



The Canadian Botanical Association Bulletin

Bulletin de l'Association Botanique du Canada

Volume 56 Number 1 - March/mars 2023

Highlights

President's Message	Pg. 1
Member News & Notices	Pg. 4
A Tribute to Lawrence Fowke	Pg. 6
2023 Conference & Awards Reminder	Pg. 8
Section Updates	Pg. 12
Teaching using a lightboard	Pg. 14
Flora North America Appeal	Pg. 15
A Tribute to George Argus	Pg. 16
The George Lawson Medal, Part 1	Pg. 23
Crabapples, by Ernie Small	Pg. 30

President's Message

1) Thank you for your donations!

Dear CBA members, I knew that you are great friends of botany, but I was humbled to also discover how generous you are as well! There are many worthy causes competing for our donations, yet many of you (also) chose to support CBA. From little to large amounts, what matters is your selfless generosity: *thank you times as many sedge species are out there!*



Your kindness is greatly appreciated and your gift will make a difference to the sustainability of our numerous awards. Rest assured that we are trying to make the most out of the donations and membership dues. Our operating costs are reduced to the professional expertise we cannot provide ourselves (e.g., accountants and lawyers) or that greatly improve our expression and communication (e.g., the Bulletin).

2) CBA purposes were finally approved by Canada Revenue Agency

As you may remember, in 2021 CBA initiated a revision of the original Association purpose from 1976, to better reflect our current professional identity and aspirations. The first draft was "germinated" by the IDEA committee, grown by the Board of Directors, and brought to fruition through vote at the AGM in June 2021. The text and official request were forwarded to the Canada Revenue Agency (CRA) in April 2022. Subsequently, CRA requested clarifications and a protracted communication via our lawyer ensued. Finally, after one modification requested by the CRA and the approval of the Board of Directors, I am happy to report that CBA has new purposes:

The Canadian Botanical Association Bulletin

The CBA Bulletin is issued three times a year (March, September and December) and is freely available on the CBA website. Hardcopy subscriptions are available for a fee.

Information for Contributors

All members are welcome to submit texts in the form of papers, reviews, comments, essays, requests, or anything related to botany or botanists. For detailed directives on text submission please contact the Editor (see below). For general information about the CBA, go to the website: www.cba-abc.ca

Executive Editor

Dr. Erin Zimmerman

cba.abc.bulletin@gmail.com

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Next issue

Texts for the next issue, 56(2), must be received by August 1, 2023

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Bulletin de l'Association Botanique du Canada

Le Bulletin de l'ABC paraît trois fois par année, normalement en mars, septembre et décembre. Il est envoyé à tous les membres de l'ABC.

Soumission de textes

Tous les membres de l'Association sont invités à envoyer des textes de toute nature concernant la botanique et les botanistes (articles, revues de publication, commentaires, requêtes, essais, etc.). Tous les supports de texte sont acceptés. Pour des renseignements détaillés sur la soumission de textes, veuillez consulter le rédacteur (voir ci-dessous). Infos générales sur l'ABC à l'URL suivant: www.cba-abc.ca

Rédactrice en chef

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Prochain numéro

La date de tombée des textes du prochain numéro, le no 56(2), est le 1 août 2023

a) promoting botanical research and understanding by gathering, developing, and sharing botanical knowledge with academics, professionals, and lay people from all spheres of society;

b) providing inclusive forums for discussion of botanical teaching, research, outreach and knowledge regardless of origin, including through conferences, symposia, workshops, publications and activities with local communities;

c) providing awards for achievements in different fields of botany to students, professors, and amateur and professional botanists; and

d) to do all things that are incidental to the attainment of the above purposes.

You will perhaps have noticed that purpose (d) has replaced our originally submitted: *“informing governments, leaders, decision makers and the general public issues of botanical and conservation concern”*. The CRA rejection of this purpose was based on the General Requirements for Charitable Registration ([CG07](#)) according to which such actions are seen as activities that further other charitable purposes of an Association, but which cannot constitute an independent purpose on their own right. The modified article (d) does not imply that we cannot *inform governments, leaders, etc.*; it just subordinates such activities to the other purposes. This broader language may serve the Association in the future to encompass “things” that we cannot anticipate at the moment.

The overall legal process was convoluted and quite draining financially but absolutely necessary to reflect what CBA has become and what it wants to be in the future. Hopefully, these new purposes will serve well the Association for a long time to come.

I would like to end this message by wishing you a forgiving winter and in reminding you to consider nominating yourselves for the available Board positions (see inside this Bulletin), nominating students for the major paper awards, and making plans for the CBA-CSEE meeting in Winnipeg, June 11-14. Spring is coming!

1. Merci pour vos dons !

Chers membres de l'ABC, je savais que vous étiez de grands amis de la botanique, mais c'est avec humilité que j'ai découvert à quel point vous étiez également généreux !

De nombreuses causes méritantes se disputent nos dons, mais beaucoup d'entre vous ont (aussi) choisi de soutenir l'ABC. Qu'il s'agisse de petits ou de gros montants, ce qui compte c'est votre générosité désintéressée : *merci autant de fois qu'il existe t d'espèces de carex !*

Votre gentillesse est très appréciée et votre don fera la différence pour la pérennité de nos nombreux prix. Soyez assurés que nous essayons de tirer le meilleur parti des dons et des cotisations des membres. Nos frais de fonctionnement se réduisent à l'expertise professionnelle que nous ne pouvons pas fournir nous-mêmes (par exemple, les comptables et les avocats) ou qui améliore grandement nos moyens d'expression et de communication (par exemple, le Bulletin).

2. Les objectifs de l'ABC ont finalement été approuvés par l'Agence du Revenu du Canada

Comme vous vous en souvenez peut-être, en 2021, l'ABC avait initié une révision de l'objectif original de l'Association datant de 1976 afin de mieux refléter notre identité et nos aspirations professionnelles actuelles. La première ébauche a été "germée" par le comité IDEA, cultivée par le conseil d'administration et concrétisée par un vote à l'AGA de juin 2021. Le texte et la demande officielle ont été transmis à l'Agence du Revenu du Canada (ARC) en avril 2022. Par la suite, l'ARC a demandé des clarifications et une longue communication via notre avocat a suivi. Finalement, après une modification demandée par l'ARC et l'approbation du conseil d'administration, j'ai le plaisir de vous annoncer que l'ABC a de nouveaux objectifs :

a) promouvoir la recherche et la compréhension botaniques en rassemblant, développant et partageant les connaissances botaniques avec les universitaires, les professionnels et les profanes de toutes les sphères de la société ;

b) fournir des forums inclusifs pour discuter de l'enseignement, de la recherche, de la vulgarisation et des connaissances botaniques, quelle que soit l'origine des participants, notamment par le biais de conférences, de symposiums, de publications, d'ateliers et d'activités avec les communautés locales ;

c) décerner des prix pour les réalisations dans différents domaines de la botanique aux étudiants, aux professeurs et aux botanistes amateurs et professionnels ; et

d) faire tout ce qui est accessoire à la réalisation des objectifs ci-dessus.

Vous remarquerez peut-être que l'objectif (d) a remplacé notre proposition initiale qui était d' "*informer les gouvernements, les dirigeants, les décideurs et le grand public sur les questions de botanique et de conservation.*" Le rejet de cet objectif par l'ARC est fondé sur les Exigences Générales relatives à l'enregistrement des organismes de bienfaisance ([CG07](#)) selon lesquelles de telles actions sont considérées comme des activités qui favorisent d'autres objectifs de bienfaisance d'une association mais qui ne peuvent constituer un objectif indépendant en soi. L'article (d) modifié n'implique pas que nous ne pouvons pas *informer les gouvernements, les dirigeants, etc...* ; il subordonne simplement ces activités aux autres fins. Ce langage plus large servira mieux l'Association à l'avenir pour englober des "choses" que nous ne pouvons pas prévoir pour le moment.

L'ensemble du processus juridique a été compliqué et assez épuisant financièrement, mais absolument nécessaire pour refléter ce que l'ABC est devenue et ce qu'elle veut être à l'avenir. Espérons que ces nouveaux objectifs serviront bien l'Association pour une longue période à venir.

J'aimerais terminer ce message en vous souhaitant un hiver clément et en vous rappelant de penser à vous proposer pour les postes disponibles au Conseil d'Administration (voir à l'intérieur de ce bulletin), à proposer des étudiants pour les principaux prix de communication, et à faire des plans pour la réunion de l'ABC-SCEE à Winnipeg, du 11 au 14 juin. Le printemps arrive !

[Translated to French by Frédérique Guinel]

New Member Publications

Saarela, J.M., P.C. Sokoloff, L.J. Gillespie and R.D. Bull. (2023) “Vascular plant biodiversity of Katannilik Territorial Park, Kimmirut and vicinity on Baffin Island, Nunavut, Canada: an annotated checklist of an Arctic flora.” *PhytoKeys* 217: 1-135. <https://doi.org/10.3897/phytokeys.217.90573>

IDEA Committee Recruitment

The Canadian Botanical Association/Association Botanique du Canada is recruiting regular members, graduate students and postdoctoral researchers to join the Inclusion, Diversity, Equity, and Accessibility (IDEA) committee! FREE CBA/ABC membership will be provided to graduate student and postdoctoral committee members! If you share our commitment to IDEA and want to contribute to IDEA-related initiatives, continue reading for information on how to apply!

The IDEA Committee is designed to foster and uphold an environment of Inclusion, Diversity, Equity, and Accessibility within the CBA/ABC. As a committee, we are committed to ensuring everyone who wishes to be a member of or participate in CBA/ABC activities feels safe and welcome to do so.

As a committee member, you can expect to participate in and contribute to the responsibilities and actions of the IDEA committee:

- Identify and raise awareness of IDEA-related issues;
- Engage all CBA sections in IDEA activities;
- Coordinate IDEA initiatives;
- Receive concerns and complaints from CBA members;
- Support local organizing committees to uphold IDEA principles at CBA/ABC meetings;
- Promote inclusion of underrepresented persons in all CBA award nominations;
- And much more!

What are the responsibilities of IDEA committee members?

- Attend IDEA committee meetings at least 3 times per year, or as needed;
- Serve for a two-year term, with the possibility of one renewal;
- Uphold IDEA principles whenever representing or participating in CBA/ABC activities;
- Share your perspective on IDEA-related issues and initiatives in committee meetings.

Interested in joining the committee? Email Nicole Fenton (nicole.fenton@uqat.ca) by March 31st with three sentences about why you are interested in joining.

New Graduate – Trinie Chisholm, M.Sc.

Chisholm, T. (2022) Recreational trail impacts on the plant communities of Castle and Castle Wildland Provincial Parks in southern Alberta.

Supervisor: Dr. Jenny McCune

My research focused on the effects of recreational roads and trails on plant communities in two provincial parks in Alberta. These two provincial parks were established in 2017 in southwestern Alberta, just north of Waterton Lakes National Park. They are home to over half of the province's vascular plant species and are popular destinations for hiking and especially off-highway vehicle (OHV) use. I quantified changes in species richness, community composition, and the presence and absence of exotic plants near hiking trails, OHV trails, or roads. The area is also known as the world's centre for *Botrychium* diversity; however, their distribution in the area is not well understood. As an additional component to my thesis, I tested a species distribution model (SDM) for the genus *Botrychium* to determine whether it could successfully predict suitable habitat for any species of *Botrychium*.



Over the course of two summers (2020 and 2021), my field assistants and I surveyed 128 transects perpendicular to footpaths, OHV trails, or roads in coniferous, deciduous, mixed forest, shrubland, or grassland vegetation. We also surveyed 24 50 m x 50 m plots ranging in predicted *Botrychium* habitat suitability at least 100 m from any trail to collect plant community data and search for *Botrychium*.

We found that the magnitude and extent of trail impacts sometimes depended on interactions between vegetation type and trail type. For example, species richness and exotic species presence were significantly higher 10m away from OHV trails relative to footpaths, but only in mixed forest and shrubland vegetation. Additionally, at elevations above 1700 m, the likelihood of exotics was significantly higher along OHV trails compared to footpaths, indicating that OHV trails are facilitating exotic species' spread to higher elevations. We also found *Botrychium* in 29% of our off-trail plots, but the SDM was not a strong predictor of *Botrychium* presence. This work provides park management with data regarding which and in what abundances exotic species are present along trails, how far these species have extended away from trails, and which trail types are promoting exotic species at higher elevations. The additional *Botrychium* occurrences can provide botanists and management with a better understanding of which species are present in the two parks, and which areas or habitats to focus on for future *Botrychium* survey efforts.



A tribute to Lawrence (Larry) Carroll Fowke

Professor Emeritus Larry C. Fowke of the Biology Department, University of Saskatchewan (U of S), Saskatoon, passed away on December 13, 2022 after succumbing to Parkinson's disease. Larry was born in Toronto, Ontario, on June 6, 1941, grew up in Saskatoon where he went to high school, and did his B.Sc. Honours at the U. of S. in 1963. He received his Ph.D. from Carleton University in Ottawa in 1968, and then went to Australia on an NRC postdoctoral fellowship, after which he joined the U. of S. as Assistant Professor in 1970. He moved through the ranks quickly and was promoted to full Professor in 1979. He served the Biology Department as Assistant Head, from 1992-94, and as Head from 1994-2000. For his service to the Department, Larry was honoured with the Rawson Professorship from 2002 to 2005.



Larry was a nationally and internationally renowned plant cell biologist; his research interests ranged from plant protoplasts, plant tissue culture of somatic and microspore embryogenesis especially of trees, and control of plant cell division. He was an author and co-author of over 120 research publications, several book chapters and conference proceedings; he co-edited a book on plant protoplasts, and wrote a book titled, "*Cells are Life*" which he completed during his illness and was published in 2021. He was invited to several national and international conferences and to various institutions around the world to present his research and remains one of the highly cited researchers in his field of work. For his research on somatic embryos of conifer trees, he and his co-workers hold five patents in USA, New Zealand, and Canada. He was also an Associate Editor of *Canadian Journal of Botany*, *Cell Biology International*, *Plant Cell Reports*, and *Protoplasma*. For his tremendous research contributions and accomplishments, Larry received several awards including a Distinguished Researcher award in 1998, an Earned D.Sc. in 2006, and Award of Innovation from the U. of S. in 2008. He was appointed as a fellow of the Royal Society of Canada in 2009 for his sustained and exemplary lifetime research contributions to the field of plant cell biology.

Larry was also a passionate teacher and was highly respected by his students for his well organized lectures with high quality imaging and novel models, which were sprinkled with some humour. He treated students with respect and made himself available freely to help them with their problems. He was duly recognized for his superior teaching and was nominated three times for a Teaching Excellence award. Larry also supervised research of many graduate students and postdoctoral fellows who now hold various positions in academia, industry, and research centers worldwide.

Above all, Larry was a very fine human being; a kind, compassionate, and gentle soul; a great friend and mentor to many. He had a wonderful sense of humour, participating in departmental skits and telling jokes to friends and family. He was also a gifted photographer and many of his pictures appear in books and periodicals, as well as adorning the walls of many friends' homes. He was a great musician; he played saxophone for the Saskatoon Community band, and during his many visits to Australia, learned to play the didgeridoo, which he loved playing at gatherings and sometimes to students in his class. He loved exploring Northern Saskatchewan on canoe trips, and enjoyed surfing at beaches in Australia.

Larry is survived by his wife Lynne Fowke (Turner) of over 60 years, son Vernon (Sylvie), daughters Christine (Shawn) and Jocelyn (Jason), and grandchildren, Connor, Victoria, Nathan, Noah, Annika, Jacob and Jeremy. He will be sorely missed by his family and friends, as well as botanists and plant cell biologists in Canada and around the world.

Vipen Sawhney,
Biology Department, University of Saskatchewan

Herbarium Digitization in Canada - Your help is needed!

By Carole Sinou & Anne Bruneau

In September 2020, we published a review of the state of digitization of herbaria in Canada (CBA Bulletin 53(2)). This review, and the accompanying statistics compiled, demonstrated that several collections had digitized and published their specimens, but also that a lot of work was still needed.

More than two years later, we would like to ask for your help to update this spreadsheet in order to have the most accurate portrait on the state of herbarium specimen digitisation across the country: [Canadian Herbarium Digitisation](#)

Do not hesitate to add your collection to the list if it is not already there.

If you have questions or requests, would like to publish data from your collection or update your published data, do not hesitate to contact us at: canadensys.network@gmail.com

A1	Herbarium	Acronym	Institution	No of specimens	No (%) digitised	Images	IFT used for publication	Visualise the
1	Herbarium							
2	Agnes Marion Ayre (NFLD)	NFLD	Memorial University of Newfoundland	100,000	13,900 (13.9%)	No	Canadensys	Canadensys
3	Brock University Herbarium (BU)	BU	Brock University	2500	100 (4%)	No	Canadensys	Canadensys
4	Bruce Bennett Herbarium (BABY)	BABY	Yukon Government	11,429	11,429 (100%)	No	Canadensys	Canadensys
5	Cape Breton University Botany Collection (CBU)	CBU	Cape Breton University		2864	Yes (2863)	Canadensys (through C)	Canadensys
6	Dr. Lucette L. Cousal Herbarium (LWC)	LWC	University of Western Ontario	49,000	9888 (20.2%)	Yes (5092)	Canadensys	Canadensys
7	E.C. Smith Herbarium (ACAD)	ACAD	Acadia University	200,000	91,745 (45.9%)	No	Canadensys	Canadensys
8	Enslin Herbarium (QE)	QE	Queen's University	142,000			Canadensys (in progress)	
9	Herbar du Québec (QUE)	QUE	Gouvernement du Québec	168,000	101,919 (60.7%)	No	Canadensys	Canadensys
10	Herbar Louis-Marie (QFA)	QFA	Université Laval	794,772	284,208 (35.7%)	Yes (26 970)	Canadensys (vascular p)	Canadensys
11	Herbar Marie-Victorin (MT)	MT	Université de Montréal	725,000	191,309 (26.4%)	Yes (19 706)	Canadensys	Canadensys
12	Living Prairie Museum Manitoba Herbarium (LPM)	LPM	Living Prairie Museum	150	150 (100%)	No	Canadensys	Canadensys
13	McGill University Herbarium (MTMG)	MTMG	McGill University	140,000	30,136 (14.4%)	Yes (20135)	Canadensys	Canadensys
14	Nova Scotia Museum of Natural History - Botany C		Nova Scotia Museum of Natural History	116,239	73,869 (63.5%)	Yes (13 794)	Canadensys (through A)	Canadensys
15	Richard Stanforth Herbarium (UWPG)	UWPG	University of Winnipeg	7000	1485 (21.2%)	No	Canadensys	Canadensys
16	Royal BC Museum - Herbarium (V)	V	Royal BC Museum	218,884	218,884 (100%)	No	Canadensys	Canadensys
17	Royal Botanical Gardens (HAM)	HAM	Royal Botanical Gardens	60,000		Yes	Canadensys (in progress)	
18	Royal Ontario Museum Green Plant Herbarium (TR)	TR	Royal Ontario Museum	1,113,840	142,452	No	Canadensys	Canadensys
19	Royal Saskatchewan Museum		Royal Saskatchewan Museum	9371	7718 (82.4%)		Canadensys (in progress)	
20	The Rooms Herbarium (NFM)	NFM	The Rooms	10,851	10,713 (98.7%)	Yes	Canadensys (in progress)	
21	TRIS herbarium	TRTE	University of Toronto Mississauga	95,000	10,928 (11.5%)	No	Canadensys	Canadensys
22	University of British Columbia Herbarium (UBC)	UBC	University of British Columbia (Beatty Mus)	687,000	530,835 (77%)	Yes (35 598)	Canadensys (vascular p)	Canadensys
23	University of Calgary Herbarium (UAC)	UAC	University of Calgary	90,000	1659 (1.8%)	Yes (1767)	Canadensys	Canadensys

Renew your CBA membership online!

This is a friendly reminder to renew your membership online now at <https://www.cba-abc.ca/membership/>. As we move to be compliant with all federal laws we will be obliged to remove people who have not renewed their membership three months after the New Year from our membership list. Of course, we will welcome you back after that date, but you might miss a bulletin!

Renouvelez votre adhésion à l'ABC en ligne!

Ceci est un rappel amical pour renouveler votre adhésion en ligne maintenant à <https://www.cba-abc.ca/membership/>. Alors que nous nous efforçons de nous conformer à toutes les lois fédérales, nous serons obligés de retirer de notre liste de membres les personnes qui n'ont pas renouvelé leur adhésion trois mois après le Nouvel An. Bien entendu, nous vous accueillerons à nouveau après cette date, mais vous risquez de manquer un bulletin!



Paper Submission and Early Registration is Open: February 16-March 31, 2023!

Joint meeting of the Canadian Society of Ecology and Evolution

and the Canadian Botanical Association

11-14 June 2023 Winnipeg

[Submit a paper](#) [Register](#)

We invite you to submit a request to give one presentation (oral or poster) at the upcoming CSEE-CBA 2023 meeting in Winnipeg. Presentations will be assigned on a first come, first served basis, as long the topic is relevant to ecology, evolution, or botany. We encourage topics related to Indigenous Knowledge and Conservation and other topics that further diversity, inclusion, and reconciliation in fundamental and applied science and in education. Presentations (talks or posters) may be in English or French.

For details about presentations, student paper awards, and student/postdoctoral travel awards, see the conference website ([Call for Papers](#)).

You must register for the conference by March 31 for your paper submission to be considered. If you have questions about paper submission or registration, or would like to either be added or removed from this mailing address, contact the local organizing committee at beepeg2023@gmail.com.

We encourage you to register early, both to pay reduced registration and to obtain a ticket to events that have limited capacity. In addition to registering for the conference, you can select workshop and field trip options, the opening reception at the Winnipeg Art Gallery (WAG) / Qaumaqug Inuit Art Gallery, a Public Plenary at the Canadian Human Rights Museum, and the Closing Picnic at le patio 340 in the St. Boniface neighbourhood of Winnipeg. See the conference website for more details on registration and conference events, including workshops and field trips.

We will be operating a temporary Child Care facility at the RBC Convention Centre from 11 to 14 June, in a room adjacent to the conference Meeting Rooms. When registering, please complete the form to identify your interest in Child Care.

Conference Lodging

You can find excellent discounts on hotel rooms on the conference website. These rooms are limited in availability (and some will be released in mid-March if not booked already), so book early to avoid disappointment.

- The local organizing committee

For more details, check the [conference website](#).

Questions? Contact beepeg2023@gmail.com



La soumission des articles et les inscriptions anticipées sont ouvertes : 16 février - 31 mars 2023!
**Réunion conjointe de la Société canadienne d'écologie et d'évolution et de l'Association botanique
Canadienne, 11-14 juin 2023 Winnipeg**

[Soumettre une proposition](#) [S'inscrire](#)

Nous vous invitons à soumettre une requête pour faire une présentation (orale ou affiche) à la réunion annuelle de la SCEE-ABC à venir en 2023 à Winnipeg. Les présentations seront assignées sur le principe de «premier arrivé, premier servi», tant que le sujet correspond à l'écologie, l'évolution ou la botanique. Nous encourageons aussi des sujets en lien avec les connaissances et la conservation autochtone et d'autres sujets qui permettent promouvoir la diversité, l'inclusion et la réconciliation dans les sciences fondamentales et appliquées ainsi que l'éducation. Les présentations (orales ou affiches) peuvent être faites en anglais ou en français.

Pour plus de détails sur les présentations, les prix pour présentations étudiantes et pour les bourses de voyage pour les étudiant.e.s et post-doctorant.es., veuillez visiter le site de la conférence ([Appel de soumission](#)).

Vous devez vous inscrire à la conférence avant le 31 mars pour que votre appel de soumission soit considéré. Si vous avez des questions sur l'appel de soumission ou l'inscription ou si vous souhaitez être ajouté ou retiré de notre liste de diffusion, contactez le comité local d'organisation à beepeg2023@gmail.com.

Nous vous encourageons à vous inscrire tôt, autant pour avoir accès à un prix réduit lors de l'inscription ainsi qu'à avoir accès aux billets pour les événements qui ont une capacité limitée. En plus de s'inscrire pour la conférence, vous pouvez sélectionner un nombre d'ateliers et d'excursions, des billets pour la réception d'ouverture au Musée des Beaux-Arts de Winnipeg/ Qaumaqug Galerie d'art Inuit, la plénière publique au Musée canadien des droits de la personne et au pique-nique de fermeture à Le Patio 340 dans le quartier Saint-Boniface de Winnipeg. Visitez le site de la conférence pour plus de détails sur l'inscription et sur les événements de la conférence incluant les ateliers et les excursions.

Nous aurons un centre de garde pour enfants au centre de convention RBC du 11 au 14 juin dans une pièce adjacente aux salles de rencontres de la conférence. En vous inscrivant, veuillez compléter le formulaire pour nous faire part de votre intérêt pour le centre de garde.

Hébergement lors de la conférence

Vous pouvez trouver d'excellents rabais sur les chambres d'hôtel sur le site de la conférence. Le nombre de chambres est limité (et certains seront remis en distribution à la mi-mars si elles ne sont pas encore réservées), alors nous vous conseillons de réserver tôt pour éviter une situation fâcheuse.

- Le comité organisateur local

Site Web du congrès : www.beepeg2023.ca

Adresse de courriel du congrès : beepeg2023@gmail.com

REMINDER: Canadian Botanical Association 2023 Call for student award nominations and applications

Each year the Canadian Botanical Association gives [awards](#) to botanists studying in Canada and Canadian botanists studying abroad. Many of the awards are available to non-Association members. Applications and nominations are open for the following:

For published papers

Alf Erling Porsild - Laurie Consaul Award for best paper in plant systematics or phytogeography. Value \$1,000

J. Stan Rowe Award for best paper in plant ecology. Value \$500

Taylor A. Steeves Award for the best paper in plant development or structure. Value \$500

Luella K. Weresub Memorial Award for the best paper in mycology or lichenology. Value \$1,000

Deadline: **March 31, 2023**

For travel to attend the Annual CBA/ABC meeting

John Macoun Travel Bursary for graduate students presenting talks or posters.

Several awards are available; value \$200-\$600

Undergraduate Travel Award for students presenting talks or posters.

Several awards are available; value \$200-\$600

Deadline: **Abstract submission deadline for the 2023 conference**

For best presentations at the Annual CBA/ABC meeting

Lionel Cinq-Mars Award is awarded for the best oral presentation in two categories:

Proposal-stage; value \$250

Results-stage; value \$500

Iain and Sylvia Taylor Award is awarded for the best poster in two categories:

Proposal-stage; value \$250

Results-stage; value \$500

Deadline: **Abstract submission deadline for the 2023 conference**

RAPPEL : Association Botanique du Canada - 2023 Appel à candidatures pour les prix étudiants et les applications

Chaque année, l'Association Botanique du Canada décerne [des prix](#) à des botanistes étudiant au Canada et à des botanistes canadiens étudiant à l'étranger. Les étudiants n'appartenant pas à l'Association sont éligibles pour plusieurs de ces prix. Les candidatures et les nominations sont maintenant ouvertes pour les prix suivants :

Pour Publication

Prix Alf Erling Porsild – Laurie Consaul pour le meilleur article en systématique et phytogéographie. Valeur : \$ 1,000

Prix J. Stan Rowe pour le meilleur article en écologie végétale. Valeur \$ 500

Prix Taylor A. Steeves pour le meilleur article concernant le développement, la structure ou la morphologie végétale. Valeur : \$ 500

Prix Commémoratif Luella K. Weresub pour le meilleur article en mycologie. Valeur \$ 1,000

Date limite de candidature : **31 Mars 2023**

Pour les frais de déplacement en vue d'assister à la réunion annuelle de l'ABC

Bourse de voyage John Macoun pour les étudiants diplômés présentant une communication orale ou une affiche. Plusieurs prix sont disponibles. Valeur : \$ 200-600

Bourse de Voyage de Bachelier pour les étudiants de premier cycle présentant une communication orale ou une affiche. Plusieurs prix sont disponibles. Valeur : \$ 200-600

Date limite de candidature similaire à **la date limite de soumission de résumé pour le congrès annuel de 2023**

Prix de la meilleure présentation à la réunion annuelle de l'ABC

Prix Lionel Cinq-Mars pour la meilleure présentation orale d'un étudiant en deux catégories :

Phase de proposition. Valeur : \$ 250.

Stade des résultats. Valeur : \$ 500.

Prix Iain and Sylvia Taylor pour la meilleure affiche étudiante en deux catégories :

Phase de proposition. Valeur : \$ 250.

Stade des résultats. Valeur : \$ 500.

Date limite de candidature similaire à **la date limite de soumission de résumé pour le congrès annuel de 2023**

Systematics, Evolution, and Biodiversity Section News

On August 23, 2022, the Systematics section held a meeting with 11 participants online and voted to rename our section “**Systematics, Evolution, and Biodiversity.**” The new name better reflects the work of the section’s membership, and we hope it will attract new members from all career stages with interests in systematics as well as evolution (macro/micro), biogeography, phylogeography, floristics, taxonomy, and related subdisciplines. We also hope it will attract members who are not academics. During the meeting, we agreed that Tim Dickinson will draft new text for our section’s webpage on the CBA site. Material will include a list of section objectives, images from fieldwork and/or labwork, examples of past winners of the Porsild-Consaul Award, and links to information like Canadian herbaria or our own research labs.

As you all know, the organization for the joint CSEE and CBA meeting in Winnipeg is ongoing. Anne Bruneau has submitted a proposal for a joint CSEE/CBA symposium and workshop entitled, “*The future of herbarium collections and taxonomy in ecology and evolutionary studies.*” The proposal was accepted by the scientific committee. Please contact us if you wish to participate in the symposium. We are looking for examples of innovative use of herbarium collections in ecological and evolutionary studies. The symposium will also discuss progress achieved at Canadian herbaria and challenges that lie ahead for university collections and taxonomic research in Canada. In addition, Kathleen Pryer and Amanda Grusz proposed a symposium entitled “*The science and art of cytogenetics: celebrating Canadian contributions to the field of plant cytotaxonomy.*” While this symposium is not explicitly associated with the Systematics, Evolution, and Biodiversity Section, we are sure many of our members will be interested in it.

Please advertise widely among graduate students and colleagues that submissions are due March 31, 2023, for our Porsild-Consaul Award in recognition of the best paper published in the field of systematics and phytogeography. Since we did not receive any applications or nominations last year, we can give away two awards this year. Application guidelines are on [here](#).

I (Julissa) would like to welcome to my research group and to Memorial University (MUN) two new graduate students. Victor Perez-Calle is a new Ph.D. student, originally from Spain, who will work on the biogeography of endemic Caribbean plants and on the systematics of the palm genus *Copernicia*, a Caribbean radiation. Charlotte Turner is a new student in the Master of Environmental Studies program at MUN. This is a non-thesis degree program that requires a review paper. Charlotte will write on the contributions of genomics to plant conservation science in Canada.

If you have any news you would like to share in future Systematics, Evolution, and Biodiversity Section updates, please send it to us and we’ll be pleased to incorporate it in our future bulletin reports.

Yours,

Julissa Roncal and Jeff Saarela
Section co-chairs

Ecology & Conservation Section News

By Jenny McCune

I am delighted to step into the role of Chair of the CBA/ABC's Ecology & Conservation Section. Thank you to Dr. Richard Caners for his hard work as chair since 2020. I am a plant community ecologist based at the University of Lethbridge. You can find out about the research my students and I do [here](#).

We are planning a full-day Symposium entitled “**The State of Plant Conservation in Canada**” during the **CSEE/CBA joint meeting in Winnipeg this June**. The Symposium has been approved by the conference organizers, so stay tuned for more information about the speaker line-up.

I want to add more information to the Section page on the CBA/ABC website, including links to university research labs, non-governmental organizations, or consulting firms that do plant ecology in Canada. If you would like us to add a link to your lab group or firm, please contact me (jl.mccune@uleth.ca) with a brief description of your plant ecology or conservation-related work, and a link to your webpage.

Finally: the deadline for student paper awards is coming up soon. Don't forget to encourage students who have published excellent papers on their plant ecology research to apply for the [J. Stan Rowe Award](#).

See you in Winnipeg!



New Ontario Tree Guide Coming Soon

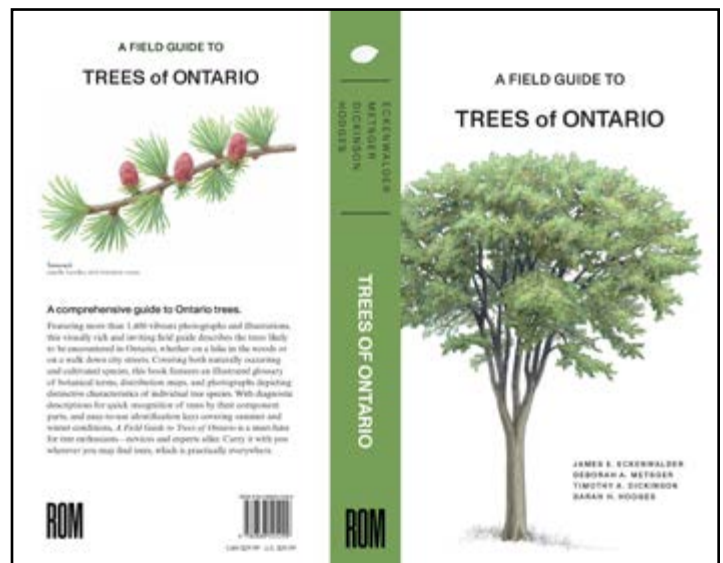
From the pussy willows ushering in spring to the maple leaves changing colours for fall, our local trees are beloved markers of the changing seasons. This spring celebrates the launch of *A Field Guide to Trees of Ontario*, a new book that is a portal to the hundreds of trees species found in Ontario.

Featuring more than 1,400 vibrant photographs and illustrations, the field guide describes the trees likely to be encountered, whether on a hike in the woods or on a walk down city streets.

The book features an illustrated glossary of botanical terms, distribution maps, and photographs depicting distinctive characteristics of individual tree species.

Covering native, introduced, and cultivated species, it includes diagnostic descriptions for quick recognition, informative notes and anecdotes, and easy-to-use identification keys covering summer and winter conditions.

A Field Guide to Trees of Ontario is a must-have for tree enthusiasts—novices and experts alike. Published by the Royal Ontario Museum, available on April 3, 2023.



How to make plant life cycles palatable to first-year students using Lightboard

By Patrick von Aderkas, Co-chair Teaching Section

Answer this simple question: when you find yourself having to fix something for the first time, where do you turn if you don't have an expert to hand? Videos. Students are no different, especially first-year students.

I have to teach the plant diversity part in a first-year evolution course. Because they supply both breadth and depth for learning, we teach plant life cycles. They build in complexity and in the end, a student who has mastered them plainly knows that they have achieved greater intellectual sophistication about organisms that are most unlike them. Teaching plants is hardly iconoclastic as most first-years have had very little exposure in their previous high schools, so in some ways, naïve learners are easy targets for pedagogical experiments. An additional encouragement is that of the 800 first-year students in this course, very few would willingly learn plant life cycles. I like this sort of daunting challenge. You could aim for survival, along the lines of “do the least harm,” or you can grasp the nettle. I actually strive to make this sing: plants provide a lovely line in phylogeny that builds deeply on the evolution of adaptations in reproduction that are not intuitive and therefore stretch students' imaginations.



The author drawing a moss life cycle using a lightboard.

I have tried various things over the years. Obviously, I have them draw the cycles in class, but that is what it is. They will lose their way and when they have to study for the quiz or exam they will have to find their way back either by drawing or having the material in a different form from which to study.

This is where short videos generated using a video camera and a lightboard come in. Lightboards are sheets of glass or plastic lit from “within” by a strip of LED lights taped around the edge of the sheet. LED lights aren't just good for lighting plants: they are excellent for shedding light on plant life cycles. Some other requirements are a black or green backdrop to hang as background. The room has to be in complete darkness, save for the light from the lightboard and supplemental lighting to highlight the instructor. You can find a fair bit on the web (YouTube has useful videos) on how to create a lightboard and how to use it effectively. They don't cost a lot of money to make – a few thousand, tops. In the last few years, I used two lightboards built by enthusiastic engineers at UVic. You will also need a decent camera, one that will shoot in low light and a set of fluorescent markers or liquid chalk markers. The recorded video is then processed using readily available easy-to-use, popular software, such as iMovie or Final Cut Pro. Editing turns out to be trivial and not time-consuming.

The good news is that students love it! I have used these types of videos, first during COVID, and now in the face-to-face world. Along with other pedagogic adjustments that we made over the same period, lightboard has improved our confidence in delivering curriculum, even to the point of abandoning textbooks. Setting goals in assessment and testing them against technologies sometimes reveals interesting changes in student learning. The responses that we got from students on use of these videos to improve their studying were universally in favour, which was reflected in better exam results.

The *Flora of North America* is almost completed: your financial support can help us finish this incredible project

We are sure that many of you are familiar with the [Flora of North America](#) (FNA), especially those iconic green, hard-covered books, which have become the first place we turn to for information about plants.

Since the first volumes appeared in 1993, this work has become the definitive treatment of the plant diversity of North America, providing detailed distributional, morphological, and taxonomic information on some 20,000 species of plants (including mosses, liverworts, and hornworts) – about 7% of the world’s total. And, [VASCAN](#) (Database of Vascular Plants of Canada), our only comprehensive record of all the vascular plants that occur in Canada, relies on the taxonomy published in the Flora of North America to produce its list.

Work on the FNA is approaching completion. Twenty-two of the planned 30 volumes, have been published, and three more are with the publisher, Oxford University Press, or are in the final stages of page layout. The remaining four volumes with taxonomic content (Volume 30 will contain summary information about the flora and the project), containing about 2,700 species, are moving along well and it is realistic to expect that all 30 volumes of the Flora will be with the publisher in 2024.

We are so close to finishing!

Although the publication of all of FNA is in sight, funding remains tight. We estimate that it will require a final \$150,000 to pay technical editors and the managing editor, and to cover the last illustrations for these volumes. If you can contribute any amount (tax deductible in the US), we would be very grateful.

Go to <http://floranorthamerica.org> and click on the “donate” button or send a check (U.S. \$ only) to FNA Business Office, P. O. Box 716, Point Arena, CA 95468.

Over the past 30 years, the FNA has become the gold standard for modern floristic research and the foundation upon which many regional floras and online resources are based. The completion of this monumental work will be a remarkable scientific achievement.

- Geoffrey A. Levin, President, Flora of North America Association

- Bruce Ford, FNA Regional Coordinator, Western Canada



<https://www.stellabooks.com/storange/images/stock/1206/1206574.JPG>

Memories and Reminiscences of Dr. George Argus

Compiled by Deborah Metsger

It was with great sadness that botanists across the country learned the news of George Argus' death on October 21, 2022, at the age of 93. A retired research scientist from the Canadian Museum of Nature, George was a world-renowned expert on the genus *Salix* (Salicaceae) and one of Canada's foremost botanists. In 1991 he was awarded the CBA/ABC Lawson Medal, Category A in recognition of his outstanding achievement with respect to the Rare and Endangered Plant Program at the Canadian Museum of Nature. A full write-up on his Lawson Medal is available in [Vol. 24\(4\) of the CBA Bulletin](#).

George Argus was also legendary within the mountaineering community as a survivor of the first successful ascent of Mt. Denali (McKinley) via the South Buttress route in 1954, which ended with a tragic descent and subsequent rescue. The story, recounted in numerous articles as well as the critically acclaimed book "Forever on the Mountain" by James M. Tabor, 2008, is nicely summarized in [this Alaskan tribute article](#). George frequently shared his story of Denali, as witnessed in the tributes below.

George's long-time friends and colleagues Ernie Brodo and Erich Haber have prepared an extensive tribute to his life, career, accomplishments, and honours for the Canadian Field Naturalist: [A tribute to George William Argus, 1929–2022. Canadian Field-Naturalist 136: 284-292](#). Rather than repeat that information here, we have chosen to share a series of short tributes, stories and anecdotes from others within the botanical community who worked with or crossed paths with this remarkable man.



George Argus in his element

Remembering George Argus: a phenomenal mentor

The Endangered Species Act of 1973 (ESA, or "The Act"), designed to protect critically imperiled species from extinction in the United States, was signed into law by President Richard Nixon. That same year, the Systematics and Phytogeography Section of the Canadian Botanical Association (CBA) formed a subcommittee on Rare and Endangered Species in the Canadian Flora. By this time, George Argus, a member of the subcommittee, had already successfully initiated an independent attempt to compile a national list of the rare plants of Canada by enlisting the cooperation of botanists from across the country. Ten years later (1983), still fresh out of my M.Sc. degree on ferns from the Univ. of Guelph, I managed to land a position at the Canadian Museum of Nature working with George Argus on the *Atlas of the Rare Vascular Plants of Ontario*. What a lucky break for me!

I thoroughly enjoyed contributing species sheets to the *Atlas* and helping George co-edit Parts 1-4 of the 1982-1987 edition of the *Atlas*. At that time, George would start work at the Museum before 7am, but he never admonished me for preferring to show up at 10am, just in time for the Botany Division's infamous morning tea break. George would head home around 4pm and I would work until 7pm. Despite our schedules being somewhat out of sync, we soon developed a robust rhythm of working together. It was a joy to come to work each day knowing that George already had a 3-hr jump on me, and that with a big smile he would hand me a slate of things to work on. Then after he left, I would prepare a similar slate of questions for him to follow up on before I arrived. And so, it went...

Following the publication of the *Atlas* (Argus et al., 1982-1987), we immediately set to work on compiling data for the national list of Canadian rare plants. Those were heady days—busy with transposing years of hard



Standing, from left: Mike Shchepanek, Michel Poulin, George Argus, Bob Ireland, Barbara Kobolak, Albert Dugal, Kathleen Pryer. Seated or kneeling, from left. Pak Yau Wong, Erich Haber, Irwin Brodo, Alice Lett, Linda Ley.

copy data contained in scores of binders into our new-fangled computer database. On Christmas Eve in 1987, as we were wrapping up the project, our entire 2MB database, containing information on more than 1000 rare species, completely vanished in a computer crash. It was such a blow! George and I could not imagine starting all over again from scratch. Miraculously, a month later, a local computer company called SYNERSYS, through the expert work of Terance and Timothy Mahoney, managed to rescue all our data. Without their help, Argus and Pryer (1990) would not have seen the light of day. Incidentally, I just checked online, and that company still exists today! I know that George would join me in giving them our heartfelt thanks and best wishes, 35 years later!

Working with George was fun and always enlightening. Every day he lived up to the motto

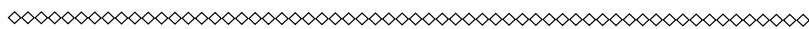
given to him by his own mentor Hugh Raup: “*Whatever you do in life it should be fun, and as soon as it stops being fun, stop doing it*”. That also became my motto, and a good rule of thumb for choosing subsequent mentors along the way. George was always a good listener and a quick and articulate thinker to bounce ideas to. George was always kind and enthusiastic about helping me to achieve my goals, and I am indebted to him for all that he taught me. George will always be dearly missed.

Kathleen Pryer,
Professor of Biology
Duke University, Durham, NC

Literature Cited

Argus, G. W., K. M. Pryer, D. J. White, and C. J. Keddy. (Editors). 1982- 1987. Atlas of the rare vascular plants of Ontario. Parts 1-4. National Museum of Natural Sciences, Ottawa.

Argus, G.W. & K. M. Pryer. 1990. Rare vascular plants in Canada. Our natural heritage. Canadian Museum of Nature, Ottawa. 191 pp.

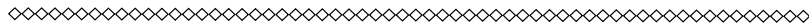


Remembering George Argus: A man with limits and many talents

My first encounter with George Argus was on a CBA/ABC pre-conference fieldtrip to Eastern New Brunswick in late June 1984. It was a three-day fieldtrip led by Hal Hinds and H. Harrier that explored a myriad of inland and coastal habitats from Fredericton to the Bay of Fundy, to Kouchibouguac National Park and back. With many keen botanists along—Eric Haber, Paul Maycock, Steve Varga and more—it was a marvelous trip, except that it rained for two days straight. Everyone was soaked from slogging through bogs and marshes in the rain. By the end of the 2nd day George went on strike, parking himself, legs out-stretched on a back seat of the bus while others ventured out into another downpour! On Tuesday afternoon of the conference-proper, there was a field trip along the St. John River in Fredericton to view rare plants. As reported in the CBA Bulletin summary of the conference “*The Tuesday afternoon field trips were notable for another reason — the torrential downpour! Intrepid botanists enjoyed them all and dried off later.*” Well, not all did! George Argus had no appetite for botanizing in the mud again, even to see a nationally rare plant! Instead, he and I went to view the quilt show at the Fredericton Art Gallery, then spent the afternoon touring the streets of Fredericton finding fabric stores, coffee shops and craft stores. I learned that George was an accomplished sewer and smocker, making all his own country dance

costumes, and at one time his shoes! He loved fabric as much as I did! He also had been a potter and had I was delighted to meet a man, and a senior scientist who had so many unconventional outside interests and passions. Country dancing was one of George's fondest activities and his eyes lit up whenever he spoke of dance. Those CBA conference experiences were the first of many pleasant and enriching interactions I was privileged to have with George over the years— visiting him at the herbarium at CMN where I witnessed his smocking at tea break, organizing a willow workshop for the Field Botanists of Ontario, touring him through the ROM galleries, hosting him at my home. Through all of them he was an exemplar of good humour, good friendship, good scholarship, and living life to the fullest. Thank you, George.

Deborah Metsger
Assistant Curator, Botany
Royal Ontario Museum



Memories of Dr. George Argus: Willow workshops and so much more

Dr. George Argus was someone who I'd heard of ever since taking my first botany/taxonomy class but it wasn't until the year 2000 that I got to meet him in person. It was then that I reached out to him to see if he would be interested in conducting a workshop on *Salix* for us in Alberta, and while I was apprehensive to approach him, I soon came to realize what a wonderful, down to earth, humble man he was. He readily accepted the invitation. It was during the planning and conduction of that workshop that we became good friends. I was able to get him back to Alberta for additional workshops over the years, all of which were run out of the Palisades Centre in Jasper National Park and one of those years overlapped with a lichen workshop with Ernie Brodo. Ernie and George were good friends and it was amazing being in the field the two of them and enjoying dinners afterwards with them and wives Fenja and Mary.

George and I spent time in the field pre- and post-workshops, and it was during one of those 'side trips' that he found a new population of Sitka willow (*Salix sitchensis*) which up until that point, was known from only one location in the province. Being in the field with him was a real treat. He was eager to share his extensive knowledge and he was an amazing teacher. He wasn't afraid to say that he didn't know. In fact, at one workshop, he threw a specimen over his shoulder when someone brought him a particularly troubling specimen saying 'I have no idea' which was followed by a comment that we shouldn't be afraid to say that we don't know and that some specimens just can't be 'labelled.' When he wasn't 'teaching' he was a bit more relaxed and would often break into song when we were checking out the willows of an area. He loved iced cappuccino from Tim's, so we had to make sure that we included a few of those on our various trips.

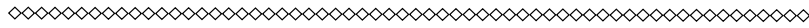
He shared the story of his McKinley climb with me early on in our friendship and he subsequently told the story (with photos) to workshop participants the year of the 50th anniversary of the climb. Seeing the photos really drove home what a spectacular and tragic feat it was. The climb wasn't something that he liked to talk about given the turn of events but I'm very glad that I was able hear it from him. That story deepened my respect for him.



Right: George examining willows at Willow workshops in Jasper National Park, Alberta

There are many things that I remember fondly about George. He was a humble, gentle, kind, knowledgeable, funny man. His interests were many. His knowledge immense. He was an amazing man. I will miss him.

Joyce Gould
Senior Scientist,
Office of the Chief Scientist
Alberta Environment and Protected Areas



A tribute to George Argus: my dear friend and colleague



George and Ranessa after dinner one evening in 2009.

I studied the Lake Athabasca sand dune willows for my doctoral work at the University of Alberta, and that is when I first contacted George via e-mail to ask him some questions about my research. Shortly after finishing my Ph.D., I had the opportunity to participate in one of George's workshops in Jasper National Park. So, July 2001 became the beginning of a wonderful friendship when I picked George up from the Edmonton airport; I had a trunk full of microscopes for the course and George in tow, and we headed to the Alberta Rockies. I enjoyed that willow course and took two others (in 2003 and 2004), and I was invited to be an assistant for three additional willow workshops (in 2006, 2008, and 2009). I had the great pleasure of botanizing with him in Alberta, Alaska, Indiana, and New York. Every willow excursion was enriched by George's kind, gentle, and adventurous spirit. George started as a valued mentor in my life but soon became my friend. I met his wife, Mary, while in Alaska in 2004, and I came to know his daughter, Rebecca, through social media in 2009 (as per George's suggestion to reach out to her).

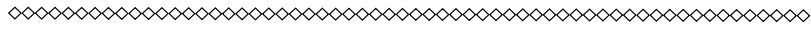
It was a treat to have George call to say hello or send an e-mail to discuss some recent willow research. His knowledge was impressive,

and his commitment to nature and promoting good stewardship was awe-inspiring. Anyone who knew George was well aware of his fun sense of humor, from quips in conversation to participating in a botany conga line up to the Cavell Meadows (in search of *Salix stolonifera* that particular day). It was so delightful to work with George, and I was touched when he asked me to proofread his introduction to the treatment of *Salix* in the *Flora of North America*. I was always intrigued to hear about his life's journey, including his historic expedition on Denali.

Numerous lives have been touched by George's expertise, his kindness, his humility, his positive energy, and his endearing personality. I am incredibly fortunate to have so many wonderful memories, and I miss him. For those who had the pleasure of knowing George, they will agree that he was one of the most amazing humans to share life with...even if only for a few days in a willow identification workshop. I will be forever grateful that our interest in willows enabled our botanical paths to converge, and I am honored to pay tribute to my dear friend and colleague, Dr. George Argus.



George teaching New York Willow Workshop, 2009



Memories of George Argus at the CMN: lunches, rituals, and practical jokes

George always had a well prepared lunch which I'm sure he prepared himself. At lunch, the pocketknife came out and lunch preparation began. Once preparation was complete, eating began, or the pocketknife came out mid-way through lunch to cut up fruit. George often made his own bread and we would get a description of what was in the bread or how it was made. This is a carry-over from his younger days working at his father's bakery. Everything was eaten in order with a methodical cleanup at the end. Conversations over lunch varied, from issues about taxonomy to operations at the museum. Sometime showing concerns, but most often thought-provoking issues about taxonomy and science in general. Once time was up, it was back to the office or herbarium, with limited to no communication for the rest of the day.



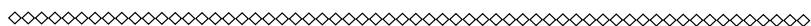
Folks from Botany 2012 celebrating anniversaries with colleagues and their families.
Front row left to right: Adam King, Cheryl McJanet, Susan Aitkin.
Back row: Paul Hamilton, Mary Argus, George Argus

Here at the National Heritage campus, George worked out of the herbarium with a temperature of 18 C. George always wore a vest to keep warm in the herbarium, even in the summer. At lunch George kept the vest on while sitting outside in the hot summer sun. I equated this to collecting as much heat as possible before entering the herbarium to continue working into the afternoon. A ritual I will remember.

George also had a ritual for opening the access door to the herbarium. His access card was hanging high around his neck. This allowed George to brush up to the key pad by the door with his chest (hands-free) or with a little jump with a forward push of the chest such that his access card would pass by the key pad which opened the door. I never saw George open the door any other way.

I'm sure you already have the story of Sylvia Edlund putting rocks in George's wicker collecting basket. George carried rocks around Victoria Island for many days before realizing the joke.

Paul Hamilton
Senior Research Assistant, Botany
Canadian Museum of Nature



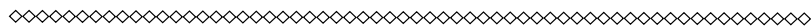
Memorable Travels with George Argus

On two memorable occasions, I had long drives with George. The first one, in 1994, was to Harvard. On the way we dropped in at Harvard Forest to deliver lichens from Ernie Brodo. There, and at Harvard, it was special to see the respect that George was held in by people in the Harvard Botany Department who remembered him. On the trip, he told me about the climbing accident on Mt. Denali – his experiences being left in the tent with

broken bones, while two people went for help, and about the man who died. That man's wife was pregnant at the time. When we were in Cambridge, Massachusetts, George contacted the son she gave birth to after his father died.

The other memorable drive was to New York Botanical gardens to a memorial event for Arthur Cronquist, who was an outstanding botanist last century. George and I had both worked with Arthur and wanted to be there. We were the only people from outside the U.S. to attend, and this was appreciated by people at the New York herbarium.

Susan Aiken
Retired Senior Scientist, Canadian Museum of Nature



George Argus, Laurie Consaul and Mike Dalwitz CSIRO enroute to an INTKEY workshop at Harvard. Mike developed INTKEY, the software that George used to build his willow keys.

Memories of George Argus: an icon, a storyteller and a gentleman

From my earliest university days, George Argus was someone I hoped to meet. This might naturally be attributed to the fact that he had authored some of the favourite resources that guided my formative understanding of plants and conservation in Canada. However, what made George uniquely intriguing was the way that my mentors' eyes danced when they talked about him, and how animated they became in recounting experiences that he'd made possible.

My lucky day finally came when George - retired from his Museum obligations - visited Alberta to teach a willow workshop for the Prairie and Northern Plant Diversity Centre (PNPDC), where I was working. He cut no corners, arriving days in advance to scout the best field sites and collect fresh specimens for a focused, rich student experience. My role at the PNPDC called on me to copy and bind the custom key he had crafted specifically for the workshop area (!) and to help with some other logistics for the fast-moving instructor and the star-struck trainees who scrambled in his wake. There were willows from dawn to way past dusk, punctuated by good stories over meals. The workshop both exhausted and exhilarated the students; all of us left thoroughly smitten with our teacher. It was my honour to bring George back to the airport in Edmonton, a four-hour drive made short by lively conversation.

Years later, our paths crossed again at the National Herbarium of Canada (CAN). The pace of emeritus willow work seemed – if it was possible - to have accelerated. From an unassuming desk between the cabinets, George received and prepared loans, identified specimens, corresponded and collaborated with people around the world, and hosted visitors. As he worked through the collection on any project, he added written prompts for observations to fuel many more, for when he had time to circle back.

As ever, there were fantastic true stories, masterfully-told: a Gaspé fire tower, Lake Athabasca, a Florida swamp... I'm not the only one who angled to hear some of them many times. He also patiently answered questions about the herbarium's past and generously (often vigorously) opined about its present and future priorities. He met all of us, in our diversity of knowledge and skills, with interest and respect... and, when a significant occasion called for it: hugs. I love to remember the day that a straight-laced former co-worker dropped in to the herbarium unannounced. George shouted their name with a chuckle of delight, which is what signaled those nearby to look

up and witness the visitor, immobilized in a surprise bear hug, as their expression transformed from alarm, to exasperation, to an ear-to-ear grin.

When it came time for George to conclude his herbarium career, he was as open and energetic as always. He shared his changing memory and abilities as matters of heartbreaking fact, without dwelling on the loss. He decisively ceased identifications to protect the resource he had built, and poured energy into organizing and documenting. Boxes of maps, crates of books and documents, borrowed specimens...everything was tidied, labeled, and swiftly passed, like batons, into the hands of proud, awestruck, grateful colleagues and friends.

Jennifer Doubt
Curator, Botany
Canadian Museum of Nature



George and Mary Argus

The George Lawson Medal, Part I.

An expanded portrait of George Lawson, outstanding contributor to Canadian botany

Frédérique Guinel¹ and Jennifer Doubt²

1. Professor Emerita, Biology Department, Wilfrid Laurier University

2. Curator, Botany, Canadian Museum of Nature

The CBA Bulletin [Number 2 of 1969](#) featured an announcement that the George Lawson Medal in Botany, the most prestigious award of the Association, would be conferred for the first time at that year's annual banquet. A short biography of Lawson followed, based mainly on an article published by Rousseau and Doré in 1966. At the time, little was known about Lawson, but in the last few decades, three historians have shed more light on his botanical life and accomplishments; furthermore, the archives of Queen's and Dalhousie Universities have become much more accessible. In our ongoing effort to record, more fully and consistently, the history of CBA awards, we plan a three-installment Lawson 'miniseries' in the Bulletin volumes of 2023, to

- I. paint a fuller picture of Lawson the botanist, based on resources made available since the 1969 Bulletin,
- II. share the history of the Lawson medal and some statistics about the medal recipients, and
- III. provide an overview of the Botanical Society of Canada (1860-63), which Lawson founded.

Part I is below. Enjoy!

From the start: Curious, brave, and driven

Lawson was born in Newport, Fifeshire, in Scotland on October 12th, 1827 (MacKay, 1896). He loved being outside, observing, and studying what he saw. In his late teenage years, he was apparently of an adventurous mind and quite bold. Zeller (1990) recounts that in 1846, 19 year-old Lawson wrote to prestigious botanist Sir William Hooker, Director of the Royal Botanic Gardens, Kew, and founder of its prominent herbarium. In need of advice on behalf of a supposed friend, Lawson asked Hooker if one "willing to undergo *any* hardships, dangers, or difficulties" and ready "to devote his lifetime in searching out the riches of the trans-Atlantic forests" would be "rewarded by brilliant discoveries." That Hooker apparently never answered (Zeller, 1990) did not discourage Lawson who, in 1848, entered the University of Edinburgh where he studied Natural Sciences.

During his studies, Lawson met John Hutton Balfour, Director of the Royal Botanic Garden, Edinburgh, and Botany professor at the University of Edinburgh, who would be his career-long mentor. He integrated quickly and actively into the botanical community, becoming assistant secretary and herbarium curator of the Botanical Society of Edinburgh (Zeller, 1990), and serving first as a lab demonstrator, then as an assistant-professor in Botany at the University (Rousseau et Doré, 1966).

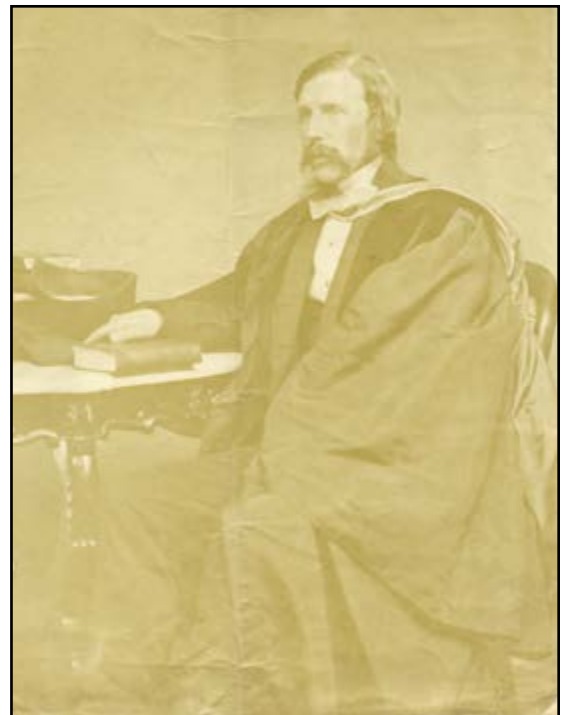


Figure 1. A young Lawson in his academic regalia. Unfortunately, no precise date is given for this photograph but we like to think that it was taken not long after him getting his Ph.D. in 1857.

Dalhousie Libraries Digital Exhibits (PC1, Box 16, Folder 112, Item 2) accessed 2022, November 28.
<https://digitalexhibits.library.dal.ca/items/show/335>

At some point, Lawson left Scotland to attend the University of Geissen, Germany, where he graduated in 1857 as a Doctor of Philosophy (Rousseau and Doré, 1966). His Ph.D. training was likely influenced by the views of Justus von Liebig, a chemist who had worked for close to 30 years in Giessen before departing in 1852 (Rousseau and Doré, 1966). Liebig is known for having developed organic chemistry and for applying it to the study of biology and agriculture, three areas of study that remained close to Lawson's heart throughout his academic career.

During these formative years, Lawson developed excellent organizational skills as assistant librarian for the Royal Society of Edinburgh, compiling a model library catalogue (Zeller, 1990). He became a skilled communicator and, according to MacKay (1896), had already written 44 scientific papers and a book by the time he left Europe for Canada. By then, he had also developed and begun to apply a rigorous scientific approach to his field and lab work (Zeller, 1990). To Lawson, observation, exploration, description, and identification of plants were paramount, as were studies that established relationships between plant morphology, distribution and habitat (Rousseau and Doré, 1966; Zeller, 1990).

Ambition, connections, and work in Kingston

Edinburgh offered limited opportunity for Lawson to fulfill his considerable ambition. Convinced by his potential, an international network of scientists, professors and colleagues supported his search for expanded horizons (as seen in testimonies found in the [Archives of Dalhousie University](#)). They depicted Lawson as a diligent man of high moral character, respected by his peers, and loved by his students. Strongly recommended by Balfour in particular, Lawson obtained the position of Chair of Natural History and Chemistry at Queen's College (now Queen's University) in Kingston, Upper Canada. He moved in 1858, bringing with him his library, equipment, and botanical specimens from Edinburgh (McDowall, 2016). With a solid reputation as an accomplished scientist, Lawson's starting salary [425 £ per year (Rousseau and Doré, 1966), i.e., an estimated CDN\$ 112,000 in today's currency] was higher than those of his established colleagues (Zeller, 1990).

Although his was the first non-clerical professorial appointment in the college (Rousseau and Doré, 1966), his status as a Church of Scotland Elder strongly influenced the decision to hire him (Connor, 1986). In 1858, the College was not yet 20 years old. It was controlled by the Presbyterians of Upper Canada, who had fought for such an institution in the growing colony, not only for the education of their ministers but also for the instruction of youth in Science and Literature. The role of College Principal – the most powerful official in the institution – was reserved for clergy. When Lawson arrived, the Principal was Reverend John Cook, who was replaced in 1859 by Reverend William Leitch. The dissemination of scientific knowledge was probably not prioritized as highly in Upper Canada as it was in Europe at the time, creating an environment that may have presented challenges to Lawson's in his new role at the church-led institution (Connor, 1986).

Lawson was nonetheless very active and productive in Kingston. As he had done in Edinburgh under Balfour's supervision, he implemented microscopes in Botany classes and led field trips to reinforce theory with practice (Zeller, 1990). He designed a teaching laboratory where students would perform numerous hands-on experiments, including their own chemical analyses (Connor, 1986). He also established a college herbarium and planted Canada's first botanical garden to serve as his students' living laboratory (McDowall, 2016). Soon after he arrived in Kingston, Lawson met John Macoun (1831-1920), school teacher in Belleville and future Dominion Botanist. The two corresponded thereafter (Waiser, 1998), probably enjoying the chance to discuss their common interests in fieldwork and wild flora.

In 1860, Lawson, with the support of Principal Leitch, created the short-lived but significant Botanical Society of Canada (BSC; Connor, 1986). At the time, there were only a handful of Canadian scientific organizations, e.g., the Royal Canadian Institute, the Natural History Society of Montreal, and the Geological Survey of Canada, none of which focussed solely on the advancement of Botany (Lawson, 1860). Lawson wanted the BSC to be much more

than a local amateur Victorian club where high-society people could be seen (Connor, 1986). In his first address to Society members, Lawson proposed “to employ the Botanical Society as an instrument for the collection of facts and the working out of details which are of immediate interest to the botanist alone, but of the greatest importance in leading to correct results in general science. Scientific Societies on a broader basis have too often degenerated into popular institutions, calculated rather for the amusement of the many than for the encouragement and aid of the few who are engaged in the prosecution of original discovery” (Lawson, 1860).

According to Zeller (1990), Lawson based the foundation of the Society on a single tenet: for settlers to exploit natural resources fully, the botanical riches of the territory needed to be documented in detail. With the creation of the BSC, Lawson wanted to offer realistic solutions to problems facing the colonists. Farmers would receive advice on seeds and pests, for example, and manufacturers would be given advice on natural dyes. Above all, Lawson wanted the BSC to advance the investigation of the nature and geographical distribution of native plants in Canada. The last *Flora boreali-Americana* had been published in London in 1840; Hooker had based the book on samples collected principally by Sir John Richardson and his assistant Thomas Drummond on Captain Sir John Franklin’s expedition of 1825-1827. In his address to the BSC in 1860, Lawson mentioned “that we have still, therefore, the singular anomaly of a country distinguished by its liberal patronage to science, dependent for its information respecting its native plants on the descriptions of specimens culled by early travelers” (Lawson, 1860).

The lens through which this jarring observation was made affirms the broken / siloed communication that characterized the time. The circles in which Lawson was active relied on “early travellers” for knowledge of native flora in the absence of positive relationships with Indigenous knowledge-holders or even with colonial contemporaries in Québec, where native plants were being collected and identified by local botanists¹. Of note, “*La flore canadienne*” of Provencher would be published in 1862.

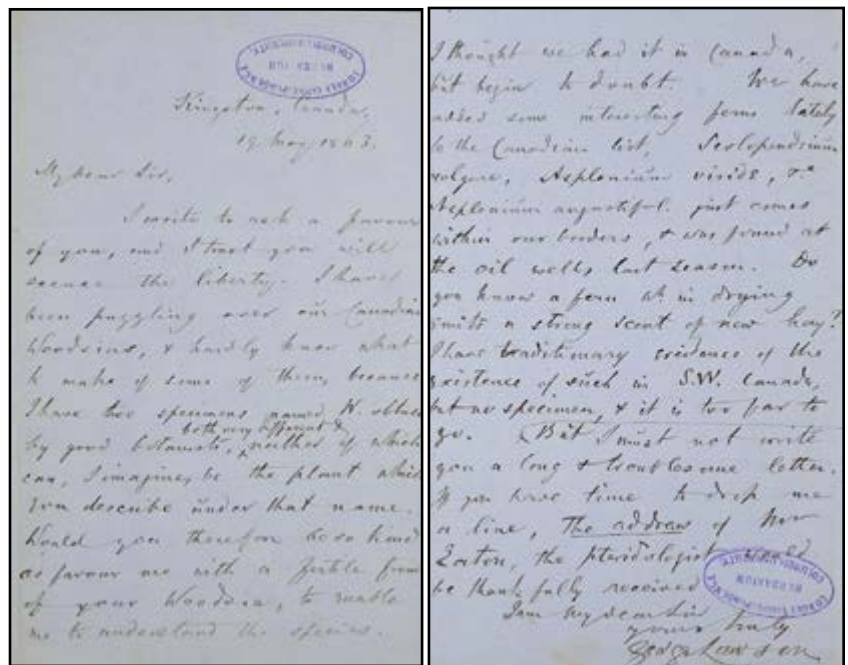


Figure 2. Letter from George Lawson to John Torrey (1796-1873), 19 May 1863. At the time, Torrey was retired from the New-York Botanical Garden.

(Biodiversity Heritage Library, accessed in January 2023). <https://www.biodiversitylibrary.org/item/246413#page/1/mode/1up>

In part, it reads: “*I have been puzzling over our Canadian Woodsias, and hardly know what to make of some of them, because I have two specimens named *W. obtusa* by good botanists, both very different and neither of which can, I imagine, be the plant which you describe under that name. Would you therefore be so kind as favour me with a fertile frond of your Woodsia, to enable me to understand the species?*”

Challenges and demise of the Botanical Society of Canada

The new BSC needed funding and, in his attempts to garner support, Lawson may have felt pressured to expand the scope of the organization to please many potential stakeholders, against his own strong inclination for a focused vision. Lawson seems to have experienced another tension which may be familiar to some of our readers: how to attract citizen scientists while still applying rigorous methods and maintaining accuracy. “We should seek rather to bring our members and the public into scientific modes of thought and expression”, he asserted, “than to

¹ For those interested in learning about these individuals, we suggest reading the different volumes of “*Curieuses histoires de plantes du Canada*” by Asselin, Cayouette et Mathieu. 2014-2019, Editions du Septentrion.

allow our Society to yield up its scientific character to suit the popular taste” (Lawson, 1860). To reach its goals, the BSC had some delicate balances to strike.

Lawson rallied the BSC to fill what he saw as a huge knowledge gap, by gathering geo-referenced herbarium samples from across the vast land. Recognizing the magnitude of the challenge, he proposed to motivate Society members and amateur botanists alike to participate (Zeller, 1990). In his 1860 address, Lawson drew attention to the observers already available “throughout the length and breadth of Canada, as well as in the other North American Provinces, from the Red River in the far west, to the Island of Prince Edward” (Lawson, 1860). In explicitly dismissing broad enjoyment as a society goal, however, he surely limited recruitment. He asked a lot from his audience and their contacts, who would (he expected) report the sighting of plants, prepare herbarium sheets, harvest seeds, and precisely locate where the collections occurred...all of which might understandably have come across as too much hard work.

As demonstrated by the number of people who responded to the call for Corresponding Members, Lawson’s proposal enthused botanists all over the world (Connor, 1986). However, Lawson’s goal for *hands-on* members seems not to have been met. We are not aware of any record of the number of people who participated or the number of hours they contributed. What is certain is that a huge load was borne by Lawson over the next three years. It was he who compiled the data, organized the world-wide trade of specimens and seeds, and edited the *Society Annals*, all while seeking funding (Connor, 1986).

Given the government’s focus on confederation at the time, support for the exploration of the colony flora was not a political priority. In the end, Lawson was never able to secure funding for his flora project. When Hooker eventually extended help, it was too late: Lawson had already resigned from Queen’s College (Zeller, 1990), precipitating the BSC’s utter collapse in 1863. No one adequately took over the work Lawson had performed; furthermore, keeping it a truly professional society turned out to be an impossible task (Connor, 1986).

Historians have not been able to pinpoint a single reason for Lawson’s sudden resignation. The strain of managing the BSC, combined with a lack of financial and political support for his ambitious work plan, could not have helped. Reportedly, relations among faculty members at Queen’s were tense. There was personal enmity, but also - and likely more important - was a distrust between the College faculty and its clerical leadership regarding the autonomy of the professors (Connor, 1986). Lawson was among several to resign by the end of 1863.

Fresh start and successes in Halifax

Lawson moved to Halifax where, upon the reorganization of Dalhousie College, he accepted a position of Professor of Chemistry and Mineralogy (MacKay, 1896). At Dalhousie, Lawson taught chemistry and a class in botany. Concurrently and for many years, he taught also medical chemistry and botany to the Halifax Medical College (MacKay, 1896). As a teacher, Lawson continued to promote hands-on experiments in his teaching lab and to lead field excursions for his students (Zeller, 1990). Additionally, he became much involved in Agriculture; he not only ran a stock farm in Sackville, but also was active in the service of the Nova-Scotia government. He was named Secretary of the Board of Agriculture in 1864, and then Secretary for Agriculture in 1885 (McKay, 1896; Zeller, 1990).

Lawson was generous in sharing his time and knowledge. For example, in addition to his academic duties at Dalhousie, he gave night classes to



Figure 3. A much older Lawson, the photograph of which was likely taken when he was living in Halifax.

Dalhousie Libraries Digital Exhibits
(Peter B. Waite fonds, MS-2-718,
PB Box 13, Folder 97, Item 1),
accessed 2022, November 28. [https://
digitalexhibits.library.dal.ca/items/
show/337](https://digitalexhibits.library.dal.ca/items/show/337).

workers in the chemistry industries, first under the banner of the Technological Institute of Halifax, an institute he helped to organize (Zeller, 1990), and later independently, when the institute folded for lack of funds (MacKay, 1896). He had a tremendous working capacity and he used his great organizational skills to fulfill concurrent academic, agricultural, and administrative duties. The extent to which Lawson's remarkable feats may have been enabled by his wives (Lucy Stapley, whom he married in Scotland and who died in 1871, and Caroline Matilda Knox, *née* Jordan, whom he married in 1876), or by others, is left largely to speculation. It seems likely that such productivity would necessitate a team effort.

With an entrepreneurial mind and a healthy streak of resilience, Lawson participated in the creation of several societies, in addition to the short-lived BSC, over the course of his life. He was a founding member of the Royal Society of Canada (RSC) and its President in 1887-1888. Shortly afterwards, in 1891, under the auspices of the Royal Society, he founded the Botanical Club of Canada (BCC). In an address he made to the members of the RSC in 1891 (Lawson, 1892), his views on this newly-created Club clearly evoked and built upon the BSC. This society "of the simplest possible kind" would be composed of the botanical members of the RSC, and these members would be considered "a band of gleaners", "an army of explorers pervading the whole extent of our Dominion" to explore, collect and identify plants. He envisioned that in each locality, there would be a leader who would gather the local observations, and would encourage and guide the amateur collectors; furthermore, all leaders would meet annually to report their observations and exchange ideas. Lawson remained BCC President until his death by a stroke at home on November 11, 1895.

Inspiration for a prestigious Canadian botanical award

Lawson was curious, energetic and multi-faceted, not limiting his work to one group of plants. He wrote about diverse vascular plant groups (e.g., horsetails, ferns, Ericaceae, Nymphaeaceae), as well as mosses and diatoms (Rousseau and Doré, 1966). He was interested in many aspects of plant biology, describing, for example, the movement of protoplasm in plant cells in 1854 and the presence of diatoms, spores, and hairs in atmospheric dust in 1857 (Rousseau and Doré, 1966). Throughout his life, he also demonstrated a deep interest in geological explorations, especially in the North of Canada (Zeller, 1990). In his attempts to link or connect distribution, adaptation, and survival of plants under changing climatic and geological conditions, Lawson advanced some topical research for his time; he was trained soon after Humboldt's famous expeditions (Humboldt's Russian expedition took place in 1829) and he moved to Canada just as Darwin and Wallace's Origin of species appeared in print (1859).

Lawson was a prolific and eclectic writer. In Lawson's obituary, MacKay (1896) mentioned 107 communications, including 93 in Botany, 4 in Zoology, and 5 in Chemistry (this despite the fact that Lawson was hired in Canada as a Professor in Chemistry). Furthermore, Lawson would have written at least 40 reports and Presidential addresses (MacKay, 1896), and he would have directed the Nova Scotia Journal of Agriculture for 12 years while writing its articles for the most part (Rousseau and Doré, 1966). True to his values, Lawson chose the Transactions of the Nova Scotia Institute of Science to publish 15 of his papers, even when he had more prestigious avenues available to him (MacKay, 1896). Of note, in 1866, he described part of the native flowers of Nova-Scotia that Maria Morris Miller (1810-1875), an Atlantic-Canadian artist and teacher, had drawn as lithographs. Furthermore, Lawson is the author of the first Fern Flora of Canada (1889),

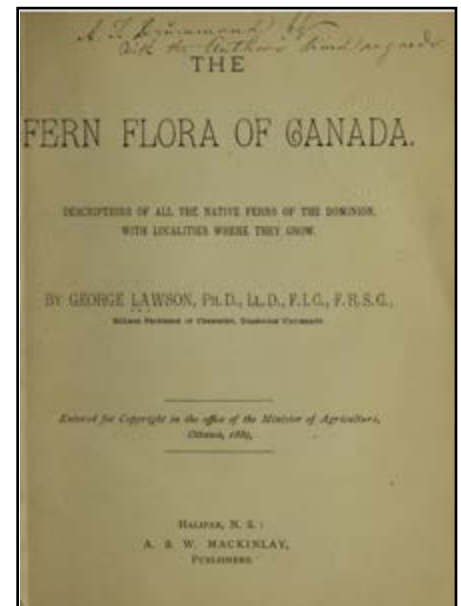


Figure 4. Title page of the "*Fern Flora of Canada*" written by Lawson and published in 1889. Lawson autographed it for A.T. Drummond, one of his oldest students from Queen's College in Kingston. Drummond became a lawyer in 1864 and moved to London, Canada West. He and Lawson remained in contact throughout the latter's life.

(Biodiversity Heritage Library, accessed in January 2023.) <https://www.biodiversitylibrary.org/item/129724#page/5/mode/1up>

in which all the known native ferns of the Dominion, and their distributions, were described.

According to Rousseau and Doré (1966), Lawson came to Canada with idea of publishing a *Flora canadensis*. He must have begun to work on it in Kingston as, when he arrived in Halifax, he had with him an elaborate draft of 143 pages, consisting of an extensive list of plants and their distribution. Lawson presented a synopsis of this work to the newly-created Nova Scotia Institute of Science in 1864. Despite working his entire Canadian life on this catalogue of plants, Lawson was never able to complete it (Rousseau and Doré, 1966). Lack of funds, massive study area, small botanical community, bad political timing, and a large or poorly distributed workload may all have contributed to his failure. He did what he could by publishing completed portions as monographs, each focussing on one botanical family and its distribution, several of which appeared in the 1870s and 1880s (Rousseau and Doré, 1966).

Lawson was highly respected by his colleagues as evidenced by the references provided for him along his career path. Balfour, his mentor, wrote in 1863 that he was a zealous and indefatigable botanist; in an anonymous obituary (Anonymous, 1895), one wrote that his “genial spirit and kind demeanour won for him many staunch friends and admirers.” Nonetheless, Zeller (1990) had harsh words for his method of research, which to her was more indicative of a hard-working secretary than of a creative scientist. In her view, Lawson never really broke off the mould of his Scottish education. She recognizes, however, that his passion and his pedagogical approach had a tremendous impact on the foundations of the discipline of botany in Canada.



Figure 5. Lawson’s 1862 specimen of *Equisetum arvense*, collected “In the bed of the River Trent,” now housed at the Canadian Museum of Nature.

CAN 10091016. Photograph © Canadian Museum of Nature, by Samantha Clifford

To us, there is no doubt that Lawson was a creative person with original ideas about teaching and gathering data in a collaborative manner. Although Lawson seems to have stayed largely within the bounds of his education and “station” as dictated by the pervasive mindset of his culture, his objective of comprehensive biodiversity information remains urgent (even if some of the motivations have changed) and is still elusive today. We note that many respected botanists (including several Lawson medal winners) have worked and continue to work toward some of the goals Lawson envisioned, including a widely-accessible common catalogue in which all botanical taxa identified in Canada are listed and their distributions are described. That Lawson devoted his life to wrestling a problem that remained unresolved, to convincing those around him of its merit, and to making as many differences along the way as he could, gives him much in common with other exceptionally-inspiring members of the current scientific community.

It is interesting to read his views on the progress of botany in Canada, which he presented to RSC members in 1891 (Lawson, 1892), as he neared the end of a long and busy career. Again, some of his comments reflect familiar present-day concerns, suggesting that he may have lived ahead of his time. First, he feared that plant systematics as a field would disappear at the expense of trendier disciplines. Second, he had very high respect for the amateur botanists that collected for the love of science, and he worked hard to instil wider public appreciation of detail and adherence to rigorous scientific methods. Finally, he placed a high priority on collaboration and communication, including engagement with laypeople and the public.

More than seventy years after this capstone address, when they presented at the 1964 RSC symposium on the Pioneers of Canadian science, Rousseau and Doré expressed surprise that no species were named for Lawson; he had, after all, named several varieties of plants in honour of his contemporaries. Furthermore, they advocated

for the *in extenso* publication, by the then newly-formed (1964) Canadian Botanical Association, of Lawson's annotated manuscript of *Flora Canadensis*. To them, such work would have filled an important void in the Canadian scientific publication record (Rousseau and Doré, 1966). One can only wonder whether the informative biography by Rousseau and Doré, two highly-respected Canadian botanists, was a spark that contributed to the naming of the CBA's most prestigious award after George Lawson... or to the fitting conferral of the first Lawson medal to Rousseau himself.

While researching Lawson's life, we came to admire, respect, and like this man who appears to have faced problems similar to our own. He is one among many scientists whose youthful visions of "brilliant discoveries" (as expressed in Lawson's early letter to Hooker) were tempered by experience with repetitive and/or unacknowledged effort and time-consuming administration. Even so, he carried his love for botany over and past many hurdles. He believed in high standards, in collaboration, and in generously sharing his botanical knowledge. We find it endearing that he kept in touch with his old students! We are confident that, if he were around today, he would be in his element in the CBA and a big fan of our annual conferences.

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TOP CANADIAN ORNAMENTAL PLANTS.

34. Crabapples (*Malus species & hybrids*)

ERNEST SMALL^{1,2}

In spring, crabapple trees are the leading flowering woody ornamental in cold climates such as in Canada, extensively planted along public boulevards and on private lawns. Varieties are available that produce dazzling floral displays, delightfully tart miniature apples with various culinary usages, and decorative fruits that last well into winter, attracting birds and other wildlife.



Figure 1. Ornamental crabapple trees.
Photos by Ted (CC BY SA 2.0).

Names

Scientific names: Apples are species and hybrids of *Malus*. The genus name *Malus* is based on the Greek *melon*, a name that was applied to the apple as well as to other tree fruits with a fleshy exterior. The word also traces to an older language, Akkadian, where *malum* meant fullness or to be full. Malic acid, which produces the sour taste of crabapples, has the same language root.

English names: The word “apple” is perhaps derived from the Old High German *apful*, or the Old Slavic *ablŭko*. In old Europe, it was common practice to coin names for new edible plants that were introduced using familiar names, and this was particularly true for the well-known apple. Thus, depending on language, lemons were called “Persian apples,” dates were “finger

apples,” potatoes were “apples of the earth,” eggplants were “mad apples,” pomegranates were “apples of Carthage,” and tomatoes were “love apples” and “gold apples.” Numerous plants unrelated to the apple have “apple” in their name, for example: Adam’s apple (*Tabernaemontana divaricata*), bake apple (*Rubus chamaemorus*), custard apple (*Annona* species), and sugar apple (*Annona squamosa*).

The catch-all term “crab apple” is ambiguous; it is often applied to specific wild species, but also to any small sour apple, sometimes including varieties of the common domesticated apple and to apple trees that originated from the seeds of tossed apple cores. In commerce, crabapples are frequently defined as less than 5 cm in diameter. The “crab” in crab apple (crabapple, crab-apple, crab) may be an allusion to the crab, from the French *crabbe* for this crustacean, with the suggestion that crabapples are fit only for crabs.

French names: Pommetier, pommetier à fleurs, pommetier sauvage, pommier décoratif, pomme sauvage, pommette

Symbolism

Apples are represented as symbolic of forbidden fruit and sin in several religions. In Christian tradition, the story of the Garden of Eden has left a stain on the reputations on all of the participants: not just Adam and Eve but also the snake and the apple tree. More favourably, the biblical interpretation of the apple as the “tree of knowledge” led to the associated tradition of giving an apple to the teacher, a symbolic way of indicating respect for the world of learning.

¹ Science and Technology Branch, Agriculture and Agri-Food Canada, Neatby Bldg., Central Experimental Farm, Ottawa ON, K1A 0C6

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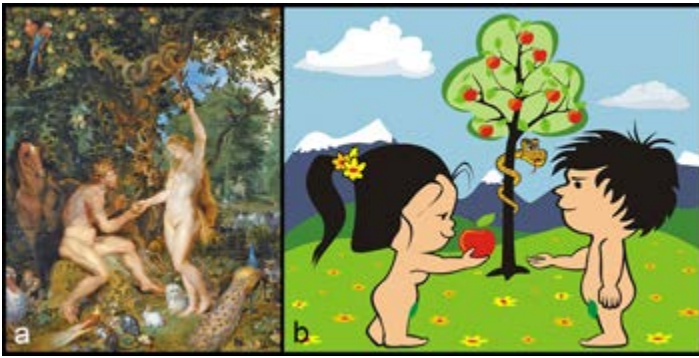


Figure 2. The symbolic role of the apple tree in in the Garden of Eden. (a) Painting (public domain) showing Eve receiving a forbidden apple from the snake and giving one to Adam. Prepared (ca. 1615) by Jan Brueghel de Oude and Peter Paul Rubens, housed in the Mauritshuis Museum, Netherlands. (b) A charming, if much simpler, illustration of the story. Source: Shutterstock, contributor: Ottoflick.

chief ancestors, notably *M. pumila* (paradise apple), *M. sylvestris* (European crab apple), and *M. baccata* (Siberian crab apple). The apple has been grown by human beings at least as far back as recorded history in both Europe and western Asia, and may have been the earliest of all fruits to be cultivated. Kazakhstan, dating back some 8,500 years, is often said to be the birthplace of the modern apple. Lake Dwellers of central Europe grew apples in neolithic times, as reflected by the discovery of stored apples seeds. The Greeks and Romans were familiar with about two dozen varieties, while modern man is believed to have selected as many as 10,000, indeed some claim 15,000 (almost half of them American, as reflected in the expression “American as apple pie”). Although there are thousands of apple varieties, only a few dozen have commercial importance. Apple cultivars are generally mutants which have been selected from great numbers of seedlings, and propagated and held true to type by budding or grafting. Trees raised from the seeds of apples rarely possess as desirable qualities as the maternal trees from which they were obtained. Depending on variety, apples range in size from a little larger than a cherry to as large as a grapefruit. The skin of an apple may be red, green, yellow, orange, or brown, and the flesh white, cream, pinkish or greenish.

The apple is the most widespread of all fruits, accounting for about half of the world’s output of deciduous tree fruit. Apples may be kept for 8 months in an atmosphere of reduced oxygen, regulated by carbon dioxide and low temperature, and such controlled atmosphere storage prevents continued ripening and makes tree-fresh apples available through the winter months.

Wild apple species

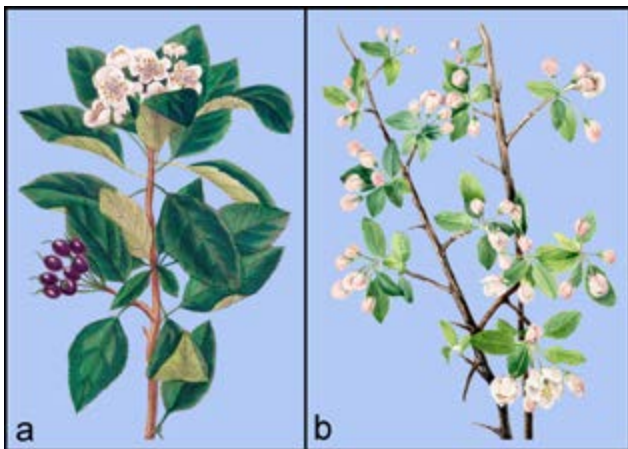


Figure 3. Native Canadian species of *Malus*. Public domain illustrations. (a) *Malus fusca*. Source: Michaux, F. 1846. The North American sylvia, vol. 2. J. Dobson, Philadelphia. (b) *Malus coronaria*. Source: Walcott, M.V. 1925. North American wild flowers, vol. 1. Smithsonian Institution, Washington, D.C.

Malus species are deciduous shrubs or small to medium-sized trees growing as tall as 15 m. The several dozen species are native to the temperate Northern Hemisphere, the majority in Eurasia, particularly in China. *Malus coronaria* (in Ontario) and *M. fusca* (in B.C.) are the only Canadian indigenous species, but several others are naturalized. The plants can live for more than a century, some surviving for more than two centuries.

Domesticates

Most modern apple varieties are placed in the hybrid *M. × domestica*. Several European species are the



Figure 4. Paintings of Japanese flowering crabapple (*Malus × floribunda*). Hybrids with this species provide many of the showiest ornamental cultivars. Source (public domain): Van Houtte, L. (ed.). 1862–1865. Flore des serres et des jardins de l’Europe, Volume XV.

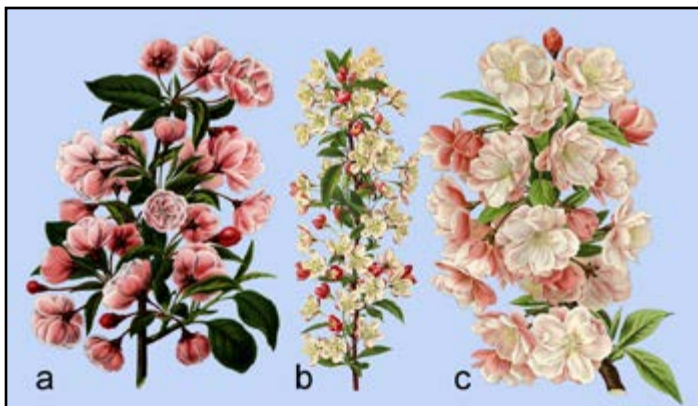


Figure 5. Paintings (public domain) of some of the Asian species extensively employed to breed ornamental crabapples. (a) *Malus spectabilis* (Chinese flowering crabapple). Illustration by Abraham Jacobus Wendel, from the Dutch language book: Witte, H. 1868. Flora: afbeeldingen en beschrijvingen van boomen, heesters, éénjarige planten, enz. voorkomende in de Nederlandsche Tuinen. Wolters, Groningen. (b) *Malus sieboldii* (Toringo crabapple). Source: Revue Horticole, 1870, sér. 4, vol. 42. (c) *Malus baccata* (Siberian crabapple). Source: Van Houtte, L.B. (ed.). 1873. Flore des serres et des jardin de l'Europe, volume 19.



Figure 6. Flowers and fruits of ornamental crabapples. (a) Flowers. Photo by PaulaN (CC BY SA 4.0). (b) Fruit. Photo by SeppVei (public domain).

More than 1,000 crabapple cultivars have been recorded. Most ornamental crabapples originate from Asian species, especially Chinese flowering crab (*M. spectabilis*), Siberian crabapple (*M. baccata*), Toringo crabapple (*M. sieboldii*), and Japanese flowering crabapple (*M. floribunda*). The last-mentioned is considered as the most beautiful of the ornamental crabapples. American species that are parents of crabapple cultivars include garland or sweet crab (*M. coronaria*), Oregon or Pacific crabapple (*M. fusca*), prairie crabapple (*M. ioensis*), and southern crabapple (*M. angustifolia*). The flowers and fruits of ornamental crabapples essentially resemble those of conventional apples, but the blooms are especially dense and colourful and the small fruits are usually in clusters.

Ornamental use



Figure 7. Flowering crabapple trees lining public roadways. (a) Trees lining a path in a park. Photo (public domain) by Mona El Falaky from Pixabay. (b) Trees lining a boulevard in Chelyabinsk, Russia. Photo by Shèyǐng shī (CC BY SA 4.0).



Figure 8. Common colours of crabapples. Source of photos: Shutterstock. (a) Contributor: Traveller70. (b) Contributor: Tatyana Mi. (c) Contributor: Amelia Martin.

Crabapples are widely grown for their attractive growth habit, spring flower display, and decorative fruits. Some dwarf ornamental forms have been selected. Frequently the flower buds are red, but when they open they are white or pink, the predominant flower colours (some cultivars have red flowers). Fruits are usually yellow, orange, purple, or red. Some varieties have attractive fall foliage, others have fruits that persist overwinter. Some varieties have semi-doubled or doubled flowers, and some have especially fragrant blooms. Weeping forms are also available. Flowering crabapples are frequently planted as street

trees, bordering major roadways and boulevards, and as compact lawn specimens.



Figure 9. Crabapples persisting on trees in winter. Source of photos: Shutterstock. (a) Contributor: Kobeprior99. (b) Contributor: Sarah Marchant.

Although some crabapples are quite edible, the small fruits are usually so tart (astringent) that they are considered inedible as fresh fruit. It has been claimed that smaller crabapples are usually less tasty than larger ones. Crabapples are suitable for jams, jellies, preserves, and cider. They are an excellent source of pectin, contributing to its usage for jellies. Crabapples can be incorporated in baked goods and chutneys, but admittedly coring them is laboursome. Apple wood is fragrant, and is burned to provide a pleasant scent and flavour to smoked or barbecued foods.

The seeds of all apples, including crabapples, have trace amounts of amygdalin, which breaks down into cyanide. However, large numbers of seeds must be chewed and swallowed to produce serious toxicity (the seeds need to be pulverized through chewing in order to release the toxins). Wildlife frequently consume crabapples and appear resistant.

Other uses



Figure 11. Bonsai crabapple trees. Photos by Jerry Norbury (CC BY ND 20).

Culinary use



Figure 10. Crabapple culinary preparations. (a) Candied crab apples on sticks, for sale in Japan. Photo by Tuchodi (CC BY 2.0). (b) Crabapple preserve. Source of photo: Shutterstock, contributor: MaxCab. (c) Crabapple jelly. Photo (public domain) by Nutrition, Food Safety & Health.

Some crabapples are used as rootstocks for domestic apples, for example to provide cold hardiness or to dwarf the trees. They are also used as sources of pollen in apple orchards. Crabapples are popular bonsai plants, and the smallest cultivars can be used for container gardening. Wildlife make considerable use of the flowers and the fruit of crabapple trees, whether cultivated or growing in the wild.



Figure 12. Wildlife consuming crabapples. (a) Yellow shafted flicker (*Colaptes auratus*). Source of photo: Shutterstock, contributor: Glenn Krahulic. (b) Virginia opossum (*Didelphis virginiana*). Photo by Normanack (CC BY 2.0). (c) White-tailed deer (*Odocoileus virginianus*) Source of photo: Shutterstock, contributor: Breck P. Kent.

Care of plants

Propagation

The most attractive ornamental crabapple varieties are often grafts, composed of a cloned cultivar on the rootstock of a hardier species of *Malus*. Grafting is not practical for most amateur gardeners.

Planting

Crabapple trees are normally planted from potted nursery specimens in the fall but can be spring-planted. Most commercially sold starting stock will require several years to flower, but very large material that requires professional transplanting may already be in flower. Tree planting rules should be followed: dig the hole twice as large as the root ball, loosen the root ball, add soil amendments such as peat moss, and water frequently and deeply during the first few weeks.

Climate

Crabapple trees are suited for regions with cold winters and warm summers, which is where most Canadians live. Crabapples have survived in northern Alberta (see Harris 1970).

Exposure

Although semi-shade is tolerated, full sun is best (at least 6 hours daily). The ultimate size of the tree should be considered: not too close to a foundation,

and distant from other trees as they enlarge in the future. Crabapples are superb small specimen trees for small lots, but the largest cultivars are also useful as shade trees and the dwarf forms are suitable for some borders. Crabapple trees often drop their fruit in the fall and early winter, and the decaying apples may stain driveways, sidewalks, and patios if located too close to them (this is much less of a problem for cultivars with persistent fruit).

Soil & moisture conditions

Crabapple trees grow well in many soil types. However, ideal soil for crabapples is rich, loamy, well-drained, with a pH of 5.5 to 6.5. A mulch at the base of the tree (wood chips and pine bark are suitable) is recommended (turf grasses are best not grown against the trunk). Established trees usually need watering only in prolonged droughts. Most crabapples do well with minimal or no fertilization.

Maintaining plants

Regular pruning is recommended; hitting the trunk with lawnmowers is not. Wrapping the trunk of young trees will shield them from rabbits, deer, and winter sunburn.

Curiosities of science and technology

- The first colonists in New England naively transplanted American wild crabapple trees to their gardens, hoping that cultivation would immediately turn them into large trees producing succulent fruit as in Europe. Of course, the wild trees merely produced crabapples.
- The McIntosh, the most Canadian of all apple varieties, is red-skinned or greenish blushed with red. This thin-skinned, all-purpose apple is tender and requires less cooking time than most other varieties. In 1796 John McIntosh left the Mohawk Valley of New York and settled in southern Ontario. About 15 years later, he discovered about 20 apple trees, which legend has it grew from seeds discarded by an indigenous person. One of the trees turned out to be the first McIntosh apple. John's son Allen learned how to take shoots from the tree and graft them onto other trees, thus reproducing the McIntosh apple, possibly the most famous of all apple cultivars. The original tree was scorched during a fire in 1884, but survived until 1906.

A monument marks the spot southeast of Ottawa where the tree lived for almost a century, and in 1996 the Canadian government issued a silver dollar featuring a bough full of McIntosh apples, commemorating the 100th year since John McIntosh arrived in Canada.

- At the transition of the 19th and 20th centuries, “apple green” was a popular color because it was thought to be calming. Asylum walls were painted apple green to calm the patients, and husbands were advised to paint their kitchens apple green so their wives “would not insist on getting the vote.”
- Twenty-five percent of the volume of an apple is air, which is why it floats.
- Why does the white flesh of apples and potatoes turn brown when exposed to air for a few hours? For the same reason that iron rusts – oxidation (chemical combining with oxygen) occurs. When oxygen becomes available due to removing the skin of the apple, the enzyme polyphenol oxidase (also known as tyrosinase) oxidizes compounds (phenolics) in the fruit, turning them brown. Browning of a peeled apple can be prevented simply by putting it in water, so that the enzyme does not have access to oxygen.
- An old (unkind) adage regarding apple tree pruning: you should be able to throw a cat through the branches without hitting any of them.
- Espalier is the horticultural practice of training the branches of fruit trees such as apples to grow on a frame so that the fruit can easily be harvested. By growing the plant against a sun-facing stone wall, the heat accumulated by the wall stimulated growth. As well as being practical, espalier is decorative and artistic.



Figure 13. Espalier: Training plants to grow on frames. (a) Diagram for growing fruit trees on a frame. Image (public domain) from: Edinburgh Postmaster General. 1846. Post Office Edinburgh and Leith directory. Coloured by B. Brookes. b) An espaliered crabapple tree. Source: Shutterstock, contributor: Joanne Dale.

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Acknowledgements

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Figure 14. Canadian stamps issued by Canada Post in 2021. The pink-flowered painting is Rosseau crabapple, introduced in 1928 at Ottawa's Central Experimental Farm by pioneering ornamental plant breeder, Isabella Preston (1881–1965). The white-flowered illustration is Maybride, a dwarf crabapple bred by Preston's successors, Daniel Foster Cameron and Dexter Reid Sampson.

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