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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 completes my sixth year as your Bulletin Editor and, under normal circumstances, another Editor would be taking over the task. However, the Executive have been unable to find a volunteer willing to take over the job, so, as mentioned in the last issue, I have agreed to continue as Editor for an additional (but absolutely final!!) year.

As usual, the production of this issue is a bit late. There are, however, some interesting features which have been contributed by members. We have another in the continuing series on Poorly Known Economic Plants of Canada, this time on Cascara. Several book reviews have been received and included in this issue. There is also an excellent review of some of the research which has been carried out on the plant collections at the Montréal Botanical Garden, which should give us cause to slip away from next year's Annual Meeting to visit the Garden.

I would like to express my thanks to those members who have provided items for inclusion in the Bulletin. Whether these are notifications of meetings, contributions to the Plant Press, reports of sections, book reviews, lists of graduates, etc., they all make my job a little easier. Please continue to submit items of interest to our membership.

This year's booklet containing the membership list of the Association is mailed with this issue of the Bulletin. As in previous years, information is included on the mailing address, telephone and FAX numbers, E-mail addresses, membership category and sectional affiliations. This information was taken directly from the Treasurer's membership database and attempts to include all recently arrived changes that have been sent in to the Editor and the Treasurer. I should note here that all changes in address or contact information should go to the Treasurer, who maintains the Association list. If they are sent to me, they must be forwarded by me to the Treasurer, and that takes a little extra time for the changes to be made.

Finally, you will note from the citations included in this issue that I received the Mary Elliott Service Award at the Annual Meeting in Charlottetown. It means a lot to me that my efforts in various capacities on behalf of the Association have been appreciated. I would like to thank whoever it was who nominated me and the Awards Committee, who made the final decision. Thanks also to Doug Larson, who crafted a unique (and heavy!) plaque for the occasion. I am one of a dwindling number of persons who knew and interacted with Mary Elliott on CBA committees. During my term as Treasurer she became President, and I was very impressed at her ability to run a tight meeting. We were all shocked by her untimely death, but the Service Award helps to keep her memory alive in those of us who knew her.

Joe Gerrath, Editor

Future Annual Meetings
Prochaines Réunions Annuelles

1997
Université de Montréal (Institut botanique)
(with/avec A.I.B.S.)
August/août

1998
University of Saskatchewan
Saskatoon, SK
Early July/au début de juillet

1999
St. Louis, Missouri
(with XVI International Botanical Congress)
August 1-7 août

2000
University of Western Ontario
London, ON

2001
Okanagan University College
Kelowna, B.C.

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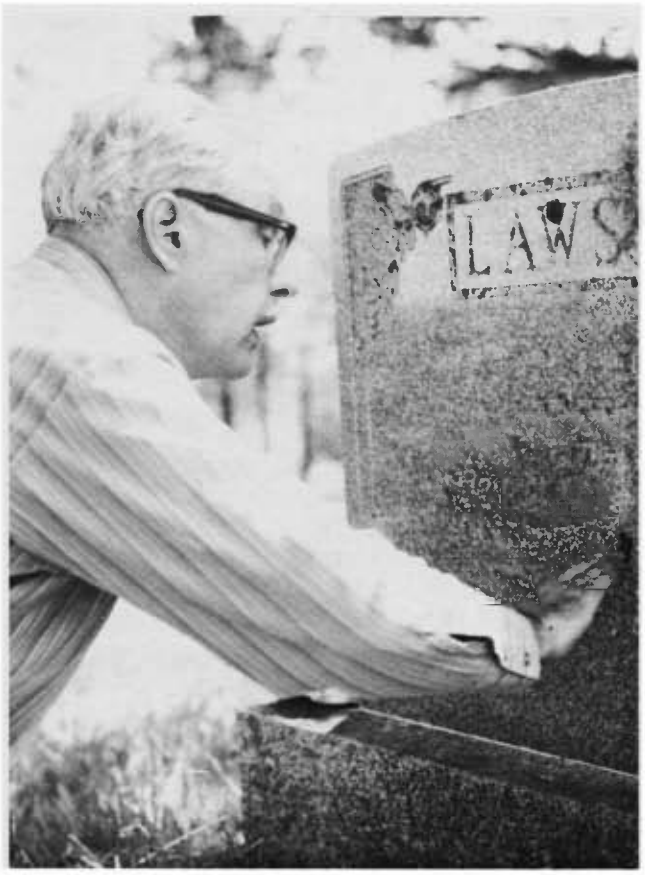
W.G. (BILL) DORE - 1912-1996

Dr. William George Dore died on his 84th birthday, 17th April 1996. Bill Dore will be known to most members of the Canadian Botanical Association as one of its founding members and as an enthusiastic participant in the Association, attending all the annual meetings until the Victoria meeting in 1988. After 1988 Bill's health was not stable enough for him to be able to travel well. As the most eminent authority of Candian botanical history it was Bill who suggested that the most prestigious honour of the CBA be named after George Lawson.

Bill received his BA (Honours) from Queen's University in 1933 where he was awarded the Gowan Foundation Award in Botany. In his undergraduate days Bill worked as a summer student in the Division of Botany at the Dominion (Central) Experimental Farm in Ottawa. In 1935 he received an MSc degree in Agronomy and Botany from McGill University (Macdonald College). From 1933 to 1937 he was employed with both Macdonald College and the Dominion Experimental Farm on pasture studies. From 1937 to 1945 he was Lecturer in Botany at Dalhousie University and then moved to the University of Guelph as assistant lecturer for 2 years. In 1947 he returned to the Dominion Experimental Farm in Ottawa where he worked until his retirement in 1976. He began his PhD studies at Ohio State University in 1938 under the famous Edgar N. Transeau. The war and the domestic demands of a young family interrupted his studies, but in 1948 he completed his thesis, Pasture Associations of Eastern Canada, and was awarded a PhD in Ecology.

During his career Bill pursued many aspects of Botany. His interest in pasture studies, and the difficulties in field identification of plants munched by cows, lead to the production of one of the first publications specifically on the identification of grasses by vegetative characteristics (Nowosad, Newton Swales & Dore 1936). The preface to the second edition (1938) begins with "*The fact that the first edition of this modest bulletin, designed only to meet a local need, met with a profuse and world wide demand, is evidence of the rising interest in grassland research. Combined, however, with a steady stream of letters of appreciation from pasture workers everywhere and even from leading taxonomists, this unexpected response has led the authors and sponsors of the bulletin to believe that a new revised edition may prove useful.*" This was characteristic of many of the publications of Bill Dore. In his writing he was attentive not only to a specialized scientific audience, but also to a wider, less technical readership. Other landmark publications written in this vein which enjoyed great popularity include Wild-rice (Dore 1969) and Grasses of Ontario (Dore & McNeill 1980). These important references are not just compilations of the work of others, but full of unique observations made over many years of careful observation and backed up by laboratory and cultivation studies.



W.G. Dore on a pilgrimage to Middle Sackville, Nova Scotia, 20 June 1972.

Another lasting contribution to Canadian botany are Bill's collections of plant specimens which populate most herbaria in Canada and can be found in herbaria throughout the world. With collections numbering in the tens of thousands, most of which included duplicates, there are few Canadian botanists who have collected the Canadian flora as broadly, taxonomically or geographically. As the years of collecting went by, Bill's labels tended to get longer and longer. His specimen label data are often supplemented with ecological observations, photographs, letters, drawings, historical notes, humorous anecdotes, etc.

Canadian botanists will remember Bill as a warm and delightful individual with a unique sense of humour. The work of most members of the Association pursuing systematics, botanical history, phytogeography, floristics, plant ecology or horticulture in Canada will have benefited at one time or another from his vast knowledge and kindly generosity. Colleagues and friends will miss his enthusiasm, persistence, unique powers of observation, penetrating insight and keen wit. A more complete biography and bibliography is planned for future publication in the Canadian Field-Naturalist.

References:

Nowosad, F.S., D.E. Newton Swales and W.G. Dore. 1936. The identification of certain native and naturalized hay and pasture grasses by their vegetative characters. Macdonald College; McGill Univ. Tech. Bull. 16. 78 pp. (Reprinted 1938, 1942 and 1946)

Dore, W.G. 1969. Wild-rice. Can. Dept. Agric. Publ. No. 1393. 84 pp. (Reprinted 1971, 1973, 1975)

Dore, W.G. and J. McNeill. 1980. Grasses of Ontario. Agric. Can. Res. Br. Monogr. 26. 566 pp.

Stephen Darbyshire,
Agriculture & Agri-Food Canada

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Congratulations to:

David Cass, University of Alberta

David Cass is one of ten recipients of the **3M Teaching Award**, the highest teaching award in Canada. Dr. Cass had previously received awards from his University for excellence in teaching.

Taylor Steeves, University of Saskatchewan

The Botanical Society of America has elected Taylor Steeves as a "Corresponding Member". Corresponding members are "distinguished scientists who have made outstanding contributions to plant sciences and who live and work outside the United States of America". Dr. Steeves becomes the only Canadian among a group of 50 such corresponding members.

[*Thanks to Vipen Sawhney for this information*]

CBA/ABC ECOLOGY SECTION
Annual Report - 1996

1. The **Rowe Prize** was offered for the first year. The 11 nominated papers were of very high quality. The Ecology Section executive selected a winner and an honourable mention. There are already 2 nominees for next year.

2. **Directors. Retiring**: Alex Mosseler and Doug Larson contributed actively to the Section; Doug was a very effective secretary. **Continuing**: Kate Frego, Isobel Waters and Paul Cavers. **New**: Peter Nosko (Nipissing University) and Ed Reekie (Acadia University).

3. **Lionel Cinq-Mars Award.** Richard Staniforth represented the Section this year, and will continue next year. He will be joined by Liette Vasseur, with Keith Winterhalder as alternate.

4. **Ecology Section Symposia** for future meetings.
1997. Montreal, Aug. 1-7: Ecological dangers of biotechnology, with special emphasis on biodiversity and ethical aspects.
1998. Saskatoon, theme Plant Biotechnology: Applied or agricultural ecology.
1999. St. Louis, International Botanical Congress: It was suggested that, for large meetings, CBA executive should propose symposia, rather than Sections.

5. **CBA Membership**. The Section notes that a very large number of prominent Canadian plant ecologists are not members of CBA; a significant number of students for the Rowe Prize are supervised by non-members. We feel the CBA would be more influential if we had more members, especially dealing with matters of national concern. The Section would like to add several suggestions for increasing membership to those proposed by the CBA executive:

(a) announce and list new members in the CBA Bulletin.

(b) provide lists of of papers of ecological interest (and relevant papers for other sections) in *Can. J. Bot.*, etc. to members.

6. **Relationship with *EcoScience*.** We request that the Treasurer look into the possibility of processing subscriptions to *EcoScience* along with membership renewal/*Can. J. Bot.* subscriptions, and possibly obtaining a slight fee reduction for members who subscribe in this way, as is presently done for the *Can. J. Bot.*

Kate Frego, Secretary
Paul Cavers, Chair, Ecology Section

CALL FOR NOMINATIONS

CBA BOARD OF DIRECTORS

Members of CBA are invited to submit nominations for the following positions on the Board of Directors of the Association.

Treasurer [term - 1997-1999]
3 Directors [term - 1997-1999]

One of the Directors must reside west of the Manitoba-Ontario boundary. The others may reside anywhere.

Nominations must be signed by at least three members of the Association and must be accompanied by the consent of the nominee. **All nominations must be received before January 31, 1997, by the Secretary of the Association.**

Ronald E. Dengler
Life Sciences Division
Scarboroough Campus, University of Toronto
1265 Military Trail
West Hill, ON M1C 1A4

GEORGE LAWSON MEDAL

Members of CBA are invited to submit nominations for this prestigious award, to be presented at the next annual meeting at Montréal. A maximum of two awards may be given, one in each of the following categories of eligibility.

A. Recognition of the cumulative, distinguished contributions of a senior researcher, teacher or administrator who has worked in Canada for most of his/her career and who has contributed notably to the advancement of Canadian botany.

B. Recognition of a single outstanding contribution to botanical knowledge, which may be a published paper of exceptional significance, a series of published papers, a monograph, or a book. Canadian botanists at any stage of their career are eligible in this award category.

Nominations should be accompanied by a *curriculum vitae*, a clear statement of the nominee's contribution to Canadian botany, and as much documentation as possible (including letters by others supporting the nomination.). **Nominations should be sent to the President of CBA, who chairs the awards committee, before January 31, 1997.**

Dr. C.C. Chinnappa
Department of Biological Sciences
University of Calgary
Calgary, AB T2N 1N4

MARY E. ELLIOTT SERVICE AWARD

Members of CBA are invited to submit nominations for this award, which recognizes meritorious service to the Association by an individual member. If a suitable candidate is proposed, the award will be made at the next Annual Meeting in Montréal.

Nominations must include a citation of approximately 100 words and a statement detailing the service contributions of the nominee to CBA. **Nominations should be sent to the President of CBA, who chairs the awards committee, before January 31, 1997.**

Dr. C.C. Chinnappa
Department of Biological Sciences
University of Calgary
Calgary, AB T2N 1N4

Nominations for both the Lawson Medal and the Elliott Award are kept on file for three years after submission, but nominators are requested to provide updated information for the second and third years.

PROPOSITION DE CANDIDATURES

BUREAU DE DIRECTION DE L'ABC

Les membres de l'ABC sont invités à proposer des candidatures pour les postes de directeurs de l'ABC.

trésorier [de 1997 à 1999]
3 directeurs [de 1997 à 1999]

Un des directeurs doit habiter à l'ouest de la frontière provinciale du Manitoba et de l'Ontario; la location des deux autres n'est pas importante.

Chaque nomination doit porter la signature d'au moins trois membres de l'association et doit être accompagnée du consentement de la personne nominée. **Les nominations doivent être reçues avant le 31 janvier 1997 par la secrétaire de l'association.**

Ronald E. Dengler
Life Sciences Division
Scarboroough Campus, University of Toronto
1265 Military Trail
West Hill, ON M1C 1A4

LA MÉDAILLE GEORGE LAWSON

Les membres de l'ABC sont invités à proposer des candidatures pour ce prix, qui sera presenté à la prochaine réunion annuelle de l'association, à Montréal. Il y a deux catégories d'éligibilité.

Catégorie A: Pour reconnaître une contribution unique et exceptionnelle à la botanique canadienne par un botaniste canadien. En pratique, ceci prendra la forme d'un livre, d'une monographie ou d'un article apportant une contribution significative ou exceptionnelle à la botanique.

Catégorie B: Pour reconnaître l'ensemble des contributions distinguées d'un chercheur, professeur ou administrateur qui a travaillé au Canada la plus grande partie de sa carrière, et qui a contribué de manière importante au développement de la botanique canadienne.

Toute nomination doit être accompagnée d'un *curriculum vitae*, d'un exposé concis faisant état de la contribution du candidat à la botanique canadienne, et d'autres documents comme des lettres d'appui d'autres personnes. **Chaque nomination doit être reçue, avant le 31 janvier 1997, par le président du comité de sélection.**

Dr. C.C. Chinnappa
Department of Biological Sciences
University of Calgary
Calgary, AB T2N 1N4

LE PRIX MARY E. ELLIOTT

Les membres de l'ABC sont invités à proposer des candidatures pour ce prix, qui est donné à un membre pour service de mérite exceptionel à l'Association. La présentation de ce prix aura lieu à la prochaine réunion annuelle de l'ABC à Montréal.

Toute nomination doit inclure une citation (comprenant à peu près 100 mots) et un exposé détaillé décrivant les services rendus à la société par la personne nommée. **Veuillez envoyer vos nominations, au plus tard le 31 janvier 1997, au président du comité de sélection:**

Dr. C.C. Chinnappa
Department of Biological Sciences
University of Calgary
Calgary, AB T2N 1N4

Chaque nomination, soit pour la médaille Lawson, soit pour le prix Elliott, est gardée pendant trois ans par le comité de sélection. Le comité demandera aux personnes qui ont proposé un nom de fournir de nouveaux détails ou des modifications pour la deuxième et la troisième année d'éligibilité.

AWARDS AT CHARLOTTETOWN
MÉDAILLE GEORGE LAWSON MEDAL

Margaret E. McCully

The following is the text of the citation read by CBA/ABC President, Keith Winterhalder, at the awards ceremony in Charlottetown.

The Lawson Medal was established in 1969 "to provide a collective, formal expression of the admiration and respect of botanists in Canada for excellence in the contribution of an individual to Canadian Botany". It is named after Dr. George Lawson, Canada's first professional botanist, who was instrumental in founding Canada's first botanical garden (1861), the Botanical Society of Canada (1860-1862) and the Botanical Club of Canada (1891-1910).

The 1996 recipient of the Lawson Medal (Category B) for a life-time contribution to Botany was born at St. Mary's, Ontario, and gained her B.Sc. in Agriculture at the University of Toronto in 1956. Following two years as a chemistry and biology teacher at Shelburne High School in Ontario, she returned to the University of Toronto to complete her M.Sc. in Plant Ecology, where she worked on the morphology and ecology of *Hippuris vulgaris*, the common Mare's-tail. After two more years of teaching biology in an English school she entered Harvard University, where she completed her Ph.D. in Cell Biology in 1966, working on the histology of the algal genus *Fucus*, the rockweeds.

For those of you who are still in suspense, I should tell you that this year's recipient of the Lawson Medal is Dr. Margaret Elizabeth McCully, who is Professor of Biology at Carleton University and the Ottawa-Carleton Centre for Graduate Studies, and Director of Carleton's Cryo-analytical Microscopy Facility.

Dr. McCully has been a faculty member at Carleton University since 1966, and during her stay there she has garnered many personal honours, as well as making the name of Carleton University known throughout the world. Her own university has honoured her by two CUASA Scholarly Achievement Awards and a Major Research Achievement Prize, and in 1988 she was invited to give Carleton's Davidson Dunton Research Lecture. In the wider scientific community, she has been honoured by being elected a Fellow of the Royal Society of Canada in 1987, and by the degree of D.Sc. (honoris causa) conferred by St. Mary's University in 1993. Laboratories all over the world have benefited by sharing her knowledge and experience as she held visiting fellowships, lectureships or professorships at the University of Leeds and Oxford University in the U.K., the University of California at Davis in the U.S.A., and Monash University, the University of Melbourne, LaTrobe University, Australian National University and the University of Western Australia in Australia. In 1994, she was invited to give the Hamm Lecture at the University of Minnesota in Minneapolis. At the XIII International Botanical Congress in Sydney, Australia in 1981, she was an Honorary Vice-president, and she served as a Member of Council with the Academy of Science, Royal Society of Canada, 1989-1992.

Dr. McCully's research has mainly involved the study of plant root structure, and root/soil/bacterial interactions as they affect plant function. It has sought to answer questions as to how plants acquire nutrients from very dilute solutions and immobilized states in the soil, and how these nutrients are transported within the plant. She has pioneered the use of modern optical and electron microscopy to study root development and bacterial associates in the soil, and their influence on soil structure. At the same time, she does not scorn "low technology" equipment, and has impressed generations of students and post-docs by her appreciation of what can be seen with a sharp razor blade, a freehand section and a properly adjusted microscope. Her personal maintenance of extraordinarily high standards of technical excellence, and her expectations of others, has rubbed off on many who have come in contact with her.

In shifting her perspective from the laboratory-bound environment of many root studies to the field and the rhizosphere, she took a "holistic" view of the root in the ecosystem. What a wonderfully broad perspective for someone known for the high quality of her photomicrographs and electron micrographs! To quote a letter supporting her nomination "Margaret's research into the structure and functioning of roots has resulted in new insights into rhizosphere dynamics, water and ion uptake, lateral root development and longevity, and various other topics. Margaret has challenged the dogma concerning many root characteristics, and is showing that many of the "facts" that we all learned can not be supported by careful observation and experiments." Quite apart from her contribution to scientific knowledge, her studies on the behaviour of mainly agriculturally important plants in the field are potentially invaluable to plant nutritionists and agronomists. She is author or co-author of approximately 100 papers in refereed journals, always accompanied by exceptional photomicrographs, as well as a number of books and book chapters.

Dr. McCully's role as a teacher is equally impressive. In addition to teaching a variety of courses at the undergraduate and graduate level, Dr. McCully has designed and taught special units in such areas as Techniques for Optical and Electronic Microscopy, Fluorescence Microscopy Technique and The Algae and Protozoans as Experimental Systems. The books on Plant Structure and Development co-authored by T.P. O'Brien are standard references throughout the world. Neither has she forgotten her years teaching at the high school level, and she has been active in revising the biology curriculum for the Ontario Ministry of Education, as well as running workshops for teachers.

Margaret loves what she does, and has fun doing it. Those who have worked with Margaret know her both as a passionate and demanding scientist and as a warm and caring human being, who loves to impart her knowledge and her infectious enthusiasm to students. What a wonderful model for young botanists! And what more appropriate recipient of the Lawson Medal than this ambassador for Canadian Botany! I take it as a great privilege to be able to represent the Canadian Botanical Association/Association Botanique du Canada on this occasion, and to present the Lawson Medal to an outstanding Canadian Botanist - Dr. Margaret McCully."

MARY E. ELLIOTT SERVICE AWARD

Joe Gerrath

The following is the text of the citation read by CBA/ABC President, Keith Winterhalder, at the awards ceremony in Charlottetown.

The Mary E. Elliott Service Award was created in 1978 in memory of plant pathologist and mycologist Mary Elliott, who died in 1976 after serving as Secretary, Vice-President and President to the Association during the four previous years. The Award recognizes meritorious service to the CBA/ABC by an individual member. The 1996 recipient of this award is someone who has quietly played an absolutely key role in the Association's activities over a number of years, as well as being involved in some lesser-known activities.

The major contribution that Dr. J.F Gerrath, known to us all as Joe, has made to the CBA has been in his role of Editor of the Bulletin. During his tenure as Editor, Joe has completely revamped the Bulletin, changing the look, style and content of the publication. The current Bulletin is clean and well laid out, easy to follow and very informative. It is a highly professional newsletter, and new features such as the "Plant Press" and "Poorly known economic plants of Canada", contributed by Ernie Small and Paul Catling, make it a document that is fun to read - one that we all look forward to receiving, and cannot wait to consume upon its arrival.

Another lower profile but equally onerous responsiblity taken on by Joe was that of Treasurer, from 1975 - 1977. He has also undertaken the difficult and time-consuming task of editing and updating the membership directory, which contains names, addresses, phone and fax numbers, and email addresses. In 1993, he produced his well-known "Historical Review" and "By-laws and Membership Directory", in which he summarized the history of CBA/ABC, all individuals who had served on the Executive, and award winners. This document has proven to be a valuable, frequently-consulted resource.

Another area in which Joe has tirelessly served the Association has been in the judging of the Lionel Cinq-Mars award. How many of us have noticed that, when the judging committee files into the back of the room just as a student paper is about to start, Joe is almost always among their number? This difficult, somewhat thankless task is a critical part of another of our major activities - the encouragement and recognition of young scientists.

It is therefore my pleasure and honour to present the Mary E. Elliott Award for 1996 to someone who has played a major role in maintaining and strengthening some of the most important activities of the CBA, as well as forging new connections within the Canadian Botanical Association and with the outside world - Joe Gerrath."

TAYLOR A. STEEVES AWARD

Mark D. Wilkinson

The Taylor A. Steeves award for the best paper published in 1995 by a Canadian student in the Structure and Development area was awarded this year to Mark D. Wilkinson who completed his Ph.D. at the University of British Columbia under the supervision of Dr. George Haughn for the paper,

Wilkinson, M.D. and Haughn, G.W. 1995. UNUSUAL FLORAL ORGANS controls meristem identity and organ primordia fate in Arabidopsis. - Plant Cell 7: 1485-1499.

This paper represents a merging of developmental and molecular techniques in understanding how floral morphogenesis is regulated. The paper describes the skilful use of double mutant combinations to identify control points in flower development. One of the judges stated, "An excellent introduction of a complex topic, that was intentionally made inclusive for all readers; comprehensive discussion of the new discoveries".

The award was presented by Dr. Steeves at the banquet of the annual conference of the Canadian Botanical Association held this year in Charlottetown, Prince Edward Island from June 23 to 27. Unfortunately, the recipient was unable to attend as he has taken a postdoctoral position with the Max Planck Institute in Cologne, Germany.

There were 4 nominations this year and all were of excellent quality, reinforcing the fact that we are producing some excellent graduates in the Structure and Development area.

Bill Remphrey, Structure & Development Section

BOOK REVIEW

Dynamics of weed populations. By Roger Cousens and Martin Mortimer. 1995. Cambridge University Press, Cambridge.

This book is a synthesis between the vast body of literature on weeds in agricultural systems and ecological theory regarding population dynamics. Ideas commonly applied in ecology are used to describe how weed populations can become significant components of primarily agricultural systems. I emphasize agricultural systems because these authors do, and though they do a fine job of applying ecological theory to weed populations, I found myself wishing there was more information on weeds or aliens in natural systems. I think part of the problem is that the bulk of published literature on weeds is from agriculture, but I also think this emphasis is at least partly attributable to the fact that Cousens specialty is within agriculture (he's from a Department of Agriculture in Western Australia). The successful marriage with ecological theory is no doubt attributable to Mortimer's expertise in the Department of Environmental and Evolutionary Biology (in Liverpool).

The 332 pages are divided into 9 chapters. The chapter headings are self-explanatory: 1) Weed population dynamics - the framework, 2) The dynamics of geographic range expansion, 3) Dispersal within and between populations, 4) Processes involved in the regulation of population density, 5) The intrinsic dynamics of population density, 6) Extrinsic factors affecting population density, 7) The spatial dynamics of weed populations, 8) The evolution of herbicide resistance, and 9) Weed population dynamics: synthesis and prognosis.

In chapter 2 models of range expansion are discussed, and I found the discussion of lag phases versus continuous exponential rates of increase useful. In addition, of use were descriptions of methods for estimating range expansion. Examples referred to include aliens in natural systems such as *Bromus tectorum* in the rangelands of the interior plateau region between the Rockies and coastal mountain ranges. Chapter 3 focusses on dispersal mechanisms and along with natural dispersal methods are included "spread by tillage" and "combine harvester". Not included was dispersal by all-terrain-vehicles which is a problem for the spread of aliens in protected areas [Lonsdale and Lane (1994) Biol. Cons. 69: 277-283]. Chapter 4 reviews seed and seedling ecology for weedy species. The discussion on seed bank ecology is thorough, and covers 13 pages, with a review on germination on the following 8 pages. While chapter 5 discusses models of population growth with some examples from weedy species, chapter 6 is largely concerned with the effect of agricultural practices on weed populations, including tillage, crop rotation, sowing date and density, fertilizers and herbicides, and bio-control agents. There is a useful discussion on the most effective time at which to "control" weed populations, which would be applicable both to agricultural and natural systems.

It seems to me that the primary objective of this book is to make ecological theory accessible to farmers and weed scientists, so that judicious use of herbicides can be made. Understanding something about the life cycle and population growth of weeds is necessary to work towards integrated pest management which does not rely on heavy handed chemical warfare. To that end, this book accomplishes its goal, and I recommend it highly as well for anyone wishing to learn more about what is known about the ecology of weeds in agricultural systems. However, this book does not venture far into the body of literature on alien species in natural systems, and their impact on conservation and biodiversity.

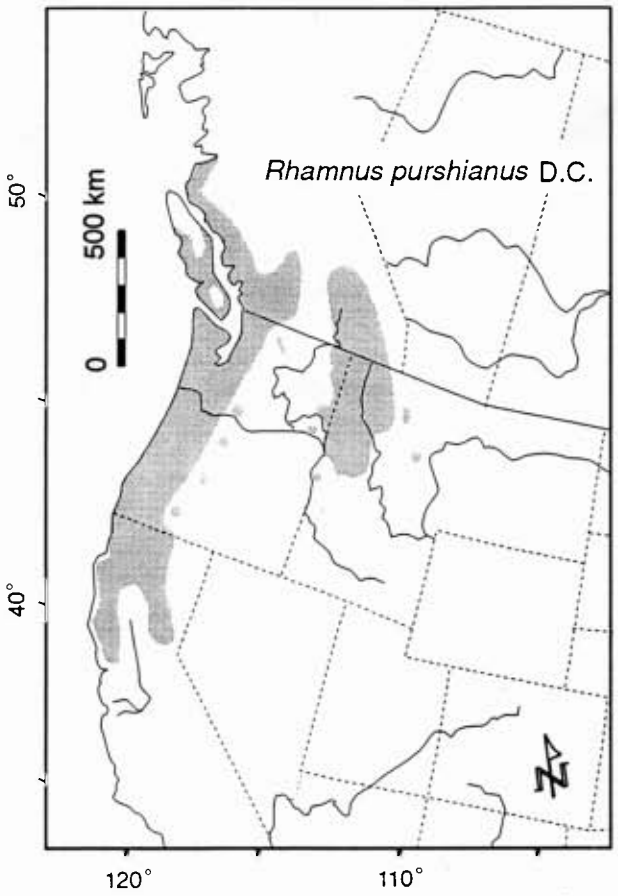
Pam Krannitz
Research Scientist
Environment Canada
Canadian Wildlife Service

Poorly Known Economic Plants of Canada - 11. Cascara, *Rhamnus purshianus* DC.

E. Small and P.M. Catling, Eastern Cereal and Oilseed Research Centre, Agriculture and Agri-food Canada, Saunders Bldg., Central Experimental Farm, Ottawa K1A 0C6

Names: Cascara, Cascara Sagrada. French: Écorce sacrée, Cascara. *Rhamnus* has been considered both masculine and feminine, so that one encounters both "*R. purshianus*" and "*R. purshiana*". Early botanists favoured the masculine version, and the *Botanical Code* recommends that tradition be followed. The name "bearberry" is sometimes employed for Cascara in British Columbia, but is best reserved for *Arctostaphylos uva-ursi*. The drug (i.e. bark preparation) is known as cascara sagrada (French = écorce sacrée, cascara sagrada), from the Spanish for "sacred bark". Below, following majority practice, the plant is referred to as Cascara while the laxative bark preparation is cascara sagrada.

Cascara is a deciduous shrub or tree as tall as 12 m (very rarely to 15 m) and with a trunk diameter sometimes approaching a meter, although usually no more than 50 cm. The ashy-gray to dark brown, often red-tinged bark, which constitutes the economic part of the plant, is thin and smooth, and develops brown to gray scales. The freshly cut interior surface is bright yellow, but darkens rapidly. The leaves are 5-18 cm long, oblong, with 10-12 pairs of prominent parallel veins. Most plants have both bisexual and unisexual flowers, although occasionally a plant bears flowers of only one sex. The berry-like drupes are red when immature, ripening to black or purplish black, sweet, juicy fruits 6-12 mm in diameter. These are eaten by birds and mammals, which disperse the seeds. As the plants are frequently cut down for their bark, it is fortunate that stump sprouts arise readily.



Rhamnus purshianus occurs in the Pacific Coast region from British Columbia (including Vancouver Island) southward in the coastal ranges and in the Sierra Nevada to southern California; it also occurs in the Rocky Mountain region, east to northern Idaho, northwestern Montana, and occasionally in Arizona. Overcollecting has eliminated the plant in parts of its range. *Rhamnus purshianus* is often found in moist areas, by streamsides and in woods, often in lowlands and canyons, and in submontane areas to about 1500 m. It is also distributed along fence rows and roadsides. While Cascara is widespread, it is usually not abundant, generally occurring amidst local forest and woodland species. It is very tolerant of shade, and often is an understory species.

There are a variety of miscellaneous minor uses for Cascara. The wood is locally used for posts, fuel, and for turnery. Cascara honey is considered very tasty, although somewhat laxative. The fruits may be eaten by humans, although a temporary reddish cast to the skin is said to occasionally result. Extracts from Cascara have been employed to flavour

liqueurs, soft drinks, ice cream and baked goods. Cascara is sometimes grown as an ornamental, principally in the eastern US and Europe. The tree is also planted to provide food and habitat for wildlife, and to control soil erosion.

Cascara is mainly useful for its laxative bark, and in this respect is one of the most valuable commercial native pharmacological crops of North America. Pacific Northwest Indians used cascara sagrada for centuries as a traditional remedy for constipation, and white settlers took up this use in the early 1800's. Today, cascara sagrada accounts for about 20% of the US laxative market, the latter estimated to be worth about US$400 million annually. The overall retail value of Cascara bark is of the order of $100 million. Cascara sagrada has been recorded in about 200 drug products sold in Canada, and occurs in more North American drug preparations than any other wild-collected material. It has been called the most widely used cathartic on earth. However, the demand for it appears to have diminished somewhat since the 1960's because of the development of alternative drugs.

Cascara sagrada is an example of the maxim that good medicines should taste bad. If taken as a tonic or tea (rather than in capsule form) it is bitter and tends to provoke nausea. It is very useful for habitual constipation, but is also employed for digestive complaints, and in treating haemorrhoids. It is most recommended for disorders in which an easy evacuation of the bowel is desired. It should not be used during pregnancy (cathartics may induce labour) or lactation (the laxative may be transferred to the infant), or in cases of intestinal obstruction. Frequent use may result in loss of water and salts, deposition of pigment in the intestinal mucosa, and red urine. Cascara sagrada is not habit-forming, and indeed should only be used on a short-term basis. The laxative utility of *R. purshianus* should not be confused with that of the comparatively dangerous *R. catharticus* (buckthorn), once widely employed in Europe and imported by North American colonists, who reportedly needed an explosive laxative that would "act like dynamite". The cathartic activity of cascara sagrada is due to a mixture of hydroxyanthracene derivatives (particularly anthraquinone glycosides). These excite peristalsis in the colon, and so are useful in treating chronic constipation. The mechanism has been explained as an inhibition of the absorption of electrolytes and water from the large intestine, with a consequent increase in volume of the bowel contents strengthening the dilation pressure and thereby stimulating peristalsis. Cascara sagrada is classified as a tonic laxative, strengthening the peristaltic muscles of the intestinal wall so that additional use of a laxative becomes unnecessary.

Cascara bark is still collected from wild trees throughout the range of the plant, particularly in Washington. It has been cultivated for harvest of the bark in British Columbia, Washington and Oregon, and occasionally in Eurasia, but plantations have not achieved much economic success, and the plant remains largely gathered from the wild. Because it is a secondary host of Oat Crown Rust (although not as significant as such species as *R. frangula*), local regulations may limit its cultivation. Formerly, harvest involved stripping the bark from the trunk of standing trees, a wasteful and unacceptable procedure that kills the trees and harvests only some of the bark. By contrast, felling the tree and leaving a 30 cm stump cut at an angle (to shed water) allows complete harvesting of bark, including that of the branches, and lets the plant regenerate. The average yield of bark per tree is 4.5 kg, but ranges from about 2 kg for a 7.5 cm diameter tree to 71 kg for a 43 cm diameter tree. The harvested bark is sun-dried, broken into pieces, packed and shipped to dealers. Because fresh bark tends to cause griping and nausea, the bark is aged for a year, or artificially aged by heat (e.g. 1 hour at 100°C). Apparently handling Cascara for a prolonged interval can transfer the laxative effects through the skin, although this does not seem to be a significant problem for individuals harvesting the bark. The drug preparation should be stored away from moisture and light.

Overharvesting of wild trees is a continuing problem. In British Columbia, cutting trees on Crown land requires a permit, and provincial legislation also governs how such cutting may be carried out. In the first half of this century, wild trees sometimes supplied annual harvests of over 300 t in B.C. alone, with harvests from throughout the natural range estimated in some years at about 2,000 t. Reliable estimates for recent times are not available. Cultivation may become more economically feasible as natural populations continue to decline. The tree is so easily established that cultivation and/or increasing its frequency in natural habitats to that of former times and promoting sustainable practices could strengthen the Cascara industry in Canada.

BOOK REVIEWS

Genetics and the Manipulation of Life. The Forgotten Factor of Context. by Craig Holdrege. 1996. Lindisfarne Press, Hudson, N.Y. Price: $US 14.95.

We live in a genocentric age: the emphasis is on genes and their manipulation. Genes are considered enormously powerful. Yet genes themselves cannot do anything. Power resides in genes plus their context of which they form an integral part. Ignoring or minimizing context can have grave consequences.

In his book **Genetics and the Manipulation of Life. The Forgotten Factor of Context**, Craig Holdrege illustrates the importance of context. He begins by pointing out that a tree cannot be understood in isolation from the landscape of which it forms an integral part. For example, a basswood tree on a dry and exposed south-facing slope may be almost bush like, whereas a basswood tree on a north-facing slope of a forested valley may have a long trunk. Similarly genes cannot be understood without the organism and environment of which they form an integral part. Changes within the gene's environment may affect its expression. Therefore, the gene

by itself cannot be considered the cause of a trait. A trait results from the complex interplay of genes and their environment. Neither genes nor environment have priority over each other. We need to consider the whole organism-environment system. And since we as observers and manipulators are integral parts of the environment, we also have to be aware of our influence through our thoughts, emotions and actions.

Holdrege examines Mendelian and modern genetics from this wider perspective. He shows that there is a strong tendency to forget the genes' context and he points out far-reaching consequences of this neglect in experimentation with plants, animals and humans. A cow, for example, is seen as a bioreactor from the point of view of manipulative genetics that overlooks the whole and becomes obsessed with isolated parts out of context.

Holdrege writes beautifully in a simple style avoiding technical terms as much as possible. Thus the book can be read and understood not only by university students but even by advanced college or high school students. Yet, inspite of this simplicity, the book offers profound insights for research scientists in biology, especially geneticists. I therefore strongly recommend this book to biologists and lay persons. Since the book adresses a profound lack or deficiency in our present-day culture, namely the forgotten context and wholeness, it is a book written for our age. If taken to heart, it might be a cure from the ills and dangers of destructive manipulative genetics.

Rolf Sattler, Department of Biology
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Photosynthesis. Fifth Edition. by D.O. Hall and K.K. Rao.

This book is described as being a review on photosynthesis (211 pp.) which will appeal to students and teachers of biology, especially for college and university degrees. The book is well written and includes a large number of figures which should be useful in the explanation of central concepts in photosynthesis. The introductory chapters view photosynthesis by considering light, energy and energy transfer. A discussion of units is included along with an excellent discussion of how light, oxygen and carbon dioxide are measured. Chapter 2 emphasizes the history of photosynthesis research and the progress of ideas with carbon metabolism and variables which alter the dark reaction determining the saturation rate of photosynthesis. Oxygen evolution via the Hill reaction and incorporation of carbon dioxide via the Calvin cycle are discussed along with the Emerson enhancement, the Z scheme, Mitchell's chemiosmotic hypothesis and C3 and C4 photosynthesis.

The scientific foundations for constructing a picture of the light reactions and the dark reactions in plants provide the framework for the Chapters 4 through 6. Chapter 4 discusses the photobiophysics of light absorption, fluorescence and charge separation. The development of the concept of two light reactions in series rather than in parallel with cytochrome fb_6 connecting the two photosystems is an interesting presentation of noncyclic electron transport. Chapter 5 begins with a discussion of the formation of ATP and NADPH and progressively discusses cyclic photophosphorylation, ferredoxin, the Mehler reaction and pseudocyclic electron transport. Sites at which artificial donors, acceptors and herbicides act within the electron trasport chain are discussed within the context of the above pathways of electron transport. Chapter 6 presents an overview of C3 and C4 photosynthesis and a discussion of topics relevant to any discussion of greenhouse effect.

A synopsis of bacterial photosynthesis and the evolution of photosynthesis presents a summary of how PSII-like and PSI-like photosystems may have evolved. The book concludes with a discussion of current research in photosynthesis (1994, the date of publication for the fifth edition) and a brief discussion of techniques. Brief discussions are presented for phytochromes, chloroplast development and genetics, assembly of polypeptides into chloroplast membranes, and ion and metabolite exchange across the chloroplast envelope. Among the techniques discussed are protoplasts (PEG and calcium), electroporation, microlaser, microinjection and biolistics (particle gun) methods of introducing various substances into plants and the creation of transgenic plants. The chloroplast genome and mutants, especially of unicellular organisms, are discussed as useful tools in basic and applied research. Regulatory control of photosynthsis by the reducing agents ascorbate, glutathione and proteins of the ferredoxin thioredoxin system is discussed prior to whole leaf and plant studies, productivity and the uptake of nitrogen and carbon.

Dr. Michael White, Dept. of Biology
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Fire and plants. by William J. Bond and Brian W. van Wilgen. 1996. Chapman & Hall, London, UK.

When I first got this book I did what every body else does when they receive a book in their discipline; I checked the references to see whether I was cited. Alas I was not cited and so I set about in earnest to write a scathing, highly critical review that would smother sales and teach the authors a thing or two. This feeling lasted but a second and then I sat down to give the book the review it deserved.

This book is a good introduction to the role of fire in plant population and community dynamics. The first chapter effectively summarizes the book. The second chapter briefly describes the fire regime and flammability. Subsequent chapters describe response, demography, evolutionary ecology, competition and the organization of communities, all within the context of plants and fire. The role of fire in

management and global change form the basis of the last two chapters. The book, by design, does not provide in-depth coverage of all topics. The coverage, however, is sufficiently broad with many important papers cited in the text. The authors point out several gaps in knowledge and in the application of this knowledge but the brevity of the book (225 pages of text in a 263 page book) precludes mention of all uncertainties. The figures and tables are reasonably clear and straight-forward. Lines in some figures are too thick, but this is a minor complaint. The eight colour plates reproduced well in my copy and reflect the range of topics covered in the text.

The effect of fire on plants is very much determined by the frequency, timing and intensity of fire. One strength of the book is the discussion of interval-dependent (time since last fire) effects, density-dependent effects and event-dependent (season and intensity of fire) effects of fire on plants and the consequences for predicting population dynamics.

The book is probably best suited for upper-level university courses or graduate courses (provided that additional readings are assigned to graduates). Plant ecologists and fire ecologists who have been ignoring each other should find this book a welcome addition to their libraries. Ecologists who have kept up-to-date will find this book an effective summary of fire and plant dynamics.

John C. Hogenbirk, Research Associate
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Plant-Microbe Interactions. Volume 1. Edited by G. Stacey and N.T. Keen. Chapman & Hall, New York. 316 pp.

To paraphrase the editors, this new series is intended to document the development of plant-microbe interactions especially as this relates to the manipulation of these interactions for particular outcomes. In Volume 1 there are eight chapters written by 15 authors from the United States, Mexico, France and Canada. A quick scan of the volume makes it obvious that the emphasis here is on the molecular, but the authors differ in the treatment of their subject matter so that in many cases the chapters present the molecular information gently enveloped within the overall context of the organisms. As a person whose eyes glaze over a few paragraphs into most detailed accounts of life at the molecular level, I still found lots to be excited about in this volume.

In Chapter 1, Gregory B. Martin summarized the cloning of plant disease resistance genes and in Chapter 2, Luis Herrera-Estrella, Laura Silva Rosales, and Rafael Rivera-Bustamante described the approaches used to create disease-resistant transgenic plants. Because of my interest in mycorrhizae, I read with particular interest Chapter 3 by Urs Neuenschwander, Kay Lawton, and John Ryals on long-lasting, broad-spectrum systemic acquired resistance (SAR) to pathogen attack and was amazed once again that plants seem hardly even to notice when mycorrhizal fungi crawl into their intimate nooks and crannies. This chapter also gives new meaning to the old medical saw "Take two aspirin and call me in the morning".

Christopher L. Schardl in Chapter 4 summarized the taxonomy, life cycle, evidence of mutualism, host specificity, pharmacological activities, and evolution of the endophytic fungi, *Epichloe* species and hybrids, of grasses while exploring the potential for molecular level understanding of genome structure and evolution. He argues that this symbiosis is "analogous to a single organism (and) is one of the most complex genetic systems to emerge to date. The grass is an allohexaploid hybrid, and its maternally inherited endophyte was recently characterized as a heteroploid, double hybrid".

Jim W. Kronstad's account in Chapter 5 of the pathogenesis and sexual development of smut fungi combined a discussion of disease symptoms and economics with details of molecular genetic analysis of mating systems in the fungi. Linda S. Thomashow and David M. Weller summarized the mechanisms of biological disease control by introduced bacteria and then explored more closely the fluorescent *Pseudomonas* spp. and antibiosis (Chapter 6). In Chapter 7 on legume signals to rhizobial symbionts, rather than reviewing the methodological problems of trying to assess rhizosphere colonization, Donald A. Phillips and Wofgang Streit focused on natural plant signals released by alfalfa, soybean, and common bean and suggested a new research approach called signal analysis. The yin to this yang is presented in Chapter 8 by Jean Claude Promé and Nathalie Demont on the nodulation factors that are produced by the rhizobia and that are the primary determinants of specificity in the nitrogen-fixing symbiosis between legumes and rhizobia.

Although many of the authors claimed that their chapters were not intended to be comprehensive, I was impressed by the 100-200 references cited in most chapters and although I am an expert in none of these fields, it was clear that any of the reference lists could be used as entry point into specific areas of interest. Despite my systemic constitutive resistance (SCR) to the narrow-mindedly molecular, I found that all of the chapters contained some gem that got me thinking and most did a fine job of putting the molecular into context. Finally, I appreciated the way all of the authors pointed the reader toward the yet-unanswered questions and the exciting possibilities. Although I would not invest in my own personal set, you would certainly find me encouraging my library to acquire this new series.

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RESEARCH AND COLLECTIONS AT THE MONTRÉAL BOTANICAL GARDEN

Denis Barabé and Luc Brouillet

Editor's Note: This is the text of a paper presented by Denis Barabé at the annual meeting of the American Association of Botanical Gardens and Arboreta, Montréal, 22-25 July, 1995. Since our Annual Meeting is in Montréal next year, this paper will provide an excellent overview of some of research activities that have been carried out on the collections at the Montréal Botanical Garden.

First of all, I would like to say that this presentation was prepared with Luc Brouillet who is professor at the University of Montreal. For 15 years, we have been collaborating on several research projects involving the living collections of the Montreal Botanical Garden.

Fourteen years ago, in 1981, at the occasion of the 50th anniversary of the Montreal Botanical Garden, I presented a communication titled "The role of collections in scientific research". At that time, one of the main purposes of the Garden was to promote the utilisation of its collections for research. Fourteen years later, the situation has changed considerably; now we have to demonstrate the utility of research for the development of collections. Why did this reversal of situation occur? As many other cultural and scientific institutions, botanical gardens are presently facing drastic decreases in their budgets. When there is less money, each component of the garden must be analysed in detail in function of the general and particular goals of the botanical garden.

A botanical garden comprises many components: maintenance, horticulture, research, administration, security, customers' services, marketing and education. If one asks the question: which are the essential components of a botanical garden?, one receives as many answers as there are components. The horticulture section will say that without gardeners it is impossible to grow plants; the marketing section will claim that without publicity nobody would come to see the collections; the education section will say that, without the public education programs, the botanical garden could not fulfil its primary role, and the research section will claim that, without research, a botanical garden is not a botanical garden. In fact, and it should not be surprising to this audience, each component of a botanical garden is essential to its development and visibility. Therefore we must take two further points into consideration. Firstly, a botanical garden is more than the sum of its components. It is the interrelationship between components that creates a dynamic from which will result a cultural, educational and scientific institution. It is this type of institution that should be called a botanical garden. Secondly, as is well known, there are many types of botanical gardens. Depending on the particular goals of a garden, the emphasis may be put on a particular component. In this case, this component becomes more developed than the others. All botanical gardens, however, share a common goal: to develop their collections for esthetic and educational purposes.

The question that we wish to address here is: what is the impact of research on the development of collections? We will try to answer this question by adopting a practical perspective. The impact of research will be analysed in relation to the activities carried out at the Montreal Botanical Garden. The role of scientific activities in the development of collections may be considered from different points of view. Three aspects will be examined here: research, education, horticulture. We will show how different research projects, carried out at the Montreal Botanical Garden, have had or might have had an effect on the development of collections. I will also show how research may influence the horticultural and educational aspects of a botanical garden.

In a full-fledged botanical garden, four aspects are generaly assumed to be important: botany, ethnobotany, horticulture and landscapinq. But, within each of these aspects, it is very difficult to progress and be creative without the help of research activities. This does not necessarily imply botanical research, but may involve other types of research, in education and in landscaping. Today, however, my presentation will focus on the utility of botanical research to the development of collections. I will present two research projects done at the Montreal Botanical Garden in collaboration with the Plant Biology Research Institute.

But first, I would like to discuss two collections of the Garden that have been used for research in the past. It is clear that research may determine the emphasis put on a particular collection in the garden. At the Montreal Botanical Garden, for instance, Henry Teuscher, the first curator, made a lot of taxonomic and horticultural research on the Orchid collection in the 50's. Even if he did not describe new species, he wrote no less than three hundreds papers containing taxonomic and cultural notes on the specimens growing at the Garden. Thanks to him, the Montreal Botanical Garden possesses a significant Orchid collection that brings the admiration of visitors. The second curator of the Garden, Marcel Raymond, did taxonomic work on the Gesneriad collection. In the 60's, he described new species of *Columnea* from specimens growing in our collections. His interest in the taxonomy of Gesneriads allowed us to build one of the largest collections of Columneas in the world. Presently, the Orchid and Gesneriad collections contitute two of the main horticultural and botanical axes of the Montreal Botanical Garden. Without the major scientific interest in the systematics of Orchids and Gesneriads shown by these curators,these two collections would not have expanded so much. Thus, they would have been unable to play their esthetic and educational role in the exhibit greenhouses.

At the beginning of the 80's, with my colleague Luc Brouillet, I started a project on the systematics and morphology of genus *Begonia*, which comprises some twelve hundred species. The collection of the Montreal Botanical

Garden contains more than 230 species and 300 cultivars. Three main research projects have been realized so far using the *Begonia* collection. The first concerned the comparative anatomy and development of the *Begonia* flower. Flowers at different stages of development were collected on 6 species. This project allowed us to explain the developmental evolution of the *Begonia* flower. The second project dealt with the comparative analysis of leaf micro-anatomical characters, types of trichomes, of stomata, of epidermal cells, etc. For this study, samples of leaves were collected on more than one hundred species. The results of this research made it possible to shed new light on *Begonia* classification.

The last project concerning the *Begonia* collection was the analysis of inflorescence architecture and flower structure in relation to reproduction. In genus *Begonia*, flowers are unisexual and offer no rewards other than pollen to their pollinators. In general, the female flowers possess an inferior ovary, generally with wings. A quantitative analysis of the different parts of male and female flowers, for example, the length of the perianth, the stamen, and the stigma, showed that the female flowers have the same overall shape and size as male ones. From a biological point of view, this similarity in shape would indicate that female flowers attract pollinators by deception mimiking the male flowers. The pollinators are attracted to the stigmas of the female flowers, which have the overall shape and color of the stamens of male flowers. When the insect comes to the female flower, thinking that it will land on a male flower, it effects cross pollination. To obtain these data, measures were taken on more than 75 species at different stages of development.

The results of this research were used to prepare a permanent educational exhibit in the main greenhouse of the botanical garden. When the Garden wants to prepare exhibits, we must choose between different topics. It is not possible to show everything. But how do we choose? In general we try to select the newest and most interesting aspects that relate to the living collections. I am convinced that research allows us to gain a better understanding of recent developments in a particular field. In the case of the *Begonia* flower, for instance, our research has allowed us to develop a close relation between a biological phenomenon (the results of our research), an exhibit (the educational aspect), and a collection (horticultural aspect). Without this research, it would have been very difficult to prove that the flower of *Begonia* is an interesting example of pollination by deception. This example demonstrates how research is closely related to the educational and horticultural aspects of a botanical garden.
Without the living collection, it would have been difficult or even impossible to carry out these three projects on the genus *Begonia*. On the other hand, these projects brought about a better taxonomical identification of some specimens, stimulated the acquisition of new species, and publicized the collection at the international level, within the scientific and horticultural communities at least. As you know, many species are not found commercialy, but only through exchange. When you are known to hold a good collection in a particular taxonomic group, it is easier to obtain rare specimens for educational or scientific purposes. Also, when the scientific and horticultural community knows that you maintain valuable collections in certain groups you may receive spontaneous donations.

Another example of research using the living collections at the Montreal Botanical Garden concerns the comparative morphology of the flower of Aroids. The family Araceae includes about 120 genera and 1200 species. In the family, there are two main types of inflorescence: with bisexual flowers, as can be observed in genus *Anthurium* (the flowers have a tetragonal shape), and with unisexual flowers as in genus *Philodendron*. In the latter, the female flowers occupy the lower part of the inflorescence and the male flowers the upper part. I began to study the anatomy and development of the Aroid flowers 15 years ago. To be able to do this research, it was necessary to obtain inflorescences belonging to many different species. Inflorescences at different stages of development were collected in the wild and on specimens growing at the Montreal Botanical Garden. To obtain new species, I organized several field trips to tropical Africa and South America, particularly French Guyana. These field trips allowed us to obtain very interesting specimens from both a botanical and a horticultural point of view. The majority of these species cannot be obtained from commercial nurseries. For example, there are very interesting species in the genera *Anchomanes* and *Dracontium*. Both possess only a simple leaf which is renewed each year. These exotic species may also be very attractive to the visitors of the Garden. At the beginning of my research on Aroids many interesting species were lackinq, particularly African ones. But field trips and exchanges with other specialists allowed me to increase considerably the number of specimens in our collection. In fact, 40% of the specimens of the collection were acquired after I started my research on this family.

The last example of research is related intimately to the Orchids collection. Presently, part of the Orchids collection is used in a research project on the mode of germination of Orchid seeds belonging to different subfamilies. The collection of the Garden is used to obtain the seeds. Many specimens were manually self-pollinated to produce them. The seeds obtained were cultivated *in vitro* to study the mode of development of the seedlings. In this case, the reseach on seed germination doesn't have a direct impact on the development of the collection. But, on the other hand, it is bringing better identification of specimens, because the comparative analysis requires accurate identification of the species used. Moreover this research could have some fallout for ornamental horticulture.

To conclude this short presentation, I would like to review briefly the main effects that research might have on the development of collections and their use for educational and horticultural purposes.
1) Research allows a better identification of the specimens
2) Research allows the acquisition of rare and spectacular specimens

3) Research helps to determine the main emphasis in the development of collections
4) Research helps to raise and maintain an interest in a particular collection
5) Research represents the scientific support for the use of collections in education

I must note that the impact of research is not limited to the particular taxonomic group under study. For example, when I go to other countries to collect Aroids, I also collect other plants to improve our holdings. Many plants that have been collected in French Guyana some years ago are presently growing in the exhibition greenhouses. These plants represent interesting elements that can be seen by visitors. From an educational viewpoint, we can say the same: the impact of research is not limited to the group that you are working on. The expertise obtained in doing research can be expanded to more general purposes. For instance, the general topic of the main exhibition greenhouse is "The Monocotyledons", with an emphasis on arborescents and giant taxa. These plants belongs to the Palmae, Zingiberaceae, Strelitziaceae, Gramineae, etc. The scientific and educational orientation in the choice of plants and exhibits presented in this greenhouse relies on the expertise of researchers working at the Montreal Botanical Garden. This expertise is based in great part on the research projects that have been realized at the Garden during the last 20 years. Without this expertise, it would have been very difficult to realize an exhibit based on a scientific theme such as the monocot families.

I would like to end this presentation by quoting Henry Teuscher, the first curator of the Montreal Botanical Garden, who wrote in 1940 in his "Program for an ideal botanical Garden" (p.1):
"A botanical garden is, of course, first of all an educational institution. As long as botanical gardens have existed - and their history is indeed a long one - they always have served education in one way or another." and also (p.2) *"Of course, a botanical garden should be the center of botanical research for the region in which it is located, and have a well qualified scientific staff; of course, it should co-operate closely with the local universities and other institution of learning..."* This is exactly how we conceive the role of the Montreal Botanical Garden today.

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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.

Kenneth Rankin, 1909-1996

This British accountant was responsible for the establishment of much of the huge privately-owned area of coniferous plantations now found in Scotland. After the Second World War he advised his clients to plant trees to supply a national need for wood and to take advantage of tax incentives which meant that plantation owners could avoid paying income tax, capital gains tax and estate duty. He set up several management companies which eventually merged to form the Economic Forestry Group which, at its peak, was planting 30,000 acres of conifers per year. The Eskdalemuir complex in Scotland is said to be the largest privately-owned forest in Europe (36,000 acres). Rankin's investment strategy was so successful that the Chancellor of the Exchequer was forced to cancel the tax breaks in 1988. The private forestry industry in Britain remains profitable, however. Although not trained in forestry, Rankin was made an Honorary Fellow of the Institute of Chartered Foresters, the first non-professional to be so honoured. He also was awarded the Society of Forestry gold medal for his contributions to British forestry.

The Times of London, June 26, 1996

Private *Rhododendron* Collection in B.C.

Next year's participants in a *Rhododendron* convention in Vancouver will be treated to a tour of Richard Mossakowski's hillside garden in West Vancouver overlooking Howe Sound. Over the last 15 years Mossakowski, who was born in Warsaw, Poland, and came to Canada in the 1960s, has planted more than 1,300 cultivars of *Rhododendron* (from 300 different species) on his rocky terrain. The plants thrive although they are buffeted by wind and rain in the winter and have to endure hot, dry days in the summer.

Kitchener-Waterloo Record, July 6, 1996

Hawaii Declares War on Invader

Governor Cayetano of Hawaii recently approved a campaign to eradicate a serious pest, the introduced weedy plant, *Miconia calvescens*. The governor called it "a natural disaster waiting to happen". It has already taken over an estimated 70% of Tahiti's forests, where the locals call the plant "green cancer". Introduced into Hawaii as an ornamental plant in the 1960s it is now present on 4,000 hectares, mostly on Hawaii and Maui, but also in small pockets on Oahu and Kauai. The fast-growing plant matures in about 5 years, producing small fruit with hundreds of seeds that are spread by birds which eat the fruit. In its native Brazil the plant has to compete aggressively with other jungle plants. In the Hawaiian islands it forms dense thickets up to 15 metres high and its large (90 cm long) heart-shaped leaves block out sunlight from smaller native plants. This loss of native understory plants presents a serious environmental problem of increased erosion. At present scientists have not found any natural enemies that could be used in a biocontrol strategy. The present campaign will use the time-honoured method: find a plant, pull it out, chop it up and destroy the bits.

China Daily, May 18, 1996

Warning! Germander Zaps your Liver!

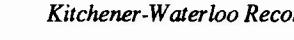
Germander tea has been used in European folk medicine for centuries. Recently, however, capsules containing germander powder have been marketed for weight control and in this form it has a serious side-effect; it causes liver damage resulting in jaundice. Two Montréal researchers (in *Canadian Medical Association Journal*) report such an effect in two women and several cases have been reported in France (which banned all germander preparations in 1992). In the Montréal cases the jaundice cleared up over about two months after the women quit taking the germander capsules. Consider yourself warned about the dangers of germander.

Marilyn Dunlop, Toronto Star, June 15, 1996

And now ... the Good Herb

Researchers report that a drug derived from a Chinese herb is as effective as quinine in prevention of deaths from malaria. The drug, called artemether, is obtained from the traditional Chinese remedy "qinghaosu". Your editor is not a linguist, nor an expert in herbal medicine, and the plant constituents of the remedy are not mentioned in the article. However, it might be a good guess the artemether is derived from a species of *Artemesia*. There are some side effects noted with artemether use when compared with quinine treatment. Patients are slower to emerge from malarial coma and more likely to have convulsions with artemether.

Kitchener-Waterloo Record, July 11, 1996



A Botanical Shangri-La

"Dulongjiang is heaven for botanists" begins this article about a recently botanized part of China's Yunnan Province. The Dulongjiang region borders Myanmar to the south and the deep valleys around the Dulongjiang River are 95% covered by old growth forest. Botanist Li Heng and her colleagues from the Kunming Institute of Botany spent nine months cataloguing the seed plant diversity of the region in 1990-1991. Her study has found 158 families containing 673 genera and a total of 1,920 species, among which there are 169 species endemic to the region. The families with the most species are Orchidaceae (141 spp.), Asteraceae (107 spp.) and Ericaceae (105 spp.). The area has representatives from several families endemic to China: Davidiaceae, Stachyuraceae, Dipentodontaceae and Podoaceae. The researchers estimate that 84% of the species have temperate affinities and the remainder are tropical. Geologically Dulongjiang was part of the Myanmar-Malaya plate which collided with the Eurasian plate and this, perhaps, explains some of the unique features of the region's flora.

Shao Ning, China Daily, June 12, 1996

Some Like it Hot!

In a recent article in *Nature* researchers at the University of Adelaide report that flowers of the sacred lotus (*Nelumbo nucifera*) maintain an internal temperature of 30-35 C, even if the ambient temperature drops to 10 C at night. Only two other plants, skunk cabbage and elephant's ear, both in the Araceae, are known to regulate flower temperature. The Adelaide researchers speculate that the reason the lotus expends such a lot of energy to produce heat (about one watt per flower) is to keep insect pollinators active inside the closed flowers during the night. The pollinators, mostly beetles, will emerge in the morning well-dusted with pollen.

New York Times, October 1, 1996

Honey Bee Saviour Dies

Continuing the subject of plant pollination, this time about the honey bee, comes this obituary for Karl Adam Kehrle, who died in early September at the age of 98. He was better known as Brother Adam of Buckfast Abbey, Devon, and became famous because of several films and TV specials that were made about his research. Largely self-taught, Brother Adam came to be regarded as the world expert on the care and breeding of honey bees. He, almost single-handedly, saved the honey bee from the acarine disease (parasitic mites) which had devastated European hives of domesticated bees in the early part of this century. He spent many years searching for mite resistant wild bees and breeding this resistance into his domesticated populations at the Abbey. Queen bees from his Buckfast strain are now sold world-wide and the resulting workers pollinate hundreds, if not thousands, of species of plants. Sadly, however, Brother Adam's breeding research will not continue at the Abbey. Althouth the bees earn the Abbey more than £20,000 annually in reproduction rights, the newly elected Abbott considers that the main purpose of the Buckfast bees is to produce a lot of honey.

The Times of London, September 3, 1996

Hops

We all know that hops are used to give beer its distinctive flavour. The hop, however, has a long history of use as a medicinal plant. Extracts from hop leaves and inflorescences have a sedative and sleep-inducing effect in humans, and are also thought to have anti-bacterial and anti-fungal properties. For a long time hops were prescribed by herbalists to relieve tension headaches and other maladies. In the days when hops were harvested using manual labour, it was discovered that some people are allergic to the juices of the plant and to dust particles rising from masses of collected inflorescences. These people suffer severe contact dermatitis from the juices and may have asthmatic attacks after inhaling the dust. A few people are so sensitive to the plant that they become uncontrollably drowsy (often appearing to be drunk) after inhaling fumes given off by the plant or by harvested hop inflorescences.

Dr. Thomas Stuttaford, The Times of London, Sept. 4, 1996

Sage Advice

The 17th century herbalist who wrote that sage "*helpeth a weake braine or memory and restoreth them being decayed in a short time*" may have be right. In a 1995 report in *New Scientist*, researchers report that sage oil may inhibit an enzyme involved in memory loss in Alzheimer's disease. The research is now shifting to the isolation and identification of the active chemical(s) in the sage oil.

Australian Horticulture, February 1996
Thanks to Sylvia Taylor for sending this item

Chocolate Shocks?

An engineering graduate student at Michigan State has discovered that a melted Hershey chocolate bar is an "electrorheological" fluid (commonly called a "smart fluid"). When a high-voltage electrical field is applied to the melted chocolate it instantaneously becomes a stiff gel (the reverse occurs when the power is turned off). This property of smart fluids is known as the "Winslow effect", and it occurs in several liquids which are, like chocolate, suspensions of droplets in an oily fluid. The auto industry has been studying several smart fluids for use in computer controlled shock absorbers. The idea is that the computer would control an electric field which would automatically stiffen or liquify the smart fluid in the shocks in order to smooth out the ride on rough roads or to permit better cornering of the vehicle. The Michigan State research team thinks that Hershey bars should be added to the smart fluids being tested.

New York Times, September 24, 1996

Wollemi Pine Progress

Over the past year Australian researchers have propagated 500 saplings of the recently discovered Wollemi Pine. Some were put on display at Sydney's R.B.G. and others are to be sent to Kew, Edinburgh and other botanical gardens. It should not take many years before *Wollemia nobilis* is available for sale from commercial nurseries.

The Times of London, September 3, 1996

Meetings / congrès

NABC Meeting

The **9th Annual Meeting of the National Agricultural Biotechnology Council (NABC)** will be held at the University of Saskatchewan, **June 1-3, 1997**. The theme of the meeting is: Resource Management in Challenged Environments. Obtain details about the meeting from the website: **http://www.cals.cornell.edu/extension/nabc** or via Email: **nabc@cornell.edu**.

Plant Molecular Biology

Advances in Plant Molecular Biology is the title of a symposium to be held in Glasgow, U.K., **August 13-15, 1997**. Obtain details about the meeting from the website: **http://taxonomy.zoology.gla.ac.uk/plant_meeting.html**

Forestry Congress

The **XI World Forestry Congress** will be held in Antalya, Turkey, **October 13-22, 1997**. The Congress theme is: Forestry for Sustainable Development: Towards the 21st Century. For information, contact either: **Mesut Y. Kamiloglu, Ministry of Forestry, Ataturk Bulvari 153, Ankara, Turkey** or **Luis Botero, FAO, Forestry Department, Via delle Terme di Caracalla, 00100 Rome, Italy [Email: luis.botero@fao.org].**

INTECOL VII

The **7th International Congress of Ecology** is being planned and will take place in Florence, Italy, **July 19-25, 1998**. To obtain information or to be placed on the mailing list, contact **Almo Farina [Email: afarina@tament.it].**

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