum (tall thoroughwort). This species is adventive elsewhere in southern Ontario, but is probably native on Pelee Island (see discussion by Oldham [1988], in this issue). Tall thoroughwort is present at the Stone Road Alvar and at Lighthouse Point.

With the exception of several recent additions, Wilf Botham's (1981) flora of Essex County provides a comprehensive listing of all the plants of Pelee Island, as does Core's (1948) earlier treatment of the flora of the Erie Islands. Duncan (1973) and Campbell & Reznicek (1977) provide an interesting discussion of a number of the island's rare plants. Oldham's (1983) treatment of significant natural areas in the Essex region presents useful information on the natural features of Pelee Island, while Jacques & Kirk (1986) provide a specific discussion of the Stone Road Alvar property. A historical perspective to botanizing on Pelee Island is provided by Stuckey's (1986) paper on a 1904 expedition to the island by Ohio State University faculty and students.

I would like to remind readers that casual collecting of the rare plants on Pelee Island does not serve any useful purpose. Collecting at the specified sites requires permission from the appropriate landowner and is granted only for legitimate research.

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FRANK'S LOVE GRASS (Eragrostis frankii), SMALL-FLOWERED GALINSOGA (Galinsoga parviflora) and PURPLE SAND GRASS (Triplasis purpurea) DISCOVERED IN THE VICINITY OF HAMILTON, ONTARIO

Arthur Runnells (1912-1988), late of Hamilton, Ontario [see NEWS OF BOTANISTS, below]

Eragrostis frankii - Frank's love grass

This small grass was discovered in September, 1986, at Millgrove, just north of Hamilton, on the Millgrove Loam Farm (Fig. 1). This private property, containing a series of various-sized ponds, is situated 3.4 km west of Highway 6 on Millgrove Road. The owners will allow visitors to explore the area if they do not harm the wildlife, especially the nesting Canada geese. Interesting plants here include orchids, gentians, and an assortment of grasses, sedges and rushes.

E. frankii was found growing in sandy loam beside an internal road used by heavy trucks. Dore & McNeill (1980) state that this grass "is as yet of rare occurrence in the province" and that "occurrences in Ontario are considered introductions." Since Dore & McNeill's report, it has been found at the Stone Road Alvar on Pelee Island by Oldham (1983) and is reported from Point Pelee National Park by Jellicoe (1984).

This is a very distinctive grass and judging from informal sightings, may not be as rare as thought. It grows in dense clumps and the small spikelets and long-hairy ligules aid in ready field identification. It should be watched for, particularly on roadsides and in waste places.

Galinsoga parviflora - small-flowered galinsoga.

This diminutive "weed" was discovered only a few meters from Triplasis purpurea (see below) on the landward edge of the Hamilton Beach site (Fig. 1). A good field indication of this species is the almost glabrous stem. The commoner species, G. quadriradiata (=G. ciliata), has coarse, spreading, often glandular hairs (Fig. 2). Other differences may be best determined with lens or microscope. The ray flowers of G. parviflora have no pappus and the pappus of the disk flowers equals or exceeds the corolla. In G. quadriradiata the pappus is shorter than the corolla.

A perusal of some Ontario plant lists makes one wonder if G. parviflora is not more prevalent in the province than is presently assumed. Monroe Landon (1960) studied and collected the

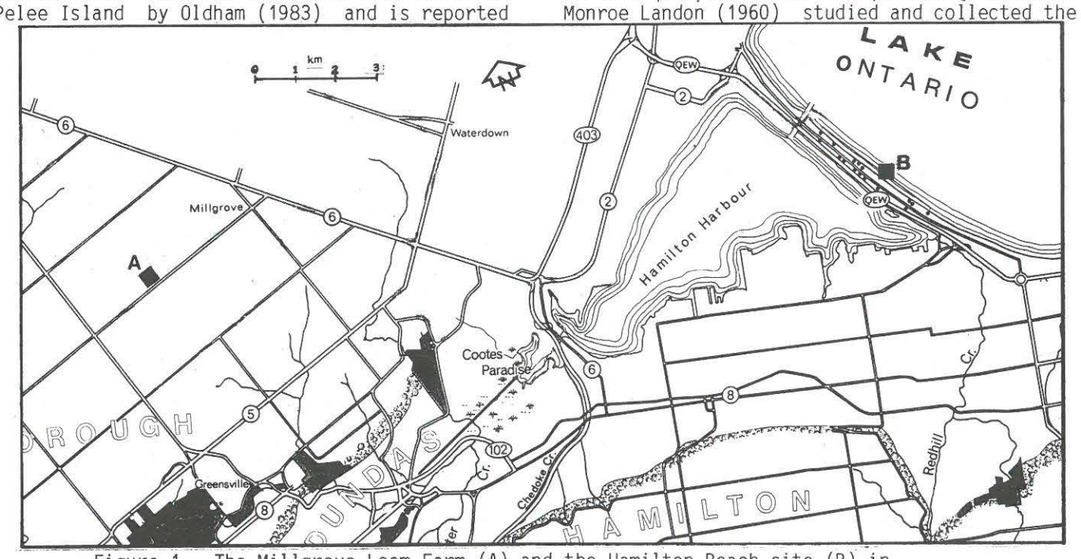


Figure 1. The Millgrove Loam Farm (A) and the Hamilton Beach site (B) in the Regional Municipality of Hamilton-Wentworth. (Base map reproduced with permission of the Hamilton Region Conservation Authority.)

plants of Norfolk County, as it was then known, for many years but he does not record G. quadriradiata, though he includes G. parviflora. Campbell & Lamb (1984) in their provisional listing of the plants of the Regional Municipality of Waterloo recognize only G. parviflora. In the considerable area around Thunder Bay, Claude Garton (1984) shows G. parviflora, but his list does not mention G. quadriradiata which is reported from Quetico Provincial Park (Walshe 1980). In the Regional Municipalities of Peel and Halton both species are known (Webber 1984; Crins 1986).

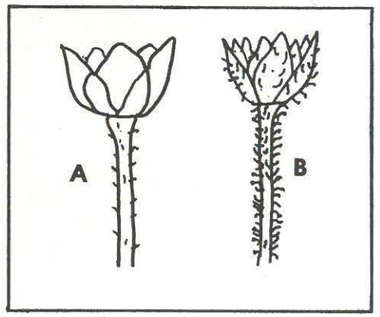


Figure 2. Peduncle and involucre (magnified 5X) of Galinsoga parviflora (A) and G. quadriradiata (B) showing difference in hairs and hairiness.

Triplasis purpurea - purple sand grass.

Long known from the sand beaches of Lakes Erie and Huron, this grass has been considered "apparently [absent] along Lake Ontario shores

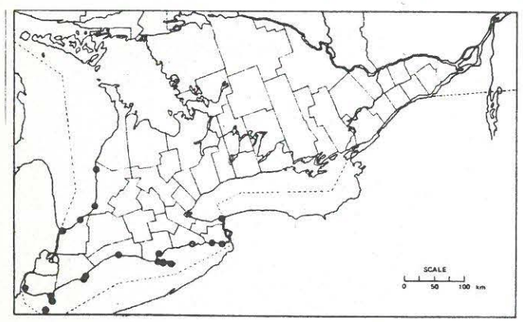


Figure 3. Distribution of Triplasis purpurea as recorded by Dore & McNeill with new station at Hamilton Beach (*). (Reproduced with permission of author.)

except for an occurrence at Niagara-on-the-Lake," according to Dore & McNeill (1980; Fig. 3). A population was discovered September, 1986, on Hamilton Beach just north of Bell Cairn Memorial School, about 2.5 km south of the lift bridge over the Burlington Canal (Fig. 1). Several clumps were found in an area about ten m square and two more were seen further south on the beach. This section of the beach is accessible to the public and parking is not a problem. The Hamilton-Burlington shoreline provides an extensive sand beach that might reveal other sites.

Only one species of Triplasis is known in Ontario (Dore & McNeill 1980). It is regarded as a predictable beach grass and is occasional in places such as Long Point, Point Abino, Rondeau and Point Pelee. Field marks are the alternate light and dark stem sections; the short, stiff, often inrolled leaves and the tufts of white hairs at the bases of the sheaths. The stems are visibly jointed. Practically all the Hamilton plants had lateral, cleistogamous panicles hidden in the sheaths.

Acknowledgement: Thanks to Dr. J.S. Pringle, Royal Botanical Gardens, Hamilton, for confirming the identification of the above plants. Specimens have been deposited in the Gardens' Herbarium (HAM).

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THE OCCURRENCE OF FRESHWATER RED ALGAE IN ONTARIO

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In Canada, the sparse amount of general information on phycology (the study of algae) can be attributed to the lack of communication between field botanists and researchers, coupled with the expense of compound microscopes and reference books and the time and expense of sample preparation. However, there are some groups of algae that can be examined without the expensive equipment and these are waiting to be observed in their natural environment by the local field botanist. We are referring particularly to certain members of the red algae (Rhodophyta) that are relatively unstudied and little known because of their occurrence in freshwater.

At present, few articles have been written about the collection and identification of freshwater red algae but recently Sheath (1984) has provided a good introduction to the subject in a comprehensive technical review of the biology of the group. Red algae are most often thought of as a group of large marine macrophytes, the seaweeds, occurring on the Canadian coasts. However, there are freshwater red algae in Canada, across at least the southern half of Ontario, and their occurrence is quite common.

The first report of red algae in Ontario was made by Kemp in 1858, from a locality near Paris, Ontario (cited in Lowe 1923). Since that time a handful of studies from Sweden (e.g. Israelson 1942), England and, more recently, Canada (e.g. Sheath & Hymes 1980) have shown that red algae are frequently present in freshwater habitats. Why have we not heard more about these plants? The two main reasons are the absence of experimental research on freshwater red algae and the masking of the red colour in the plants, making them appear green (two exceptions are Boldia and Audouinella).

It is becoming evident that the freshwater red algae are more important than phycologists had realized. Besides being quite common, the red algae are extremely productive, fixing more energy per cell than the other freshwater algae. In a recent survey on the Matamek River near Sept-Iles, Quebec, we found that when measuring the uptake of radioactive carbon, Batrachospermum densum was 2 to 100 times more productive than the other algae growing in the same stream. If that production is going into energy-rich cells, it could mean that the grazing minnows, snails, caddisflies, mayflies and probably even blackflies are getting a "high energy" food. Another important biological feature of the freshwater red algae is their tolerance for nutrient enrichment, high heavy metal levels and even pH changes, at least on a short-term basis. As an example, we observed pH changes from 6.3 to 4.9, as a result of a rain storm, in the Muskrat River adjacent to the Matamek River in eastern Quebec. The pH change caused no visible effect on the algae.

Habitats

Red algae have been found along lake shores, in bogs and in streams. Of these habitats, the most important are streams. The prime habitats for the development of red algae are streams that are exposed to direct sunlight, have a current flow greater than 10 meters per minute and are not too turbid. What size streams are we talking about? We use Strahler's (1957) measuring scheme. In Strahler's system, the brook-size streams that originate from snow melt or ground water discharge are classified as first order streams. When two first order streams meet, the resultant stream is a second order stream. When two second order streams meet, a third order stream results (Fig. 1).

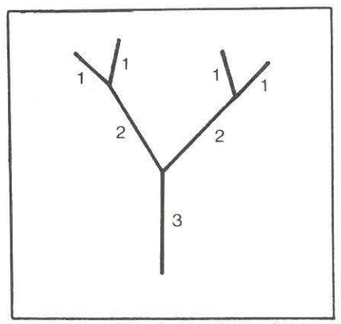


Figure 1. Strahler's (1957) system of river classification. Headwater streams are first order ("1"). Second ("2) and third order ("3") streams are formed by the merging of lower order streams.

In this system, the largest river in North America, the Mississippi River, is classified as a 9th or 10th order stream. Red algae typically occur in streams ranging from 2nd to 5th order. Second order streams are generally less than a metre wide, while 5th order streams are anywhere from 10 to 30 m wide. Rocks and boulders in the faster flowing regions of the stream are the best habitats for red algae.

The macroscopic genera

The common genera that are observed and identifiable with the naked eye are presented here with some general information on habitat and occurrence. In most cases a representative station for at least one common species in each genus is mentioned. All of the freshwater red algae collected or reported from Ontario are listed in Table 1.

Table 1. Species of freshwater red algae presently found in Ontario (based on collections in the National Museum at Ottawa and on current research by R.G. Sheath of the University of Rhode Island).

Class	Species
Bangiophyceae	
	Bangia atropurpurea (Roth) C.Ag.
	Boldia erythrosiphon Herndon
	Chroodactylon ramosum (Thwaites) Hansg.
	Kyliniella latvica Skuja
Florideophyceae	
	Audouinella macrospora (Wood) Sheath
	A. violacea (Kutz.) Hamel
	Batrachospermum boryanum Sirodot
	B. keratophytum Bory
	B. moniliforme Roth
	Lemanea fucina (Bory) Atkinson
	Sirodotia suecia Kylin
	S. tenuissima (Holden) Skuja
	Tuomeya americana (Harv.) Papenfuss

Audouinella Bory

Species of this genus have very small growth forms and can be easily missed in field collecting. Under optimal growth conditions, the taxa are small red or blue-green tufts ca. 0.4 cm in diameter (containing hundreds of filaments) attached to aquatic plants and larger algae. HABITAT: Commonly associated with or attached to Lemanea and Tuomeya filaments; can also be found attached to moss species from the genus Fontinalis. Populations of A. violacea have been found in the Thames River at Delaware and Highway 2.

Bangia Lyngbye

Unlike the other genera, this is a marine alga which has recently invaded the Great Lakes (Sheath & Cole 1980). It forms a dense red mat of thread-like filaments attached to stones and boulders. To the eye there is no apparent shape or structure. B. atropurpurea is commonly found on stones and boulders in harbours all along the lower Great Lakes.

Batrachospermum Roth (Fig. 2, A and B)

This is one of the most widely distributed genera. It is characterized by its dark green colour, slimy surface texture and irregular branches. A close examination reveals the clumped (patchy) nature of the visible branching threads. Under 50X magnification, a series of whorled branching clumps (Fig. 9) can be seen along the main filament, which can be an intertwined series of filaments. The length can range from 1 to 12 cm. HABITAT: Located on boulders, stones and stems in flowing streams, along lake shores and in bogs. This group is found throughout southern Ontario and is most prominent during the fall, winter and spring seasons when the water is colder and clearer. Plants of B. moniliforme have been collected in Blue Springs Creek at Campbellville Side Road near Rockwood.

Boldia Herndon (Fig. 2, C and D)

Boldia is what you would expect freshwater red algae to look like. The plants are flat, sac-like tubes attached to the substrate by a small stipe. The colour can vary from pale to bright red. The length varies from 1 to 15 cm (Howard & Parker 1980). HABITAT: Located on boulders, stones, wood, and even on snail shells. This group is generally found in the quieter waters of streams with a swift current.

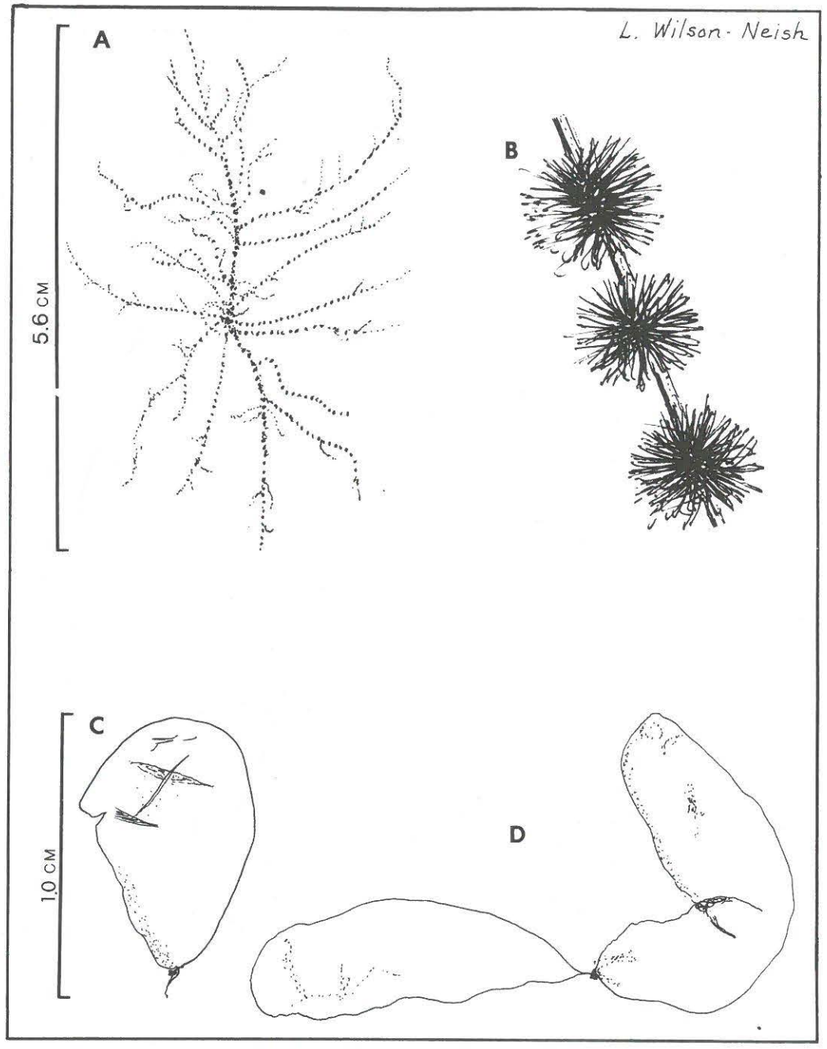


Figure 2. Some Ontario species of red algae. A & B: Batrachospermum moniliforme (B: enlarged detail). C & D: Boldia erythrosiphon. Illustrations by Laure Wilson-Neish, National Museum of Natural Sciences, Ottawa.

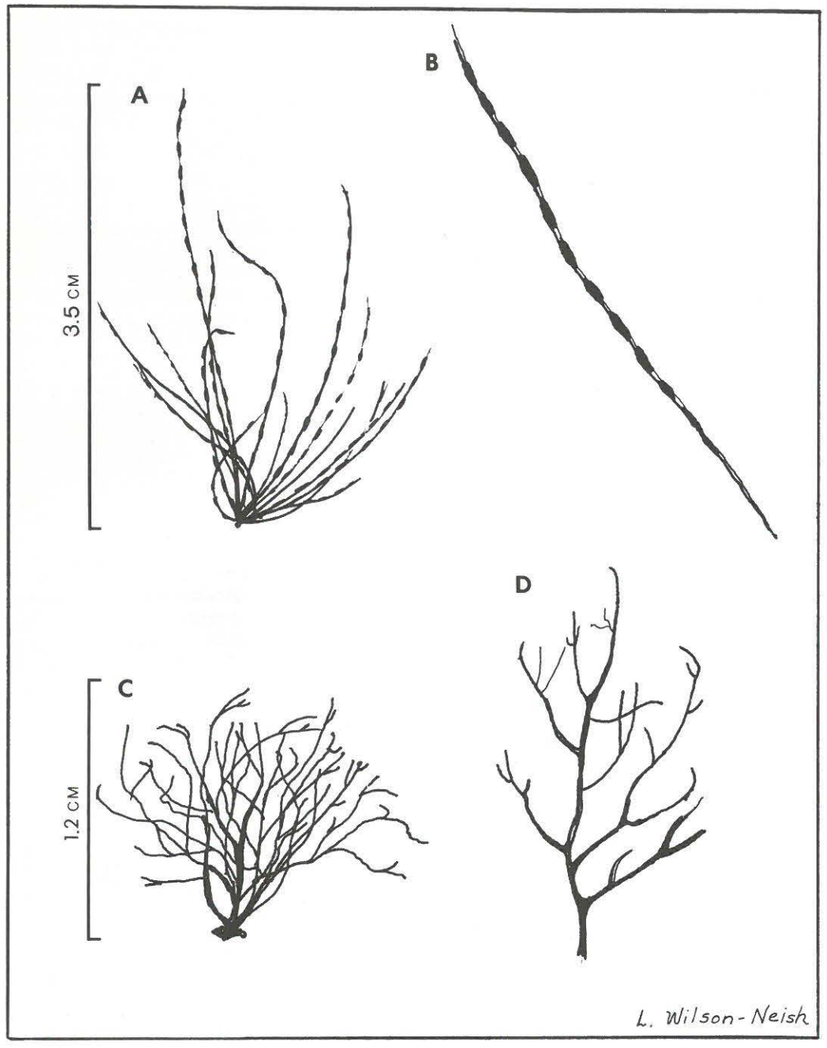


Figure 3. Some Ontario species of red algae. A & B: Lemanea furcina (B: enlarged detail). C & D: Tuomeya americana. Illustrations by Laure Wilson-Neish, National Museum of Natural Sciences, Ottawa.

To date B. erythorsiphon has only been found in 5 localities in Ontario, all on the Canadian Shield.

Lemanea Bory (Fig. 3, A and B)

The taxa of this group are found in clumped mats that can sometimes be mistaken for grasses or horsetails. They are usually green to yellow-green with dense bulbs or nodes evenly distributed along the "stem", which gradually tapers towards the tip. The length ranges from 2 to 9 cm (Israelson 1942). HABITAT: Located in shallow, fast flowing streams attached to the bedrock or on the downstream side of boulders and stones. In Ontario, this genus is generally found in 2nd to 5th order streams on the Canadian Shield. A good population of Lemanea fucina can be found in the Moira River at Belleville, near Highway 401.

Sirodotia Kylin

This genus is very similar in appearance to Batrachospermum and can only be distinguished with difficulty. The key difference between the two genera is the appearance of the carposporophyte, a small cellular mass that develops after the fusion of male and female plant forms. S. tenuissima has been reported in the Madawaska River upstream of Lake of Two Rivers, in Algonquin Park.

Tuomeya Harvey (Fig. 3, C and D)

The taxa of Tuomeya are branched, dark green, shrub-like masses that arise from a common stock. To the eye, and even under the microscope, there are no distinct features in filament structure. Due to the small size and dark green colour, it takes careful examination of submerged stones to locate these masses. The length ranges from 0.5 to 1.5 cm (Papenfuss 1958). HABITAT: Located on boulders and stones in streams of relatively swift current. We have collected specimens in water up to 1 m deep. In Ontario, this genus has been found in 2nd to 5th order streams on the Canadian Shield. A population of Tuomeya americana can be found in the York River at Bancroft near Highway 62.

Microscopic genera

Species in the genera Chroodactylon and Kylinella are microscopic and cannot be identified in the field without the use of a microscope. Like Audouinella, the taxa in these genera are attached to vascular plants and larger algae. Chroodactylon ramosum has been found on Cladophora spp. (macroscopic green algae) in the Saubie River at Allenford and Highway 21.

Photomicrographs of taxa in these genera as well as several other Ontario species not illustrated here can be found in the review by Sheath (1984).

Conclusion

The red algae are an important group of plants that we as field botanists should be aware of. The next time you pass a stream with good current flow and exposure to direct sunlight, examine some of the submerged stones. You may be surprised to find one or another species of red algae. The Botany Division of the National Museums is interested in field records and voucher specimens. We would be pleased to receive well-collected and properly labelled specimens.

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TALL THOROUGHWORT (Eupatorium altissimum L.) IN ONTARIO

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Tall thoroughwort, upland boneset or tall snakeroot (Eupatorium altissimum) was first collected in Ontario (and Canada) in 1968 by Wilf Botham as an adventive along a railroad right-of-way in Maidstone Township, Essex County (Campbell & Reznicek 1977; Botham 1981). In 1972, it was collected from a savanna on Pelee Island, Essex County (Campbell & Reznicek 1977), and in 1973 from along a railroad right-of-way in the Town of Dundas, Regional Municipality of Hamilton-Wentworth (Pringle 1974). McIntosh & Catling (1979) encountered tall thoroughwort in 1976 in a Niagara Falls railway yard. Botham (1981) reported its occurrence in Windsor. In this paper, E. altissimum is newly reported from Kent, Lambton and Oxford Counties and Regional Municipalities of Haldimand-Norfolk, Halton, Peel and York, though substantiating specimens have not yet been collected from the latter three municipalities. It has also been recently reported from Elgin County (Stewart 1988). In addition, I discuss its native or adventive status in the province and its apparent spread in recent years.

A member of the Asteraceae, tall thoroughwort (Fig. 1) is a robust (to 2 m tall), white-flowered perennial, which often forms clumps of a dozen or more stems. It is readily distinguishable from E. perfoliatum and E. rugosum, the other two white-flowered species in the genus in Ontario. Boneset (E. perfoliatum) has opposite leaves which are united basally, surrounding the stem. Tall thoroughwort has opposite leaves which taper to the stem and are sessile or have very short petioles. White snakeroot (E. rugosum) has heart-shaped or triangular leaves with distinct, slender petioles. Both Ontario joe-pye weeds (E. maculatum and E. purpureum) typically have purplish flowers, although occasional white-flowered individuals are found. Such white-flowered forms have much larger, more distantly spaced leaves than tall thoroughwort and the leaves are borne in whorls of four or more at each node (Pringle 1974).

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Tall thoroughwort is common throughout much of eastern North America, ranging from Pennsylvania to Minnesota and Nebraska, south to North Carolina, Alabama, Missouri and Texas (Fernald 1950). It occurs in a variety of habitats, usually dry, including calcareous shores, bluffs, open woods, clearings, prairies, old fields, roadsides, railroad track embankments, cut-over woods, calcareous woods, thickets and pastures (Fernald 1950; Johnson 1974).



Figure 1. Tall thoroughwort at the Stone Road Alvar, Pelee Island, Essex County, photographed 24 August 1981.

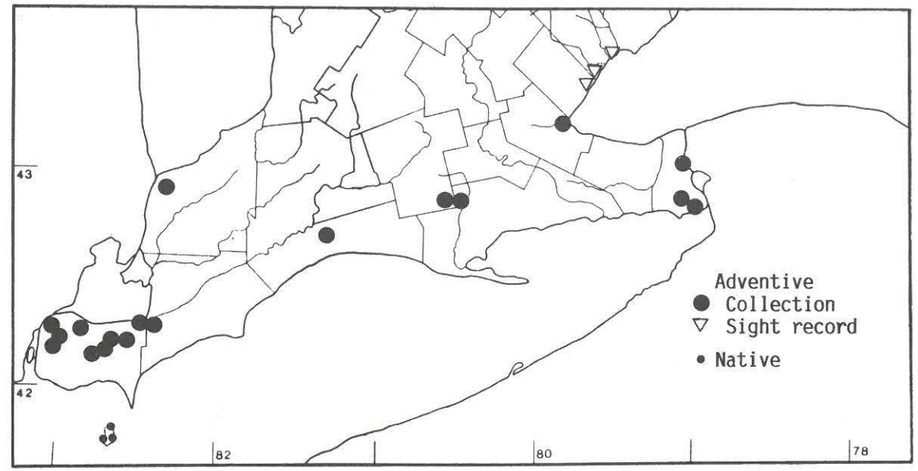


Figure 2. Distribution of tall thoroughwort (Eupatorium altissimum) in Ontario.

I am aware of 28 populations of tall thoroughwort in Ontario (Fig. 2), 21 of which I have examined in the field. Fifteen stations are now known from Essex County, 3 in the R.M. of Niagara, 2 in Hamilton-Wentworth, and one each in Elgin, Kent, Lambton, and Oxford Counties and Haldimand-Norfolk, Halton, Peel and York Regional Municipalities. Of the 28 populations, 23 are along railway tracks or within 100 m of a railway track and they are certainly adventive. One population occurs along Highway 401, and also is likely to be adventive. In Windsor, one population occurs in a disturbed prairie near a major arterial roadway (Huron Church Line, connecting the Ambassador Bridge with Highway 401). Although the matter is not clear-cut, I feel that this population is also non-native, since tall thoroughwort is not found in less disturbed prairie communities nearby. The remaining three populations occur on Pelee Island in western Lake Erie.

It is probable that the Pelee Island populations of tall thoroughwort are native. The railway never served the island. Rather than growing along roadsides on the island, tall thoroughwort occurs in savanna-thicket communities which have prairie and alvar affinities. At all three Pelee Island sites, the species grows in association with other rare native species. Soils on the island are strongly clacareous, as Pelee is a limestone island with only shallow soil in most places. Along with other types of habitats, tall thoroughwort is widely reported to occur in calcareous habitats (Fernald 1950; Massey 1961; Radford et al 1968; Johnson 1974). Pelee Island is the northerly limit of a number of native plants (Duncan 1973; Campbell & Reznicek 1977). Tall thoroughwort has been known from Johnson's Island, Ohio, in western Lake Erie since the late 1800's and Moseley (1899) considered it native there, as well as on the adjacent Ohio mainland (Marblehead Peninsula). It also occurs on Kelley's Island, Ohio (Dodge 1914; Core 1948), only 12 km south of Pelee Island.

Wilf Botham (pers. comm.) has transplanted tall thoroughwort from the railroad site in Maidstone Township, Essex County, and from the Stone Road Alvar, Pelee Island, and grows the plants side by side in his garden. He has noted that the plants from Pelee Island have distinctly wider leaves than those from Maidstone Township, suggesting different sources for at least these two populations. Argus & White (1977) included Eupatorium altissimum among the rare native plants of the province. However, in subsequent deliberation, the species was considered introduced and excluded from Part 3 of the Atlas of the rare vascular plants of Ontario (Argus & Keddy 1984). It appears to me that a case can be made for the native occurrence of tall thoroughwort on Pelee Island.

The increasing number of recent records of this conspicuous plant in Ontario suggests that it is spreading. Swink & Wilhelm (1979) record E. altissimum from all 22 counties in the Chicago region and note a tremendous increase since the time of H. Pepoon (1927) who mentioned only one

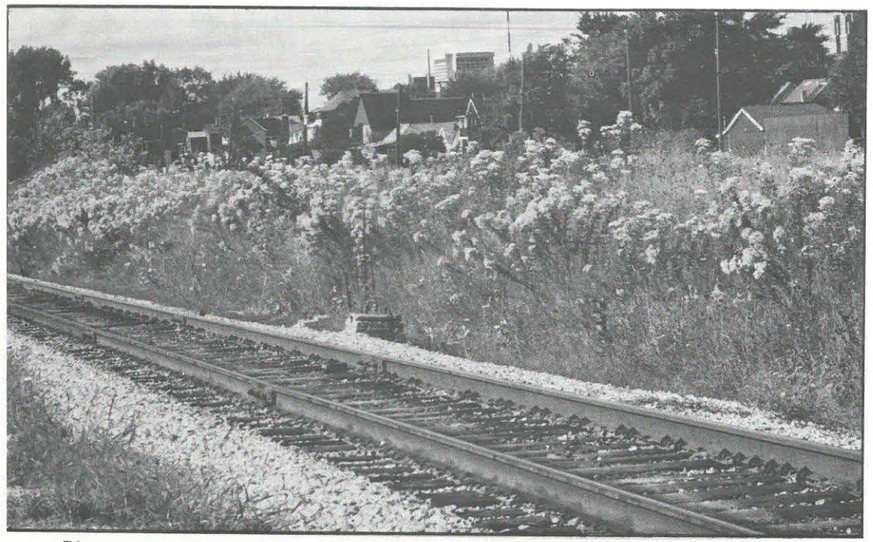


Figure 3. Population of tall thoroughwort in Windsor, Essex County, photographed 18 September 1982.

1895 collection. Its occurrence along railroad tracks at Sarnia, Windsor, Niagara Falls, and elsewhere, suggests that careful searching along railroad rights-of-way in the intervening areas will produce additional records. The species is best sought during its early August to late October flowering period. At this time its white flowers, deep green leaves, and large size make it distinctive and readily recognizable (Fig. 3).

My most recent observations come from train trips between London and Toronto on 16 and 17 September 1987. On that occasion, I observed tall thoroughwort at four locations, three of which are previously unreported. Being unable to stop the train, no vouchers were obtained. However, even small populations were easy to pick out since the plants were in full flower. From west to east, the previously unreported populations are along Canadian National Railroad tracks, between 1.5 and 3 km east of Oakville Station, between 3 and 5 km west of Port Credit Station, and between 1.5 and 3 km west of Mimico Station. These are the first reports in Halton Region, Peel Region and Metropolitan Toronto, respectively. The fourth population seen was the one at Dundas (Pringle 1974), which was observed to be thriving.

Acknowledgements: Donald Sutherland, Wilfred Botham and Bill Stewart kindly allowed me to report on populations of tall thoroughwort they discovered and had useful discussions of the species in Ontario with me.

Documentation: ELGIN CO.: Stewart s.n. (TRT, UWO), Southwold Township, Shedden, Sept 1987. ESSEX CO.: Botham 821 (CAN), 1698 (CAN), 1925 (CAN, DAO, LKHD), 4252 (herbarium of Wilf Botham); Campbell & Donaldson s.n. (WLU) Campbell, Reznicek, & Donaldson s.n. (CAN, WLU), Campbell, Francis, & Diebolt s.n. (DAO); Oldham 1949 (TRTE), 2055 (TRTE), 3160 (MICH, TRTE), 3327 (TRTE), 3410 (DAO), 4124 (TRTE), 4563 (TRTE, herbarium of the ERCA), 5507 (CAN), 5636 (CAN), 6796 (CAN), 6930 (MICH). Details of the Essex County collections are avialable from the author.
REGIONAL MUNICIPALITY OF HALDIMAND-NORFOLK: Sutherland 7983 (TRTE), Municipality of Delhi, along Michigan Central Railway, 1 km W of LaSalette, 12 Sept. 1986.
KENT CO.: Oldham 6941 (TRTE), Tilbury East Township, CNR tracks, 5 km ENE of Jeanette's Creek, 13 Sept. 1986.
LAMBTON CO.: Oldham 6808 (CAN), Sarnia, Hwy. 40 at CNR tracks, 29 Aug. 1986.
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JOHN MACOUN'S ACADEMIC DEGREES

James S. Pringle, Royal Botanical Gardens, P.O. Box 399, Hamilton, Ontario L8N 3H8

Something of a mystery has arisen among historians of botany as to the when and from what university or universities the Canadian botanist John Macoun received the degree of Master of Arts. Several biographical references state that he received this degree from Syracuse University, but give no date. Waiser (in Macoun 1979) gave the date "1899" in his annotations to the second edition of the Autobiography of John Macoun but this is a typographical error for "1889" (Waiser in litt. 1 April 1987). Waiser's source for 1889 was a letter from Macoun to Prof. Lucien Marcus Underwood, of Syracuse University, dated 12 February 1889 (Library, National Museums of Canada), in which Macoun wrote "Thanks for your kind intention regarding the degree of A.M.[sic]" As noted by Waiser (Macoun 1979), this does not explain the designation of Macoun as "M.A." in documents dating as far back as 1869. Subsequently, Waiser (in litt. cit.) discovered a letter of 11 February 1869 (in Queen's University Archives) from Macoun to Andrew Thomas Drummond in which Macoun wrote that an unspecified "college in New York [had] conferred the degree of M.A." on him the previous July.

The degree of Master of Arts was first awarded to Macoun in 1868 by Genesee College of Lima, New York (Anonymous 1880). Genesee College was founded by the Methodist Episcopal Church. It received its charter in 1849 and offered its first classes in the fall of 1850 (Galpin 1952; Ellis et al. 1967).

Genesee College made no distinction between honorary and other master's degrees except perhaps with regard to a fee, since no courses, thesis, residence or formal examination was required. "Higher degrees were conferred either as a result of professional experience gained in a special field following graduation, or in honorary recognition of one's service to the College, the Methodist Church, the State or Nation....Graduate work in the modern sense did not exist" (Galpin 1952).

The year Macoun received his M.A. degree, 1868, coincided with an offer of a position on the faculty of Albert University in Belleville, Ontario, which just that year had assumed university status. Like Genesee College, Albert

University was affiliated with the Methodist Episcopal Church.

As of 1868, Macoun had published only two papers (Adams 1928-30), one of which was of extremely limited circulation, but his extensive correspondence and exchange of specimens had already impressed some botanists in the United States and Canada with his abilities. However, the fact that it was little Genesee College, with no strength or tradition whatever in botany, that conferred the degree of Master of Arts on Macoun at so early a stage in his career indicates that this was an arrangement between the M.E.C. schools to enhance the appearance of the Albert University faculty list.

In 1870, de facto, Genesee College was moved to Syracuse and its name was changed to Syracuse University. Such physical assets as the "natural history cabinet" (valued at $3500) accompanied most of the faculty and students on the trip from Lima to Syracuse and, at the time, there were plans to retain the college name. Legally, however, because of conditions attached to earlier donations to Genesee College, it remained in Lima until its formal dissolution in 1875 and Syracuse University was founded de novo. The faculty and trustees of Syracuse University realized that the alumni of Genesee College would wish to regard themselves as alumni of Syracuse rather than have their degrees orphaned. Also, they would be more likely to contribute to Syracuse if they could regard themselves as its alumni. The legal objection, however, was also recognized. Therefore, in 1871, the faculty and trustees of Syracuse resolved: "That all Alumni of Genesee College who shall make application therefore, will be admitted by the Syracuse University to the same degrees to which they have heretofore been admitted by Genesee College, and will thereupon be deemed to all intents and purposes to be Alumni of the Syracuse University." Many of the Genesee alumni applied for and received their Syracuse degrees at Syracuse's first commencement in 1872, but there was no time limit. Some received such degrees as late as the 1890's (Galpin 1952). These degrees were conferred per adoptionem and, later, ad eundem, the latter term meaning that a degree from one university is accepted by another university as sufficient evidence of qualification for the same degree from the latter school with no further requirements being imposed.

In its list of those who had received the degree of Master of Arts in 1889, The University Herald (Anonymous 1889) included "John Macoum [sic], A.M. (Genesee), ad eundem." (The honorary degrees were listed on another page and did not include ad eundem degrees.) Nothing further with regard to Macoun's ad eundem degree appeared in the Herald. The role of Prof. Underwood must have been minor, since the 1871 resolution made Macoun eligible for the degree. Perhaps it was he who called Macoun's attention to the resolution or he may have offered to handle the formal application. He may also have assured Macoun that none of the general criticism of awarding a master's degree ad eundem to anyone who had received the degree from Genesee would be directed at him, Macoun. It does not appear that Macoun could have been present at the commencement ceremony in June, because his correspondence with Sereno Watson of Harvard University (quoted by Rodgers 1944, p.301) indicates (more clearly than his autobiography) that he spent most or all of the spring and summer of 1889 in British Columbia.

Acknowledgements: I am grateful to Dr. W. A. Waiser of the University of Saskatchewan for helpful correspondence; to the Library Services staff of the National Museums of Canada for a copy of the Macoun-Underwood letter cited herein; and to the staff of the George Arents Research Library of Syracuse University for locating and making available archival material on events of 1889 at Syracuse.

References

Adams, J. 1928-1930. A bibliography of Canadian plant geography to the end of the year 1920. Trans. Roy. Can. Inst. **16**:293-355; **17**:103-145, 227-265.

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Anonymous. 1889. Commencement exercises. The [Syracuse] University Herald, **17**(10):198-202.

Ellis, D.M., J.A. Frost, H.C. Syrett & H.J. Carman. 1967. A history of New York State, 2nd ed. Cornell Univ. Press, Ithaca.

Galpin, W.F. 1952. Syracuse University. Vol. One: The pioneer days. Syracuse Univ. Press, Syracuse.

Macoun, J. 1979. Autobiography of John Macoun, M.A., Canadian explorer and naturalist, 1831-1920, 2nd ed. With notes by R. Glover and W.A. Waiser. Ottawa Field-Naturalists' Club Spec. Publ. 1. Ottawa.

Rodgers, A.D., III. 1944. American botany, 1873-1892: Decades of transition. Princeton Univ. Press, Princeton.●

KEY TO THE BEDSTRAWS (Galium) IN CANADA

R.J. Moore, formerly of the Biosystematics Research Centre, Agriculture Canada, Ottawa.

The bedstraws (genus Galium) belong to the family Rubiaceae, a family that is mainly tropical and subtropical but has representatives in almost all life zones. In Ontario the native genera of the family are Cephalanthus (buttonbush), Galium (bedstraw), Houstonia (bluets), and Mitchella (partridge-berry).

Galium is a genus of herbaceous plants with generally weak stems that occasionally grow in a tangle, frequently supported on other plants. Some of the more diminutive species creep along the ground; others stand erect and are only 10 or 12 cm high. Various species are found in most of the habitats present in Ontario.

The leaves of Galium are whorled and it is important to examine several nodes in the middle portion of the stem(s) to determine the number of leaves in a whorl and their size.

The flowers of Galium are perfect, epigynous and have 3 or 4 small petals. The fruit is usually a pair of dry or fleshy drupes which is bristly in some species. Both flowers and fruits are of critical importance in identifying the more difficult taxa. A close examination of a group of plants will often reveal both flowers and fruits, sometimes on a single individual. In southern Canada, various taxa of the genus occur from coast to coast with all but two of the species present in Ontario.

The following key to Galium in Canada was written by R.J. Moore in 1974. It was a preliminary effort that was never published. Dr. Moore has given permission to print the key although he is not able to review and check its present state, as he is now retired from botanical research. The species concepts are his at the time the key was written. He has parenthetically included the basic chromosome number for most taxa. The key is offered to readers of THE PLANT PRESS as Moore prepared it with slight editorial changes but no guarantees or excuses. Taxa not in the province or of limited or historical occurrence and the affinities of unfamiliar taxa are noted by the editor, [], based on H.J. Scoggan's Flora of Canada, vol.4, published in 1979. The editor would be pleased to receive some feedback from those who use the key.

Key to Galium in Canada

1. Leaves conspicuously 3-veined (a midvein and two parallel lateral veins), obscurely so in G. bifolium; leaves mainly 4 per node, occasionally 4-6; fruits spiny (stiff hairs; sometimes smooth in G. boreale)....2

1. Leaves not conspicuously 3-veined.....7

2. Leaves 30-50 mm long, occasionally 5-6 per whorl; flowers and fruits mostly sessile..3

2. Leaves 20-30 mm long, regularly 4 per whorl; flowers and fruit pedicellate.....4

3. Leaves oval or oblong, obtuse; flowers yellow, pubescent..G. circaezans Michx. (x=11)

3. Leaves lanceolate, acuminate; flowers purple, glabrous.....G. lanceolatum Torr.

4. Each leaf whorl composed of unequal-sized pairs, obscurely 3-veined.....G. bifolium Wats. [A western species; not in Ontario.]

4. All leaves of a whorl equal in size.....5

5. Upper leaves distinctly larger than the lower, leaves almost round, thin, light green.....G. kamtschaticum Steller (x=11) [Only Ontario station on Lake Superior.]

5. Upper leaves not distinctly larger than the lower.....6

6. Leaves ovate or elliptic, firm, dull, margins ciliate; fruits bearing hooked hairs.....G. pilosum Ait. (x=11)

6. Leaves lanceolate; fruits smooth or bearing straight hairs.....G. boreale L. (x=11)

7. Leaves 4-6 (never 8) per node.....8

7. Leaves 4-8 per node.....17

8. Leaves 4-6 per node, but mainly 4 or 5; fruits smooth (Section Eugalium; x=12)....9

8. Leaves principally 6 per node (rarely 4 or 5; never 8).....16

9. Corolla 3-lobed, white.....10

9. Corolla 4-lobed (occasionally also 3- and 4-lobed flowers present).....14

10. Fruits 0.8-1.0 mm round; peduncles 0.5-4 mm; principal leaves 2-10 mm; stems matted, scabrous.....G. brevipes Fern. & Wieg. [A variety of trifidum to some.]

10. Fruits 1.25-2.0 mm round; peduncles 3-30 mm; principal leaves 6-20 mm long.....11

11. Leaves retrorse scabrous; upper internodes often scabrous.....12

11. Leaves and internodes glabrous; leaves fleshy.....13

12. Leaves chiefly in 4's, linear or linear-oblanceolate and narrow (ca. 1 mm; 5-15 X 0.75 X 2.5 mm); fruit pedicels slender, scabrous, arcuate, 5-30 mm long; flowers few, cymes sparingly or not branched.....G. trifidum L. (Intermediates of G. trifidum-tinctorum = G. trifidum var. subbiflorum Wieg., with long, more or less smooth pedicels.)

12. Leaves 4-6 on main axis, broadly oblanceolate to oblong spatulate, 6-20 mm (7-10 X 1-2 mm); peduncles stiff and straight, pedicels glabrous, 2-5 mm...G. tinctorum L. [A variety of trifidum to some.]

13. Leaves oblanceolate to oblong spatulate, those on primary axis 6-12 mm; peduncles and pedicels 3-10 mm.....G. brandegei Gray [A variety of trifidum to some.]

13. Leaves linear or linear-oblanceolate, 7-20 mm; peduncles 5-30 mm.....G. trifidum var. halophilum Fern. & Wieg.

14. Leaves 15-30 mm long; fruits on main stem 2.5-3.5 mm diam....G. obtusum Bigel. (x=12)

14. Leaves to 20 mm; fruits 1.5 mm long.....15

15. Flowers numerous, in spreading, dichotomously branched cymes; leaves elliptic or spatulate, thin, 10-20 X 1-5 mm.....G. palustre L. (x=11)

15. Flowers fewer, in simple cymes, later overtopped by elongating branches; leaves oblanceolate or spatulate, reflexed, 5-15 mm, scabrous beneath on midrib and margin.....G. labradoricum Wieg.

16. Fruits or ovaries spiny; leaves ovate, to 30 X 8 mm, minutely scabrous.....G.triflorum Michx. (x=11)

16. Fruits or ovaries smooth; leaves ovate-lanceolate, to 20 X 5 mm, strongly scabrous.....G. asprellum Michx.

17. Leaves 4-8 per node, small, ca. 8 X 1.5 mm, spatulate; fruit smooth, 1.5-2 mm; a matted, trailing perennial, not erect or twining.....G. saxatile L. (x=11) [European origin; known only from Quebec.]

17. Leaves 6-8; stems erect or twining; annual or perennial.....18

18. Perennial (rhizomatous); erect or suberect but not twining.....19

18. Annual (not rhizomatous); stems twining..22

19. Leaves small, narrow and thick, upper leaves to 7 mm long, lower leaves to 18 mm; flowers yellow.....G. verum L. (x=11)

19. Leaves larger, 10-30 X 5 mm.....(G. mollugo L. s.l.)...20

20. Leaves thin, lanceolate, mostly 30-50 mm long.....G. sylvaticum L.

20. Leaves firm, linear or oblanceolate, rarely 20 mm long; fruits smooth.....21

21. Flowering branches and pedicels strongly divaricate; flowers white.....G. mollugo L. (x=11)

21. Flowering branches and pedicels mostly ascending.....G. erectum Huds. [=album Milles, the name now used in Flora Europaea; a mollugo variety to some.]

22. Ovary and fruit tubercular-granular; fruits 3-4 mm long on recurved pedicels; flowers in 3's.....G. tricornutum Dandy (x=11) [European; not seen wild in Ontario since 1886 when it was collected as a garden escape by Macoun.]

22. Ovary and fruit smooth or bristly (hooked hairs) but not granular; fruits 1.5-4 mm long.....23

23. Flowers greenish-yellow, 1-1.5 mm diameter; pollen grains to 24 um; fruits 1.5-2.8 mm long, excluding spines, spiny or smooth; stem nodes glabrous or lightly pubescent; leaves narrow, linear-lanceolate, mucronate, firm-textured, to 40 X 3 mm.....24

23. Flowers white, 2 mm diameter; pollen grains 25-30 um; fruits usually 2.8-4 mm long, excluding spines, occasionally smaller, fruits spiny or rarely smooth; stem nodes usually tomentose but sometimes nearly glabrous; leaves linear-oblanceolate, lax, to 50 X 5 mm.....25

24. Fruits smooth...G. spurium L. forma spurium [A variety of aparine to some.]

24. Fruits spiny.....G. spurium forma vaillantii (DC) R.J. Moore

25. Fruits smooth or tuberculate, without spiny hairs.....G. aparine forma intermedium (Bonnet) R.J. Moore

25. Fruits spiny....G. aparine L. forma aparine

[Moore appended the following notes to his key to assist in distinguishing 3 confusing taxa. They may require still further study to elucidate a set of characters that clearly distinguishes the three.]

G. palustre: Flowers white with a trace of rose, 4-merous, numerous; cymes branched, pedicels smooth, mostly short; leaves mostly 10-20 X 1.5-5 mm, in whorls of 4.

G. trifidum: Flowers white (white or white-yellow when dry), usually 3-merous, less numerous [than palustre]; cymes not branched, pedicels scabrous, long, arching; leaves 5-15 X 0.75-2.5 mm, in whorls of 4.

G. tinctorum: Flowers white (white or white-yellow when dry), usually 3-merous, less numerous [than palustre]; cymes not branched, pedicels smooth, short (less than 5 mm); leaves small, to 10 X 2 mm; whorls of 5 and 6; plant stouter and firmer than trifidum.●

NEWS OF FIELD BOTANISTS

IN MEMORY OF JOHN ARTHUR RUNNELLS
(1912 - 1988)

Regrettably, John Arthur Runnells passed away on 24 January 1988. Many of us in the Hamilton Naturalists' Club or Field Botanists of Ontario remember him affectionately by the name of Art.

Most of his working life he was an accountant with the Pigott Construction Company of Hamilton. With such training, Art developed a skilled and sensitive eye for accuracy and detail. After his retirement and the development of an interest in botany, he brought those same talents to plant studies. Over the years, with patient care, Art taught those of us with less experience or patience how to notice the details of plants and use them to identify our woodland flowers.

I can remember many a weekend or Wednesday evening hike with the Hamilton Club when we would come across a strange new plant along the trail. Generally a small group would gather around and we would ponder its identity. Finally, after thumbing through the plant field guides for a while, we would give up and proceed to track down Art. Once found he was promptly coerced and led over to identify our mysterious plant. Sure enough, in his own generous and patient way, he would share his knowledge with us and solve our little mystery.

His passion for and dedication to plants led Art on botanical trips all over Ontario, from Pelee Island to the north shore of Lake Superior. Art knew our flora intimately from many solitary and group outings. By the end of the 1987 field season, Art had identified 1642 native and naturalized species. He was well on his way to completing a goal, which was to see all of the native vascular plants of Ontario.

Art was a much admired and irreplaceable friend and colleague of many of us in the Hamilton Naturalists' Club. We shall deeply miss him.

David Bradley, Wiarton

[This notice also appeared in The Wood Duck, Vol. 41, No. 8, April, 1988. We always regret losing a long-time subscriber and supporter but we are doubly saddened when that individual was just beginning to share his wealth of knowledge and experience with us. See page 9, above.]

INFORMATION & REQUESTS

CANADIAN SOCIETY OF ENVIRONMENTAL BIOLOGISTS

The Ontario Chapter of the Canadian Society of Environmental Biologists (CSEB) has been reactivated and now has a membership campaign underway. Plans are being formulated for a variety of activities. Meetings are planned at regular intervals in 1988.

Objectives of the CSEB are: to further conservation of the natural resources of Canada; to encourage prudent management so as to minimize adverse environmental effects; and to develop and promote policies that seek to achieve a balance among resource management and utilization, protection of the environment, and the quality of life.

Individuals with training in biological sciences are invited to join. For information write to Canadian Society of Environmental Biologists, P.O. Box 962, Station F, Toronto, Ontario M4Y 2N9.

15th ANNUAL NATURAL AREAS CONFERENCE and the 10th ANNUAL MEETING OF THE NATURAL AREAS ASSOCIATION (NAA)

A conference entitled "Ecosystem Management: rare species and significant habitats" is scheduled for the State University of New York, College of Environmental Science and Forestry, Syracuse, New York, June 6-9, 1988.

Conference topics include:
- Inventory and monitoring techniques;
- Significant habitat management and restoration techniques;
- Data analyses and management;
- Life history studies;
- Effective interaction among scientists, managers, landowners and conservancies;
- Public involvement and education;
- Legal aspects of ecosystem management;
- Roles of arboreta, botanical gardens, zoos, and the horticulture industry.

Conference participants and guests may stay in university housing (full meal service available), or in hotels and motels in the city. Some camping facilities are available just outside the city.

Write to: ESF Continuing Eduction, SUNY College of Environmental Science and Forestry, Syracuse, NY, 13210-2784, USA. State your accommodation preference with your inquiry about registration costs.

PROGRAM ESTABLISHED FOR THE CONSERVATION OF CANADA'S RARE PLANT RESOURCES

Canada has an estimated 1,200 species of native plants that are rare or endangered. Botanical gardens and arboreta have the potential to contribute toward lessening of the threat of extinction under which these species exist. At the founding meeting of the Canadian Plant Conservation Program, hosted by the University of Guelph Arboretum, representatives from Canada's botanical gardens and related institutions and agencies, convened to consider appropriate objectives and action.

This national program focuses on the roles living collections can play in a comprehensive conservation effort. With a goal of conserving genetic diversity of rare native plants and heritage ornamentals, detailed objectives were defined.

Improved communication and cooperation between institutions with living collections is one objective. Such institutions are encouraged to carry out research into the biology of rare plants. This will provide information needed for the management of valued natural habitats. Garden-propagated collections of rare plants in public institutions can also serve conservation through the promotion of public awareness of the issues in their interpretive programs.

This group intends to maintain communications with agencies directly concerned with habitat conservation and support that effort. Garden collections of rare plants are seen as a complement to habitat conservation. Sampled from wild populations in such a manner as not to further endanger them, the collections provide material for research as well as a source of appropriate genotypes for re-introduction into restored habitats or depleted populations.

A parallel program will be established for the preservation of heritage garden plants, both those that have been in cultivation since the time of European settlement and old cultivars developed in Canada.

The groundwork for this program was done by Patrick Seymour and the staff of the Devonian Botanic Garden, Edmonton, Alberta. The members of the executive are John Ambrose, University of Guelph Arboretum (chairman); Randy Currah, Devonian Botanic Garden; Bernard Jackson, Memorial University Botanical Garden, St. John's, Newfoundland (committee chairman); Peter Rice, Royal Botanical Gardens, Hamilton; and Ann Smreciu, Devonian Botanic Garden (committee chairman).

John Ambrose, University of Guelph

CANADA'S WETLANDS--ONTARIO'S WETLANDS

CANADA

A map folio published jointly by Environment Canada and Energy, Mines and Resources Canada deals with the wetlands of Canada. The folio contains:

(a) The wetland regions of Canada, a full colour map at 1:7,500,000;
(b) Distribution of wetlands in Canada, a full colour map a 1:7,500,000;
(c) Wetlands in Canada: a valuable resource, an 8-page fact sheet.

The maps were compiled for and included in the 5th edition of the National Atlas of Canada. Cost is $6.95 (+ 8% tax for Ontario residents). Copies of the folio are available from any federal map sales agent or: The Canada Map Office, 615 Booth St., Ottawa, Ont. K1A OE9.

ONTARIO

A series of Ontario wetland maps based on the 1:50,000 scale National Topographic Series has been produced by the Canada Land Use Monitoring Program of the Inland Waters/Land Directorate, Environment Canada, with input from various federal and provincial agencies. The maps depict both present (1983) wetland areas and those converted to other land uses. Map symbols indicate the characteristic vegetetation and soil and water classes of each wetland. The area south of the Canadian Shield is covered by 125 maps. Each map is an ozalid blue print that measures approximately 90 X 120 cm.

Maps can be ordered by requesting the appropriate N.T.S. index number. They cost $7.00 each (tax included) plus $2.50 (postage for 1 to 3 maps) or $3.50 (postage for 4-6) and are available from the Federation of Ontario Naturalists, 355 Lesmill Rd., Don Mills, Ont. M3B 2W8. (Orders outside Canada add $3.00 extra.)

A LIST OF ADDRESSES PROVIDING EARTH SCIENCE DATA OF INTEREST TO FIELD BOTANISTS

compiled by Stephen Darbyshire, Biosystematics Research Centre, Central Experimental Farm, Ottawa, Ontario K1A 0C6

The following addresses can provide access to considerable information on geomorphology, geology, hydrology, meteorology and economic geology. Remarks accompanying the addresses are brief and may not cover all the data potential of a particular department.

Hydrographic charts

Canadian Hydrographic Service
Bayfield Laboratory
Canada Centre for Inland Waters
867 Lakeshore Road
Burlington, Ontario L7R 4A6

Chart catalogues are available upon request.

Topographic maps

Canada Map Office
615 Booth Street
Ottawa, Ontario K1A 0E9

Three indices to the National Topographic Map Series are available free. Index No. 1 covers Ontario. A separate index lists general and special purpose maps.

Map Unit, Public Services Centre
Ministry of Natural Resources
Whitney Block, Queen's Park
Toronto, Ontario M7A 1W3

A wide variety of contour and planimetric maps are available. Timber-type maps are available for most areas.

Ministry of Transport and Communications
Information Management Office
1201 Wilson Avenue
Downsview, Ontario M3M 1J8

Land use maps

Ontario Centre for Remote Sensing
Ministry of Natural Resources
880 Bay Street, 3rd floor
Toronto, Ontario M5S 1Z8

Ontario Land Inventory Maps give physiographic site classification.

Aerial photographs

National Air Photo Library
615 Booth Street
Ottawa, Ontario K1A 0E9

Photographs of general coverage are available in black and white. Colour, infra-red and non-conventional imagery are available for certain local areas.

Air Photo Unit, Public Service Centre
Ministry of Natural Resources
Whitney Block, Queen's Park
Toronto, Ontario M7A 1W3

Complete coverage of Ontario is available at 1:10,000 for the south and 1:15,840 for the north; enlargements, to 13X, can be ordered.

Satellite imagery

Canada Centre for Remote Sensing
2464 Sheffield Road
Ottawa, Ontario K1A 0Y7

Ontario Centre for Remote Sensing
Ministry of Natural Resources
880 Bay Street, 3rd floor
Toronto, Ontario M5S 1Z8

Some enhanced satellite imagery is available.

Geological surveys

Geological Survey of Canada
615 Booth Street
Ottawa, Ontario K1A 0E8

Bedrock and surficial geology maps for most of Canada; some radiometric, geomagnetic and geochemical maps are available. Indices to published reports and index maps are available.

Ontario Geological Survey
77 Grenville Street
Toronto, Ontario M5S 1B3

Circulars, maps, miscellaneous papers and reports are available from the Public Service Centre, Ministry of Natural Resources (see address above). Indices of maps and publications are available upon request.

Ministry of Transport and Communications
Soil and Aggregate Section
Central Building
1201 Wilson Avenue
Downsview, Ontario M3M 1J8

A detailed inventory of sand, gravel and aggregate sources for road construction available.

Soil surveys

Ministry of Agriculture and Food
Communications Branch
Legislative Buildings
Toronto, Ontario M7A 1A5

Maps and reports for counties in arable areas of the province are available.

Hydrology

Inland Water Directorate
Publications Division
Ottawa, Ontario K1A 0E7

A wide variety of hydrologic data are published and price lists are available upon request.

Ministry of the Environment
Water Resources Branch
125 St. Clair Avenue West
Toronto, Ontario M4V 1P5

Reports, papers, bulletins and maps dealing with surface and ground water are published; unpublished data are often available from regional offices.

Climate

Canadian Climate Centre
Atmospheric Environment Service
4905 Dufferin Street
Downsview, Ontario M3H 5T4

Records from weather stations available.

Atmospheric Environment Service
Ontario Region
25 St. Clair Avenue East
Toronto, Ontario M4T 1M2

Published summeries of climatic data available for individual years and cumulative periods.●

ONTARIO PLANTS IN PRINT

BRITTONIA
REFERENCES FROM 1980-1987

compiled by Ian D. Macdonald, 105 - 19th Street N.W., Calgary, Alberta T2N 2H8

Aiken, S.G. 1981. A conspectus of Myriophyllum (Haloragaceae) in North America. **33**:57-69. (Review of 10 native and 3 introduced species with nomenclature, identification keys and ecology; 9 species in Ontario.)

Coffey, V.J. & S.B. Jones, jr. 1980. Biosystematics of Lysimachia section Seleucia (Primulaceae). **32**:309-322. (Nomenclature, life history and ecology of 7 species with identification key; L. ciliata and L. quadriflora are mapped for Ontario.)

Cronquist, A. 1982. Map of the floristic provinces of North America. **34**:144-145. (A small map identifying 13 floristic provinces and 9 subprovinces in N. Am. South of Sault Ste. Marie-French River-Mattawa R., Ontario is in the "Altantic N. Am. Region - Appalachian Province"; north of the line is in the "Circumboreal Region - Canadian Province.")

Hellequist, C.B. & G.E. Crow. 1986. Potamogeton X haynesii (Potamogetonaceae), a new species for northeastern North America. **38**: 415-419. (Formal description of this hybrid of P. strictifolius Fern. X P. zosteriformis Fern.; occurs in Ontario along Lake Huron shoreline in Lambton, Bruce and Simcoe Counties; map and illustration.)

Jones, A.G. 1980. Data on chromosome numbers in Aster (Asteraceae), with comments on the status and relationships of certain North American species. **32**:240-261. (Summary of the nomenclature for Aster and Virgulus; chromosome numbers for 56 species, but only A. borealis from Ontario; some habitat and distribution information for each species.)

Semple, J.C. & J. Ford. 1981. The phytogeography of leaf morphology in two species of North American asters: Lasallea novae-angliae and L. oblongifolia (Compositae). **33**:517-522. (Morphological/biogeographical study of these two asters, discounting the recognition of eastern or western varieties of either; has general distribution maps.)

Semple, J.C., G.S. Ringius, C. Leeder & G. Morton. 1984. Chromosome numbers of goldenrods, Euthamia and Solidago (Compositae: Asteraceae), II. Additional counts with comments on cytogeography. **36**:280-292. (Chromosome numbers for 6 Euthamia and 56 Solidago; includes 22 Ontario species.)

Semple, J.C., G.S. Ringius, C. Leeder & G. Morton. 1985. Erratum: Chromosome numbers of goldenrods, Euthamia and Solidago (Compositae: Asteraceae), II. Additional counts with comments on cytogeography. Brittonia, **36**:280-292. **37**:121.

CANADIAN FIELD-NATURALIST
REFERENCES FROM 1985

compiled by Charles Cecile, R.R. 1, Cambridge, Ontario N1R 5S2

Britton, D.M., W.G. Stewart & W.J. Cody. 1985. Cystopteris protrusa, creeping fragile fern, an addition to the flora of Canada. **99**(3): 380-382. (Cystopteris protrusa is reported new to the flora of Canada from three localities in southern Ontario; one in Elgin and two in Essex Counties.)

Catling, P.M. 1985. Notes on the occurrence, ecology and identification of the Massachusetts fern, Thelypteris simulata, in Ontario. **99**(3):300-307. (Thelypteris simulata (Davenp.) Nieuwl. is newly reported in Ontario. Two stations were found in eastern Ontario, in red maple bog-fringe forests with a herb layer dominated by Osmunda cinnamomea.)

Darbyshire, S.J. & M.J. Oldham. 1985. Ohio buckeye, Aesculus glabra, on Walpole Island, Lambton County, Ontario. **99**(3):370-372. (For the first time in Canada, possibly native, reproducing populations of Ohio buckeye are reported from the north end of Walpole Island.)

Hodgins, J.L. 1985. First record of an albino wild columbine, Aquilegia canadensis, for Ontario. **99**(3):385. (A first Ontario record for the albino form is presented; considered "very rare" by Fernald (1950).)

Mills, Alex. 1985. Revised status of the holly fern, Polystichum lonchitis, in Ontario. **99**(2):252-254. (The range of the holly fern in Ontario is more extensive than previously thought; six new stations from Thunder Bay, Algoma and Manitoulin Districts and Dufferin, Simcoe and Peterborough Counties.)

Morton, J. K. 1985. Hairy hawkbit, Leontodon taraxacoides, in central Canada. **99**(4):536-538. (The hairy hawkbit is reported from three Ontario stations, Manitoulin Island, Bala, and Victoria Harbour, as a weed in lawns and on roadside verges.)

Prange, R.K. & P. von Aderkas. 1985. The biological flora of Canada. 6. Matteuccia struthiopteris (L.) Todaro, ostrich fern. **99**(4):517-532. (Complete description of the morphology, ecology and distribution of ostrich fern in Canada.)

Riley, J.L. & S. Walshe. 1985. New and interesting vascular plant records from northern Ontario. **99**(1):30-33. (Aster radula, Astragalus tenellus, Kalmia microphylla, Picea glauca var. porsildii and Sedum aizoon are new to the flora of Ontario. Documentation is presented for four species previously mapped or reported for Ontario without specimen citations: Calamagrostis lapponica, Juncus interior, Salix arbusculoides and Utricularia orchroleuca.)

Webber, J. M., D. McLeod, & R.S.W. Bobbette. 1985. More new and interesting grass records from southern Ontario. **99**(2):141-146. (Specimen citations and comments on nomenclature, taxonomy, distribution and ecology of certain grasses that represent additions to the flora of Ontario, Canada, or noteworthy range extensions in southern Ontario are presented.)

Wile, I. G.E. Miller, G.C. Hitchin, & N.D. Yan. 1985. Species composition and biomass of the macrophyte vegetation of one acidified and two acid-sensitive lakes in Ontario. **99**(3): 308-312. (The composition and biomass of the aquatic macrophyte community of Clearwater Lake, an acidified (pH 4.3), metal-contaminated lake near Sudbury, Ontario, were compared with those of Harp and Red Chalk Lakes having floras typical of non-acidic, oligotrophic lakes in southcentral Ontario.)●

LE NATURALISTE CANADIEN
REFERENCES FROM 1984-1986

compiled by Joyce M. Reddoch, 548 Rivershore Cres., Gloucester, Ontario K1J 7Y7

Cayouette, J. 1984. Variations mineures chez Primula mistassinica Michx. (Primulaceae). **111**(4):443-445. (forma intercedens (Fern.) J. Cayouette comb. nov. described from Quebec with one collection cited from Ontario.)

Chmielewski, J.G. & J.C. Semple. 1985. The cytogeography and post-glacial migration of Solidago flexicaulis (Compositae) into southern Ontario. **112**(3):307-311. (Diploid populations occur east of the Frontenac axis, tetraploid populations west of it; maps.)

Darbyshire, S.J. & S.G. Aiken. 1986. Zizania aquatica var. brevis (Poaceae): a 1983 distribution survey and a scanning electron microscope study of epidermal features. **113**: (4)355-360. (Distribution map includes var. aquatica in eastern Ontario.)

Ireland, R.R. 1984. Anacamptodon splachnoides in Canada. **111**(3):319-320. (Five Ontario collections of this rare moss mapped.)

Mulligan, G.A. 1984. Chromosome numbers of some plants native and naturalized in Canada. **111**(4):447-449. (Survey ihcludes 54 taxa collected in Ontario.)●

TRAIL & LANDSCAPE
REFERENCES FROM 1984-1986

compiled by Daniel F. Brunton, 2704 Marie St., Ottawa, Ontario K2B 7E4

Aiken, S.G. 1984. The water-milfoils (Myriophyllum) of the Ottawa District and Ottawa River, Canada. **18**(1):35-52. (Distribution, identification and growth characteristics of 7 species; photographs of several specimens.)

Anderson, R. 1984. Etymology of the teasel. **18**(3):120-121. (Discussion of common names for Dipsacus sylvestris and drawing.)

----. 1984. Spring salad from the marsh. **18**: (3)120-121. (How to collect and cook Typha.)

----. 1985. Everything we wanted to know about teasel. **19**(1):11-13. (Use of Dipsacus in cloth manufacture; drawings and local distribution of D. sativus and D. sylvestris)

----. 1985. Milkweed broccoli. **19**(3):148-149 (Use of Asclepias syrica as a vegetable.)

----. 1986. Winter wildflowers. **20**(1):16-21. (Winter remains of several common plant species are described; illustrated.)

Bridgeman, B. & W.I. Illman. 1984. The bottlebrush buckeye naturalized in Ottawa. **18**:164. (A single Aesculus parviflora has been found along the rail line at Carleton University.)

Brunton, D.F. 1984. (Letter) On John Kerr McMorine. **18**(4):164. (2500 specimen sheets at Queens University were collected by this pioneer plant collector.)

----. 1985. Recent significant plant records from the Ottawa District, Part I: Clubmoss family to sedge family. **19**(1):27-47;
Part II: Pickerel-weed family to bean family. **19**(2):96-112;
Part III: Wood-sorrel family to composite family. **19**(3):155-175. (Treats over 270 plant taxa considered significant in the Ottawa District (12 or fewer records); 41 new records for the district; provincially rare species are Carex folliculata, C. typhina, Echinochloa walteri, Glyceria melicaria, Panax quinquefolium, Platanthera grandiflora, Potamogeton vaseyi, Pterospora andromedea, Sagina procumbens, Utricularia geminiscapa.)

Brunton, D.F. 1986. The cup-plant (Silphium perfoliatum) in the Ottawa District. **20**(4): 134-137. (An introduced population of this provincially rare species reported.)

Darbyshire, S.J. 1984. Oatgrasses: The genus Danthonia in the Ottawa District. **18**:264-272. (Morphology, identification, and status of D. spicata and D. compressa; illustrations and distribution; Ontario map of D. compressa.)

Darbyshire, S. J., A. Letourneau & M. Manga. 1984. A Macoun field club trip to Kettle Island. **18**(5):228-232. (Discovery of a large bladdernut (Staphylea trifolia) population of this Ottawa River island; Ontario and Quebec distribution map; illustrations.)

Di Labio, B. 1986. Another victim of burdock. **20**(1):29. (Dead ruby-throated hummingbird found in burs of Arctium minus; Nepean.)

Dore, W.G. 1986. The reappearing helleborine. **20**(1):22-23. (Epipactis helleborine persists in the author's garden since 1964 despite eradication efforts.)

Gummer, W.K. 1984. More of those uninvited guests in the garden. **18**(2):77-79. (Nearly 100 weeds found in Ottawa yards compared.)

----. 1986. What about planting someone else's wildflowers? **20**(1):13. (Caution urged in the use of commercial wildflower seed mixtures; problems discussed.)

Hall, P. 1986. The Central Experimental Farm and the OFNC: A 100-year cross-fertilization story. **20**(4):146-151. (Mutual benefits have arisen from the participation of Agriculture Canada, Research Branch, personnel in the naturalists' club; key people listed.)

Hanes, A. 1986. The Trail & Landscape sock. **20**(4):152-154. (Plant seeds that stick to clothes are illustrated on a "hiker's" sock.)

Reddoch, J. M. 1984. White Lake fen. **18**(3): 134-141. (Vegetation and flora of a rich fen over marble bedrock near Arnprior; list of significant species.)

Ross, E. G. 1984. John Kerr McMorine. **18**(3): 142-152. (Botanical activities, particularly in Lanark County between 1861-1901, of this pioneer plant collector; extracted from an out-of-print 1969 publication.)

Taylor, R. & A. Cameron. 1985. Burdock claims an avian victim. **19**(4):208-211.
(Dead solitary vireo found trapped on burs of Arctium minus; Gloucester.)

Zgierska, I. 1985. Seasonal woodland flowering in Carson Grove. **19**(3):150-154. (Graphic representation of flowering season for over 60 species in young hardwood stand in Ottawa)●

A Checklist of New York State Plants. Mitchell, R. E. New York State Museum Bulletin No. 458 (1986). 272 pp., US$12.50 (plus $1.00 foreign mailing) available from Publication Sales, New York State Museum, 3140 Cultural Education Center, Albany NY 12230, U. S. A. (hardbound).

reviewed by John K. Morton, Department of Biology, University of Waterloo, Waterloo, Ontario N2L 3G1

This is the first checklist of the vascular plants of the state of New York to be produced in the last 60 years. All native vascular plants known to occur naturally in the state are listed, together with alien species which have survived outside of cultivation. Also included are native species now believed to be extirpated and non-native species which are not persistent. Common names are given for each species, and also an indication of abundance or rarity. There are comprehensive indices of common and scientific names. The book is pocket sized (5 3/4 x 8 3/4"), printed on a high quality paper and hard bound, so as to be a useful, rugged, and portable reference work.

The classification system adopted in this book is the recent one produced by Cronquist - not one based on the Engler and Prantl system which has been used in most North American floras this century. A selected synonymy is given for each species, but the list is very brief and only includes the more familiar names used in relation to the New York flora. Infraspecific variation at the subspecific and varietal level is also included, together with hybrids.

At a time when botanists in North America are being inundated by name changes resulting from both nomenclatural and taxonomic studies, it is refreshing and reassuring to have an authoritative and up-to-date treatment of a flora, which has retained some stability by filtering out unnecessary or erroneous changes. This, in fact, is one of the important functions of flora and checklist compilers, to keep abreast of the work of specialists, whilst at the same time maintaining a balanced taxonomic treatment for the flora. In this way, the excessive zeal of taxonomic splitters and compulsive name changers is curbed and at least a modicum of stability in the naming of plants is achieved.

The author is to be congratulated on the production of a well-balanced and up-to-date compilation which will be an invaluable refer-

ence work to botanists throughout northeastern North America. In Ontario, which is one of the few remaining provinces or states in this continent lacking either a flora or checklist, this work will be particularly useful.●

Orchids of Ontario: an illustrated guide. Whiting, R.E. and P.M. Catling. The CanaColl Foundation. Ottawa (1986). xii + 169 pp., including illustrations and maps, $12.95 (paper). Available from CanaColl Foundation, 1010 Carling Ave., Ottawa, Ont. K1A 0C6.

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reviewed by Jane M. Bowles, R.R. 3, Thorndale, Ontario N0M 2P0

This new guide is a valuable addition to the existing floral guides for Ontario. The introduction contains sections on the structure of orchid flowers, an annotated list of useful and relevant orchid texts and a few paragraphs on the protection of native orchids. The section on flower structure is clear and informative though some of the drawings are so schematic that they are difficult to interpret at first.

The flora describes 60 species and additional forms, varieties and hybrids. It begins with a concise and very usable key to genera based on floral characteristics. Those genera represented by more than a single species are each introduced on a separate page with a key to species and varieties. Some hybrids are also included in these keys. Single species genera like Dactylorhiza and Arethusa are given neither genus headings nor new pages which makes their descriptions rather difficult to locate.

Under each species heading is a short section of anecdotal nature incorporating information of special or general interest. I wish more floral guides included sections of this type. The plant description itself is limited to flower colour. Every species is illustrated, but more details of plant habit, flower structure and special characters would have been an asset. These are helpful when plant parts are missing, when key dichotomies are based on measurement of variable parts or when diagnosis is shaky for some other reason. Fairly detailed descriptions of distribution and habitat are given and dot maps are presented for each species. The line drawings are clear, accurate and diagrammatic, sometimes to the point of being stark. Some of the black and white photographs of habit, habitat and flower detail are excellent and it is too bad that colour had to be sacrificed to reduce cost.

Unfortunately the type-face of the text, presumably chosen for economy and convenience, gives the book an unnecessarily amateurish look. Use of a single type size makes headings and species names difficult to pick out.

By the authors' admission, some of the records included in the maps are over 50 years old. No indication is given of which dots represent known extant populations. Again the appearance of the book is marred by the presentation of the maps. Three different base maps in two distinct styles have been used. This makes the maps unnecessarily distracting.

A checklist near the end of the book summarizes the taxa covered, and a chart of flowering times is given. This provides a quick reference and should be extremely useful, within the limitations imposed by small sample size and different plant ranges. A glossary specifically applies terms as they relate to orchids and is a valuable incorporation.

I recommend this useful and informative book to anyone with an interest in native orchids in particular or the plants of Ontario in general●

NEW AND RECENT PUBLICATIONS

The asters of Ontario: Aster L. and Virgulus Raf. (Compositae: Asteraceae) by John C. Semple and Stephen B. Heard. 1987. University of Waterloo Biology Series, No. 30. 88 pp. $7.00.

This is a comprehensive treatment of 32 species and several subspecific taxa of the genus Aster and its segregate Virgulus in Ontario. It has a key to the taxa, full-page illustrations of the flowers and other diagnostic portions of the plants, and dot maps for each taxon.

A handling charge of $1.00 must accompany each order. No additonal charge for postage. Available from Department of Biology, University of Waterloo, Waterloo, Ontario N2L 3G1.

The flora of the Tobermory Islands: Bruce Peninsula National Park by J.K. Morton and J.M. Venn. 1987. University of Waterloo Biology Series, No. 31. 92 pp. $15.00.

This flora of 24 islands lying north of the Bruce peninsula includes Cove, Flowerpot, Russel and Bears Rump Islands among others. An introductory map identifies the islands treated. This work includes a textual section that covers the geology, climate and historical background of the islands and a discussion of the vegetation and habitats present. An overview of the flora on an island by island basis is followed by the annotated listing of nearly 550 species. A matrix of species by islands concludes the work.

The book is illustrated with 8 plates containing 67 colour photographs, most of which have been contributed by Donald R. Gunn.

A handling charge of $1.00 must accompany each order. No additonal charge for postage. Available from Department of Biology, University of Waterloo, Waterloo, Ontario N2L 3G1.

Flora of New Brunswick by H.R. Hinds. 1986. Primrose Press, 734 Albert St., Fredericton, N.B. E3B 2C6. 666 pp. Soft cover, $30.00.

This vascular plant flora is bound in soft cover and includes over 1400 drawings and more than 1000 dot distribution maps. The price includes postage and handling. It is available from the author at the above address.

Natural areas inventory of the Regional Municipality of Haldimand-Norfolk by M.E. Gartshore, D.A. Sutherland and J.D. McCracken. 2 volumes. 1987. Norfolk Field Naturalists. Simcoe. $40.

This is result of two years of intensive field study during 1985 and 1986. The natural areas inventory was sponsored by the Norfolk Field Naturalists with financial support from the government, various learned societies and conservation agencies, and private business.

The publication is in two soft cover, spiral bound (cerlox) volumes with over 600 pages of text, 120 maps and 60 photographs. Volume 1 contains descriptions of 80 significant natural areas and sites. Volume 2 includes annotated checklists of the vascular plants, birds, mammals, reptiles and amphibians found during the course of this study. Significant species are given a more detailed treatment.

Total price including postage and handling is $44.00. Available from the Norfolk Field Naturalists at P.O. Box 995, Simcoe, Ontario N3Y 5B3.

AND NOT SO HOT OFF THE PRESS...

The following Agriculture Canada titles are available at discount prices:

An atlas of airborne pollen grains and common fungus spores of Canada by I. J. Bassett, C. W. Crompton and J.A. Parmalee. $5.95 (was $12.00).
Barley register by B.R. Baum, G. Bailey and B.K. Thompson. $19.95 (was $40.00).
Ferns of the Ottawa district by W.J. Cody. Revised edition. $3.25.
Grasses of Ontario by W.G. Dore and J. McNeill. $5.95 (was $12.00).
Oats: wild and cultivated by B.R. Baum. $8.95 (was $17.50).
Trees and shrubs of the Dominion Arboretum by A.R. Buckley. $14.95 (was $19.95).

Order from the Canadian Government Publishing Centre, Ottawa, Ontario K1A 0S9. Cheque or money order should be payable to the Receiver General for Canada. Orders outside Canada add 20% and make payment in Canadian funds.

Gray's manual of botany, 8th edition, by M. L. Fernald is back in print. The publisher is now Dioscorides Press, 9999 S.W. Wilshire Blvd., Portland, Oregon 97225, U.S.A. The price is $59.95 (U.S.). This speciality publishing house carries reprints of a variety of specialized and technical botanical classics.

Available from THE PLANT PRESS:

The vascular plant flora of Peel County, Ontario by Jocelyn M. Webber. 1984. 94 pp. Soft cover. $10.00 + 2.00 postage & handling.

This comprehensive annotated checklist of the flora of Peel County includes over 1300 taxa and provides a summary discussion of the physical setting and vegetation communities of the area treated, as well as a discussion of the history of botanical investigation in Peel.

Checklist of the spring flora of the Bruce Peninsula by Joe Johnson, Jocelyn Webber, & Vince Elliott. 1984. 20 pp. Soft cover. $2.00 + 0.50 postage & handling.

A summary checklist which includes scientific and common names. If ordered in conjunction with another publication or a subscription, postage will not be charged.

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We are pleased to receive submissions about native or naturalised vascular plants, bryophytes and lichens in Ontario. All submissions should include original information (i.e., your own observations or experiences). All submissions are informally reviewed by the Editorial Committee. Submissions with content beyond our expertise may be sent to appropriate specialists for review. Articles must be written in the style of this publication and authors are encouraged to ask qualified persons to appraise their work before it is submitted.

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