THE CANADIAN BOTANICAL ASSOCIATION

BULLETIN

DE L'ASSOCIATION BOTANIQUE DU CANADA

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His Excellency the Right Honourable / Son Excellence le très honorable
Roméo Leblanc P.C., C.C., C.M.M., C.D.
Governor General of Canada / Gouverneur général du Canada

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J. F. (Joe) Gerrath
Guelph

ON THE INSIDE
À L'INTÉRIEUR

EDITOR'S COMMENTS
COMMENTAIRE DE LA PART DE L'ÉDITEUR

This issue marks the beginning of the end for me. This will be the last Bulletin volume I edit for CBA/ABC (if we can find someone who is willing to take on the task for 1997). The executive must arrange for a new Editor very soon, and I would ask that anyone who is interested in taking on this time-consuming, but very rewarding, task should contact the President, Secretary or me.

I can provide information on what is involved in preparing each issue. Unfortunately the new editor will probably be operating with either a Mac or an IBM-compatible computer, so that I would not be able to transfer over page templates from my "non-standard" Amiga computer and desktop publishing program. However, it should be relatively easy to design new page templates using available DTP or word processing programs.

Membership Renewals

Those of you who have neglected to send in your membership renewal for 1996 (it even slipped my mind until a short time ago) will find a reminder from

the Treasurer tucked into this issue. Please, don't shoot the messenger (I am bleeding through enough holes already!). This reminder reflects your membership status in the Treasurer's database as of the time the printing labels for this issue were prepared. Members whose renewal has been entered will find a "96" on the mailing label (and no reminder in the envelope).

Biodiversity Diskettes

On page 10 of this issue you will find Ernie Small's note about the delay in production of the diskettes for **Canadian Biodiversity**. At the time I am writing this commentary, I still have no firm idea of when these will be received so that I can send them out to those of you who have ordered them. Those who have ordered a set will, no doubt, have noticed that I have not yet cashed any of the cheques received, pending arrival of the diskettes. When I have the diskettes in my hot little hands, I will get them into the mail as quickly as I can. For those planning to attend the Annual Meeting, I will bring the remaining sets of diskettes to Charlottetown for distribution (free) to those who would like to have a set (and can't afford the $5.00 charge for mailing them).

Museum of Nature Update

Last October the Auditor General's report concerning the financial and management practices of the Canadian Museum of Nature was made public. The Executive of CBA/ABC obtained a copy of the report (along with a damning editorial which appeared in the Ottawa Citizen on Oct. 18, 1995). I present a brief summary here.

According to Mr. Desautels' report, "there is reasonable assurance that there are no significant deficiencies in the systems and practices examined, except in relation to strategic planning and performance measurement, management of collections and management of human resources ... . These deficiencies are significant because, in our view, they put at risk the achievement of the Museum's strategic objectives and the protection of the unique assets that constitute its collections".

Among the deficiencies, the report cites "inadequate storage facilities and a lack of comprehensive knowledge of the Museum's collection holdings" so that "the collections are at risk of deteriorating and their purposes of supporting the Museum's strategic direction and being more accessible to all Canadians are also at risk". Later the report states: "... the present cataloguing of the collections is fragmented, incomplete and, even in the cases where it is computerized, not easily accessible".

Regarding the management of Museum employees, the Auditor General notes that "the Museum is an institution where there is little or no trust between management and a significant number of staff in core functions". Later, the report notes "a high degree of anxiety and poor morale among staff" and "insufficient or ineffective consultation and communication with staff before the various changes were introduced".

The Museum's Board of Trustees responded by expressing pleasure at the passing grades given by the Auditor General in several areas. Regarding the deficiencies cited in the report, the Board noted that these were being addressed and implied that all would be set right once the current changes have been fully implemented.

Perhaps the Ottawa Citizen editorial made the most pertinent comment about the whole situation. "It's an old dodge: Declare you've been vindicated when actually you've been castigated -- and hope no one notices. That appears to be the strategy of the Museum of Nature ..."

Review Books

The Christmas mail has brought a new harvest of books from various publishers. I have listed these on page 13 and I would invite anyone who would like to write a review of any of these books to contact me a.s.a.p. Some of the books which were listed in last years issues of the Bulletin are still available for review.

Joe Gerrath, Editor

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PRIX LIONEL CINQ-MARS AWARD

Each year the Canadian Botanical Association gives an award for the best student paper presented at the CBA/ABC annual meeting. The award is made in memory of Lionel Cinq-Mars, a founding member of the Association and a widely admired teacher.

Any bona fide student enrolled at a Canadian institution of higher learning is eligible, as well as Canadian students at foreign institutions. The paper (one only per student) can be given at any session of the annual meeting. Every effort will be made to ensure that each student in the competition has a fair evaluation and an equal chance of winning the award.

Papers will be evaluated by a panel of judges (at least one from each of the sections of CBA/ABC) which is chaired by the President-Elect, C.C. Chinnappa. The merit of each paper will be judged on the basis of content (60%) (originality, technical expertise, and associated subject knowledge) and presentation (40%) (lucidity, organization, use of visual aids, audibility and "presence").

The Lionel Cinq-Mars Competition is an important part of each annual meeting. We hope that there will be many participants at Charlottetown and that the students will benefit, both from the experience of giving an oral presentation and from the comments which each student will receive from the panel of judges.

Please note that only those students who clearly indicate on their abstract form that they wish to enter the Cinq-Mars Competition will be placed on the list of participants.

Please note that a copy of the abstract form should be sent to:

Dr. C.C. Chinnappa
Department of Biological Sciences
University of Calgary
Calgary, AB T2N 1N4
FAX: (403) 220-9311

Chaque année l'association canadienne de botanique décerne un prix pour la meilleure communication orale présentée par un étudiant [ou une étudiante] lors de la rencontre annuelle de l'ABC/CBA. La récompense est remise à la mémoire de Lionel Cinq-Mars, un des membres fondateurs de l'association et un professeur fort admiré.

Tout étudiant inscrit dans une institution canadienne d'études supérieures, et tout étudiant canadien à l'étranger, sont éligibles. La communication (seulement une permise par étudiant) peut être présentée à n'importe quelle session de la rencontre. Un effort sera fait afin d'assurer à chaque étudiant de pouvoir compter sur une chance égale pour l'obtention de ce prix.

La décision finale sera rendue par un jury comprenant au moins un membre de chaque section de l'ABC/CBA et dirigé par le président désigné, C.C. Chinnappa. La qualité de la communication est jugée selon le contenu (60%) (originalité, techniques, connaissance du sujet) et la présentation (40%) (lucidité, organisation, utilisation de l'audovisuel, clarté du texte).

La compétition Cinq-Mars est une partie importante de chaque rencontre annuelle. Nous comptons sur une forte participation à Charlottetown et nous espérons que les étudiants bénéficieront autant de l'expérience acquise à communiquer oralement que des commentaires qu'ils recevront de la part des membres du jury.

Veuillez prendre note que seuls les étudiants, qui ont clairement indiqué sur le formulaire de résumé leur intention de participer à la compétition Cinq-Mars, seront inscrits sur la liste des participants.

Veuillez faire parvenir une copie du formulaire de résumé à:

Dr. C.C. Chinnappa
Department of Biological Sciences
University of Calgary
Calgary, AB T2N 1N4
FAX: (403) 220-9311

John Macoun Travel Bursary

The John Macoun Travel Bursary, named in honour of the man who served as official botanist on five major expeditions throughout Canada during the late 19th and early 20th centuries, is awarded to a graduate student who presents an oral paper in the Lionel Cinq-Mars Competition.

Eligibility:

1. Competition for the Bursary is open to **Canadian students both within and outside of Canada.** Eligible students are encouraged to apply, even if the CBA/ABC meeting is to be held at their own university.

2. Competitors **must present a paper in the Lionel Cinq-Mars Competition** at the 1995 CBA/ABC Annual Meeting at the University of P.E.I.

3. No student may receive more than one award from the Macoun Fund while registered for the same degree.

Procedures:

1. Students applying for an award must do so **no later than March 1, 1995.**

2. The application must contain the following documents:

a) **a copy of the Abstract** of the paper to be given in the Lionel Cinq-Mars Competition at the CBA/ABC Annual Meeting.

b) a **supporting letter from the student's Supervisor** of research that also includes a statement that the student is engaged in a Ph.D. or M.Sc. programme.

c) a statement from the student outlining the **amount of money requested.**

d) the student's **curriculum vitae** (one page).

e) a **letter of recommendation from a member of the student's research committee** (not the Supervisor).

3. Send the complete set of application documents to the CBA/ABC President:

Dr. Keith Winterhalder
Department of Biology
Laurentian University
Sudbury, ON P3E 2C6
FAX: (705) 675-4859

4. The CBA/ABC President will appoint a **Student Awards Committee** to screen all applications, to recommend the candidates for awards and the amount of each award. The sole selection criteria shall be those of academic merit.

5. Macoun Bursary winners will be notified before the registration deadline for the annual meeting, if possible, and awards will be paid at that time.

6. During the awards ceremony at the CBA/ABC Annual Meeting in Charlottetown, Macoun Bursary winners will be officially announced and presented with an award certificate.

Special Issue of Canadian Field Naturalist Vol. 109(3) July-September 1995

This special issue of the Canadian Field Naturalist, published in cooperation with the Missouri Botanical Garden, contains three benchmark reference papers by James S. Pringle, Royal Botanical Gardens, Hamilton. These papers cover the major floristic studies from the late eighteenth century to the end of the twentieth century for Canada, Greenland and Saint-Pierre et Miquelon. The titles are:

1. The history of the exploration of the vascular flora of Canada.
2. The history of the exploration of the vascular flora of Saint-Pierre et Miquelon.
3. The history of the exploration of the vascular flora of Greenland.

This special issue is available ($10.00 + $2.50 P&H) from: Business Manager, Canadian Field Naturalist, Box 35069, Westgate P.O., Ont., K1Z 1A2

La bourse de voyage John Macoun

La bourse de voyage John Macoun, établie en l'honneur de l'homme qui, dans l'exercice de ses fonctions en tant que botaniste, a participé à 5 expéditions majeures à travers le Canada de la fin du 19e siècle au début du 20e siècle, est allouée à un étudiant [ou une étudiante] gradué qui présente une communication orale dans le cadre de la compétition Lionel Cinq-Mars.

Eligibilité:

1. La compétition pour la bourse est ouverte **aux étudiants canadiens au Canada ou à l'étranger**. Les étudiants qui sont éligibles sont encouragés à remplir une demande même si la rencontre annuelle de l'ABC/CBA se tient à leur université.

2. Le concurrent doit présenter **une communication dans le cadre de la compétition Lionel Cinq-Mars** à la rencontre annuelle à l'Université de l'Ile Prince Edward.

3. Un étudiant ne peut pas recevoir plus d'un prix de fonds Macoun pour la période durant laquelle il est inscrit à un programme spécifique de degré universitaire.

Procédure:

1. Les étudiants doivent faire parvenir leur demande pour la bourse de voyage **au plus tard le 1er mars 1995.**

2. **La demande doit contenir les documents suivants:**

a) **une copie du résumé de la communication** pour la compétition Lionel Cinq-Mars à la rencontre annuelle de l'ABC/CBA.

b) **une lettre d'appui de la part du directeur de thèse de l'étudiant** qui doit également incluire une déclaration que l'étudiant en question est inscrit à un programme de maîtrise (M.Sc.) ou de doctorat (Ph.D.).

c) **un compte rendu des dépenses** prévues par l'étudiant.

d) **le curriculum vitae** de l'étudiant [une page seulement]

e) **une lettre de référence** d'un membre du comité de direction de l'étudiant [directeur de thèse exclu]

3. Veuillez faire parvenir la demande complète au président de l'ABC/CBA:

Dr. Keith Winterhalder
Département de biologie
Université Laurentienne
Sudbury, ON P3E 2C6
Télécopieur: (705) 675-4859

4. Le président de l'ABC/CBA nommera les membres d'un comité de sélection de prix estudiantins. Ce comité examine les demandes et recommande les candidats pour certains prix et le montant alloué pour chaque prix. Le seul critère d'évaluation sera celui du mérite académique.

5. Les gagnants de la bourse Macoun seront avisés avant la date finale d'inscription pour la rencontre annuelle, si possible, et les prix leur seront remis à ce moment-là.

6. Durant la remise officielle des prix à la rencontre annuelle à Charlottetown, les gagnants de la bourse Macoun seront annoncés et un certificat leur sera présenté.

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STEEVES AWARD AT GUELPH

In the last issue of the Bulletin the winner of the first Taylor A. Steeves Award, given by the Structure and Development Section of CBA/ABC, was omitted from the list of awards presented at the 1995 Annual Meeting in Guelph. The Steeves Award was presented to Dr. Christine M. Kampny for the paper:

Quantitative floral development in *Pseudolysimachion* (Scrophulariaceae): intraspecific variation and comparison with *Veronica* and *Veronicastrum*. Amer. J. Bot. 81(10): 1343-1353 (1994).

The paper was co-authored by the Ph.D. thesis co-supervisors: Nancy Dengler, Dept. of Botany, University of Toronto, and Tim Dickinson, Dept. of Botany, Royal Ontario Museum.

APPLICATIONS
TAYLOR A. STEEVES STUDENT AWARD IN PLANT STRUCTURE AND DEVELOPMENT

Applications for the 1995 Taylor A. Steeves Award are now being accepted. If you are a graduate student involved in Plant Structure and Development, or if you supervise or know someone who may be eligible for the award, please read this announcement carefully. This annual award was established to honour the many-faceted contributions of Professor Taylor A. Steeves to the advancement of Botany in Canada. Professor Steeves has made significant contributions to our current understanding of plant morphology and development through research papers and textbooks. He was the editor of both the Canadian Journal of Botany and the Botanical Gazette. As a teacher and researcher, he displays an enthusiasm for plants and an ability to make even the most complex concepts seem understandable. The award is intended to symbolize these attributes so aptly displayed by Professor Steeves.

Eligibility: All students who have graduated from or are currently enrolled in a Canadian university, or Canadian students who have studied abroad, in the area of Plant Structure and Development are eligible.

Conditions: The award will be given for the best Plant Structure and Development paper published in 1995 (in French or English). Papers published in late 1994 but not available in reprint form in time for the 1994 deadline (April 30, 1995) will be considered eligible. Papers can only be submitted once. The judging committee will take into account originality, scientific significance, presentation and the use of language, and its decision will be final. Although it may be preferable that the student be the sole author of the paper, joint papers will be considered, if they are accompanied by a statement on university letterhead, signed by the authors, estimating the percentage responsibility of each author for: (1) the ideas that led to the initiation of the project; (2) the actual research skill demonstrated; (3) the writing of the manuscript. **All applications should be submitted by the student's supervisor**, and should include **FIVE** copies of each of the following: (a) the actual publication (only one submission per applicant); (b) the candidate's curriculum vitae, including current address and e-mail information; (c) a statement indicating that this student is currently enrolled in a degree program, or has completed such a program during the calendar year for which the award is to be made (except for extenuating circumstances with respect to timing of publication as noted above); and, (d) a statement from the supervisor, the student, and any co-authors, establishing responsibility for the paper as outlined above.

Applications and supporting documents should be sent, **before April 30, 1996**, to:

Dr. Bill Remphrey
Department of Plant Science
University of Manitoba
Winnipeg, Manitoba, Canada R3T 2N2

Judging Committee: The current committee consists of Bill Remphrey (University of Manitoba), Art Davis (University of Saskatchewan), Larry Peterson (University of Guelph), and Denis Barabé (Jardin Botanique, Montréal, Québec). The winner will be notified by the end of May 1996, and the award will be presented at the Annual Meeting of the Canadian Botanical Association.

The Treasurer of the C.B.A., Dr. Christian Lacroix, Department of Biology, University of P.E.I., 550 University Avenue, Charlottetown, PEI C1A 4P3, will be pleased to accept donations (which are tax deductible) to the fund which finances this award. Please publicize the award as widely as possible, and **please contribute to the capital fund if you can afford to do so**.

NOMINATIONS
THE J.S. ROWE ECOLOGY AWARD

The Ecology Section of the CBA/ABC has established the J.S. Rowe Prize for the best paper published by an undergraduate or graduate student. We intend to make the first award at the annual meeting of the CBA/ABC in June of this year in Charlottetown.

Eligibility: The terms of the award require that the student must be the sole or first author of the paper and that a paper must be nominated within one calendar year of the official publication date of the journal article. For the first award, we will consider papers published in 1995 from any recognized refereed journal. The student must be a Canadian citizen and/or have done the work for the paper in Canada.

Documentation: The nomination should include a reprint of the paper (or a proof copy of the paper plus a letter from the Editor of the journal stating that this paper is in press with a 1995 publication date). Evidence should also be supplied to show that the nominee was either an undergraduate or graduate student at the time that the research was done and the paper written (a letter from the chief supervisor would be appropriate).

Nominations may be sent either to:

Dr. D.W. Larson, Secretary
Ecology Section, CBA/ABC
Department of Botany
University of Guelph
Guelph, ON N1G 2W1
FAX (519) 767-1991

or to:

Dr. P.B. Cavers, Chairman
Ecology Section, CBA/ABC
Department of Plant Sciences
University of Western Ontario
London, ON N6A 5B7
FAX (519) 661-3935.

The nomination must be received by **April 1, 1996**. The winner will be selected by a panel composed of the executive members of the Ecology Section.

RECENT GRADUATES

PH.D GRADUATES - 1994/95
Department of Botany, University of B.C.

Frank Shaughnessy (July 1994) - Population differentiation of two sympatric species of red algae, *Mazzaella splendens* and *Mazzaella linearis*, in Barkley Sound, British Columbia, Canada. Supervisor: R. DeWreede.

Xiao Yang (August 1994) - Mitochondrial DNA plasmids and senescence in *Neurospora*. Supervisor: A. Griffiths.

Guoping Xiao (September 1994) - The role of root-associated fungi in the dominance of *Gaultheria shallon*. Supervisor: S. Berch.

Sheldon Marcuvitz (September 1994) - The effects of light conditions from patchy natural canopies on the growth and morphology of white clover clones. Supervisor: R. Turkington.

Bhupinder Malhotra (December 1994) - Potassium transport in *Chlamydomonas reinhardtii*. Supervisor: A. Glass.

Selma Rosenthal (April 1995) - The effects of temperature, photoperiod, and leaf age on foliar senescence in western larch (*Larix occidentalis* Nutt.). Supervisor: E. Camm.

André Arsenault (April 1995) - Pattern and process in old-growth temperate rainforests of southern British Columbia. Supervisor: G. Bradfield.

Zora Modrusan (April 1995) - Molecular and genetic analysis of the BEL1 gene regulating ovule development in *Arabidopsis thaliana*. Supervisor: G. Haughn.

Jeong Ha Kim (June 1995) - Intertidal community structure, dynamics and models: mechanisms and the role of biotic and abiotic interactions. Supervisor: R. DeWreede.

Ken Marr (June 1995) - Biosystematics of the endemic Hawaiian species of *Lysimachia* (Primulaceae). Supervisor: B. Bohm.

Dion Durnford (July 1995) - An analysis of the fucoxanthin-chlorophyll proteins and the genes encoding them in the unicellular marine raphidophyte, *Heterosigma carterae*: characterization and evolution. Supervisor: B. Green.

M.Sc. GRADUATES - 1994/95
Department of Botany, University of B.C.

Margaret Stookey (October 1994) - Silicon uptake in rice and cucumbers. Supervisor: A. Glass.

Ute Pott (April 1995) - Bioindication of atmospheric heavy metals in the Lower Fraser Valley, B.C., Canada. Supervisor: W. Schofield.

Doug Justice (April 1995) - The systematics of rocky mountain maple, *Acer glabrum* Torr. Supervisor: F. Ganders.

Ann Walton (July 1995) - Carbon allocation patterns in plants and plant ecosystems.

Thanks to Iain Taylor for submitting this information.

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CANADIAN STUDENTS WIN B.S.A. AWARDS AT SAN DIEGO MEETING

Two students from Canadian universities received awards presented by the Botanical Society of America at the 1995 Annual Meeting last August.

The Isabel C. Cookson Paleobotanical Award, given for the best paper by a student or recent Ph.D. in the Paleobotany Section, was presented to **Georgia L. Hoffman, University of Alberta**, for the paper: A *Spirodela*-like plant from the Paleocene Joffre Bridge locality.

The Katherine Esau Award, to the graduate student who gives the outstanding paper in developmental and structural botany at the Annual Meeting, was received by **John C. Runions, University of Victoria**, for the paper (co-authored by John Owens): Pollen scavenging in spruce and evolution of the conifer pollination drop.

Thanks to Jean Gerrath for submitting this information.

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WWW Sites

Keith Winterhalder noticed, in the April 1995 issue of *Herbarium News*, the following listings of WWW URLs which may be of interest to members.

For botanists:

http://meena.cc.regina.ca/~liushus/bio/botany.html

For ecologists:

http://biomserv.univ-lyon1.fr/Ecology-www.html

Does anyone out there want to divulge their favourite botanically or ecologically oriented sites?

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Poorly Known Economic Plants of Canada - 8. Evening Primrose, *Oenothera biennis* L.

E. Small and P.M. Catling, Biological Resources Division, CLBRR, Agriculture and Agri-food Canada, Saunders Bldg., Central Experimental Farm, Ottawa K1A OC6

Common names: (Yellow) Evening Primrose. French: onagre bisannuelle (commune).

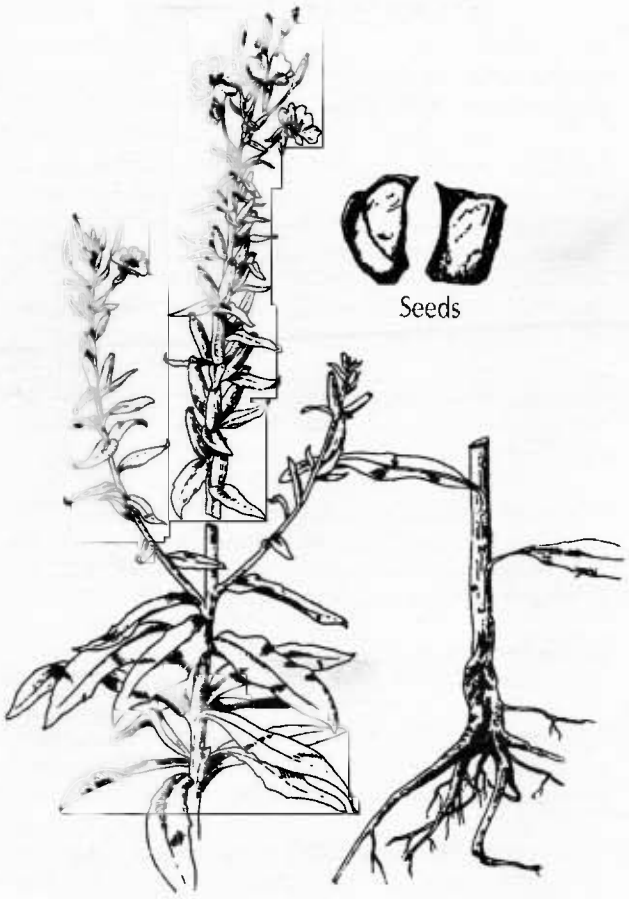
The name Evening-Primrose is optionally hyphenated. Evening Primrose isn't a "Primrose", a name best applied to the genus *Primula*. The "evening" in the name relates to the fact that the flowers of many of the 125 species of *Oenothera* open in the evening and release a scent that attracts moths for pollination.

Oenothera biennis is a biennial (as the name suggests) or short-lived perennial herb producing strong fleshy roots and a basal rosette of lanceolate leaves in the first year. In the second year the stem grows to 1-2 m tall and develops a spicate inflorescence of 4-parted, yellow, tubular flowers. The fruit is a capsule containing many seeds which mature in the fall. The seeds are very small (ca. 0.5 g/1000), but a single plant can easily produce 150,000. Some Evening Primrose seeds have been shown to live to 80 years in the soil. The pollen of many, if not all species of *Oenothera*, is unusual in having protruding apertures and viscin threads.

Evening Primrose, a native of North America, is found in all provinces of Canada, more frequently in the east than the west. It is a common weed of roadsides and waste places, often occurring in light sandy and gravelly soils. The species extends south to Florida and Mexico.

Most texts recognize var. *canescens*, with dense grayish pubescence, as the predominant plant of western North America, while the eastern plants are referable to var. *biennis*. The classification of the transcontinental *O. biennis* and related species of both North America and Eurasia is, however, very complex. Cytogenetic races of Evening Primrose are sometimes segregated as distinct species, although these are usually difficult to distinguish morphologically.

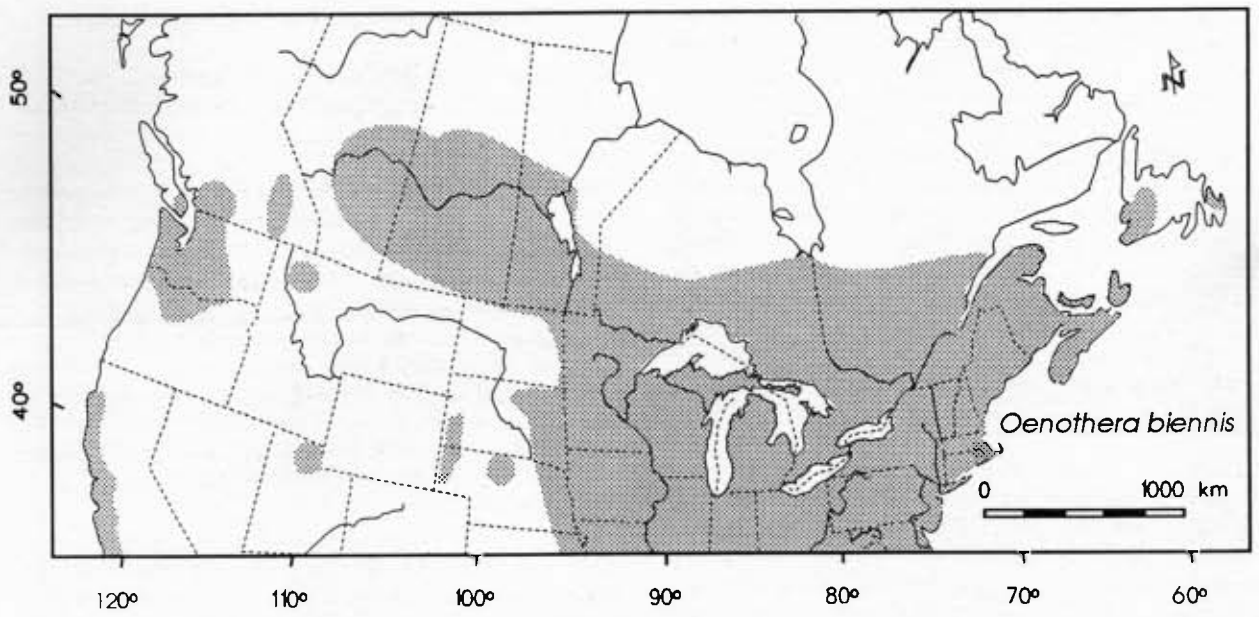
Oenothera biennis is a complete translocation complex-heterozygote, with two sets (the "complexes") of seven chromosomes maintained by a system of balanced lethals. This type of inheritance is known in a few other genera, but was first described in *O. biennis*, and is the classical example of the phenomenon discussed in evolution and genetics courses. At meiosis, translocations link the chromosomes into a ring of 14, but zig-zag (alternate) separation of the chromosomes generates the original parental sets. Lethal factors kill the pollen carrying one of the sets (so that there is 50% pollen fertility), and ovule lethal factors limit survival to the set of chromosomes complementary to that in the pollen. Self-pollination generates offspring with



the two chromosome complements found originally in the maternal plant. The permanent hybrid vigour of combining two quite different genomes is thought to explain the success of Evening Primrose as a colonizing species.

There are ornamental forms of *Oenothera biennis* with attractive habit and flowers. There are also forms with fleshy edible roots, more commonly grown in the previous century than today, for use as a vegetable. Evening Primrose leaves, shoots, roots, and seed pods were consumed by American Indians as food, and extracts were used medicinally by both Indians and by early settlers. In Europe during the early 1600's it was called "King's Cure-all". An infusion of the whole plant was thought to counter asthmatic cough, gastro-intestinal disorders, and whooping cough, and to reduce pain. Poultices were used to treat bruises and wounds.

The chief value of the species today lies in its seeds. Evening Primrose has attracted great interest as a diversification crop, grown for its seed oil, used medicinally as a nutritional supplement. The health value of the seed oil resides in an unusual polyunsaturated fatty acid, γ-linolenic acid (gamma-linolenic acid) or simply GLA. The seeds contain 17-25% oil, of which only 7-10% is GLA, although climate



and maturity affect oil content and qualitative composition, as well as overall yield. GLA is one of the so-called essential fatty acids needed by humans for maintenance of cell functions. It is a precursor in the biosynthesis of prostaglandins, especially prostaglandin E1, a hormone-like substance that has been clinically shown to regulate metabolic functions in mammals; it affects cholesterol levels, dilates blood vessels, reduces inflammation, and has additional effects. GLA is thought to be important for development of brain tissue and other tissue growth, and nature seems to provide for human infants with high levels of GLA in human milk. GLA is a normal conversion product of linoleic acid, a major constituent of most vegetable oils, so that it would appear that humans should not lack for an adequate supply. Nevertheless, some people, perhaps 10-20% of the population, appear not to have adequate levels, even when receiving large amount of linoleic acid. The deficiency seems due to lack of an enzyme that metabolizes GLA from linolenic acid, so that there is a deficiency of GLA in the blood. Useful for treating atopic eczema, GLA has therapeutic promise for premenstrual syndrome, diabetes, multiple sclerosis, alcoholism, inflammation, heart disease and stroke. Rubbing GLA into the skin is thought to be an alternative route of assimilation, and so cosmetic preparations sometimes incorporate GLA. Pharmaceutical and food companies are developing GLA-containing supplements and specialty foods for infants, the elderly, and people with health problems. Side effects have been documented, so that use should be guided by doctors and pharmacists.

While it is clear that *O. biennis* is the chief *Oenothera* species that has been grown as an oilseed, related species have also been cultivated, often unknowingly. Other species from which cultivars have been derived include *O. glazioviana* Micheli ("*O. lamarckiana*" of many authors) and *O. parviflora* Micheli. Although GLA has been obtained by fermentation of some yeasts and other fungi, and from currants (*Ribes* species), the chief commercial sources are Evening Primrose and Borage (*Borago officinalis*). Companies have engaged in a boastful debate about the comparative efficacy of GLA in their preparations made from evening primrose on the one hand, and from borage on the other. Whether borage or evening primrose is more competitive for GLA production depends on climatic and edaphic factors at a particular location. In Canada, both species are grown. Borage has a higher GLA content, but non-shattering cultivars are unavailable so that harvest is difficult. Borage is much more suitable for the Canadian prairies, where available cultivars of Evening Primrose do not overwinter reliably. However it isn't essential to grow Evening Primrose as a biennial: in Eastern Canada it is often started in greenhouses in mid-winter and transplanted to the field where it is grown as an annual.

As a cultivated plant, Evening Primrose is tolerant of a variety of soil types and a range of pH, but soils that are prone to crusting after rains and waterlogged soils should be avoided. If planted at too high a density (150 plants/m^2) the plants may not bolt.

Evening Primrose crops are raised in temperate areas of northern and eastern Europe, North America, and Australasia. U.S. production is centered in North and South Carolina, Texas, and Oregon. Canadian production is centered in Nova Scotia and Ontario. Experimental production in Manitoba has been disappointing. Annual world production of seed has increased at least 20 fold in

the last 20 years, and is currently about 4,000 tonnes. Combined U.S. and Canadian annual production is less than 200 tonnes. In good market years, several hundred ha of Evening Primrose may be grown in Canada.

Wild Evening Primrose plants shed their seeds when a pod matures, and since the pods don't mature simultaneously, harvest of seeds is difficult. Nevertheless, seed is gathered from wild plants in northeast China. Most modern Evening Primrose cultivars have non-shedding pods, which has simplified harvest and reduced seed loss. Crop yields of over 2 tonnes/ha have been recorded in Nova Scotia, although much lower yields are frequent. In Ontario, depending on the rather volatile market and variable production, a hectare may result in a gross financial return of $1,000-2,000.

The future of Evening Primrose as a pharmacological crop in Canada is uncertain because of competition from other countries and the unreliability of the present market. Certainly the demand for GLA will continue to grow and, at least from time to time, it may be anticipated that Evening Primrose crops will be grown in Canada on a contracted basis. With respect to climate and native germplasm, Canada is in a position to develop its share of the Evening Primrose market.

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CANADIAN BIODIVERSITY

The diskettes version of **Canadian Biodiversity: a guide to botanical specialists and literature** has been slightly delayed, but will be available for distribution in February. It will not be placed on Agriculture & Agri-Food Canada's World Wide Web site, as previously advertised, but an alternate site has been found. **Canadian Biodiversity** will be placed on the WWW site of Environment Canada at:

http://www.cciw.ca/eman-temp/intro.html

In the meantime, as supplies of the diskettes version will be limited, CBA/ABC members are advised to order their "free" copies now (for a $5.00 mailing fee, as announced in the last issue of the Bulletin).

Ernie Small
Agriculture & Agri-Food Canada

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RARE LICHEN LISTED

Thanks to Keith Winterhalder, who noted a report in *Global Biodiversity* 5(3): page 5 (1995) regarding the first non-vascular plant listed as vulnerable by COSEWIC (Committee on the State of Endangered Wildlife in Canada). The plant is a lichen, *Nephroma occultum*, known as the cryptic paw lichen, which is found in old-growth forests in British Columbia.

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CORRECTIONS TO MEMBERSHIP LIST

A number of errors (mostly mine) crept into the 1995 Membership List which was distributed with the October Bulletin.

First of all, my abject apology to our first Bulletin editor, Janet Stein-Taylor, for summarily drumming her out of the Association. "*Oh, the shame of it!*", as the son of the cartoon cat, Sylvester, would say. Janet assures me that she is still a member and can be contacted at the following address:

Janet R. Stein-Taylor
1410 Tulane Road
Claremont, CA 91711

Apologies also to **John McNeil** (for the extra "l" in his surname) and to **Paul Barclay-Estrup** (his postal code should be **V8K 2E4**).

I am informed that the following members have new addresses:

Alex Mosseler, Canadian Forest Service,
P.O. Box 4000, Fredericton, NB E3B 5P7
Telephone: 506-444-6197
amosseler@fcmr.forestry.ca

Liette Vasseur, Department of Biology,
Saint-Mary's University, Halifax, NS B3H 3C3
Telephone: 902-496-8234; FAX: 902-420-5261
Lvasseur@shark.stmarys.ca

Also, the telephone number of **Bill Grant** is now:
514-398-7851, Extension 7863.

Joe Gerrath, Editor

Are you reading someone else's copy of this Bulletin?

Would you like to have your very own copy so that you can linger longer over those parts that interest you?

It's easy. All you have to do to receive an application form to become a member of CBA/ABC is contact:

Dr. Christian Lacroix, Treas. CBA/ABC
Department of Biology
University of P.E.I.
Charlottetown, PEI C1A 4P3

Telephone: 902-566-0974
Fax: 902-566-0740
e-mail: lacroix@upei.ca

BOOK REVIEWS

Vegetation Structure and Species Coexistence, edited by M. Zobel, M.W. Palmer, K. Kull and T. Herben. Opulus Press, Uppsala. 1994. Price: Swedish, 250 Kroner.

Have you ever heard of Professor Teodor Lippmaa, a vegetation ecologist from Estonia? I hadn't, and when I started reading that this book was in honour of his important contributions, I wondered how it was that I missed him. Had I simply forgotten his name or was the Atlantic an effective physical barrier for the interchange of ideas?. So I consulted the 5 other vegetation/multivariate books that are in my library to see if I could find his name. The only one that listed a paper by him was a book first authored by a European, Mueller-Dombois.

Since Lippmaa's time (he died in 1943), there has been much more of an interchange of ideas across the ocean. This book continues the process of integration, not only in the participants to the symposium upon which it is based (two Americans took part), but more importantly through the synthesis of ideas and inclusive reviews of previous research and hypotheses. That's a tall order for a small book, with only about a 100 small pages and 9 papers. It was first published as a 1994 issue of the Czech (oslovakian?) journal *Folia Geobotanica et Phytotaxonomica.*

The first paper is an introduction to the life and work of Professor Lippmaa. He believed that plant communities end up in equilibrium with their habitats. The functional study of connections between plants and their biotic and abiotic environments has become very commonplace since his time, but it is difficult to ascertain whether Lippmaa was instrumental in the initiation of this kind of research.

Two chapters are on species mobility. By following species composition in permanent vegetation plots over time, van der Maarel and Sykes (1993) showed in a European grassland that plant species, even perennial ones, are very mobile at a site and that it was clear that most species eventually establish in every microsite. This "carousel model" was tested for its applicability to other ecosystems in other countries, and found to be a consistent phenomenon in plant communities as a whole. The other chapter on species mobility reports differences in degree of mobility between plant species and communities.

Species richness in plant communities is also a topic for 2 chapters. One chapter describes an empirical test of a community level diversity maintenance mechanism (and found it to be lacking). The other reported on experiments that tested the impact of abiotic environmental factors on plant species richness.

I found these 4 papers to be an interesting synthesis and testing of a number of ideas in vegetation ecology.

The next two papers are on the ecology of moss-dominated communities, one a *Sphagnum*-dominated bog, the other an upland forested site. In *Sphagnum* peat-forming bogs, vascular plants have to cope with (among other things), accreting layers of moss. The other moss-dominated chapter is a descriptive study of moss associations, reminiscent of earlier vascular plant community studies. There is very little known about the ecology of mosses, and I applaud their inclusion in this book on vegetation ecology.

The last two chapters are of a more theoretical and historical nature. The first explores hypotheses (over 120 of them) regarding underlying reasons for species richness. The author tries to make sense of these hypotheses by using the Competitive Exclusion Principle as an organizing concept, with mixed results, but I think it is a worthwhile exercise which merits further examination. The last chapter is a historical examination of vegetation science. The author has organized the research into different approaches and paradigms. I found it a useful approach for the synthesis of a large body of information.

In conclusion, **Vegetation Structure and Species Coexistence** is a worthwhile contribution to temperate vegetation ecology. It is not a how-to book, but rather a synthesis of European and North American ideas about vegetation structure and processes at the community level.

van der Maarel, E. & Sykes, M.T. (1993) Small-scale plant species turnover in grasslands: the carousel model and a new niche concept. J. Veg. Sci. 4: 179-188

Pam Krannitz, Environment Canada, Delta, BC

Analysis of Phenolic Plant Metabolites. by Peter G. Waterman and Simon Mole. 1994. Blackwell Scientific Publications, Oxford, U.K. CDN $59.50.

Anyone who has ever made a plant extract (whether in an attempt to isolate natural products, proteins or any other metabolites) will appreciate the content of this compact volume, especially if they are new to the field of plant phenolics. More than one protein purification, I suspect, has gone awry due to the inevitable interaction between proteins and tannins as soon as plant cells are disrupted! In this book, which is a part of the Methods in Ecology Series (edited by J.H. Lawton and G.E. Likens), a broad overview of plant phenolic analysis is presented. Beginning with a description of the major classes of plant phenolics, the authors lead a trail through the often complex task of isolating and identifying individual compounds. Throughout the text, the emphasis is on the ecological aspects of plant phenolics, and the importance of understanding both the chemistry and the ecology of this widespread class of plant metabolites. The authors, however, display a distinct bias toward tannins, (which also seems to be the focus of their research) throughout the text.

By necessity, the descriptions of most techniques are brief, and in and of themselves provide insufficient detail to actually perform the analysis described. Notable exceptions to this are in chapter 4, where the isolation and total phenolic quantification are outlined, as well as in chapter 5 where tannins are discussed in detail. To their credit, the authors state unequivocally that their book is not meant to be comprehensive in its presentation of detailed protocols, but rather as a guide to the techniques that are appropriate for different types of compounds and when to use them. It is here that the book proves most valuable for "non-experts" since it has an extensive reference section where most of the major relevant volumes (with a few exceptions of some recent texts) are cited.

Another goal of the book seems to be to dispel some of the myths surrounding the analysis of plant phenolics, and to remove some of the hesitation "non-experts" might feel in attempting phenolic analysis on their own. In this regard, the authors have done an excellent job in describing a practical, common sense approach to phenolic analysis, and have written their descriptions in positive, encouraging prose. It must quickly be pointed out, however, that the authors do not trivialize the subject matter, nor do they try to make things seem easier than they really are. [Speaking from a decade of experience I am all too aware of the problems inherent in the isolation and identification of plant phenolics!] Rather the authors provide the necessary positive encouragement to wade into the fascinating world of plant phenolics, and come back out with a broader knowledge and understanding of the system they are studying.

The book is, unfortunately, not without flaws. For example, there are some calculation errors in section 4.4.4.2, which unfortunately serve to confuse the reader, when the author's intent was obviously to clarify! Notwithstanding these comments, this reader found the book to be a refreshing and positively written. It is recommended for anyone interested in the ecological role(s) of, or contemplating the analysis of, plant phenolics. It serves as a gentle introduction to the techniques of phenolic analysis as well as the phenolic analysis literature, and provides the necessary encouragement to give things a try. It also serves as a reality check for those in the phenolic analysis field, and provides an introduction to the field of chemical ecology. I can think of some great collaborations already...

Mark Bernards, Programme in Chemistry,
University of Northern British Columbia

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Bromus L. in North America. By Leon E. Pavlick. 1995. Royal British Columbia Museum, Victoria.

This monograph dealing with the bromes and chesses occurring in North America has been produced as a result of taxonomic revisionary work conducted by Leon Pavlick over the past decade or so, in his efforts to contribute to a revised **"Manual of North American Grasses"** and to produce a new manual of the grasses of British Columbia. It includes 51 species, more than half of which are native to North America. Twenty-eight species have been recorded in Canada.

A brief introduction outlines the general approach, including the species concept, used in this monograph, as well as limited background information on difficult taxonomic problems, the relationships of *Bromus* within the grass family as a whole, economic importance, and ecology of some species. The remaining unresolved taxonomic problem regarding "meadow bromegrass" is noted. This chapter also contains a morphological description of the genus.

Following the introduction are the keys to the sections of the genus (five sections are represented in North America), and to the species within each section. For species with which I have most familiarity, the keys seem to be quite workable. However, it remains to be seen how well the key works for some of the critical species groups where a narrow species concept has been used (e.g., section *Ceratochloa*).

The bulk of this monograph comprises the species accounts. Sections, and species within sections, are treated alphabetically. Each species treatment includes a morphological description, along with chromosome number(s) if known, a brief description of habitat and range, a range map, and additional taxonomic references. Forty-eight of the 51 species in this monograph are illustrated. In cases where common names exist, they are also noted. A few species contain two or more recognized varieties or subspecies, and in these cases, each infraspecific taxon is also briefly described. In the treatment of *B. hordeaceus*, which contains four subspecies in North America, a key is provided to differentiate among them.

The quality of the descriptions and illustrations is generally good. There are occasional inconsistencies in format, and a few typographical errors have crept into the text. However, these do not detract from the usefulness of the monograph. The distribution of each species is plotted on a standard North American base map. For species with limited or spotty ranges, this can be a problem, because the stippling used to indicate the distribution can be difficult to see on some parts of the base map, and interpretation of the locations indicated can be difficult on such large-scale maps. There are also a few errors of omission on the range maps, such as the eastern stations of *B. aleutensis*, and the Wisconsin station of *B. erectus*.

The book concludes with several brief sections dealing with excluded species, nomenclature, definitions of botanical terms, a bibliography, and an index.

Pavlick has taken a liberal view of species limits in this monograph, and has chosen to recognize several taxa at specific rank that have been treated as synonyms or infraspecific taxa by some previous North American grass systematists. Some examples include *B. nottowayanus*, which is differentiated from *B. pubescens*, and several species in section *Ceratochloa*.

This book provides a comprehensive treatment of a relatively large and difficult grass genus. I will be interested to see what the reception will be to the narrow species concept used here. It may be that problems in the delineation of species limits may emerge as systematists and agronomists use this monograph, but this can be a benefit of using a narrow species concept, since it may serve to focus future research efforts. Pavlick has done a good job of summarizing the state of knowledge in this genus for North America. Everyone interested in the systematics and distribution of grasses in North America should acquire this book.

William J. Crins,
Ontario Ministry of Natural Resources,
Huntsville, Ontario

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Reviewers needed for the following books:

Flore Laurentienne, Troisième édition, mise à jour par Luc Brouillet et Isabelle Goulet. Les Presses de l'Université de Montréal, 1995.

Dynamics of Weed Populations. by Roger Cousens & Martin Mortimer. Cambridge University Press, 1995.

Plant-Microbe Interactions. Edited by Gary Stacey & Noel T. Keen. Chapman & Hall, 1996.

Seasonally Dry Tropical Forests. Edited by Stephen H. Bullock, Harold A. Mooney & Ernesto Medina. Cambridge University Press, 1995.

Terrestrial Orchids: from Seed to Mycotrophic Plant. by Hanne N. Rasmussen. Cambridge University Press, 1995.

The Conservation of Plant Biodiversity. by Otto H. Frankel, Anthony H. D. Brown & Jeremy J. Burdon. Cambridge University Press, 1995.

Potential Ecological Impacts of Climate Change in the Alps and Fennoscandian Mountains. Edited by A. Guisan, et al. Conservatoire et Jard. Bot. de la Ville de Genève, 1995.

Wind and Trees. Edited by M. P. Coutts & J. Grace. Cambridge University Press, 1995.

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CALL FOR RESOLUTIONS FOR THE ANNUAL GENERAL MEETING, CHARLOTTETOWN

Members who wish to submit Resolutions to be included on the agenda of the CBA Annual General Meeting in Charlottetown should take note of the following rules (extracted from By-Laws 68-77).

Resolutions require a mover and 4 seconders, all of whom must be CBA members in good standing. They must be submitted to the Secretary of CBA at least 10 weeks before the Annual General Meeting (by April 15, 1995). All resolutions must be accepted by the Board of Directors before they are placed on the agenda of the Annual General Meeting, and may be returned for revisions if they do not conform to the guidelines for Resolutions specified in By-Laws 68-77.

PROPOSITION DES RÉSOLUTIONS POUR L'ASSEMBLÉE GÉNÉRALE ANNUELLE, CHARLOTTETOWN

Les membres qui désirent proposer une résolution pour inscription à l'ordre du jour de l'assemblée générale annuelle de l'ABC à Charlottetown doivent prendre note des règlements suivants (extrait des règlements 68 à 77 de l'Association).

Les résolutions requièrent un proposeur et quatre secondeurs tous membres en règle de l'Association. Elles doivent être soumises au secrétaire de l'ABC au moins dix semaines avant l'assemblée générale annuelle (au plus tard le 15e avril 1995). Toute résolution doit être acceptée par le Bureau de direction avant d'être inscrite à l'ordre du jour de l'assemblée générale annuelle. Si la résolution ne répond pas aux exigences requises dans les règlements 68 à 77, elle sera retournée au proposeur avec indication des revisions à faire.

The Plant Press / La Presse Botanique

These pages are intended as a chronicle of news items about plants (or about CBA/ABC members) appearing in newpapers or in the popular science magazines. Contributions from your local newspapers are invited. Send the editor a clipping, photocopy or simply a note about the item and don't forget to indicate the source and date.

Ces pages sont consacrées aux nouvelles concernant les plantes (ou certains membres de l'ABC/CBA) qui paraissent dans les journaux. Les contributions en français sont également encouragées. Faites parvenir vos soumissions au rédacteur en chef ou au rédacteur adjoint, section francophone, et n'oubliez pas d'indiquer la source de l'article et la date de publication.

Frankincense Featured

During the Christmas season there always seems to be a newspaper article explaining the gifts of the Magi (especially frankincense and myrrh, which few people other than botanists really know much about). This article concentrated on frankincense, which is now (as in the past) mostly obtained from coastal areas of Oman and Yemen. The finest frankincense, which is bluish-white, comes from the region of Dhofar, the only part of Oman which receives reliable rainfall during the monsoon season (June to November). Elsewhere, a lower quality, honey-coloured product is obtained from the scrubby trees that may be as much as 5 metres high. Frankincense harvesters use a special knife, called a manghaf, to scrape away the greyish, papery bark until the milky sap oozes out. The sap dries and hardens into a gum much like that from a pine. It contains an oil which, when distilled, smells like weak eucalyptus. This oil is used in the Omani capital, Masquat (or Muscat), as an ingredient in expensive perfumes. The gum is also sold to those who wish to burn it in specially designed clay burners, producing a pleasantly fragrant smoke which is allowed to permeate clothing. Some still use the gum to purify water or chew it to freshen their breath. Pregnant women occasionally chew it in the hope of increasing their baby's intelligence. Many religions have used burning frankincense in purification ceremonies and the ancient Egyptians used it in the process of mummification. Centuries ago the frankincense trade extended throughout the known world, from the Chinese Empire to the farthest reaches of the Greek and Roman Empires. As recently as 1939, this product accounted for 75% of the export earnings of Oman (oil exports now dominate).

Keeble McFarlane, Toronto Star, December 23, 1995

The Tiny World of Pitcher Plants

Stephen Heard, a recent graduate of U.B.C., has described the remarkable "processing chain" which operates in the water-filled leaf of the pitcher plant (*Sarracenia purpurea*). Although the plant secretes chemicals which make the water as acidic as vinegar, there are three insects whose larvae survive and, indeed, thrive. These larvae (a flesh fly, a midge and a mosquito) occur only in pitcher plant water and form a processing chain which utilizes the trapped insects and ultimately provides the plant with valuable nutrients. Each pitcher usually has only one fly larva (if there are more, they duke it out until only one survives). This larva remains near the surface of the water and gets first crack at any insects that fall in, tearing them apart into smaller bits (some of which the larva eats). The smaller fragments are of the correct size to be handled and eaten by the midge larvae (several live in each pitcher). Once again the food material is reduced in size to an extent that it can be utilized by the mosquito larvae (again, there are several in each pitcher). To demonstrate that dead insects are passed in one direction along this chain of larvae, Dr. Heard manipulated the system by adding more midge larvae to some pitchers and more mosquito larvae to others. With more midge larvae the mosquitoes prospered (more food was made available). However, adding more mosquito larvae had no effect on the midges. These results show that the mosquito larvae must wait until the other larvae process the insects before they can participate in the chain.

Carl Zimmer, Globe & Mail, October 14, 1995

Long Distance Sex

Pollination biologists are having to revise their ideas about how far pollinators can carry pollen and how big an area might be covered by a breeding population of uncommon tropical forest trees. Seed protein profiles were used to trace the parentage of seeds from 26 tree species in tropical forests from 10 different countries. Almost all of the seeds proved to be products of cross-pollination, often between two quite widely separated trees. Obviously the pollinators are able to carry pollen much longer distances than was previously thought possible. Other research in Panama and Sri Lanka, however, has found that when the number of flowering trees in a forest is reduced (e.g. by selective logging), self-fertilization becomes more frequent. Although nobody knows how pollinators react to such thinning of the forest, presumably their ability to carry pollen long distances is disrupted. These discoveries disturb forest managers, since they indicate that selective logging, or anything which fragments the tropical forest, could threaten the survival of many tree species because of the increased inbreeding.

Carol Moon, New York Times
(reprinted in Globe & Mail, August 5, 1995)

Ancient Mushrooms

A piece of amber, thought to be 90-94 million years old, found in New Jersey contains two small mushrooms with caps that are 3.2 mm across. The fossil mushrooms appear to be related to the modern fairy ring mushrooms (*Marasmius*) found in many North American lawns.

Globe & Mail, October 14, 1995

Rip van Winkle Seeds

Two reports appeared last year concerning the germination of seeds found in ancient Chinese tombs. In the first report archaeologists dug up a 2000-year-old bamboo tube filled with tomato seeds. In order to preserve the bamboo, they wrapped it in a damp cloth. Within a month 40 of the seeds had germinated. An agricultural research institute in Sichuan province grew them until they produced the ancient equivalent of tomatoes. In the second report, a plant physiologist at UCLA germinated several lotus seeds which had been collected in China and radiocarbon dated. One of the seeds was 1200-years-old and another was 600-years-old. The plants produced seemed to be just as physiologically robust as modern plants.

Kitchener-Waterloo Record, August 23, 1995
Globe & Mail, November 18, 1995

The Cardiobar

Dr. Robert Nicolosi and colleagues at the University of Massachusetts have designed a candy bar that helps to lower blood cholesterol levels. The Cardiobar, as it is called, contains guar gum, soy protein and an oil from rice bran, all of which are known to be effective in reducing cholesterol levels. Volunteers who ate two bars daily had their cholesterol levels (averaging a moderately elevated 263 points) reduced by an average of 33 points. Don't look for the Cardiobar at candy stores. It may never be marketed.

Kitchener-Waterloo Record, November 14, 1995

Smells ease Stress

Several recent studies have shown that pleasant smells have a calming effect upon people under stress. The Sloan-Kettering Cancer Center has used heliotrophin, which smells like vanilla, to calm patients during magnetic resonance imaging scans. A preliminary test in the New York subway system showed that the (unspecified) odor used was effective in reducing the incidence of pushing and shoving by commuters. Finally, the use of fruity or floral smells was found to reduce tension and fatigue in women during menopause. The author of the research article even suggested that it might be better to control riots using pleasant aromas (like that of chocolate chips) rather than using tear gas.

Marilyn Dunlop, Toronto Star, December 30, 1995

Sage vs Alzheimer's

British doctors report that an oil extracted from the common herb, sage, inhibits the activity of acetylcholinesterase, an enzyme believed to play a role in memory loss. They speculate that isolation of the active ingredient may lead to the development of a drug for the treatment of Alzheimer's disease.

Globe & Mail, October 14, 1995

MEETINGS / CONGRÈS

S.E.R. '96

The **Society for Ecological Restoration** will be holding its **1996 International Conference** at Rutgers University, New Brunswick, N.J., **June 20-22, 1996**. The theme for the conference will be "Paved to Protected: Restoration in the Urban/Rural Context". Pre- and post-conference field trips will explore actual restoration projects in the New York/New Jersey/Pennsylvania area. Obtain information from: **ser96@aesop.rutgers.edu** or write to: **Society for Ecological Restoration Conference, 1207 Seminole Highway, Suite B, Madison, WI 53711.**

IOPC-V

The **Fifth International Organization of Paleobotany Conference** will be held at the University of California, Santa Barbara, from **June 30 to July 5, 1996**. The theme of the conference is **Floristic Evolution and Biogeographic Interchange through Geologic Time**. For information, contact: **Bruce Tiffney, Department of Geological Sciences, University of California, Santa Barbara, CA 93106 [E-mail: tiffney@magic.ucsb.edu].**

Mycorrhizae (ICOM/NACOM) Meetings

The **First International Conference on Mycorrhizae (ICOM)** and the **Tenth North American Conference on Mycorrhizae (NACOM)** will be held jointly at the University of California, Berkeley, **August 4-8, 1996**. For information: **ICOM, c/o Tom Bruns, 108 Hilgard, Dept. of ESPM, University of California, Berkeley, CA 94720-3110 [E-mail: ICOM@mendel.berkeley.edu].**

Lichenology Symposium

The **Third International Association for Lichenology Symposium** will be in Salzburg, Austria, **September 1-7, 1996**. For information: **Dr. Roman Türk, University of Salzburg, Institute of Plant Pathology, Hellbrunnerstr. 34, A5020 Salzburg, Austria [E-mail: tuerk@edvz.sbg.ac.at].**

FORTROP'96

The **International Conference on Tropical Forestry in the 21st Century (FORTROP'96)** will be held at the International Convention Center on the campus of Kasetsart University in Bangkok, Thailand, **25-29 November 1996.** The Conference is being organized to commemorate the Sixtieth Anniversary of Forestry Education in Thailand and the Centenary of the Royal Forest Department. Post-conference excursions will be arranged to different parts of Thailand and neighboring countries. For further information, please contact: **FORTROP'96 Secretariat, Faculty of Forestry, Kasetsart University, P.O. Box 1054, Bangkok 10903, Thailand. [Email: fforskt@nontri.ku.ac.th]**

Issued quarterly (January, April, July, October) and sent to all members of CBA/ABC. Non-members and institutions may subscribe at a price of $45.00 per annum post free (Overseas airmail: add $10.00). Cheques and money orders (in Canadian funds ONLY) should be made payable to "**The Canadian Botanical Association**" and addressed to the Editor.

Advertisements for **Positions Available** and **Classified** categories may be placed at a cost of Can$5.00 per published column centimeter. Individual members of the Association may place free advertisements of **Positions Wanted** and **Post-doctoral Opportunities.**

Veuillez aviser le trésorier de tout changement d'adresse pour assurer une livraison ininterrompue du bulletin.
To ensure continuous delivery of the Bulletin please notify the Treasurer promptly of any change of address.

Copy for the April Bulletin must be received before March 30, 1995.

Les soumissions pour le bulletin d'avril doivent arriver au plus tard le 30 mars 1995.

Publication date for the October Bulletin:
October 31, 1995
Date de publication pour le bulletin d'octobre:
le 31 octobre 1995