

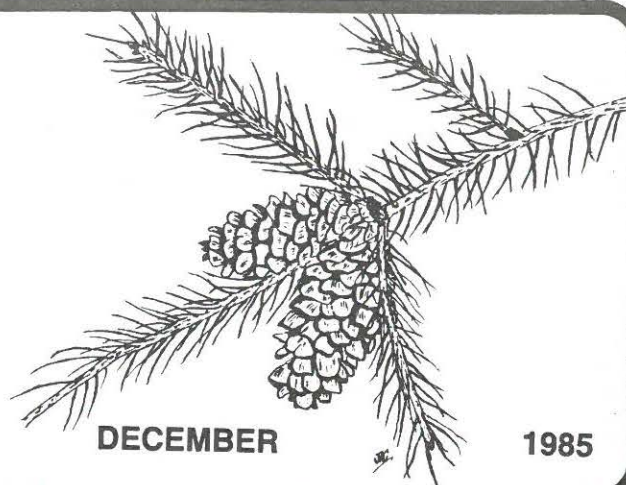
THE PLANT PRESS

FIELD BOTANY IN ONTARIO

Vol. 3 No. 4

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NEWS

1986 SUBSCRIPTION RENEWALS

We are pleased that 1986 subscription renewals are coming in promptly. A final notice for subscription renewal is enclosed with this issue and we hope that those who have already subscribed for 1986 (as indicated by attached receipts) will give these forms to potential new subscribers. We have found that recommendation by our readers is our best means of advertising and we are most grateful to those who have encouraged others to subscribe at naturalists' club meetings, at the office, on field trips, by gift subscription, etc.

The 1986 subscription form enclosed in the September issue implied that "individual" subscribers must use their home address. What we hoped to convey was that we expect institutional subscribers to pay the full fee. Individuals who pay for their own subscription may certainly use office addresses if this is more convenient.

We are especially grateful to all who have sent donations in excess of fees. The Plant Press, Inc. is a non-profit organization with charitable status (Ontario registration # 0691873-21-13). Receipts for tax purposes are sent promptly.

RECENT DEVELOPMENTS

We are very pleased that J.B. (Jack) Lord, Co-ordinator of Education at the Royal Botanical Gardens in Hamilton, is now a member of the Editorial Committee. Jack's special interest is the history of botany and his expertise in that area is a welcome addition.

In the last issue we indicated our need for someone to help with last-minute preparation of figures. John Graydon of Islington has recently offered to help out, and we hope to keep him busy with interesting assignments.

Jeff Kaiser is putting names and addresses of subscribers in his computer so that address labels and subscription renewals can be processed more efficiently. (We look forward to using the computer, rather than the typewriter, for future production of *The Plant Press*!) In addition to keeping track of business and circulation, Jeff's help with editing and production is gratefully acknowledged.

We are anxious to find someone who would be willing to do the mailing. This task involves one to three days work for each issue. The ideal candidate would be conscientious about details and timing; able to lift 25 to 30 mail bags, each weighing up to 10 kilograms; and willing to take these to the Gateway Post Office in Mississauga. Potential volunteers are urged to contact the Business Manager.

SUBMISSION OF MANUSCRIPTS

As *The Plant Press* becomes established, we are pleased that more unsolicited material and longer, meatier, manuscripts have been received. Excluding "Ontario Plants in Print" and "Letters," statistics for these changes are shown below.

	number of pages	number of papers	unsolicited material
1983	86	41	10 %
1984	116	50	24 %
1985	148	50	48 %

Not all material submitted is published in *The Plant Press*. Each year we receive 3 to 6 submissions which are rejected because they are either (1) not accurate (usually this can be resolved with co-operation between authors and the Editor); (2) of very local interest and better included in naturalists' club publications; and (3) too technical or not written in the style of *The Plant Press*, in which case we encourage the author(s) to send them elsewhere. Submissions to *The Plant Press* do not necessarily have to be of interest to the majority of readers, but we do expect contributors to submit papers written in the style of our publication. Poems and polemics are declined.

Information about submission of material is included on the back cover of each issue. We encourage contributors to fulfill the following:

1. keep submissions short (to 3 pages of *The Plant Press*) where possible;
2. send 3 copies of submissions, carbon copies are appreciated from those who do not have access to photocopying facilities;
3. send all material for consideration to the Editor's home address; and
4. return "proof" copies of material promptly.

In the past 3 years we have found that material does get lost in the mail, although this is a very rare occurrence (it has happened twice in the many thousands of mailings since our inception). Quite often the mail is delayed, but things eventually get through. Contributors should receive an acknowledgement of receipt of their submissions within one month of sending them. After review, which can take more than a month, authors are sent either a "proof" (if minor editing is involved) or suggestions for improvement of the manuscript. Please keep copies of all material submitted and get in touch if you do not hear from us.

We are grateful to the following individuals who have helped the Editorial Committee by reviewing/commenting on manuscripts in 1985: Dr. G.W. Argus, the late Dr. B. Boivin, Mr. J.R. Brown, Mr. W.J. Cody, Dr. H. Crum, Mr. D. Cuddy, Mr. W.B. Draper, Dr. J.M. Gillett, Dr. E. Haber, Dr. R.R. Ireland, Mr. J. Johnson, Dr. R. Jones, Ms. C. Manville, Dr. J. McNeill, Dr. J.P. Prevett, Dr. J.S. Pringle, Dr. A.A. Reznicek, Mr. J.L. Riley, Dr. J. Shaw, Mrs. M. Shivas, Mr. W.G. Stewart and Mr. H. Williams.

SUBJECTS FOR FUTURE ISSUES

In 1986 the following topics will be addressed: alien weeds in natural areas; guidelines for the cultivation of native plants; wetland terminology and evaluation; rating the popular wildflower guides; long-term results of transplanting efforts (with records of successes and failures); new plant records for Ontario; growing native plants from seed; conservation of significant botanical areas; early botanical expeditions in Ontario; statistical analysis of plant checklists; descriptions of interesting areas to botanize in Ontario; hybrids; keys to difficult plant groups; etc.

We would be pleased to receive more material from plant ecologists and/or graduate students who would provide brief summaries of current research projects of interest to field botanists. We still need more material for 1986 and we would be very pleased to hear from anyone who is interested in writing papers for *The Plant Press*.

Thank you for your continued support!

LETTERS

Field botanists experienced in writing papers appreciate that considerable time is needed to gather necessary information and to prepare material suitable for publication. No individual should be discouraged from contributing to *The Plant Press* because they are "corrected" by later feedback. However, we do expect our contributors to spend the time necessary to prepare material suitable for publication. The goal of improved communication among field botanists can only be met by the process of those who have access to specific details of knowledge (i.e. new or overlooked plant records and publications) adding to the reports and ideas of others.

COMMENTS ON THE LIST OF ALIEN WEEDS WHICH ARE DETRIMENTAL TO NATURAL AREAS

Many readers have already returned ratings of the most serious alien weeds of natural areas in Ontario. A compilation of results and a discussion will be included in a future issue; however, some preliminary comments may be of interest.

"Regarding the alien weed survey, I must take exception to your listing of manitoba maple [*Acer negundo*] as non-native. It surely is not native in the areas you designate as north-eastern and eastern, and probably the eastern part of central Ontario. But it is native in Rainy River-Thunder Bay districts [northwestern Ontario] according to Hosie (1978. *Native Trees of Canada*.); considered native in western Essex County by Botham (1981. *Plants of Essex County*); and is certainly native in Toronto. We know the latter is correct from the writings of Mrs. Catharine Parr Traill (1885. *Studies of Plant Life in Canada*). On page 205 she wrote the following:

'Ash-Leaved Maple. *Negundo aceroides* Moench

'...There is a fine grove of these trees on the banks of the river Humber, near Toronto.'

"There is still a grove on the east bank of the Humber River, just south of the Bloor St. bridge, and another in Lambton Woods. Not that we admire this species, but we must stand up for its native rights!

[The status of manitoba maple in Ontario is controversial and I did hesitate before putting it on the list. Somehow I think that the date 1885 is a bit late for determination of the status of this tree in Toronto. Unfortunately the earliest settlers were too busy cutting down the trees to collect them. JW]

"As one who uses the Metropolitan Toronto parks and open areas for walking, I find only two of the plants on the list really detrimental. Garlic mustard (*Alliaria petiolata*) is in every nook and cranny and I suppose that it is obliterating the native flora, but which native plants would grow in these more-or-less disturbed places I am not certain. I would like to see violets there, but these plants are fast disappearing from our woods - this could be due to trampling by children running through the woods, or to collecting for transplanting to gardens, etc. Perhaps we would have more herb robert (*Geranium robertianum*), lopseed (*Phryma leptostachya*), and honewort (*Cryptotaenia canadensis*) if there were less garlic mustard.

"The other detrimental plant in Metro is *Vincetoxicum* (dog-strangling vine). It is strangling not only dogs (I have seen a small dog all tangled up in its bare stems), but many plants which grow at the edges of woodlots. It has formed enormous mats in the Glendon area. In fields it is only competing with non-native plants, but at the edges of woods it climbs all over sumacs and viburnums and lays flat goldenrods and asters. Beside the railway embankment in the Don Valley it is tangling with poison ivy! As far as the rest of the list [enclosed with the September '85 issue] is concerned, the plants seem to fill a niche in this very disturbed area of Metro - but I sure hate to see non-natives encroaching upon undisturbed vegetation."

Emily Hamilton, Toronto

"It is hard to know just where alien weeds are affecting natural vegetation, as many are established in our area where the vegetation is extensively disturbed anyway. Three of the alien weeds on the list [enclosed in the September issue], *Alliaria petiolata* (garlic mustard), *Hesperis matronalis* (dame's-rocket), and *Vincetoxicum* spp. (dog-strangling vine) do dominate

woodland vegetation locally during part of the year, and they likely exclude native species to some extent. *Vincetoxicum* spp. are all over central Toronto parks and they seem to be spreading...

"It would be interesting to inventory ground-cover in a potential area of spread now, and compare it after *Vincetoxicum* does arrive."

Clive Goodwin, Toronto

"There is no need to preach to botanists about the long list of 'enemy' plants which occur in Ontario. Every part of the province has its own variation in the symphony of invading pests. I have some 'favourite plants to hate,' a few of which I cannot resist mentioning here. I find *Lythrum salicaria* (purple loosestrife) and *Hydrocharis morsus-ranae* (frog-bit) are particularly nasty in wetlands in eastern Ontario. While most people can recognize *Myriophyllum spicatum* (eurasian water-milfoil) as a problem to their power boats, *Lythrum salicaria* is still planted at cottages 'to add some pretty colour to that drab lake.'

"Even though the general demise of the native flora and vegetation can be anticipated, the precise effects of alien weed invasions are very difficult to predict. Like the movement of a clock's minute hands, gradual changes in the flora are clearly visible only to the ablest observer. To the rest of us, changes are only vaguely seen through memories and retrospect."

Stephen Darbyshire, Ottawa

"Why worry about these [alien] species - they are here to stay."

Paul Eagles, Cambridge

"I ask myself a series of questions...

1. How can one form of vegetation be 'detrimental' to another form of vegetation?

2. What are the criteria to measure a detrimental effect?
3. How can one of these alien species be detrimental to a native species?
4. Are [you] talking about competition?

"Competition is a process and not subject to judgements of good or bad. Aren't we concerned about whether the alien plants are aesthetically displeasing [sic] (e.g. smell) or cause a disease/rash (or are poisonous) or interfere with recreation or commerce? The appearance of an alien is far too subjective.

"As the question is presently stated, no plant is detrimental to natural vegetation. Purple loosestrife (*Lythrum salicaria*), in particular, is pleasant to look at. So are some of the others. Eurasian water-milfoil (*Myriophyllum spicatum*) clogs propellers and could possibly be a danger to swimmers; but it [provides] good fish habitat and looks attractive until it starts to decay.

"As an extreme situation you might have alien plants causing shifts in soil development, soil erosion rates, soil nutrients, or the water table, but [this now concerns] detrimental effects on the environment and not the vegetation.

"Even then the effects are not detrimental unless they affect people."

Stephen Gray, Petawawa

FURTHER COMMENT ON BOTANICAL RESOURCES

"When I look back over my 60-year period of familiarity with the flora and fauna within an approximate radius of 70 km from the City of Toronto, I shudder to think of the immeasurable destruction of our natural heritage I have witnessed in the wake of urban development and similar operations brought about by the so-called march of progress...

"The more I ponder over past events the more I am inclined to favour the propagation by seeds of our native and naturalized plants. It is also my opinion that experiments with seeds should be confined to our own individual areas within the province.

"I am reluctant to see transplanting become a common method of plant propagation. Although I think some experimentation by botanists and other qualified individuals could be useful, what happens if the general public starts transplanting species from boreal habitats to the Carolinian and vice versa? Many such transplants will be confined to home flower gardens and will at least be controlled to some extent. My feeling is that many plants from far away places will be planted away from the garden entirely and in time any records will be lost. This may cause a great deal of confusion for future botanists."

Wm. E. Cattley, Orillia

"I was very interested in [J.M. Webber's] paper 'Ontario's botanical resources: some opinions on management concerns' (Plant Press 3(3):79-82); in particular, the sentence near the end '...it is irresponsible to sow seed of species which are absent from the local flora...' I tend to agree with this opinion, even though as a gardener I may covet new or strange plants that I see elsewhere, and want to try in my garden. I also agree that we should not forget the rare habitats in which the rare plants grow, even if the rare plants can also be made to grow somewhere else.

"All the seed catalogues that I see offer mixtures of wildflower seeds, labelled as 'eastern,' 'western,' or 'Rocky Mountain,' and so on. If such seed grows successfully and the practice continues, with the more resilient species 'getting loose' and self-propagating, the outcome would be a rather meaningless and haphazard blending of species and the blotting out of existing natural plant groupings. The selling of such seed collections is already pretty well established; can we stop it or prevent certain species from being included?

"While agreeing that the random spreading of flower seeds across the country is objectionable from one viewpoint, I cannot help but see another side to this. Gardeners for many years have been buying seeds and plants that come from other areas. Not all of these are hybrids and specialties destined mostly for colourful flower beds; many of them are seeds, bulbs and plants of species that come from other parts of North America and from other countries

where they were among the native plants. Many of these take well in gardens and some even 'take over' if let go (e.g. some *Sedum* spp. (stonecrop) and *Ajuga reptans* (bugleweed)). They may spread by seed or runner, from roots that are thrown out, and some of them become a part of local 'wildflower' lists. They don't often become a nuisance, but the possibility is always there. (More than 100 species are included as 'escaped from cultivation' in Gillett & White (1978. Checklist of Vascular Plants of the Ottawa-Hull Region, Canada.) Even if these plants have not moved far, they have survived on their own in nature. The point I am trying to make is that gardeners have long been doing some of what we might now start challenging. Gardeners have been importing for probably as long as there have been flower gardens for show (and competition).

"I was startled at the information on the poor record of transplanting to 'suitable habitat.' Since it is so easy to move many wildflowers into gardens, why should it be difficult 'from one natural area to another?' Although gardens will generally offer routine watering and some fertilizing, they may be very different from natural habitat in terms of things like soil chemistry and consistency. I have *Hepatica acutiloba* (liverleaf), *Asarum canadense* (wild ginger), and *Phlox divaricata* (blue phlox) growing happily in a corner of my garden, and a neighbour has had flowering clumps of *Trillium grandiflorum* (common trillium) for more than 15 years. The latter was divided because the clump was large. These examples are not endangered species (which are perhaps more difficult to move?), but then Lape's 'dozens of species' do not sound like endangered species either.

"I also agree that 'transplanting to gardens' is not the answer for saving special plants. When I first began thinking about this I was of the opinion that rare plants should be saved along with and in their proper and special habitat. However, another thought has developed and this is that much the same thing may have to be done for plants as is done for animals. Whether we like it or not, zoos are likely going to be the only sure way of seeing certain mammals, for instance. The concept of protection, and prevention of species obliteration, is not new to zoos which operate intensive programs on breeding in captivity for pandas, whooping cranes, etc. Do botanical gardens ('bots'?) already practise this with rare plants? If not, or if not enough, should they be encouraged to do so as one means of trying to save species? Transplanting to gardens,

especially botanical gardens, perhaps should not be dismissed too abruptly."

Bill Gummer, Ottawa

"I am delighted by the prompt response from readers and I hope that the opinions and views above will encourage further discussion. As I enjoy gardening and have experimented with native plants for many years, I hope that any ensuing debate is not misconstrued as a 'war between interest groups.' We all gain from the discoveries of related disciplines and if botanists can influence those who garden or those involved in natural area planning and management, so much the better!

"I certainly agree with Paul Eagles that alien weeds are here to stay. The point I make is that we should be concerned about their effect on the ecology and value of our premier natural areas. What effect does a carpet of garlic mustard have on regeneration of Carolinian forest? Surely a natural area devoid of alien weeds is more valuable than a comparable one carpeted with garlic mustard. I think that Stephen Darbyshire's report (on page 122 of this issue) should be seriously considered by all involved in management of natural areas.

"While I am sure that Stephen Gray is familiar with the definitions of 'flora' and vegetation,' I include these (on page 145) for the benefit of others. The aesthetics of alien weeds have nothing to do with the issue of whether they affect native vegetation. Rather than the word 'detrimental,' how about 'suppress, disrupt, or alter natural succession of native vegetation?'

"Bill Gummer's letter raises many important points and my responses to a few are given briefly below:

"1. If botanists can provide commercial seed growers with information about the desirability of component species, so much the better. If alien weeds which disrupt natural vegetation (e.g. purple loosestrife) were included in The Weed Control Act of Ontario, then it would be illegal to sell seed mixtures including them.

"2. If gardeners are warned about potential hazards of importing certain plants, I think they will listen with interest.

"3. Transplanting to natural areas is different from transplanting to gardens. Mr. Lape was dealing with forest plants and these may be limited by light and moisture in the wild. Gardeners can control these factors to some extent.

"4. A large animal may require many square kilometres of habitat, whereas habitat requirements for plants are often much smaller (for example oak savannas, a rare type of vegetation in Ontario, are inherently small). Zoos may well be the answer for preservation of large mammals, especially those from the Third World where humans face starvation without agricultural expansion. In Ontario, however it is relatively inexpensive to purchase the nature reserves necessary to ensure preservation of rare plants.

"5. I think it would be wonderful if botanical gardens propagated rare native plants from seed provided that native habitat were also preserved. However, I wonder if there is enough public interest in Ontario to support funding of such beyond the level of 'summer student' projects."

Jocelyn Webber, Mississauga

COMMENT ON THE USE OF TAXONOMIC ORDER

Major vascular plant manuals used in Ontario and many published checklists for smaller regions, like most Ontario herbaria, are arranged in taxonomic order. This order is supposed to reflect phylogeny, although most botanists today agree that some groups, the monocots for example, are more advanced than once believed. Hence the order followed in many treatments is now obsolete.

In the herbarium it is useful to be able to compare specimens of taxa which are closely related when using these to confirm an identification. Such comparisons are not readily made when alphabetical order is used, mainly, I suppose, for efficient filing of specimens. In my opinion, it is much easier to confirm the identification of taxa in large genera, e.g. *Carex*, when closely related taxa are filed on the next shelf, rather than 3 cabinets away due to the first letter of the species' name.

However, for the presentation of checklists of small areas, such as parks or nature reserves, I question the value of taxonomic order. Perhaps this arrangement is used to "look scientific," a poor reason in my opinion. After many lively discussions with Jeff Kaiser, I have come to prefer listing botanical names alphabetically by genus and species within the following groups: "trees," "shrubs," "ferns,"

"graminoids," and "forbs." Precise delineation of these groups is difficult, and there are times when it may be preferable to lump some of the groups or add others, such as "aquatics." With the addition of common names (where available), I think checklists arranged this way are more useful and, as family names are deleted, take up less space.

Last year I asked some of our readers what they felt about taxonomic order. Some other opinions appear below.

"The one benefit I can see about plant lists in alphabetical order by scientific name is that this format allows an individual with little or no knowledge of botany to quickly and mechanically run their finger down one list and compare it to another list (for whatever project specific cross-checking is required). If listings are to be simplified for the use of planners, the list could also be coded to indicate the significance of each plant listed. I agree that groupings by growth form (i.e. trees, forbs, aquatic, etc.) would be understandable to most planners regardless of background. However, could you lose more than you would gain by not using 'taxonomic order' under these group headings?

"Since 'taxonomic order' is based on classification by similarities, then listings in taxonomic order provide useful information in themselves. For example, it is often helpful to be aware that a plant you are not familiar with has similarities to a plant you know.

"Although alphabetic listings make referencing (or cross-referencing) of lists easier, I would guess that knowledgeable reviewers of the botanical component of a report would have a much easier time determining and commenting on adequacy (scope, accuracy and completeness) if such lists were presented in 'taxonomic order.'"

Patrick Reynolds, Environmental Planner,
Ministry of Transportation & Communications,
Central Region, Willowdale

"The use of taxonomic order for plant checklists is a Canadian tradition."

Rick Bobbette, Barrie

IDEAS

POSSIBLE FACTORS INFLUENCING THE EXCEPTIONALLY LARGE CONE CROP OF WHITE SPRUCE IN NORTHERN ONTARIO IN 1984

Bruce Thacker, 374 Van Norman Street, Thunder Bay, Ontario P7A 4C3

The white spruce (*Picea glauca*) cone crop in the vicinity of Thunder Bay in northern Ontario was exceptionally large in 1984. A limited literature search was undertaken to find an explanation for the periodicity of cone crops.

Romberger & Gregory (1974) observed that "The subject of flowering in trees [is] vast, complex and confusing." They proposed a "working hypothesis" to explain the periodicity of flowering and to set the various factors in relation to each other. They suggested that there were a number of systems (e.g. photo-period and its effect) involved in initiating floral development, each of which is required but not in itself sufficient.

Other authors still hold to a primary factor as the determinant (e.g. the level of nitrogen according to Schmidtling (1974)). Added to that hypothesis was the idea that a mature tree carries a "burden of history" (Romberger 1969). "Tissues that were differentiated or modified in response to last month's or last year's conditions...are still present and are part of the microenvironment of the meristematic tissues today." (Romberger & Gregory 1974).

Climatic conditions, including temperature, hours of sunshine, and water stress, appear to have the greatest influence on size and periodicity of cone crops. In spruce, flower buds are initiated during the summer of the year prior to the cone crop. The number of reproductive buds initiated can be affected by weather conditions of the previous summer. Water stress from dry summers can restrict growth the following spring (Puritch 1972). Cool summer temperatures can increase the number of leaf primordia formed, and hence the number of loci for reproductive buds, since they form in the axils of the leaves the following spring (Puritch 1972). Set against the benefit of a cool summer is the warm, dry summer requirements for flowering and cone production. A summer

with a large number of sunshine hours will result in greater levels of carbohydrates through increased photosynthesis.

Kraus & Kraybill suggested in 1918 that a high C:N (carbon to nitrogen) ratio favoured flower bud initiation. This has been supported by more recent research (Hashizume 1973). Schmidtling (1974) makes a case for nitrogen accumulation (especially nitrates, according to Ebell & McMullan (1970)) being the limiting factor, although he does not rule out completely the role of carbohydrates. Seeming to take the approach of "necessary but not sufficient" conditions, Kozlowski (1971) states that the "tendency for floral induction is high when adequate nitrogen and high carbohydrate levels occur in branches."

Once floral buds are initiated, weather conditions (and insects and disease) can greatly influence the numbers of buds reaching maturity either through mechanical damage (e.g. wind, frost) or through abortion of buds due to water stress or inadequate nutrient levels. Overwintering dormant buds are quite resistant to cold and dehydration (Kramer & Kozlowski 1960).

Developing flowers and cones divert large amounts of nutrients from vegetative growth, with the suggestion that reduced radial growth can be observed for good cone crop years (Sweet 1975). Position of the cones in relation to the sun is also a factor. Larger cone crops are seen in the crowns of open grown trees, on trees at the edge of stands, and on the south sides of crowns. "It is not clear whether these cone responses are related strictly to light or to the related increase in temperatures" (Puritch 1972).

As noted above, weather conditions (temperature, sunshine hours, water stress) have a considerable effect on the final cone crop in conifers by influencing flower bud initiation, flower, and cone development. In fact the temperature and sunshine hours for Thunder Bay for 1982 and 1983 (May to August) show a favourable correlation to some of the factors mentioned above. In 1982 the mean temperature for the 5 months was slightly below that of the normal, and the mean hours of sunshine were in total below that of normal. This would be the season in which leaf primordia were established (and, consequently, loci for floral buds). In 1983 the mean temperature was higher than the normal, and similarly the mean sunshine hours totalled more than the normal. In that summer, the floral buds were initiated.

While data are not given for 1984, there was nothing catastrophic to abort or damage the developing cone crop. Thus the observed cone crop might be expected (not necessarily predicted) considering the preceeding years' weather conditions.

The descriptions of weather data above are based on a sample which is temporally and geographically very limited. This does not prove the role of climatic factors in the production of cone crops. To explain the exceptionally large cone crops which were observed for species of *Picea* province-wide in 1984, a rigorous examination of a larger sample of weather data is needed.

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POTENTIAL PROJECTS ON PHENOLOGY

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By way of comment on R.D. Ussher's letter in the June issue of *The Plant Press* [*Plant Press* 3(2):38] and [the Editor's] request for correspondence on the subject of phenology, I offer the following suggestions and information.

I suspect there are a considerable number of readers of *The Plant Press* who keep personal records of various phenological events, whether these be the first appearance of birds, frogs, insects or flowering dates of flowers, shrubs, trees, etc. For some few, myself included, it is almost a passion. Those who have records spanning several years actually harbour a data bank, which if properly compiled, could serve to put Ontario field botany "on the map," so to speak. The flowering chart of orchids of the Bruce Peninsula, compiled by Ross Brown [*Plant Press* 3(2):47-49] is an excellent example of what can be accomplished! These data could further be grouped according to district or township to learn something about the effect of climatic factors on particular species as one moves from south to north. Also, by compiling data from different areas, selected species could be mapped according to their average flowering sequence across the province. (Why not a flowering map as well as the more familiar distribution map?) Flowering maps are nothing new. They have been produced in other countries, notably Germany and some parts of the United States, using data collected via phenological observation networks maintained over a period of years.

Many readers may not realize that prior to the 1940's, a network of 10 to 15 observers across Ontario recorded flowering dates on some 20 to 25 native and naturalized plant species. This was part of a national network reporting to the Meteorological Service of Canada. Annual reports were published as far back as the turn of the century in the *Journal of Education*, *Transactions of the Royal Society*, and later by the Meteorological Service. So far as I know, no one has ever processed or compiled any of this data.

More recently, in 1969-70 the late R.E. Beschel of Queen's University, Kingston, set up a volunteer observation network in cooperation with

the Federation of Ontario Naturalists. Preliminary isophene maps were drawn up for Ontario showing the first flowering dates of common trillium (*Trillium grandiflorum*), common dandelion (*Taraxacum officinale*), and lilac (*Syringa vulgaris*).

Also, in Alberta, a 10-year study (1973-82) was conducted by C.D. Bird and the Federation of Alberta Naturalists. Twelve common species were chosen and recorded for 25 areas of the province. Annual reports were published in the Alberta Naturalist, with a final summary in May 1983 listing the average dates for each area.

By all of this, I am not suggesting that yet another network be established because of the length of time required (at least 10 years) to obtain useful averages. Rather, I suspect that there is a surprising amount of phenological data presently existing, some published, but mostly unpublished, which if retrieved and contributed, could form the backbone of a kind of "plant flowering atlas."

The kind of information to be listed would be species, location, phenophase observed, earliest date and year, latest date and year, mean date and the span of years in the record. Where the length of record was less than 10 years, the actual years and dates would be required in order to assign an "adjusted mean," based on a balanced distribution of early and late seasons. In the case of rarer species, which may not be observed in every season, single flowering records may also prove to be useful.

I do not expect that the available data would cover enough separate locations to produce "flowering maps," but nevertheless, it would be a beginning on which to base any future projects or studies. In addition to personal and published records, information (particularly on mid-flowering dates in different areas) could also be obtained from dated photographic files and herbarium specimens.

In a project of this kind, the question of accuracy would naturally be of some concern. Apart from actual variations to be expected from habitat exposure and genetic variability of species, there are bound to be variations in how different observers have interpreted particular growth stages such as leafing, first flowering, mid-bloom, etc. Some records may have to be qualified or even discarded because of bias error. But overall, I believe that the

information gained would be a major improvement over existing texts which merely estimate flowering time to the nearest month or season! Also, there would be the potential to learn much more about the influences of climatic factors on particular species.

My own personal record-keeping began in the early 1970's with the nagging thought in the back of my mind that there must be something useful to learn from this kind of data. Many times I have been foiled in the search for a certain species in flower because I arrived too early or too late. Accurate flowering information seems often hard to pin down, especially in early spring in an unfamiliar area. A "flowering atlas" would help solve this problem and add to the general knowledge of plant phenology in Ontario (which is at this point rather meagre).

Perhaps this sounds like a rather ambitious project, nevertheless I believe that sooner or later it should be done. It is of course dependent on voluntary contributions, so if enough people are willing to go through their records and compile their lists, it could be a useful project for Ontario field botanists. ♦

ELIMINATION OF ALIEN WEEDS IN NATURAL HABITATS: A NEW LOOK AT AN OLD METHOD

Stephen J. Darbyshire, 7 Braemar St., Ottawa, Ontario K1K 3K3

I think that naturalists in all parts of the world feel somewhat helpless as they see on-going habitat destruction. The effects of urbanization, expanding agriculture, acid rain, gypsy moths, and erosion are familiar to many of us. However, the insidious suffocation of our native flora by invasive, alien species is less obvious and rarely recognized as the destructive force that it is.

In parts of the world where the native flora has economic value for grazing, invasion of alien weeds has been of concern where it impinges on the economic use of native plants.

It is ironic that it was through the practice of relatively primitive forms of agriculture, such as grazing, that the disruptive potential of alien weeds in natural habitats was first recognized and formally addressed. When economic problems occur today, the usual response is to apply the latest technology. However, technology may not provide the best cure for environmental problems. There are no herbicides which selectively differentiate between alien and native plants, for example.

In a recent paper in *Fremontia*, the journal of the California Native Plant Society, an effective, non-technological method for control of alien weeds was described (Fuller & Barbe 1985). That paper is a summation of an earlier publication by an Australian naturalist, Joan Bradley (1971). Bradley's method involves careful hand weeding of alien plants in natural areas. Areas subjected to hand weeding should be adjacent to areas with native species. After hand pulling the alien weeds, small treated plots are gradually recolonized by the native plants and alien weeds are eventually but effectively eliminated. Incredible as it may seem, dramatic results have been reported for a minimal amount of effort, so long as this manual technique is applied in a systematic [no pun intended] and consistent fashion.

I think that this "new" method, hand weeding, should be learned as a fundamental technique of vegetation management by all involved with field botany. Armed with the knowledge of which plants are alien and therefore undesirable, what seedlings look like, etc., field botanists can now take an active role in preserving the integrity of natural habitats. We are no longer in a position to shrug and say "There really isn't anything I can do."

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1985: THE EARLIEST SPRING IN MEMORY?

Wilfred Botham, R.R. 1, Cottam, Ontario
NOR 1B0

When Mother Nature gave us summer temperatures for six days in a row in April 1985, from the 18th to the 23rd, she may have broken all records. On those six days the temperature hovered around 27°C for several hours each day. Such a sustained heat wave seldom occurs in Ontario even in mid-summer.

All of the heat speeded up plant growth to a remarkable degree. First-flowering dates started toppling almost immediately. *Thaspium trifoliatum* var. *flavum* (meadow parsnip) in our yard was the first noted. From an early flowering date of 8 May it jumped ahead to 21 April. From then until early July, almost 200 plants yielded new early flowering dates. The first flowering dates of many of these plants had been recorded over the past 20 years or more. In an average year very few new early flowering dates are obtained.

Leaf growth was also affected. There is a time each spring when the canopy of deciduous woods fills in with leaves until the sky can not be seen through the trees, as viewed from a short distance away - say 1/4 km. (Where I live in Essex County the woodlots are like islands on the landscape. Prior to leafing I see the sky through them.) Over the past 50 years I have noted this phenomenon in Essex County, Ontario. It usually occurs in the first or second week in May. It can occur as early as the last week in April, and it has been delayed until the third week in May in a few years. In 1985 the woods reached this leafed-out stage on 23 April - the last day of the six-day "summer" - the day before the last week in April! ♦

[Anyone interested in Wilf Botham's compilation of flowering dates in "Plants of Essex County" (1982) may still obtain a copy from the Essex Region Conservation Authority, 360 Fairview Avenue West, Essex, Ontario N8M 1Y6. The cost of this 210 page book is \$ 8.50. JW]

NOTES & REPORTS

Triadenum virginicum (L.) Raf.
(MARSH ST. JOHN'S-WORT) IN ONTARIO

A.A. Reznicek, University of Michigan Herbarium,
North University Buidling, Ann Arbor,
Michigan 48109

The marsh st. john's-worts are now generally recognized as belonging to the genus *Triadenum* Raf. rather than being a part of *Hypericum* L. Plants of the genus *Triadenum* are distinctively reddish tinged, readily recognized, and thoroughly familiar to field botanists. It has been common knowledge that Ontario plants are all one species, the widespread, northern, *T. fraseri* (Spach) Gl., or *T. virginicum* (L.) Raf. subsp. *fraseri* (Spach) J.M. Gillett, if one chooses not to consider the northern plants a distinct species from the primarily southern and eastern *T. virginicum*. (Gleason & Cronquist (1963) are the only authors of a major floristic manual to report *T. virginicum* for Ontario.)

I first became familiar with true *Triadenum virginicum* in southwestern Michigan, an area well-known for the occurrence of coastal plain elements in the flora. Later, I found it to occur very locally in *Sphagnum* bogs in south-eastern Michigan. *Triadenum virginicum* is nevertheless a rare plant in Michigan and a pleasant surprise to the field botanist who discovers it.

It was then quite a surprising to read in Gillett & Robson's (1981) "st. john's-worts of Canada" that, in addition to specimens of *Triadenum virginicum* from southern Nova Scotia, they saw "an interesting specimen of rather doubtful quality from Go Home, Muskoka District, Ontario..." This record was inadvertently not mapped for Ontario (J.M. Gillett, personal communication). However, since the Muskoka area is well-known for its coastal plain disjuncts, a search for *T. virginicum* there seemed desirable. I was able to do this, while on holidays in August 1985, and found *T. virginicum* in several localities on the shores of lakes on the Canadian Shield near Georgian Bay in Simcoe County.

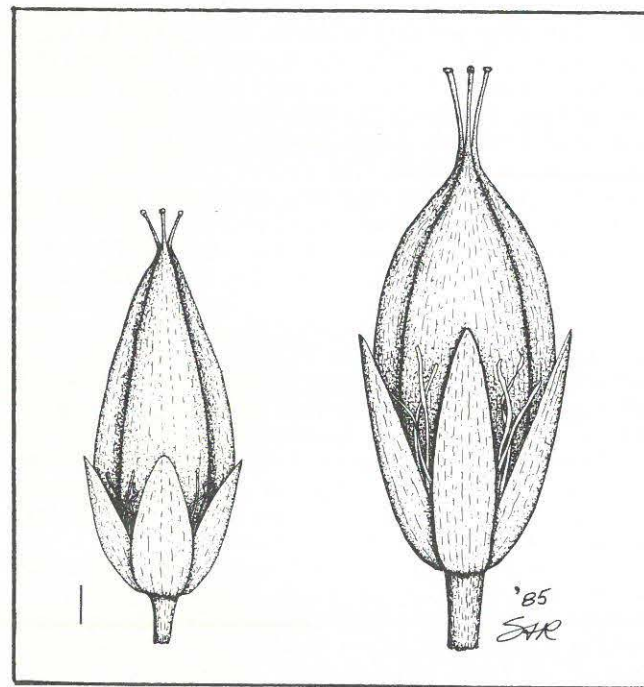


Figure 1. Fruits of *Triadenum fraseri* (left) and *T. virginicum* (right). The bar equals 1 mm.; illustrations by Susan Reznicek.

After examining hundreds of collections of northern *Triadenum* spp. in the University of Michigan herbarium, including my own from Michigan and Ontario, I lean strongly towards recognizing both *T. virginicum* and *T. fraseri* at the species level, although admittedly they resemble each other closely. A key to the two species of *Triadenum* in Ontario, based on measurements of plants from the Great Lakes region, is given below. Representative fruits are illustrated in Figure 1, thanks to my wife Susan's artistry.

There appeared to be no overlap in style length and I found no intermediates or possible hybrids. The conclusion that these two plants are best recognized as species was also reached by Utech & Iltis (1970) for Wisconsin and conforms to the treatment presented in Gleason & Cronquist (1963). The long styles of *Triadenum virginicum* give it a "bristly" appearance that makes it recognizable in the field even as one is canoeing along a lakeshore. Other, more subtle and less reliable characters of sepal shape and branching habit also distinguish the species and are helpful once learned.

Key to *Triadenum* in Ontario

Styles 0.6-1.5 mm long; sepals in fruit
2.5-4.6(5.2) mm long (very rarely
longer) *T. fraseri*

Styles 2.1-2.9 mm long; sepals in fruit
4.8-7.2 mm long *T. virginicum*

A map of the distribution of *Triadenum virginicum* is not provided because the known localities are all only a few kilometres apart. Also, the actual distribution of *T. virginicum* in Ontario is as yet unknown. How widespread is it in the Georgian Bay region? Is it essentially confined to the Georgian Bay region, like other coastal plain disjuncts, such as *Rhexia virginica* (virginia meadow beauty), *Dichanthellium spretum* (panic grass), and *Bartonia paniculata* (screw-stem)? Does it occur, like *Platanthera blephariglottis* (white fringed-orchid), somewhat more widely in southern Ontario *Sphagnum* bogs? (See maps in the Atlas of the Rare Vascular Plants of Ontario.) All this still needs to be discovered by field botanists. If you find *T. virginicum*, collect a specimen with good fruits and deposit it in a major herbarium to document your discovery.

Documentation: Ontario: Simcoe County, Matchedash Tp., Conc. II, Lot 13, southeast shore of Otter Lake, 27 August 1985, A.A. Reznicek & S.A. Reznicek 7621, CAN, DAO, MICH, TRTE; Tay Tp., Conc. XIV, Lot 17, ca. 1 mile east of Port Severn, north shore of unnamed lake, A.A. Reznicek & S.A. Reznicek 7625, DAO, MICH, TRTE.

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Carex crus-corvi Shuttlew.: A SEDGE
NEW TO CANADA FROM ESSEX COUNTY

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NOR 1B0

On 10 May 1985 I found a sedge that I did not recognize. Indeed, the top part, the inflorescence, was more grass-like than sedge-like in appearance at that early stage of development. It was growing in a depression at the edge of a small woods on the west side of Big Creek in Tilbury West Township, Essex County. The east part of the woods is on the old floodplain of the creek. Although the depressions on the floodplain are water-filled in the spring months, it no longer functions as a floodplain because of the high banks on both sides of the creek that have been built up with soil that was dredged from the creek over the years.

At the time of discovery only one clump of the sedge was seen. I collected several culms, unconscious of the fact that the species could be rare! However, no underground parts were collected. I showed my specimen to Mike Oldham at the Essex Region Conservation Authority. He was as mystified as I.

On 10 June Dr. A.A. (Tony) Reznicek, from the University of Michigan, and Jocelyn Webber, University of Toronto, joined a group of us in Essex County to do some sedge hunting. When I showed them a specimen of "my" sedge they both said "*Carex crus-corvi*" without hesitation. An English name is "Crow-spur sedge." It is the first record for Canada.

On a subsequent visit to the woods, on 25 June 1985 in company of Mike Oldham, Tony and Susan Reznicek, Paul Catling, and Vivian Brownell, many more plants were located. The total number of clumps of *Carex crus-corvi* found to date is probably in excess of 50.

Carex crus-corvi is found from Florida to Texas, north to Nebraska, Minnesota, Wisconsin, Michigan, Ohio, and now Ontario. It is not common anywhere due to its restricted habitat of low, wet woods on floodplains, pond edges and sloughs. ♦

Addendum: A few days following the above events Mike and Tony were botanizing in a floodplain in the vicinity of Sarnia, Lambton County, when they discovered a second Canadian station for *Carex crus-corvi*! [Documentation: specimens will be distributed to major Ontario herbaria.]

Platanthera leucophaea (Nutt.) Lindl.
(PRAIRIE FRINGED-ORCHID)
ON WALPOLE ISLAND, LAMBTON COUNTY

J. Ross Brown, Tupperville, Ontario NOP 2M0

Platanthera leucophaea (prairie fringed-orchid, Fig. 1), although seemingly widespread in southern Ontario, is one of our rarer orchids (White et al. 1982). This species of fens, marshes, wet meadows, prairies and lakeshores is currently known from the counties of Essex, Lambton, Bruce, Grey, Simcoe, and Leeds & Grenville, and the regional municipalities of York and Ottawa-Carleton. No known sites are from the Precambrian Shield. Although most Ontario populations consist of few plants, those at George Lake in the Bruce Peninsula and in the Minesing Swamp in Simcoe County are among the largest populations in the world. Platanthera leucophaea also occurs in west-central New Brunswick, and Paul Catling discovered a major station in southern Manitoba in July 1984 (Johnson 1985).

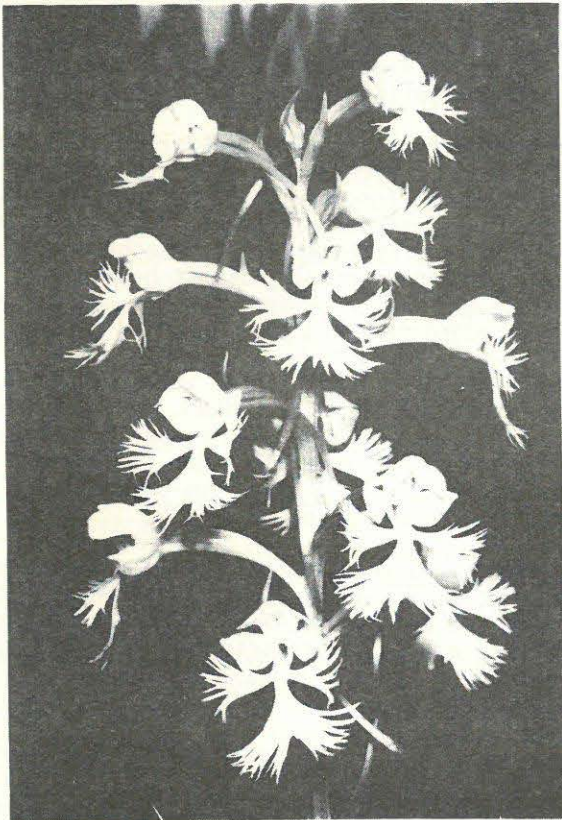


Figure 1. Flowering raceme of Platanthera leucophaea (prairie fringed-orchid) photographed at Walpole Island on 7 July 1983.

Although Platanthera leucophaea is more-or-less holding its own in Canada, recent population trends in the United States are very discouraging. County records there show a 69% decline compared to historic records (Bowles 1983). In Missouri alone, county records have dropped from 13 to one. Hopefully, current conservation efforts in Canada will prevent similar drastic declines.

Discovery of the Walpole Island populations

Early in this century, Dodge (1914) reported that Platanthera leucophaea was abundant on the St. Clair delta islands in Lambton County. Half a century later, however, Gaiser (in Gaiser & Moore 1966) reported that she was unable to rediscover P. leucophaea in Lambton County, but that further investigation was necessary. Since then, 3 populations of P. leucophaea have been discovered on Walpole Island. These are described below; however, in the interests of conservation and because Walpole Island is private land, the exact locations of these populations are not shown.

1. the first population

On 11 July 1966, Rob Simpson hopped on his motorcycle and headed for Walpole Island, determined to rediscover the elusive Platanthera leucophaea. After many hours and many miles he "hit paydirt," a stand of 5 plants of P. leucophaea growing in a wet roadside meadow. Rob told me of his discovery and I visited the site on 12 July. One plant was in full flower, 2 were past flowering, and 2 were non-flowering plants. All grew within a 2.5 m stretch of damp sand just beyond a roadside dredge cut, associated with Teucrium canadense (wood-sage), Lobelia spicata (pale spike lobelia), Rudbeckia hirta (black-eyed susan) and Solidago sp. (golden-rod).

On 2 July 1967, one flowering plant of Platanthera leucophaea was seen at the same locality, and 6 or 7 grew nearby between the dredge-cut and the road. Water levels rose considerably in 1968 and P. leucophaea has not been seen at this site since 1967 (Table 1).

2. the second population

On 3 July 1977, I discovered a new population 1 km to the north of the first, in a moist, sandy, tallgrass prairie. On 3 and 4 July, 22 plants of Platanthera leucophaea were found (Table 1) scattered over an area approximately

Table 1. Number of plants of Platanthera leucophaea at 3 Walpole Island populations from 1966 to 1984.

year	first pop'n	second pop'n	third pop'n
1966	5	-	-
1967	7 or 8	-	-
1968	-	-	-
1977	-	22	-
1978	-	18 or 19	-
1980	-	2	-
1983	-	±35	-
1984	-	±20	8

75 X 250 m. This site, our best for P. leucophaea on Walpole Island, is very rich in locally and provincially rare plants. These are listed in Table 2.

Two other species of Platanthera, P. flava (tuberclad orchid) and P. lacera (ragged fringed-orchid) occur with the second population of P. leucophaea. Platanthera flava occurs in 2 or 3 small but thriving stands and in habitat apparently identical to that of P. leucophaea. Platanthera flava normally flowers about a week earlier than P. leucophaea. Platanthera lacera seems to be very scarce here, with no more than 4 plants noted in any one year. On 7 July 1984, Gary Allen, Mike Oldham and I found one plant of Calopogon tuberosus (grass pink) at this site, our first Walpole Island sighting.

Two soil samples were taken in August 1982 by Marlin Bowles and Don Langendoen. These were approximately pH 5.8 and 7.0 (i.e. moderately acidic to neutral), and are typical of similar readings taken at many other North American stations of Platanthera leucophaea (pH range of 5.3 to 7.6 (Bowles 1983)).

3. the third population

On 7 July 1984, 8 plants of Platanthera leucophaea were found at the Potawatomi Prairie, approximately 4 km ESE of the second population. The open, tallgrass prairie habitat adjacent to oak forest was similar to the sites for the first and second populations of P. leucophaea, but did not have the species diversity of the site for the second population.

Six plants of Platanthera leucophaea were scattered over several hundred metres of grassland and 2 very large plants were found in roadside ditches by Paul Pratt et al. Interestingly, these 2 plants, the largest that we have seen, occurred in disturbed habitats.

Comments on the morphology and life history of Platanthera leucophaea on Walpole Island

Platanthera leucophaea on Walpole Island averages about 60 cm in height; the 2 tallest plants were 107 and 117 cm. The maximum raceme length observed was 21.6 cm and maximum flower length (excluding the nectar spur) was 2.85 cm. The largest number of flowers per raceme was 23, with an average of 12 flowers per plant in 1983. Flower size is extremely variable; some plants have flowers almost twice the size of others.

Unlike flower size, colour seems virtually constant. Flowers have creamy-white petals and lips, with pale green claw and spur opening. Sepals are suffused with pale green, especially on outer surfaces, and spurs are green, becoming paler proximally.

A very pleasant, lily-like fragrance from the flowers has been detected in the morning, but not in the afternoon. Flowers are fragrant at night and are attractive to sphinx moths, which are the chief pollinators (Case 1964; Bowles 1983).

Walpole Island populations of Platanthera leucophaea tend to be widely scattered. However, at the second population one could easily see 8 plants from one vantage point. The tallest flowering plants were taller than surrounding early summer vegetation, a feature possibly related to moth pollination.

Table 2. Plants associated with Platanthera leucophaea on Walpole Island. The symbol * indicates plants seen within 1 m of at least 1/3 of the plants of P. leucophaea surveyed; other species listed are more loosely associated.

SCIENTIFIC NAME	COMMON NAME
TREES	
Quercus rubra	red oak
	(cont'd...)

(Table 2, cont'd...)

SHRUBS

Rosa sp. rose

FORBS

Anemone canadensis canada anemone
 * *Apocynum cannabinum* indian hemp
Asclepias purpurascens purple milkweed
A. sullivantii sullivant's milkweed
Aster novae-angliae new england aster
Calopogon tuberosus grass pink
Cirsium muticum swamp thistle
 * *Coreopsis tripteris* tall coreopsis
 * *Desmodium canadense* showy tick trefoil
 * *Fragaria virginiana* common strawberry
Galium boreale northern bedstraw
Helianthemum bicknellii hoary froastweed
 * *Lathyrus palustris* marsh pea
Lobelia spicata pale spike lobelia
Liatris spicata blazing star
Loesel's Loesel's twayblade
 * *Lycopus americanus* water horehound
 * *Lysimachia quadriflora* prairie loosestrife
Lythrum alatum winged loosestrife
Platanthera flava tuberclad orchid
P. lacera ragged fringed-orchid
Polygala incarnata pale milkwort
P. sanguinea field milkwort
Potentilla anserina silverweed
 * *Pycnanthemum virginianum* mountain mint
Rudbeckia hirta black-eyed susan
Sisyrinchium mucronatum blue-eyed grass
 * *Smilacina stellata* starry false solomon's seal
Solidago canadensis canada goldenrod
 * *S. graminifolia* grass-leaved goldenrod
Solidago rigida stiff goldenrod
Teucrium canadense wood sage
Tradescantia ohimensis ohio spiderwort
 * *Vernonia altissima* tall ironweed
 * *Veronicastrum virginicum* culver's root
Viola spp. violet
Zizia aptera heart-leaved meadow parsnip
Z. aurea golden alexanders

GRAMINOIDS

Andropogon gerardii big bluestem
Calamagrostis canadensis canada blue joint
Carex spp. sedge (many not ident.)
Eleocharis spp. spike-rush
Juncus effusus soft rush
Spartina pectinata cord grass
 * *Panicum virgatum* switch grass

FERNS

Thelypteris palustris marsh fern

Like its close relatives *Platanthera lacera* and *P. psycodes* (purple fringed-orchid), *P. leucophaea* can be very erratic in year-to-year flowering. The flowering period of *P. leucophaea* on Walpole Island extends from approximately 25 June to 20 July, but this is quite variable. In 1977 flowering was finished by 5 July, following several very warm days. In contrast, several plants seen at the same location on 7 July 1984 were entirely in bud; these were obviously several days from anthesis and would probably flower until at least 20 July.

Platanthera leucophaea also shares with several relatives a susceptibility to blight on the leaves and flowers. However, large unblemished individuals are truly spectacular. Due to the rarity of this species across its entire range, plants should never be collected. Any new stations should be reported to appropriate agencies, most notably COSEWIC, so that efforts to preserve this rarity and its habitat can be maintained.

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[Other recent research on *Platanthera leucophaea* in Ontario includes a COSEWIC report by V. Brownell and a study of the Minesing Swamp population by B. Ford of Trent University.]

** An update about the Walpole Island populations is given on page 145 of this issue.]

THE MOSS *Kindbergia praelonga* (Hedw.) Ochyra: DISCOVERED IN HALIBURTON COUNTY, ONTARIO

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In August 1984, I discovered a small colony of the moss *Kindbergia praelonga* (Hedw.) Ochyra [Synonym: *Stokesiella praelonga* (Hedw.) Robins.] (Brachytheciaceae) in a moist depression in an old peat bog at the eastern end of Drag Lake, Haliburton County.

This moss (Fig. 1), more common and widespread in western North America, Europe, and Asia, is very rare in eastern North America. Ireland et al. (1980) reported specimens from Ontario and Nova Scotia. Crum & Anderson (1981) cite records from the Magdalen Islands, Cape Sable Island, Newfoundland, and New Hampshire. The only previous Ontario record is a specimen collected by Macoun in 1891 at Foster's Flats, Niagara Falls, Welland County (CANM 183141).

A duplicate of the Haliburton specimen has been seen by R.R. Ireland, and my thanks to him for reading the manuscript of this note and giving permission to reproduce the figure.

Documentation: Ontario: Haliburton County, Dudley Township, spruce/sphagnum bog near East Bay, Drag Lake, UTM grid ref. 068952, 15 August 1984, F.S. Cook 3405 (CANM; UWU).

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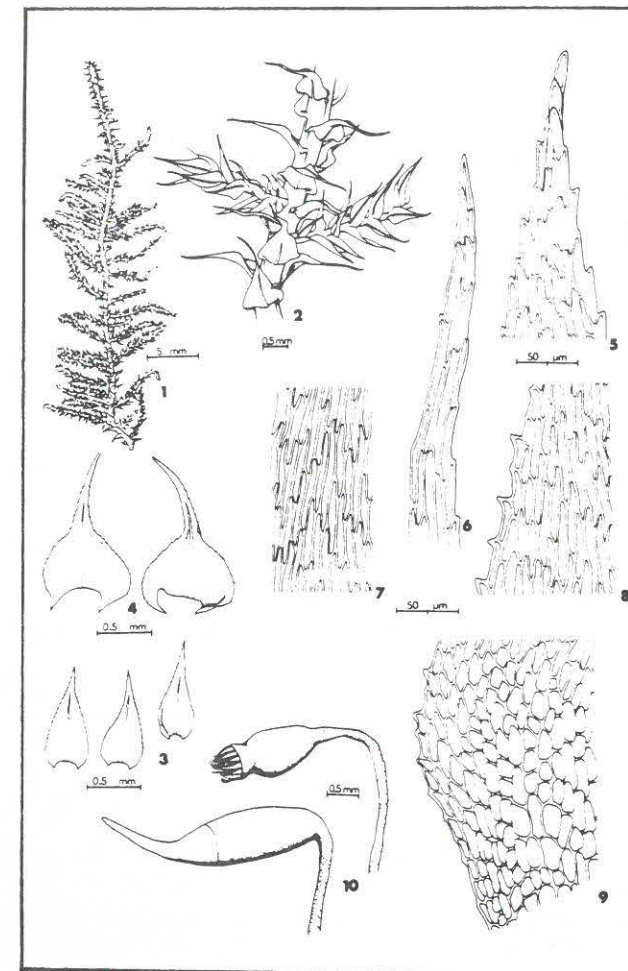


Figure 1. *Kindbergia praelonga*. 1. Habit. 2. Portion of stem and branches. 3. Branch leaves. 4. Stem leaves. 5-9. Leaf cells (5, apical of branch leaf. 6, apical of stem leaf. 7, median of stem leaf. 8, median-marginal of stem leaf. 9, alar of stem leaf.) 10. Capsules, operculate (wet), inoperculate (dry). Illustrations (as *Stokesiella praelonga* var. *stokesii*) from Moss Flora of the Maritime Provinces by R.R. Ireland (1982). Reproduced courtesy of National Museum of Natural Science, National Museums of Canada. ♦

Vincetoxicum spp. (DOG-STRANGLING VINES):
ALIEN INVADERS OF NATURAL ECOSYSTEMS
IN SOUTHERN ONTARIO

Malcolm Kirk, R.R. 1, Ravenna, Ontario NOH 2E0

In the ecology of plant invasions created by international commerce and travel, most weed species introduced into northeastern North America flourish on disturbed sites - farmlands, roadsides, and recent subdivisions. Often competing with cultivated species in cropland, pasture, and garden, they can be suppressed by cultivation or herbicides.

There are, however, some introduced plants which may become dominant in natural ecosystems rather than cropland or pasture, e.g. *Myriophyllum spicatum* (eurasian water-milfoil), *Lythrum salicaria* (purple loosestrife), an introduced strain of *Phalaris arundinacea* (reed canary grass) and *Vincetoxicum* spp. (dog-strangling vines). These alien species tend to form mono-dominant stands, thereby excluding a wide variety of native plants along with their dependent wildlife. Two of the most aggressive alien species belong to the genus *Vincetoxicum*.

Inadvertently introduced from Europe as garden weeds in the northeastern United States, the spread of *Vincetoxicum* spp. in Ontario has been slowly increasing in recent years (Pringle 1973). The present known distribution of *Vincetoxicum* spp. in Ontario is compared with records mapped by Pringle (1973) in Figure 1.

Vincetoxicum rossicum (Kleopov) Barbarich and *V. nigrum* (L.) Moench, are now established and spreading on upland sites in southern Ontario. Before the publication of volume 3 of *Flora Europaea* in 1972, these species were widely known in North America as *Cynanchum medium* auct. non R.Br. and *C. nigrum* (L.) Pers. (see McNeill 1981); their common names are dog-strangling vine and black swallow-wort, respectively. These species may be distinguished by a number of characters (Pringle 1973), the most obvious being the shape and colour of the corolla lobes (Fig. 2).

Once established, these perennials form dense colonies of intertwining, "woody" but herbaceous stems that envelop and crowd out all other herbaceous plants. The interlocking stems tend to fall down as summer progresses, hence the common name. Most significant is its ability to flourish in gardens, on grassy slopes, streambanks, and even in woodlots. On

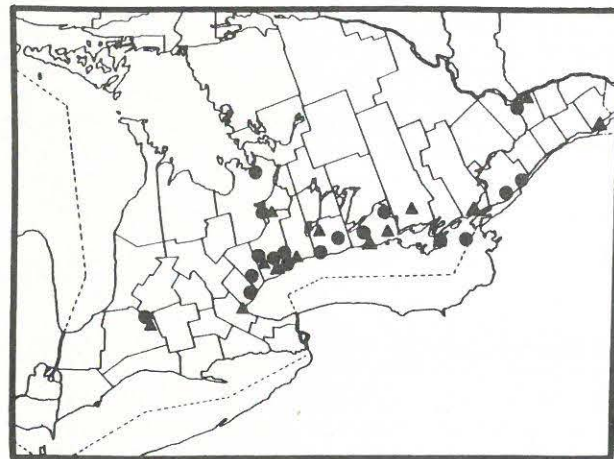


Figure 1. The distribution of *Vincetoxicum* spp. in Ontario based on records mapped by Pringle (1973) for *V. rossicum* and *V. nigrum* (indicated by the symbol ▲); more recent records of the genus are based on specimens in CAN, DAO, HAM, MICH, OAC, QK, TRTE, and WAT (indicated by the symbol ●).

lawns, new shoots sprout after the mower has passed over. Like other members of the milkweed family (Asclepiadaceae), dog-strangling vines reproduce from pods loaded with parachute-lifting seeds. Once established, the plants soon form dense populations and spread locally. The genus should be considered as potentially troublesome weeds (Pringle 1973).

Vincetoxicum spp. are not a major menace to cropland or pasture, and so they are not included in the mandate of the Ontario Agricultural College to research and advise on control of farm weeds. Nonetheless, Douglas McLaren of Crop Science at the University of Guelph conducted an experimental spray-to-kill on a population near Keswick (York Region) in 1978. The formidable root system resisted most selective chemicals (McLaren, personal communication). Of course one could apply a complete herbicide, such as "Roundup," but on slopes, removal of all vegetation would result in soil erosion, and re-vegetation would likely include *Vincetoxicum*.

To view *Vincetoxicum* first-hand, drive along the Don Valley Parkway in Toronto. From Lawrence Avenue to Highway 401, *V. rossicum* blankets many slopes, where it found a vast

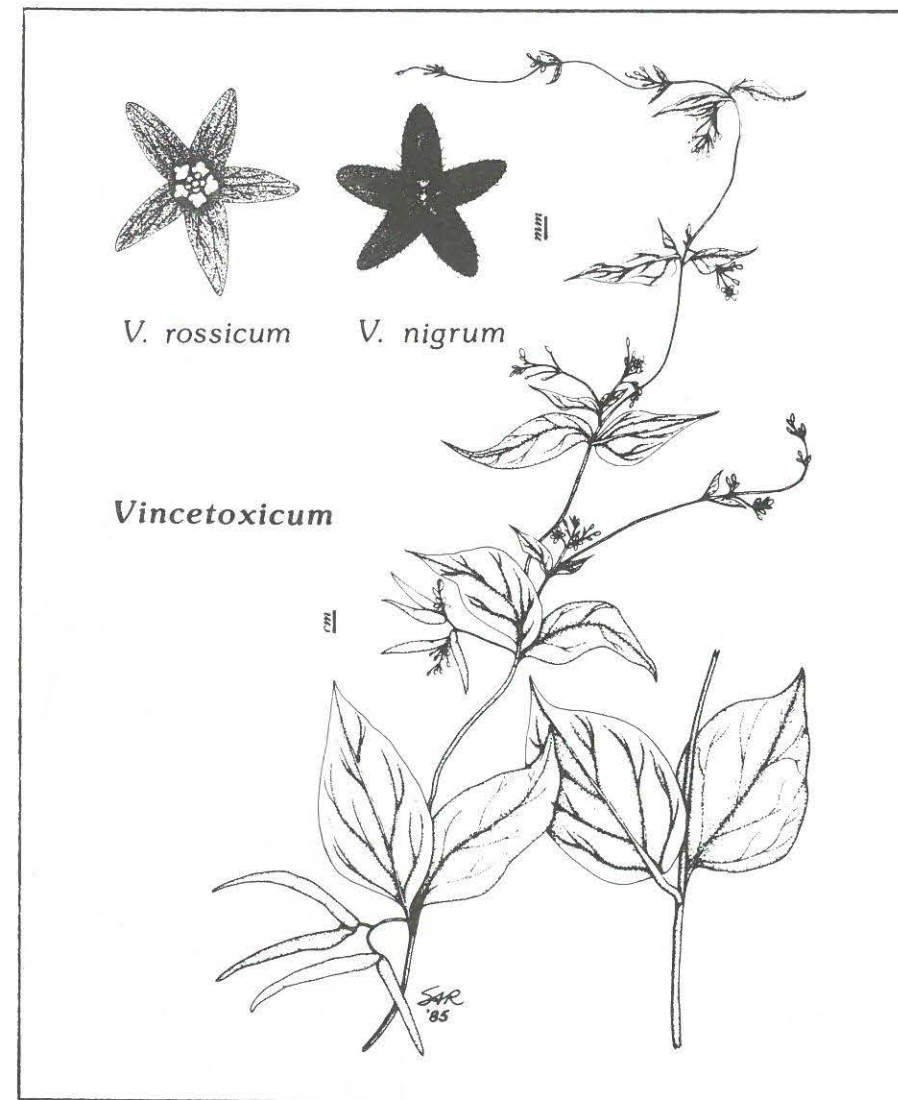


Figure 2. Flowers of *Vincetoxicum rossicum* and *V. nigrum*; habit sketch of a branch with flowers and fruit. Illustrations by Susan Reznicek.

seed bed 30 years ago. The leaves turn golden yellow in mid-September, before other plants, for the benefit of car-window botanists. Keep your eye on the road - the traffic is more dangerous to you than the weed!

Acknowledgements: I am grateful to Susan Reznicek for providing the illustrations and to the following individuals and herbaria for supplying locality information for the genus for Ontario: S.J. Darbyshire (CAN, DAO); J.S. Pringle (HAM); A.A. Reznicek (MICH); J. Canne (OAC); A.E. Garwood (QK); J.M. Webber (TRTE); and L. Barr (WAT).

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* Note that although this paper is dated as published after volume 3 of *Flora Europaea* (1972), the paper was in press and nomenclature could not be corrected. ♦

PROPAGATION OF NATIVE AND NATURALIZED ONTARIO PLANTS BY SEED: RESULTS OF A SIX-YEAR STUDY

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Having had a life-long interest in wildflowers, I appreciated my wife's birthday gift in 1974, the book, "Pioneering with Wildflowers" by Senator George D. Aiken. I was thrilled with his accounts of collecting wildflower seeds, propagating the plants, and selling them. I said, "If Senator Aiken can propagate and sell wildflowers in the United States, then Robert Burcher can do the same in Canada, when I reach the time to retire."

It was not until 1978 that I retired. Then we bought a house near Beaverton (Durham Region). The house was located on a lot well-supplied with trees. Their shade provided a good environment for the woodland wildflowers which I hoped to propagate.

At first, my methods of storing the seeds were unsuccessful. When I hung the seeds in paper bags on a clothes line, in the unheated garage, they rotted. The next year I suspended bags of seed on a line in the basement, but because of dampness, the seeds were destroyed by mildew. Finally, success came when I placed the seeds in bags or on styrofoam trays on the tops of the kitchen cabinets.

Thus, for six months (June to December), our kitchen becomes a centre of activity in preparation of the seeds. I strip the remains of the fruits, then, by using a fine camel hair brush, I separate the seeds from the trash. The cleaned and dried seeds are placed in individual envelopes, labelled with botanical and common names, date of collection, and the location of collection.

By January I start planting seeds of the previous year's collections. At first I used soil, but this resulted in a profusion of weeds, so I tried a mix of 1:1 vermiculite and peat moss. This resulted in uncontaminated samples.

Seeds are planted in plastic trays about 8 X 18 cm and 15 X 20 cm. The trays are placed on wooden bases with wire frames. A plastic bag is pulled over each frame, giving the appearance of covered wagons. The "covered wagons" are put under fluorescent lights in the basement. Every few days the plastic bags are

opened and water is sprayed on the trays to give sufficient moisture.

When the seeds have germinated to a height of about 1 cm, the seedlings are transplanted into styrofoam coffee cups where they grow to about 5 cm. In late spring, the seedlings are planted in garden plots.

In each of the past 6 years I have attempted to grow seedlings of about 35 species of native and naturalized plants, mostly wildflowers. Most of the seeds were collected in Ontario. These trials have met with varying degrees of success (Tables 1 - 5). Of particular interest to me are those plants for which I have been unable to obtain seedlings (Tables 4 and 5). It may be that my methods of propagation are not suitable, or perhaps these species are just difficult. I would be pleased to hear from anyone who has suggestions!

Table 1. Plants which have shown exceptionally good germination and growth of seedlings. (These species appear to be so aggressive that they may be undesirable; the symbol + indicates naturalized species.)

SHRUBS

+ Rhamnus cathartica European buckthorn

FORBS

Cakile edentula sea-rocket
+ Campanula rapunculoides creeping bellflower
+ Centaurea vochinensis star-thistle
+ Hieracium aurantiacum orange hawkweed
+ Linaria vulgaris yellow toadflax
+ Malva neglecta common mallow
Oenothera parviflora small-flowered evening-primrose
+ Saponaria officinalis bouncingbet
+ Solanum nigrum black nightshade
+ Tragopogon pratensis meadow goat's-beard
+ Vicia cracca tufted vetch

Table 2. Plants which have shown reasonably good germination and growth of seedlings (the symbol + indicates naturalized species).

SHRUBS & WOODY VINES

+ Berberis vulgaris common barberry
Celastrus scandens climbing bittersweet
Clematis virginiana virgin's-bower

FORBS

Anaphalis margaritacea pearly everlasting
(cont'd...)

(Table 2, cont'd)

Anemone canadensis canada anemone
A. virginiana thimbleweed
Arisaema atrorubens jack-in-the-pulpit
Asclepias syriaca common milkweed
A. incarnata swamp milkweed
Aster novae-angliae new england aster
Campanula uliginosa marsh bellflower
Caulophyllum thalictroides blue cohosh
+ Convallaria majalis lily-of-the-valley
+ Epilobium hirsutum hairy willowherb
Eupatorium maculatum spotted joe-pye weed
Geranium robertianum herb-robert
+ Hemerocallis fulva orange day-lily
+ Hesperis matronalis dame's-rocket
Hydrophyllum virginianum john's-cabbage
Monarda fistulosa wild bergamot
Polygonatum pubescens solomon's-seal
+ Potentilla argentea silvery cinquefoil
(+) Rudbeckia hirta black-eyed susan
Smilacina racemosa false solomon's-seal
Thalictrum polygamum tall meadow rue
+ Veronica longifolia long-leaved speedwell

Table 3. Plants which have shown poor germination and growth (the symbol + indicates naturalized species).

SHRUBS

Aralia hispida bristly sarsaparilla
Ledum groenlandicum labrador tea
+ Rosa rugosa rugosa rose
Taxus canadensis canada yew

FORBS

Aster puniceus red-stemmed aster
A. simplex tall white aster
Clintonia borealis blue-bead lily
+ Eryngium planum eryngo
Eupatorium rugosum white snakeroot
Gentiana andrewsii closed gentian
Lathyrus palustris marsh vetchling
Maianthemum canadense canada mayflower
+ Polygonatum commutatum solomon's-seal
Solidago canadensis canada goldenrod
Solidago graminifolia narrow-leaved goldenrod

Table 4. Plants which have not germinated in a single trial planting. (These are ones which should be tested again; the symbol + indicates naturalized species.)

TREES

+ Catalpa bignonioides catalpa
(cont'd...)

(Table 4, cont'd)

SHRUBS

Sambucus canadensis elderberry
Symphoricarpos albus thin-leaved snowberry

FORBS

Anemone quinquefolia wood-anemone
Collinsia canadensis richweed
Cornus canadensis bunchberry
Desmodium paniculatum tick-trefoil
Epilobium angustifolium fireweed
Erythronium americanum yellow trout-lily
Helianthus divaricatus sunflower
Gaultheria procumbens checkerberry
+ Hypericum perforatum st. john's-wort
Impatiens capensis spotted jewelweed
Monotropa uniflora indian pipe
Panax quinquefolius ginseng
Sagittaria latifolia broad-leaved arrowhead
Trillium undulatum painted trillium
Viola sp. violet

Table 5. Plants which have not germinated in two to five trials. (Different techniques have been used to encourage germination; the symbol + indicates naturalized species).

FORBS

+ Achillea millefolium yarrow
Actaea pachypoda white baneberry
(5 attempts at germination, including crushing the seeds, which seems to help A. rubra; pH will be investigated)
Cypripedium acaule stemless lady's-slipper
C. calceolus yellow lady's-slipper
(Seed of both of the orchids above was planted in the fall with no spring germination; shall try two seasons of winter cooling)
+ Epipactis helleborine helleborine
(5 times collected; have tried 2 or more winter plantings with no success)
Gentiana rubricaulis closed gentian
Podophyllum peltatum mayapple
(4 times collected and dried; no germination)
Sanguinaria canadensis bloodroot
(collected twice with no germination over one winter; will try a second years' winter)
Spiraea tomentosa hardhack
Trillium grandiflorum common trillium
T. erectum purple trillium
Viola pubescens downy yellow violet◆

INTERESTING BOTANICAL AREAS
AT LUTHER MARSH, CENTRAL ONTARIO

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Ontario N0J 1S0

Luther Marsh is well-known for its wildlife populations, but has received little botanical attention. Previous studies have dealt with specific ecological relationships. Foster (1968) determined aquatic plants present in the marsh and their value to waterfowl; Reader (1975; 1977; 1978; & 1979) studied pollination and defoliation of the heath shrubs on the Wylde Lake bog; and studies on prescribed burns and caloric values of selected tree and shrub species have been completed (James 1976; James & Smith 1977; 1978a; 1978b; and Smith & James 1978).

Recently a checklist of vascular plants and vertebrates of Luther Marsh was completed (Sandilands 1984). A total of 604 vascular plant taxa in 98 families was reported, including 420 native taxa and 184 introduced or alien species. Only 2 provincially rare species (*Juglans nigra* and *Valeriana uliginosa*) have been reported, but 21 have been found in 3 or fewer localities in Wellington County (Ecologists 1982). As many areas have not been fully botanized, it is likely that additional species will be found.

Luther Marsh is located along the boundary of Wellington and Dufferin counties in central Ontario, between Arthur and Orangeville. It is accessible from Highways 9 and 89 (Fig. 1). Approximately 5,044 ha of land are managed jointly by the Ministry of Natural Resources and the Grand River Conservation Authority.

The marsh is actually an impoundment covering 1,600 ha. It is quite shallow (1-2 m) and becomes choked with aquatic vegetation in the summer. Around the marsh are agricultural land, plantations, extensive swamps, a large bog, and some fens.

The purpose of this note is to direct botanists to the more interesting areas of Luther Marsh. There are many other locations within this area where botanists may have an enjoyable outing, but three accessible and interesting sites described below merit special attention. The locations of these three sites are shown on Figure 2.

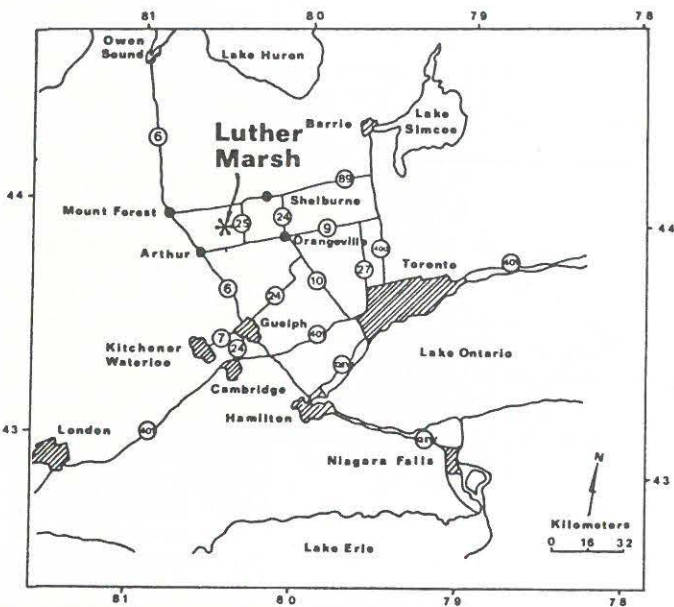


Figure 1. Location of Luther Marsh in central Ontario.

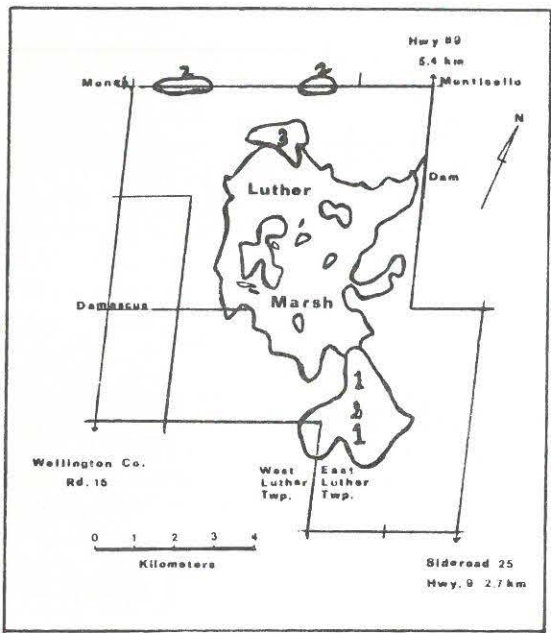


Figure 2. Location of the most interesting botanical areas at Luther Marsh: 1 - Wylde Lake Bog; 2 - two areas along the Monck-Monticello Road; and 3 - the Egerton Esker.

1. Wylde Lake Bog

To get to the Wylde Lake bog, turn north off Highway 9 to the east-west Luther Townline, which is also the division between Wellington and Dufferin counties. The bog is approximately 3 km north. Except for the township roads running through the bog, it is relatively undisturbed. It is also one of the largest bogs in southern Ontario, being approximately 450 ha in size.

The bog will be of particular interest to those who enjoy sedges and heaths (Tables 1 and 2). Most of the sedges and the first 6 heaths listed in Table 2 can be seen without straying from the township road. Other species worthy of note include the following:

<i>Cypripedium acaule</i>	(stemless lady's-slipper)
<i>Spiranthes romanzoffiana</i>	(hooded ladies'-tresses)
<i>Betula pumila</i>	
var. <i>glandulifera</i>	(swamp birch)
<i>Stellaria longifolia</i>	(long-leaved stitchwort)
<i>Brasenia schreberi</i>	(water-shield)
<i>Sarracenia purpurea</i>	(pitcher plant)
<i>Drosera rotundifolia</i>	(round-leaved sundew)
<i>Pyrus melanocarpa</i>	(black chokeberry)
<i>Ilex verticillata</i>	(winterberry)
<i>Nemopanthus mucronata</i>	(mountain holly)
<i>Hypericum majus</i>	(a st. john's-wort)
<i>Aster borealis</i>	(rush aster)

2. The Monck-Monticello Road

This road passes through some interesting habitats, including coniferous and mixed swamps, shrub and sedge fens, and damp and upland meadows. Again, without straying far from the shoulder of the road, one may see the following species:

<i>Cypripedium calceolus</i>	(yellow lady's-slipper)
<i>C. reginae</i>	(showy lady's-slipper)
<i>Lilium philadelphicum</i>	(wood lily)
<i>Ranunculus flabellaris</i>	(yellow water-buttercup)
<i>Geum rivale</i>	(water avens)
<i>Polygala paucifolia</i>	(fringed polygala)
<i>Lonicera oblongifolia</i>	(swamp honeysuckle)
<i>Valeriana uliginosa</i>	(valerian)
<i>Senecio aureus</i>	(golden ragwort).

Both the large and small varieties of the yellow lady's-slipper are present, and the valerian is abundant in some areas.

Table 1. Sedges of the Wylde Lake Bog, at Luther Marsh.

Scientific Name	Common Name
<i>Carex bebbii</i>	sedge
<i>C. canescens</i>	sedge
<i>C. castanea</i>	sedge
<i>C. chordorrhiza</i>	sedge
<i>C. hystericina</i>	sedge
<i>C. interior</i>	sedge
<i>C. lacustris</i>	sedge
<i>C. oligosperma</i>	sedge
<i>C. paupercula</i>	sedge
<i>C. trisperma</i>	sedge
<i>Dulichium arundinaceum</i>	three-way sedge
<i>Eleocharis acicularis</i>	spike-rush
<i>E. intermedia</i>	spike-rush
<i>E. obtusa</i>	spike-rush
<i>E. smallii</i>	spike-rush
<i>Eriophorum spissum</i>	cotton-grass
<i>E. virginicum</i>	cotton-grass
<i>Rhynchospora alba</i>	beak-rush
<i>Scirpus atrovirens</i>	bulrush
<i>S. hudsonianus</i>	bulrush
<i>S. rubrotinctus</i>	bulrush

Table 2. Shrubs in the heath family (Ericaceae) in order of abundance at Wylde Lake Bog, Luther Marsh.

Scientific Name	Common Name
<i>Vaccinium myrtilloides</i>	velvet-leaf blueberry
<i>Chamaedaphne calyculata</i>	leatherleaf
<i>Ledum groenlandicum</i>	labrador tea
<i>Kalmia polifolia</i>	pale laurel
<i>Andromeda glaucophylla</i>	bog rosemary
<i>Gaultheria procumbens</i>	wintergreen
<i>Vaccinium oxycoccus</i>	small cranberry
<i>V. macrocarpon</i>	large cranberry
<i>V. angustifolium</i>	low sweet blueberry
<i>Gaylussacia baccata</i>	huckleberry
<i>Arctostaphylos uva-ursi</i>	bearberry

3. The Egerton Esker

This area requires a little more effort to get to, but is well worth it. Park on the south side of the Monck-Monticello Road opposite the old barn on agricultural lands. On the south side of the road there is a damp meadow with a large, man-made pond in it. There is an old gateway at the western end and an overgrown roadway which leads southward through a willow

swale into an upland meadow. Angle eastward between two small hardwood bushes and you will come to a sandy roadway. Follow this eastward until you come to the internal road system (Fig. 2). At this point, there is a number of options. A trail goes to the east along the esker through coniferous and mixed swamp and ends at an observation tower overlooking the marsh. To the south, the road leads through coniferous forest for 300-400 m; to the east, the road goes through coniferous and mixed forests and fen for almost a kilometer. The species of interest here include the following:

<u>Botrychium dissectum</u>	(cut-leaf grape fern)
<u>Osmunda regalis</u>	(royal fern)
<u>Triglochin maritima</u>	(seaside arrow-grass)
<u>Uvularia grandiflora</u>	(large-flowered bellwort)
<u>Lilium philadelphicum</u>	(wood lily)
<u>Clintonia borealis</u>	(bluebead-lily)
<u>Cypripedium acaule</u>	(stemless lady's-slipper)
<u>C. calceolus</u>	(yellow lady's-slipper)
<u>C. reginae</u>	(showy lady's-slipper)
<u>Platanthera hyperborea</u>	(tall northern green orchid)
<u>P. lacera</u>	(ragged fringed-orchid)
<u>Corallorhiza trifida</u>	(early coral-root)
<u>Spiraea tomentosa</u>	(steeple-bush)
<u>Polygala paucifolia</u>	(fringed polygala)
<u>Pyrola asarifolia</u>	(pink pyrola)
<u>Menyanthes trifoliata</u>	(buckbean)
<u>Linnaea borealis</u>	(twinflower)
<u>Campanula aparinoides</u>	(marsh bellflower)

The marsh itself is rich in aquatic plants and it supports a wide variety of species in the pondweed, naiad, water-plantain, frog's-bit, duckweed, pickerel-weed, hornwort, water-lily, and crowfoot families.

Anyone visiting Luther Marsh should follow these precautions:

1. Some of the ditches are deceptively deep. Test them carefully before wading through.
2. Certain areas have been designated sanctuaries to protect rare species or significant waterfowl nesting and staging areas. Entry for any purpose is prohibited unless special permission is obtained. The sanctuaries are marked with red signs.
3. Until July 31 of each year, a permit is required to canoe on the lake. This permit may be obtained at the main headquarters at the dam.

Most botanists from southern Ontario should enjoy a day at Luther Marsh, as much of the vegetation is more typical of northern Ontario.

Those with a zoological background will also find many species of butterflies and birds not normally found at this latitude.

Additions and corrections to the lists of plants and vertebrates of Luther Marsh are welcomed.

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[Copies of Annotated Checklist of the Vascular Plants and Vertebrates of Luther Marsh, Ontario are available from the author, address above, for \$ 6.50.]

A. COSENS (1869-1938): A BOTANIST, TEACHER, AND AUTHOR FROM TORONTO

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My father, Dr. A. Cosens (Fig. 1), was born in 1869 in a log cabin in Tuckersmith, Huron County, Ontario. His father's family came from Dorking, England, and settled on land known as the Huron Tract. The name Absalom was given by his Bible-influenced father. This name was not appreciated by my father, who preferred to be known as "Ab. Cosens" and signed his name "A. Cosens."

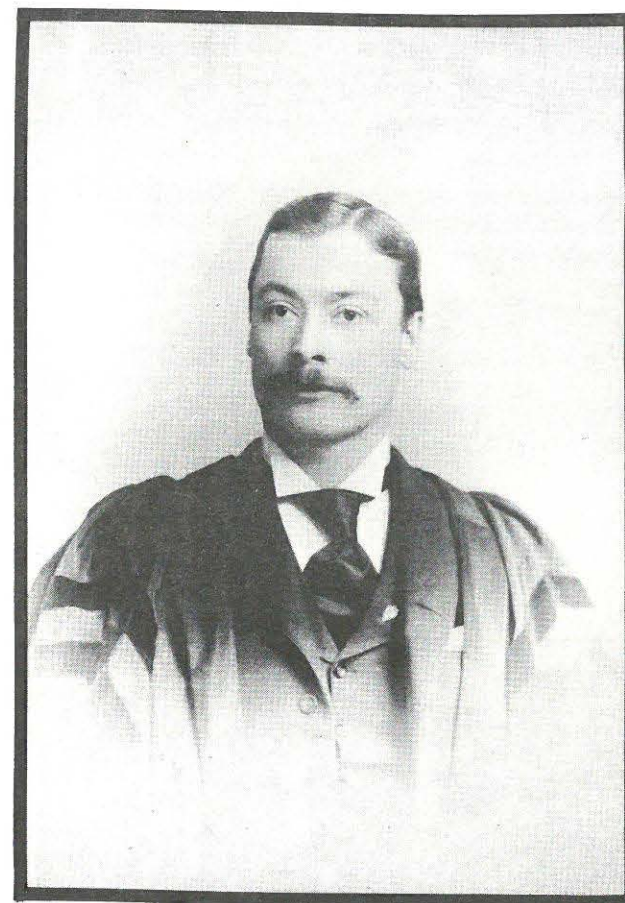


Figure 1. Absalom Cosens (1869-1938) as he appeared at graduation from the University of Toronto.

Absalom Cosens received his elementary education at the one-teacher Tuckersmith School. Later he attended the Seaforth High School, where his scholastic abilities became apparent. Money was not available for a university education, so he obtained an Ontario teaching certificate and taught in a local school for a few years while saving enough money to go to university.

During his youth and young manhood, Absalom Cosens roamed the fields and woods near his home, developing a knowledge and love of nature and all its manifestations. Thus, it was natural that he studied science subjects, including biology, minerology, and geology, at the University of Toronto. He graduated with Honours in 1896 and spent a year at the Faculty of Education to further prepare for his teaching career. His first appointment was to Brampton High School, where he taught for seven years. In 1904 he welcomed his appointment to Parkdale Collegiate Institute as Head of the Science Department, since by being in Toronto he would be able to study extramurally at the Botany Department, University of Toronto. He quickly obtained a Master of Arts degree. Then, by working at the University every Saturday over a period of years, and by spending all of his spare time studying and collecting specimens, he earned a Doctor of Philosophy degree in 1913. His special study was the insects which stimulate the formation of galls, especially on goldenrod, causing abnormal cell division. His collection of plant specimens, gathered at that time and later, are part of the herbarium (TRT) housed at the Royal Ontario Museum. Absalom Cosens' Ph.D., earned under J.H. Faull, Head of the Botany Department, was one of the last granted to a candidate carrying, at the same time, a full teaching load. From 1913 on he became known to Parkdale students, unofficially, as "Doc." This was later changed to "Old Doc," to distinguish him from his son, Gordon, who was "Young Doc."

The greatest contribution of Parkdale students to the 1914-18 war can be seen on the school's war memorial tablet. It was a sad time for all. Almost weekly, at the morning assembly, the names of those former students who were missing or killed in action would be read out. In the smaller school at that time, the names of former students, who had enlisted as young as seventeen years of age, were well-known. Those unknown and known to our family, such as Fleetwood Daniels and Robert McLuckie, became household names in our home.

Following World War I, classes at Parkdale became larger and new subjects, such as Botany, were introduced into the curriculum. Over the years my father had written chatty, natural history essays, which were published in the Sunday School papers of the Presbyterian and Methodist churches. He conceived the idea of using these as a starting point for a "Botany for High Schools," following the Botany curriculum outlined by the Ontario Department of Education. He invited Mr. T.J. Ivey, Science Master at Harbord Collegiate Institute, to be co-author with each contributing his own expertise in teaching and writing. The Cosens & Ivey "Botany" became an authorized text book and was widely used throughout Ontario and some western provinces of Canada. Later, in 1926, the two authors published a revision of Spotton's flora, entitled "Wild Plants of Canada." The scholarly key to plant families included in this publication was a major achievement at that time. Since then, changes in nomenclature and taxonomy have made it out-of-date.

When he received his Ph.D., Absalom Cosens was offered several university appointments. However, at that time salaries were too low to support a family. For this reason, he continued to teach at Parkdale Collegiate, to be involved with the Toronto Field Naturalists, and to collect and publish papers on ferns and insects. In a history of secondary school teachers in Ontario, Dr. A. Cosens is described as the most highly qualified and versatile teacher in Ontario at that time.

During over thirty years of teaching, my father was appreciated by his students and he inspired many of them to further careers in Science. Among these were Dr. Norma Ford Walker and Dr. Edward H. Craigie, who became professors and heads of departments at the University of Toronto. His son, Gordon Cosens, became Dean of the Faculty of Forestry, University of Toronto, and his daughter, Edith Cosens, was a teacher of Home Economics in three secondary schools in Toronto.

By 1927 it became apparent that his health was failing. Parkinson's disease, or paralysis-agitans, was diagnosed at a time when there was no known treatment. He reluctantly retired in 1928. This was followed by ten years of increasing helplessness and dependence upon others, which he bore with patience and courage. He died on 17 October 1938, a scholar and a gentleman. ♦

THREE AQUATIC PLANTS NEW FOR THE BRUCE PENINSULA

Robert C. Simpson, Department of Natural Resources, Lord Fairfax Community College, P.O. Box 47, Middleton, Virginia 22645

While leading a field trip in the Bruce Peninsula in July 1982, I found 3 species of pondweed, *Potamogeton crispus*, *P. pectinatus*, and *P. praelongus*, at Look About Isles Resort, on Myle's Parker Bay (3 km south of Stokes Bay). None of these pondweeds was reported for the Bruce Peninsula in current literature (Shivas (ed.) 1969; Thomson 1970; and Johnson 1979).

All three species were washed up along the rocky shore and on the boat ramp. During the next two summers, the three pondweeds were readily found washed ashore from a large weed bed in Myle's Parker Bay. *Potamogeton praelongus* and *P. crispus* were also found at scattered localities along the western shore of the Bruce Peninsula. Many floating pieces of *P. crispus* were seen in the harbour at Tobermory.

Potamogeton crispus, *P. pectinatus*, and *P. praelongus* are common in the Great Lakes region (Riley 1979). My records indicate that *P. praelongus* and *P. crispus* are frequent at least on the western shore of the Bruce Peninsula.

Documentation: Voucher specimens for the three pondweeds discussed above are in the Lord Fairfax Community College Herbarium (LFCC).

References

- Johnson, J. 1979. Checklist of Vascular Plants of the Bruce Peninsula (unpublished addendum). Federation of Ontario Naturalists.
- Riley, J.L. 1979. Ontario's pondweeds (genus *Potamogeton*). Ont. Field Biol. 33(2):1-24.
- Shivas, M. S. (ed.). 1969. Checklist of Vascular Plants of the Bruce Peninsula. Federation of Ontario Naturalists. 61 pp.
- Thomson, G. W. 1970. Vascular plants of the Bruce Peninsula: A review, with comments and additions. Mich. Bot. 9:9-16. ♦

[Joe Johnson has collected 2 of the pondweeds discussed above; he encourages others to look for other aquatics as he suspects that these habitats have not been thoroughly botanized. Part 4 of the Atlas of the Rare Vascular Plants of Ontario will include additional species of pondweeds for the Bruce Peninsula. JW]

NEWS OF FIELD BOTANISTS

CLAUDE E. GARTON: THUNDER BAY'S MOST VALUABLE NATURAL RESOURCE

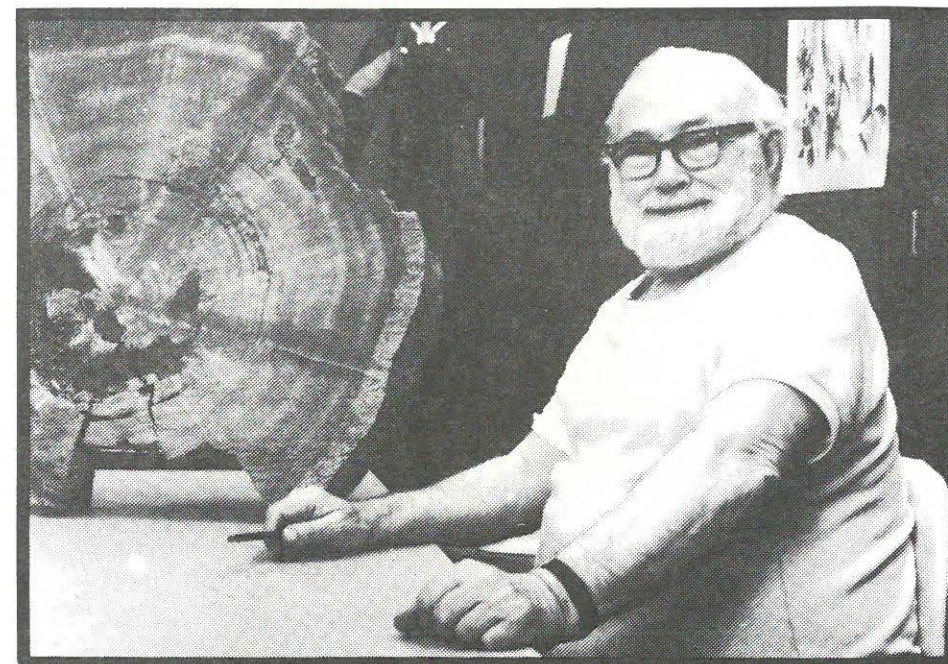
Terry Noble, 590 Valleywood Cres., Thunder Bay, Ontario P7B 5M7

Well-known throughout northwestern Ontario, Claude E. Garton has contributed more than anyone to our knowledge of the natural wonders of this part of the province. His encyclopedic knowledge of all aspects of the area's natural resources has been a continual source of amazement to those who know him. In fact, he is sometimes referred to as "Thunder Bay's most valuable natural resource."

Born in 1907 near Aylmer, Ontario, Claude later attended teachers' college in London, Ontario.

Subsequently he taught school for two years near St. Thomas before moving to what was then Port Arthur in 1928. Until 1936 he taught at St. James School and then became principal of Current River School, a position he occupied until 1941. At that time he became principal of Pine Street School before enlisting in the armed services. After his war duties, he once again became principal at Current River School, where he remained until his retirement in 1966 when the school was renamed in his honour.

During his teaching career, Claude furthered his own education through winter extension courses. He attended summer courses on campus at Queen's University, from which he graduated in 1942. It was through these courses that Claude developed an interest in biology, particularly plant taxonomy and floristics. He began collecting plants in the summer of 1933, an avocation he has continued to this day. His tenacity is reflected in the fact that over 40 first records for Ontario plants are credited to him.



Claude Garton, whose career at Lakehead University involved close collaboration with the departments of Forestry and Biology, photographed in the Claude E. Garton Herbarium (LKHD).

Following his retirement from teaching in 1966, Claude donated his plant collection to Lakehead University. The University named the Herbarium in his honour and he has been its curator ever since. Under his guidance, the Herbarium has grown to include over 76,000 specimens. Although his interests cover the complete range of floristic themes, his passion is for bryophytes and lichens, as well as those plants associated with the Lake Superior shoreline and offshore islands, particularly the Arctic-alpine affiliates which have survived here as relict disjuncts.

Claude Garton has been a member of the local fish and game club and a charter member of the Thunder Bay Field Naturalists' Club. Both individually and as a member of these clubs, Claude has been an important participant in all environmental issues that have affected not only the Thunder Bay area, but northwestern Ontario as well. In addition to having a school and the herbarium named after him, as well as numerous acknowledgements in the botanical literature relating to northern Ontario, Mr. Garton has received a number of awards of recognition for his contributions to the public. These awards include: the Coronation Medal at the time of Queen Elizabeth's coronation; the position of Honorary Professor of Biology from Lakehead University in 1966; the Federation of Ontario Naturalists Conservation Trophy in 1978; a Citizens of Exceptional Achievement Award from the City of Thunder Bay in 1979; and, in the same year, the title of Honorary Doctor of Science from Lakehead University.

Claude Garton's greatest contribution, however, has been the inspiration he continues to provide to so many people, particularly students at all levels of study. Although his association with the Herbarium will be reduced to some extent due to his health, it is to Claude Garton's credit that so many young students, perhaps unbeknownst to them, are still to be recipients of his inspiration and enthusiasm for field botany and conservation.

Much to his regret, Claude Garton is unable to carry on his duties as Curator of the Claude E. Garton Herbarium at Lakehead University (LKHD) due to recent health problems. The Departments of Forestry and Biology are making arrangements to carry on the work of the herbarium, however. At present any herbarium enquiries should be directed to Ms. Gail Jackson, Department of Biology, Lakehead University, Thunder Bay, Ontario P7B 5E1. ♦

GENETICS AND GENE COLOGY OF *Larix laricina* (LARCH) IN NORTHERN ONTARIO

Timothy Dickinson, NSERC Postdoctoral Assistant in Forestry, Lakehead University, Thunder Bay, Ontario P7B 5E1

The title above is the topic of a research project, funded by an NSERC Forestry Development Grant, that is presently under way at Lakehead University. It is a multidisciplinary project, involving personnel from the School of Forestry and the Biology Department. Components of the project include the establishment of provenance trials at Thunder Bay and Pickle Lake (R.E. Farmer and G. O'Reilly), studies of genetic variation via isozyme analyses (P. Knowles), shoot morphogenesis (A.D. Macdonald), and wood properties (K.C. Yang). In addition, Dr. W.H. Parker and I are examining range-wide intra-specific variation in features of tamarack cones and short shoot needles.

Our Ontario material was collected last year at the same time as the seeds and seedlings that are being used to establish the provenance trials. Most of the collections from outside Ontario have been made (or are being made this summer) by colleagues in other areas, throughout the remainder of the range. Last summer I made some collections in Quebec, New York, Pennsylvania, West Virginia, and Ohio, and this summer we will be collecting in the Rockies (*Larix lyallii* and *L. occidentalis*), in northern Alberta and the Northwest Territories, and in northern Manitoba.

We are collecting data from samples of 10 to 20 trees from each of what will eventually be more than 50 populations representing virtually the entire range of *Larix laricina*. Voucher specimens for each population are being deposited in LKHD; the remainder of the collections will be kept by the School of Forestry. Additional funding from the CFS block grant to the School of Forestry has enabled us to collect much of our data from permanent, stained sections of the short shoot needles. As with the cones, part of the needle data consists of the scores for characteristics traditionally used in conifer systematics. In addition, however, we are sampling the needle cross-sectional outline and examining shape variation among the population samples by means of the sheared PCA technique described by Humphries et al. (1981, Syst. Zool. 30:291-308).

We expect to complete our data collecting this coming winter, and to report on the range-wide patterns of variation in all of our data sets sometime next year. Parallel studies on the genetic variation and wood properties of the same Ontario individuals that we have studied will permit examination of the congruence of data sets from different sources. These data sets will also allow us to evaluate the extent to which phenotypic variability is associated with the degree of genetic heterozygosity.

Other studies of variation in North American *Larix* will be possible in the future. These include chemosystematic studies and the comparison of our results concerning phenotypic variation among Ontario populations with data collected from the plants in the provenance trials. ♦

[We have just received the following information from Timothy Dickinson:]

"I am finishing my Lakehead job here [518 North 35th Street, Lincoln, Nebraska 68503], where my wife has a post-doc in the Plant Pathology Department at UN-L; it means learning to commute via modem in addition to some trips back in the flesh. I plan to stay here through the spring, writing up the work done in Thunder Bay. After that, I hope to be able to do another post-doc, this time in Toronto (and have my wife join me there when she finishes here)."

WILFRED BOTHAM RECEIVES SPECIAL AWARDS

Recently we learned through the grape vine that Wilf Botham was presented with 2 awards this summer. After considerable prodding, Wilf sent us the following account of the presentations.

"I know very little about the Certificate of Merit that I received from Environment Canada other than some people at Point Pelee sent in a list of names (or was I the only name submitted?), and the Department chose my name out of many (or out of one).

"The presentation followed the Tomato Festival [on 24 August 1985 in Essex County], which this year was shared by Parks Canada in celebration of their 100th Anniversary. Marie and I rode in a democrat drawn by a pair of horses. The route was long but we were near the front end so we got to see the whole parade after we dismounted at the arena. Inside, I was seated with a few dignitaries on the platform. Prizes

were given for best float, etc., then a Mr. Dionne from Environment Canada presented me with the Certificate. Unfortunately I was unable to understand a word of what the announcer said about me, but it was somewhat lengthy. Our daughter said she could understand, but she sat out in front.

"The wording on the Certificate is, following my name in large script:

'Your voluntary effort on behalf of Environment Canada is a source of pride to the many people whose lives you have touched. Your continuing personal commitment to the environment is a true inspiration.'

"It was signed by Suzanne Blais-Grenier.

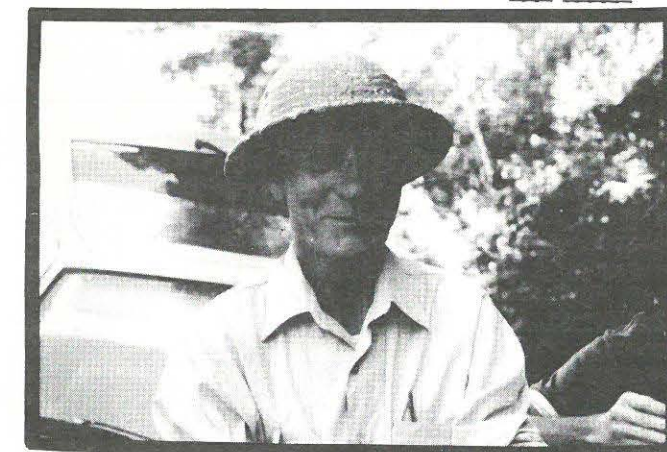
"The second award that I received was from The Essex County Field Naturalists' Club, at their annual meeting held on 11 September 1985. The award included several items. First, an engraved plaque, with the words:

'Wilfred Botham. In recognition of his contribution to the natural history of Essex County. Presented by The Essex County Field Naturalists' Club. September 11, 1985.'

"Then a scripted scroll, reading:

'Essex County Field Naturalists' Club. Presented to Wilf Botham in appreciation of significant contributions to the advancement of the knowledge of the Natural History of Essex County. September 11, 1985.'

"I also received an honorary life membership in the club. My wife and I received free tickets to the banquet. As though this were not enough, a most flattering account of me appeared in the Club's publication, *The Egret*."



Wilf Botham relaxes at the end of a botanical excursion in Essex County (photo by Jocelyn Webber, June 1985).

INFORMATION & REQUESTS

THE BIOSYSTEMATICS RESEARCH INSTITUTE

G.A. Mulligan, Director, Biosystematics
Research Institute, Agriculture Canada,
Ottawa, Ontario K1A 0C6

The Biosystematics Research Institute (B.R.I.) conducts research on the classification of insects, mites, spiders, nematodes, vascular plants, fungi, and non-medical bacteria. The Institute, with a staff of 55 professionals, provides an identification service that is widely used by other government agencies, both federal and provincial, by universities, and by individuals. It is responsible for developing and maintaining the Canadian National Collections of Insects, Arachnids and Nematodes (12,800,000 specimens), for the Agriculture Canada Vascular Plant Herbarium (780,000 collections), for the National Mycological Herbarium (250,000 collections), and for the National Collection of Fungus and Bacterial Cultures. The Collections are particularly representative of organisms of Arctic and temperate North America and those of special importance to agriculture and forestry. The Institute's unique taxonomic libraries are part of the National Library system. Canadian and foreign workers frequently borrow collections and visit to consult with Institute specialists and work with the collections and libraries.

The Institute provides Canada with a national centre of taxonomic expertise for dealing with problems relating to 90% of the species of organisms found in Canada. It conducts research and supplies information on insects, mites, spiders, plant parasitic nematodes, weeds, crop plants, native plants, plant parasitic and biodegrading fungi, and non-medical bacteria. The team of scientists and technicians develop, maintain, and continuously update a national reference system on the taxonomy, biology, and impact of these organisms to ensure that accurate and appropriate information is readily available. The Institute is the major vehicle for the flow of biosystematic knowledge in Canada, and internationally between Canada and other countries.

The following broad aims guide the Biosystematics Research Institute in its operations:

- to conduct research to discriminate and correctly name taxa that occur in Canada or are otherwise of importance to Canadians, and publish the results;
- to contribute to science and its uses by developing natural classifications and interpreting evolutionary relationships;
- to develop and maintain the National Collections of living or preserved organisms from Canada and elsewhere to provide a reference base for biosystematic research on diversity and distribution, and for identification purposes;
- to provide a national identification service for clients, publish guides to help others make identifications, and supply relevant information;
- to provide inventories and floristic and faunistic studies for selected regions, habitats, or host groups to permit effective assessment and monitoring of environments, their quality, and their changes; and
- to provide leadership and cooperation in the development of biosystematics in Canada by making expertise available for training and other educational purposes.

The Institute was formed in 1973 when the Entomology and Plant Research Institutes were amalgamated to consolidate the national research effort on the biosystematic research of the estimated 115,000 species of insects, arachnids, nematodes, vascular plants, and fungi in Canada. As custodian of major systematic collections, the Institute continues a national biosystematic program in Agriculture Canada that originated with the appointment of James Fletcher as Dominion Entomologist and Botanist in 1886 and the donation of his private collections to the Department. B.R.I. is the only Canadian organization with comprehensive national collections, biosystematic expertise, and identification services on these organisms. This permits the Institute to support many Research Branch objectives, and to make a special contribution to one of the broad aims of the Research Branch mandate "to conduct research and provide support for other branches, departments, and agencies in activities of national concern." B.R.I. provides research and taxonomic services on organisms important in production support and resource protection for two major Canadian

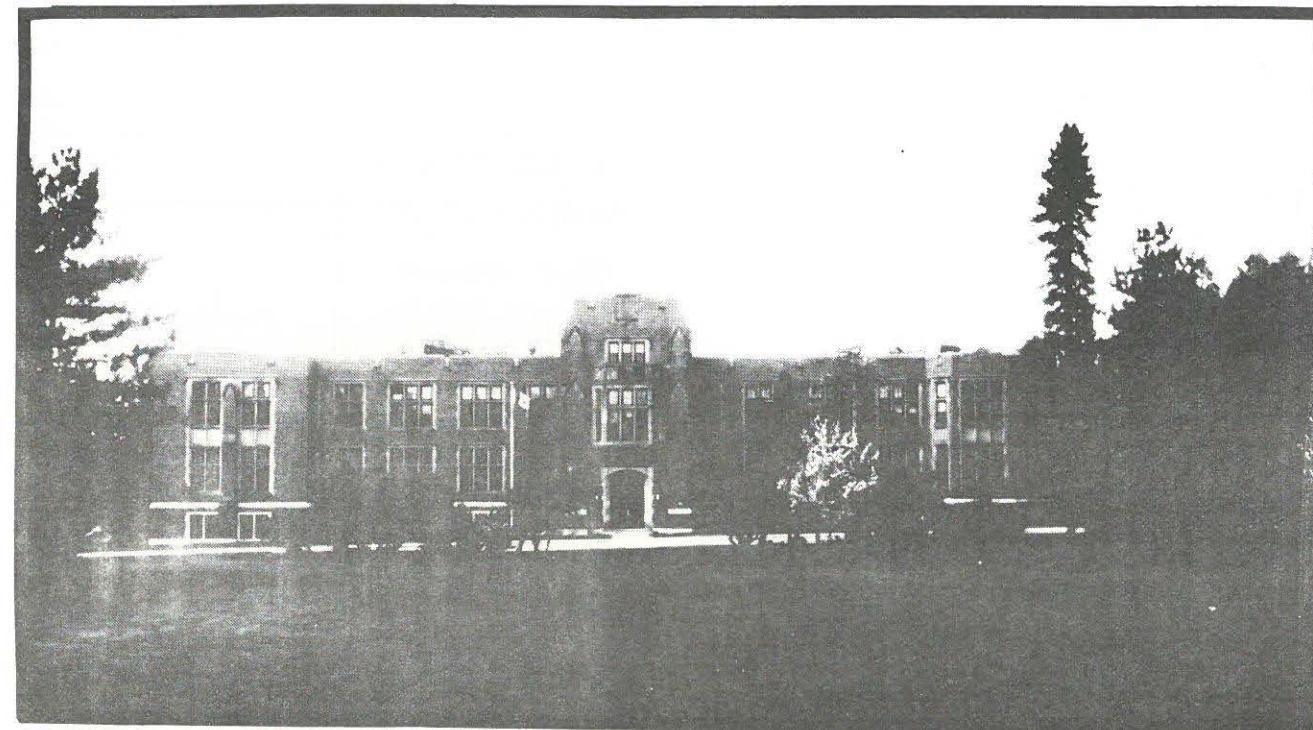


Figure 1. The William Saunders Building, one of two buildings which house the Biosystematics Research Institute at the Central Experimental Farm in Ottawa. The vascular plant herbarium (DAO) is kept in the William Saunders Building. (Photograph from BRI files.)

industries, Agriculture and Forestry, and also makes significant contributions to national efforts in health and welfare, environmental assessment and protection, parks, wildlife, recreation, jurisdiction, forensics, law, and defence.

Identification and taxonomic services are a direct extension of B.R.I.'s collection development and research activities. In response to the ongoing requirements for accurate biosystematic information on these organisms, B.R.I. scientists and technicians identify about 100,000 submitted specimens, collections, and cultures annually. Incoming material from Canadian clients is checked for condition and adequate documentation, and when accepted is assigned a priority and processed, usually in accordance with deadlines requested by clients. Important material from foreign sources is also handled on a discretionary basis when an alternative service is not available.

Comprehensive identification guides are produced: the series The Insects and Arachnids of Canada, various regional floras, Weeds of Canada, Edible and Poisonous Mushrooms of

Canada, and many others. Faunistic and floristic studies, ranging from annotated inventories to extensive interpretive treatments, of special areas such as national parks and the Arctic, are published in the Research Branch Technical Bulletin Series. Biosystematic treatments of economically important species form the basis of other series such as The Biology of Canadian Weeds, Fungi Canadensis, and a planned series on arthropod and nematode pests, predators, and parasites. Other types of technology transfer are exemplified by the Manual of Nearctic Diptera; Annotated Index of Plant Diseases in Canada; Wild-rice; Poison-ivy, Western Poison-oak, and Poison Sumach; Plant Bugs on Fruit Crops in Canada; and Atlas of Airborne Pollen Grains and Common Fungus Spores in Canada.

Additional information on our Institute or about organisms covered by our mandate can be obtained by writing to the Director [address above] or telephoning (613) 996-1665. The Institute is housed in the K.W. Neatby and William Saunders (Fig. 1) buildings on the campus of the Central Experimental Farm in Ottawa. ♦

[Reprinted with permission of Dr. R. Zander, Clinton Herbarium, The Buffalo Museum of Science]

In 1975 the State Legislature passed a law expanding the list of protected plants. The following is a simplified version of this law - Section 193.3 of the New York State Penal Code. The following are native plants which shall be protected pursuant to Section 9-1503 of the Environmental Conservation Law, and such list shall apply statewide:

<u>Arisaema dracontium</u>	green-dragon
<u>Asclepias tuberosa</u>	butterfly-weed
<u>Campanula rotundifolia</u>	harebell
<u>Celastrus scandens</u>	bittersweet
<u>Chimaphila</u> spp.	pipsissewa; spotted evergreen
<u>Cornus florida</u>	flowering dogwood
<u>Drosera</u> spp.	sundew
<u>Epigaea repens</u>	trailing arbutus
<u>Euonymus</u> spp.	burning-bush; strawberry-bush
Filices	all ferns, except bracken, hay-scented, and sensitive
<u>Gentiana</u> spp.	blue-bottles; gentian
<u>Hydrastis canadensis</u>	golden-seal
<u>Ilex</u> spp.	holly; inkberry; black alder
<u>Kalmia</u> spp.	laurel; spoonwood; lambkill
<u>Lilium</u> spp.	lily; turk's-cap
<u>Lobelia cardinalis</u>	cardinal-flower
<u>Lycopodium</u> spp.	all clubmosses
<u>Mertensia virginica</u>	bluebell
<u>Monarda didyma</u>	oswego tea

<u>Myrica pensylvanica</u>	bayberry
<u>Nelumbo lutea</u>	lotus
<u>Opuntia humifusa</u> (<u>O. compressa</u> sp.)	prickly pear
Orchidaceae	all native orchids
<u>Orontium aquaticum</u>	golden-club
<u>Panax quinquefolius</u>	ginseng
<u>Pyrus coronaria</u>	wild crab apple
<u>Rhododendron</u> spp.	azalea; great laurel; rosebay; rhodora
<u>Sabatia</u> spp.	bitterbloom
<u>Sanguinaria canadensis</u>	bloodroot
<u>Sarracenia purpurea</u>	pitcher-plant
<u>Silene caroliniana</u>	wild pink
<u>Trillium</u> spp.	any trillium
<u>Trollius laxus</u>	globe-flower
<u>Viola pedata</u>	bird's-foot violet

[There are only 2 plants protected by law in Ontario: Cypripedium candidum (small white lady's-slipper) and Isotria medeoloides (small whorled pogonia) are protected under the Endangered Species Act.]

POACHING NATIVE PLANTS CONTINUES

[Information from Faith T. Campbell, Natural Resources Defense Council, Inc., 1350 New York Ave. N.W., Suite 300, Washington, D.C. 20005.]

"Poaching of attractive plants continues. This summer, an estimated 700 plants of an orchid, Platanthera blephariglottis [white fringed-orchid], were taken from a preserve in Titus Bog in northwestern Pennsylvania. Unfortunately, Pennsylvania's plant protection law is still being drafted. However, I think we should use this incident to remind every gardener that native orchids offered for sale are always wild-collected, and may be obtained illegally."

UPDATE ON Platanthera leucophaea
(PRAIRIE FRINGED-ORCHID) AT WALPOLE ISLAND

[The following information about one of the sites for Platanthera leucophaea discussed on pages 126 to 128 of this issue) was received recently.]

"...Much of site #2 of Platanthera leucophaea is now a cornfield! Gary Allen and I hiked into the area in June 1985 to see how the site was doing...we found a thriving, new cornfield where much of the best prairie had been... Even the remaining part of the prairie was in rather sad shape in June, having obviously been burned quite late in the spring. We were able to find only one depauperate plant of P. leucophaea at this site."

J. Ross Brown, Tupperville

DEFINITIONS OF 'FLORA' AND 'VEGETATION'

The words "flora" and "vegetation" are often used incorrectly and this has resulted in confusion about their meaning. According to the glossary in Curtis (1959) they are defined as follows:

'Flora - The entire complement of plant species which grows spontaneously in a particular region. The size of a flora is determined by the number of such species and is uninfluenced by the number of individuals of each.

'Vegetation - The total of the plant communities of a region. Differs from the flora because quantitative aspects are considered; numerous or large species are given more attention than rare and inconspicuous species.'

The word "flora" may also mean "manual," as in "Gray's Manual of Botany." Floras and manuals contain keys and descriptions. Regional check-lists are more useful if they are annotated.

Reference

Curtis, J.T. 1959. The vegetation of Wisconsin. University of Wisconsin Press, Madison. 629 pp.

ONTARIO PLANTS IN PRINT

Once again we need an Associate Editor for this column. If you have access to the literature and are interested in getting involved, please contact the Editor.

AMERICAN FERN JOURNAL
REFERENCES FROM 1980 - 1984

compiled by Kathleen Pryer, Botany Division,
National Museum of Natural Sciences, Ottawa,
Ontario K1A 0M8

Futyma, R.P. 1980. The distribution and ecology of Phyllitis scolopendrium in Michigan. 70(3):81-87. [Distribution map shows three stations of P. scolopendrium in Michigan and the general range where it grows in Ontario. Three hypotheses are considered in an attempt to understand the geographic distribution of this rare fern in the upper Great Lakes region.]

Whittier, D.P. 1981. Spore germination and young gametophyte development of Botrychium and Ophioglossum in axenic culture. 71(1): 13-19. [Spores of 8 species of the family Ophioglossaceae were studied in axenic culture to determine how requirements for germination and early gametophyte development compared with results from earlier studies. Spores of Botrychium matricariifolium and Ophioglossum vulgatum var. pseudopodium were collected from Ontario.]

Moran, R.C. 1982. The Asplenium trichomanes complex in the United States and adjacent Canada. 72(1):5-11. [A key to the morphological characters that best distinguish living plants of diploid ssp. trichomanes and tetraploid ssp. quadrivalens is presented. Distribution maps show the main ranges for both subspecies in the U.S. and Canada; both cytotypes occur in Ontario.]

Beitel, J.M. & F.S. Wagner. 1982. The chromosomes of Lycopodium lucidulum. 72(2):33-35. [A chromosome count of n=67 was obtained from fertile material of L. lucidulum collected in an acidic conifer swamp in Grey County, Ontario. This count represents a new chromosome number for the species and is almost one-half the numbers previously reported from North America.]

Harms, V.L. 1983. The lady fern, Athyrium filix-femina, in Saskatchewan. 73(3):117-121. [A general map outlines the main ranges of A. filix-femina varieties in North America; var. michauxii is shown for Ontario.]♦

Airborne and Allergenic Pollen of North America by Walter H. Lewis, Prathibha Vinay, and Vincent E. Zenger. 1983. The Johns Hopkins University Press. Baltimore. xi + XVI colour plates + 254 pages. ISBN 0-8018-2940-2. \$ 60.00 (U.S.)

reviewed by A. Beaudoin, Department of Geography, Trent University, Peterborough, Ontario K9J 7B8

Although "written primarily for allergists and others in the medical profession and for aerobiologists" (p. ix), *Airborne and Allergenic Pollen of North America* contains much material that should be of interest to a much wider readership, including botanists. The authors point out that "because there is no comprehensive North American Flora...basic botanical data involving species distribution, flowering times, and taxonomy are not readily available" (p. ix). This book represents a commendable attempt to remedy this deficiency by bringing together "a large amount of divergent, yet relevant, information" concerning plants "whose pollen becomes airborne" (p. ix). This is accomplished by emphasizing visual presentation, mainly photographs, photomicrographs, and maps, "thereby allowing the user an opportunity to assimilate rapidly botanical facts on plant morphology, geography, phenology, and palynology" (p. ix).

Following an introduction, the major part of the book is organized into three chapters: Chapter 1 deals with trees and shrubs; Chapter 2 is concerned with grasses and grass-like plants; while Chapter 3 covers weeds and herbs. Many plant families are discussed: Chapter 1 includes 52 families of trees and shrubs; Chapter 2 deals with 7 families; and Chapter 3 covers 16 families. Generally, within each chapter, the entries are arranged in alphabetical order by family. Some entries also include discussions at the genus level; these are also arranged alphabetically. However, in Chapter 1, Gymnosperms and Angiosperms are arranged separately; in Chapter 2, Poaceae is the first entry, followed by other grass-like families; while in Chapter 3, Pteridophytes are discussed first, followed by other weeds and herbs.

For each family, the entry consists of a description of the main botanical features of the family, a list of the main genera, a discussion of flowering and pollen production, a description of the pollen morphology, and a discussion of allergenicity. In addition, most entries are accompanied by photographs of one or more

species within the family, usually illustrating the flowers or staminate cones. Some of these are also illustrated in colour plates in a separate section near the beginning of the book. In some cases, the entries include maps showing the distribution of numbers of species within a selected genus. The entries also contain both light-microscope and scanning electron microscope photomicrographs of some representative pollen types. These photographs and photomicrographs in particular are one of the best features of this book. In general, the images are large and very clear. The photomicrographs obtained by light microscopy are most impressive.

The volume also contains two appendices. Appendix 1 includes 735 maps showing "generalized distributions of important wind-dispersed species indigenous to North America" (p. 177). The authors point out that many of these maps are original contributions. For grasses and grass-like plants, the distributions of introduced species are also mapped. For other plants, introduced species are simply listed, together with their "zone of hardiness," which gives an indication of how far north and/or west the species might flourish. The scale of the maps (ca. 1:96,000,000) is such that great detail in the distributions cannot be displayed. Nevertheless, this section does include a valuable compendium of distribution data. Appendix 2 consists of notes on the preparation of samples and on photographic techniques and equipment.

Despite the broad scope of this book, I have some doubts about how it might be used, by palynologists in particular. Near the beginning of the book, there is a four-page section containing 136 colour photomicrographs described as a "visual key to major pollen types" (p. 5). The quality of these images is not as good as others throughout the rest of the book; many of these photomicrographs seem rather fuzzy. Although the idea of having pollen types illustrated adjacent to one another for comparison is a good one, many of these images are too small to show morphological features clearly. The book lacks a descriptive key to supplement the photomicrographs and the descriptions in the text. Therefore, it would probably not be very helpful in the laboratory for the identification of pollen types while counting. Hence, initial identification of pollen would still have to be undertaken using other sources, such as pollen keys and/or reference material. However, once the pollen is identified, this book contains a large amount of supplementary

information that might be beneficial in the interpretation of pollen assemblages. In particular, for many taxa, details of flowering times and modes of pollination are discussed. This kind of data is often difficult to obtain.

One drawback does arise from the authors' attempt to be thorough and wide-ranging, namely that little attention can be paid to the subtleties of pollen variation within each taxon. For example, less than 2 pages is devoted to a discussion of the Pinaceae. No attention is paid to the distinction of pollen of the Pinaceae below the level of genus. Since pollen from the Pinaceae is apparently not a major allergen, this discussion is presumably detailed enough for the book's targeted readers. For other major allergens, the presentation is more detailed. For example, about 14.5 pages are devoted to a discussion of the Asteraceae. From the point of view of the Holocene palynologist, this lack of detailed discussion within some taxa may be a limitation.

As a minor quibble, the book claims to be North American in scope, but most of the maps extend only as far north as ca. 60°N (about the latitude of Churchill, Manitoba). Does this reflect a lack of suitable information available for the Arctic flora?

On the positive side, the production of the book is excellent. It is printed on a high-quality, glossy paper, and therefore the text is easy to read and the black and white photographs and photomicrographs are clear and crisp. In conclusion, I would say that this book would be a useful addition to a bookshelf, as it does contain useful information and illustrations which are not readily available and accessible elsewhere.♦

The Status of Ecological Reserves in Canada by P.M. Taschereau. 1985. Canada Council on Ecological Areas, Ottawa, Ontario K1A 0E7. 120 pp. \$ 8.00.

reviewed by Stephen J. Darbyshire, 7 Braemar St., Ottawa, Ontario K1K 3K3

The author has attempted to update readers on the Canadian activities directed towards establishment of areas for the protection of plant

and animal species since the official termination of the International Biological Program (IBP) in 1974. A historical description of the development of Canadian IBP, ACER (Associate Committee on Environmental Reserves), and MAB (Man and Biosphere) organizations, and a summation of Franson's review of the legal status of ecological reserves in Canada, sets the background for the outline of federal, provincial, and non-governmental agencies involved with ecological reserves.

In appropriate sections each organization or agency is described in terms of its structure, holdings, and functioning. From a national and provincial perspective, only the major organizations with prominent activities are mentioned here, with smaller groups being sometimes mentioned in the appropriate provincial section. Each province is described in its own chapter including the state of ecological reserve legislation, the number of areas designated under IBP, as well as those presently protected by law. General comments on activities of participants, and an annotated list of pertinent publications (mostly government policy publications and reports) are also included.

In the lengthy discussion, the work of establishing ecological reserves is evaluated, critical steps and events are identified, and various questions on the maintenance of ecological reserves are addressed. The book finishes with a list of references and three appendices, giving names and addresses of the National Ecoregions Working Group, the Canadian Environmental Advisory Council, and the author's correspondents.

The general tone of the book suggests that not nearly enough is being done to protect Canadian natural habitats and few field-oriented people would disagree, in my opinion. The considerable research for this report has revealed that in the last 20 years there has been considerable progress, even if it is as yet highly disjointed and full of gaps.

This book is very useful as an overview, relating past and present activities throughout Canada. Of necessity some details are not covered, for example the municipal ecological parks in Windsor and Winnipeg. The combination of cited references and appended addresses provides very useful information and potential resources and assistance. It is to be recommended as reading for all those interested and active in protecting the Canadian natural environment.♦

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