



# The Canadian Botanical Association Bulletin

## Bulletin de l'Association Botanique du Canada

Volume 57 Number 3 - December/décembre 2024

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### Interim Presidents' Message



Greetings from Prince Edward Island! I'm pleased to be involved more directly with CBA/ABC in conjunction with Nicole Fenton and John Markham as we navigate this upcoming year. The Association was active on many fronts this past year. Here are a few examples:

- The Association had a small but mighty presence at the Plant Canada joint meeting in Winnipeg where the Plant Development Section held a symposium with CSPB (Shelley Hepworth and Elizabeth Schultz), and Laura Super delivered a teaching presentation during the Teaching Section meeting.
- The CBA presented [18 awards](#) totaling approximately \$7,000!
- The IDEA (Inclusion, Diversity, Equity, and Accessibility) Committee continued its important work which will be particularly useful for organizers of upcoming meetings.
- The Board of Directors passed resolutions supporting the Kew and Duke herbaria and engaged in efforts to prevent their relocation and closure, respectively.
- The Association continued to build its relationship with Canadian Science Publishing and the journal *Botany*, led by members (and co-Editors-in-Chief) Shelley Hepworth and Liette Vasseur.

## **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](http://www.cba-abc.ca)

### Executive Editor

Dr. Erin Zimmerman

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### Next issue

Texts for the next issue, 58(1), must be received by February 1, 2025

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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](http://www.cba-abc.ca)

### Rédactrice en chef

Dr. Erin Zimmerman

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### Prochain numéro

La date de tombée des textes du prochain numéro, le no 58(1), est le 1 février 2025

- The Student Council (established in 2023) met several times during the year, proposing initiatives to increase student engagement in CBA/ABC activities.
- The Membership Committee proposed a new rule allowing students and postdocs to remain in this membership category after completing their degrees or contracts at institutions until they find stable employment.
- The website was updated to include expanded Section pages, French translations and new content, including a page that gathers and makes available all plant articles published in the *Bulletin* since the inception of CBA.

I encourage you to visit the [CBA/ABC website](#) and navigate its pages to familiarize (re-familiarize) yourself with the organization. More specifically, I encourage you to renew your participation or engage with one (or more) of our five sections to continue the great work that is taking place. As we approach the holidays, please plan to renew your membership. An organization is only as strong as its members. For my part, I intend to gift all my Honours and graduate students with a membership to the organization for the upcoming year. Many of my former students commented on the value of this membership which includes a fantastic newsletter/bulletin as well as opportunities to meet colleagues and potential supervisors at what I would consider 'unique' meetings. By unique I mean small, informative, intimate, and social gatherings where your presence matters!

I am particularly excited to attend the annual meeting in Newfoundland in the new year: *Botany on the Rock for Conservation and Sustainability*. Organizers are actively working to build a program and field trips that will represent our organization well. The website for the conference is set to go live in January.

Best wishes to you and your families for the upcoming holiday season.

I leave you with a little holiday pun for you to enjoy or roll your eyes at: *Happy botanists like 'merry'-stems!*

Christian Lacroix  
University of Prince Edward Island

Salutations de l'Île-du-Prince-Édouard ! Je suis heureux de m'impliquer plus directement cette année avec l'ABC/CBA, en collaboration avec Nicole Fenton et John Markham. L'Association a été active sur de nombreux fronts au cours de l'année qui s'achève. En voici quelques exemples:

- L'Association a eu une petite mais puissante présence à la rencontre conjointe de Plant Canada à Winnipeg, où la section 'développement des plantes' a tenu un symposium avec la CSPB (Shelley Hepworth et Elizabeth Schultz), et Laura Super a fait une présentation sur l'enseignement lors de la réunion de la section 'enseignement'.
- L'ABC a décerné [18 prix](#) pour un montant total d'environ 7 000 \$ !
- Le comité IDEA (Inclusion, diversité, équité et accessibilité) a poursuivi son important travail qui sera particulièrement utile aux organisateurs des prochaines rencontres.
- Le conseil d'administration a adopté des résolutions soutenant les herbiers de Kew et de Duke et s'est engagé dans des efforts visant à empêcher leur déménagement et leur fermeture, respectivement.
- L'Association a continué à développer ses relations avec Canadian Science Publishing et la revue *Botany*, sous la direction de nos membres (et co-rédactrices en chef) Shelley Hepworth et Liette Vasseur.
- Le Conseil des étudiants (créé en 2023) s'est réuni plusieurs fois au cours de l'année, proposant des initiatives visant à accroître l'engagement des étudiants dans les activités de l'ABC.
- Le comité des membres a proposé une nouvelle règle permettant aux étudiants et aux postdocs de rester dans cette catégorie de membres après avoir obtenu leur diplôme ou leur contrat dans une institution jusqu'à ce qu'ils trouvent un emploi stable.
- Le site web a été mis à jour pour inclure des pages plus détaillées pour nos sections, des traductions en français et un nouveau contenu, y compris une page qui rassemble et met à disposition tous les articles sur les plantes publiés dans le *Bulletin* depuis la création de l'ABC.

Je vous encourage à visiter [le site web de l'ABC](#) et à naviguer ses pages pour vous familiariser (ou vous re-familiariser) avec l'organisation. Plus précisément, je vous encourage à renouveler votre participation ou à vous engager dans l'une (ou plusieurs) de nos cinq sections afin de poursuivre l'excellent travail en cours. À l'approche de la saison des fêtes, prévoyez de renouveler votre adhésion. Une organisation n'est forte que par ses membres. Pour ma part, j'ai l'intention d'offrir à tous mes étudiants de premier et deuxième cycle une adhésion à l'organisation pour l'année à venir. Plusieurs de mes anciens étudiants ont souligné la valeur de cette adhésion qui comprend un bulletin d'information fantastique ainsi que la possibilité de rencontrer des collègues et des superviseurs potentiels lors de rencontres que je qualifierais d' uniques. Par uniques, j'entends des rencontres informatives, intimes et sociales où votre présence compte !

Je suis particulièrement enthousiaste à l'idée de participer à la réunion annuelle qui se tiendra à Terre-Neuve au début de l'année prochaine: *Botany on the Rock for Conservation and Sustainability*. Les organisateurs travaillent activement à l'élaboration d'un programme et planifient des excursions qui représenteront bien notre organisation. Le site web de la rencontre sera mis en ligne en janvier.

Je vous adresse mes meilleurs vœux, à vous et à vos familles, pour la saison des fêtes.

Christian Lacroix  
University of Prince Edward Island

# In Memoriam: Dr. James Scott Pringle (1937–2024)

David Galbraith, Director of Science, Royal Botanical Gardens

Botany in Canada has lost a distinguished plant taxonomist, teacher, and friend. Dr. James Scott Pringle, the recipient of the 2023 CBA George Lawson Medal, passed away in Hamilton in September at the age of 87. As Plant Taxonomist at Royal Botanical Gardens (RBG) and an Adjunct Professor at McMaster University, Jim Pringle's remarkable career spanned six decades. I had the honour to work alongside Jim at RBG since 1995.

Jim was born in Danvers, Massachusetts, in 1937, and attended Dartmouth College in Hanover, New Hampshire. He completed his master's degree at the University of New Hampshire and his doctorate from the University of Tennessee at Knoxville in 1963, under Dr. Aaron John "Jack" Sharp (1904–1997), a botanist and bryologist. His dissertation began a career-long focus on the taxonomy of the Gentianaceae.

Upon completing his doctorate, Jim joined RBG as its first full-time scientist. The early 1960s were a period of significant growth for RBG, with an expansion of programs and staff, especially in woody plant horticulture. Jim was recruited as a plant taxonomist with expertise in cytotaxonomy and genetics. Collaborating with specialists in ornamentals like the late Charles Holetich and Freek Vrugtman, and with George



Dr. Jim Pringle in the RBG Herbarium, 2016. Photo ©Mark Zelinski from the book *Canada's Royal Garden*. Used with permission.

Pagowski, he directed part of his work during the early years at RBG toward the biology of plants in cultivation, including papers on late-blooming lilacs and participating in RBG's plant breeding program.

While Jim made significant contributions to horticultural taxa, the primary focus of his research was taxonomy and systematics of the Gentianaceae. Over his career, he authored or co-authored the names more than 88 species, subspecies, and subfamilies of vascular plants. His early work included the description of new species such as *Gentiana austromontana*, published with Dr. Sharp in 1964 in *Rhodora*, and *Gentiana puberulenta* in 1966. His extensive revisions of the genus *Gentiana* and related genera contributed significantly to understanding species diversity and evolutionary relationships within the Gentianaceae.

Throughout his career, Jim's research focused on the taxonomy of *Gentianella*, *Halenia*, and other genera within the Gentianaceae, often focusing on species from South America. He described numerous new species from Peru, Bolivia, and other regions, such as *Gentianella canoi* (2018) and *Gentianella montesinosii* (2019). His meticulous work on the floras of Ecuador and Bolivia including contributions to the Catalogue of the Vascular Plants of Ecuador (1999) and Catálogo de las Plantas Vasculares de Bolivia (2015). His collaboration with Dr. Jason Grant of Switzerland and his reputation resulted in Dr. Grant naming the Andean woody gentian *Macrocarpaea pringleana* for Jim in 2004. He also co-authored works with botanists like Dr. T. N. Ho for the Flora of China and contributed to the Flora of North America North of Mexico. He authored treatments for various floras, including for the Jepson Manual: Higher Plants of California, where he wrote the section on Gentianaceae in both the first (1993) and second editions (2012). He was deeply involved in resolving nomenclatural issues and published numerous papers resolving questions about names and classifications.

His interest in floristics, and in both adventive and naturalized species led to publications on species newly recorded in Ontario, including species showing up at the RBG Herbarium. His 2018 paper with Colin Chapman, Noteworthy collections: Four introduced vascular plants new to Ontario and Canada in *The Great Lakes Botanist*, reflected his ongoing engagement with local flora and the impact of human activities on plant distribution.

I was always fascinated to learn more about his wide network of contacts and collaborators, and the diversity of projects that interested him. Following his death, I reached out to Dr. Debabrata Maiti, Associate Professor in the Taxonomy and Biosystematics Laboratory at the Department of Botany, University of Calcutta, for some thoughts about Jim. Dr. Maiti organized a moving memorial for Jim in the herbarium at University of Calcutta a few days after he died.



Professor Debabrata Maiti (in yellow) and colleagues in the University of Calcutta Herbarium paying tribute to Dr. Pringle on 9 September 2024.

Dr. Maiti wrote “Dr. Jim Pringle was an outstanding expert on the Gentianaceae in particular and blooming plants in general. He is renowned in both the Old and New Worlds for his contribution to the specific family. Dr. Pringle has made significant contributions to the contemporary Gentianaceae family. He is a master of the subject because of his priceless contribution to the natural history of the New World.

“Among all other achievements, one of Jim’s the most striking contributions is the revisionary account of the family Gentianaceae of China. He made his mark on this work by contributing the most insightful remarks and research on the Himalayan *Gentiana* species.

“I came to connect with him a decade ago when I started debate on several species of *Gentiana* discovered in Indian Himalayan Region (IHR). His extensive expertise of nearly every species in the genus amazed me much. His eagerness to discover new things and his attitude toward unknown information are two of his most noteworthy traits.”

Dr. Maiti continued, “I was ecstatic and honored when he finally decided to co-author the piece. The article was an extensive work and dedicated to the infraspecific morphological variation in *Gentiana macrauchena* and lectotypification of the name *Gentiana incompta* Harry Sm. He consented to join the Editorial Board of the “Journal of the Botanical Society of Bengal” (the journal managed by the Botanical Society of Bengal, started in 1935) in 2019 at my request. In his capacity as Editorial Advisor (2020-2024), he provided us with guidance and knowledge.”

“Dr. Jim Pringle was knowledgeable, compassionate, and kind. He was intelligent, attentive, and composed. To have known such a gentleman is a true honor. “The Santa of the Herbarium,” Dr. Pringle is really good and very helpful. His contribution to the taxonomy of the Gentianaceae—especially *Gentiana*—is unmatched. His contributions and kind demeanour will live on in memory.”

Jim was an avid field botanist with an encyclopedic knowledge of plants. He became the authoritative source on the wild plants within RBG’s extensive nature sanctuaries. In 1969, he published the first iteration of the Checklist of the Spontaneous Vascular Flora of the Royal Botanical Gardens’ Natural Lands, which has undergone three subsequent revisions and remains a critical reference for botanists and natural lands managers.

His passion for education led him to share his knowledge with an array of students and enthusiasts. In the 1980s, he taught plant taxonomy courses at McMaster University. Recognizing the importance of hands-on learning, Jim taught the only university-level plant identification field course in Ontario at the Queen's University Biological Station at Lake Opinicon for many years. This location, one of his favorite botanizing haunts, provided an ideal setting for students to learn about whole organism plant diversity in a natural environment. Jim's commitment to education extended beyond Canada. Until curtailed by the COVID-19 pandemic, he made annual trips to Tennessee to serve as a field instructor in the Annual Spring Wildflower Pilgrimage in the Great Smoky Mountains National Park.

A published historian, Jim had a profound interest in the history of botanical exploration. He authored several papers for *Canadian Horticultural History* on historical aspects of botany in Canada, including Botanical exploration of the Canadian watershed of Lake Huron during the nineteenth century (1989). Jim also explored the contributions of early botanical collectors, including women and underrepresented groups. His chapter on Alice Hollingsworth, an early Canadian woman botanist, in the 2022 book Flora's Fieldworkers: Women and Botany in Nineteenth-Century Canada, highlighted the often-overlooked roles women played in the development of botany and the exploration of plant diversity in Ontario. His concern for social justice issues found expression in his co-authorship of A Noble and Independent Course: The Life of the Reverend Edward Mitchell with Dr. Forrester A. Lee (2018). The book chronicles the life of Edward Mitchell, the first person of African descent to graduate from Dartmouth College, making him also the first to graduate from any Ivy League college in the USA. Both Jim and Dr. Lee were alumni of Dartmouth.

Jim's contributions to botany were recognized through several honors. In addition to three new species named in his honor, *Macrocarpaea pringleana* and *Kuepferia pringlei* (a Gentian from the Himalayas described in 2015 by D. Maiti and S.K. Dey), and *Gentiana pringlei* (described by M. Shabir, P. Agnihotri, J.K. Tiwari & T. Husain in 2018), he received the John Goldie Award from the Field Botanists of Ontario in 2011. The award cited his fundamental contributions to science and his eagerness to share knowledge with both the scientific community and amateur botanists. In 2023, the Canadian Botanical Association honored him with the George Lawson Medal, the CBA's highest accolade. The medal acknowledged his dedication to advancing botany in Canada and his role in mentoring future generations of botanists.

His collaborative research continued into the later years of his life. He continued his work with international teams on phylogenetic studies, such as the 2016 paper Out-of-Tibet: the spatio-temporal evolution of *Gentiana* (*Gentianaceae*) and his 2020 study on phylogenetic relationships within *Gentiana*.

Jim was an avid ornithologist too, and participated in programs of the Hamilton Naturalists' Club, including contributing to their publication *The Wood Duck* and leading educational programs.

Jim was known for his dry sense of humor and sharp wit. He was an avid reader of pulp fiction mysteries and was renowned at RBG as a "foody." His contributions to staff potlucks at RBG were legendary, such as his Jamaican salt fish and ackee. He also delighted in intellectual challenges, creating intricate word puzzles based on bird names and then sharing them with friends who often spent months trying to solve them.



Jim with Natalie Iwanycki and Carl Rothfels on the RBG trails, 2007.

Throughout his career, Jim mentored young botanists and ecologists. His encouragement and guidance helped shape the careers of the herbarium curators at RBG through the 1990s and 2000s, including Jeremy Lundholm, Tyler Smith, Carl Rothfels, and Natalie Iwanycki Ahlstrand, all of whom left RBG to pursue doctorates and then secured faculty or senior government research positions, and Nadia Cavallin, RBG's current curator and field botanist. He worked closely with the many interns and summer students in the herbarium and with staff in RBG's Natural Lands and Horticulture Departments. He was generous with his time, always willing to discuss taxonomy, share insights from his extensive fieldwork, or provide advice on research projects.

Jim Pringle is survived by his sister, Carolyn Anastos of Hull, Massachusetts, and her family, and a wide network of colleagues, students, and friends who celebrate his enduring legacy.

A bibliography of Dr. Pringle's publications is available [here](#).

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## CBA Teaching Section Report

Dr. Laura Super and Dr. Barbara Hawkins  
November 15, 2024

As of fall 2024, we have been involved in several initiatives. Briefly, we felt it would be useful for the CBA Teaching Section to have more involvement with the newly formed CBA Student Section. To get a better understanding of the interest of the Teaching Section membership, Barbara, with input from Laura, created a survey. There are also other opportunities related to the annual meeting in 2025 – stay tuned and please get involved!

### Collaborating with the CBA Student Section:

Barbara and Laura met with graduate student members in October. Laura is now meeting with the Student Section regularly to act as a bridge between the Teaching and Student Sections. CBA students are welcome to help in any Teaching Section activities they feel are relevant.

### Teaching Section Survey:

We have created a survey that will soon be sent to the CBA Teaching Section membership via Survey Monkey. Please help us by completing this survey! In the survey, there is a section on Universal Design for Learning (UDL). Laura is doing a UDL capstone project in an early career, NSF-funded, leadership course. The capstone project is focused on creating a one hour workshop related to UDL in the classroom, workplace and broader communication (publication, conferences, K-12 outreach, etc.). As well as other offerings, we hope to present a version of the workshop at CBA 2025. Questions and interest in involvement can be emailed to Laura ([leslaura@gmail.com](mailto:leslaura@gmail.com)).

### Other Activities:

Laura has continued to be involved in initiatives related to CBA. The Kindness Project continues, and includes CBA members. Laura is also creating a phytobiome project through teaching with science, technology, engineering, arts and mathematics (STEAM). These projects will be explained in more detail in an invited General Symposium talk on teaching and inclusion, diversity, equity and accessibility (IDEA) at the 2025 conference.

Anyone with ideas for Teaching Section activities is welcome to email us any time! ([leslaura@gmail.com](mailto:leslaura@gmail.com) & [bhawkins@uvic.ca](mailto:bhawkins@uvic.ca)).

# Update from *Botany*, the Official Journal of the CBA

## **New *Botany* journal specialist**

Please welcome Matt Swift as our new *Botany* journal development specialist. Matt joined CSP in September, taking over from Rachel Pietersma. Prior to joining CSP, Matt completed his PhD at the University of Nottingham in the UK and following a 2-year period as a Postdoctoral Researcher moved into publishing as an Associate Editor at PLOS. Matt will serve as a primary contact for any and all questions related to *Botany*.



## **Introducing the new Early Career Editorial Board**

Canadian Science Publishing is delighted to introduce the inaugural cohort of Early Career Researcher Editors for *Botany*. During their 2-year term, the ECR Board will receive guidance, support and mentoring from senior members of the journal's editorial board and the Editors-in-chief. For updates and more information on the ECR Editorial board follow @Botany\_Journal on X/Twitter.

## **Promoting your research**

- *Botany* now has a dedicated page on [Research Gate](#). When your paper is published in *Botany* it will be automatically added to ResearchGate and your author user profile.
- Follow us on X/Twitter [@Botany\\_Journal](#). Learn about upcoming journal initiatives, special issues, and new plant science.
- We also welcome literature reviews on topics related to the various subject areas that *Botany* is publishing in as well as on new methods that can help advance the field of plant science.
- We invite you to contribute to some of our established collections or current special issues on [Parasitic Flowering Plants in Forests](#), [Research Advances on Cannabis](#), and [Ethnobotany and Ethnopharmacology of the Americas](#).

## **Calls for Papers:**

[Botany](#) is currently accepting submissions for three special issues:

### **[The Intrinsic Value of Botanical Gardens and Herbariums](#)**

The journal *Botany* invites submissions for a special collection that highlights the importance of living plant collections at botanical gardens and arboreta as well as preserved collections in herbariums. The value of such collections spans a broad array of disciplines from phylogeny and taxonomy to ecology and phytogeography. Collections have been and continue to be valuable sources of material and data that can be used to answer a variety of questions from distribution histories to impacts of climate change. Consider submitting a research article based on data obtained from collections, provide a commentary on best practices used to curate collections and/or challenges associated with maintaining collections, or even a methodology paper based on data from collections.

**Submission deadline:** February 12, 2025

**Guest Editors:** Stéphanie Pellerin, Rafael Filipe de Almeida

## Indigenous Knowledges and Approaches to Botanical Research

Plants are fundamental to human survival. While plants provide food, shelter, and medicine, they also contribute to emotional and spiritual well-being. Indigenous communities around the world hold deep connections to and vast knowledge about plants, especially those which are culturally salient. The journal *Botany* invites Indigenous and non-Indigenous researchers to participate in a special collection that highlights the value of Indigenous Knowledges and approaches to botanical research.

We invite reviews, perspectives, methods, notes, and research papers on key areas of focus, including but not limited to:

- Ethnobotanical studies
- Biodiversity
- Ecosystem management, restoration and conservation
- Climate change
- Sustainability and stewardship
- Collaborative research models
- Community-based monitoring and knowledge co-production
- Food sovereignty

**Submission deadline:** March 12, 2025

**Guest Editors:** Hugo Asselin, Noémie Boulanger-Lapointe

## Plant Reproduction and Seed Development: New Advances Under a Changing Climate

Robust plant reproduction and seed development are essential to our society and the ecosystem. The challenge of ensuring the success of these processes is continuously growing under climate change. In this *Botany* collection, we invite new insights related to these topics in all aspects of plant sciences. Reviews, perspectives, notes, methods, plant genomic resources, and research articles are welcome. Topics include but are not limited to:

- Mechanistic studies that advance our knowledge in the regulation of flowering, pollination, seed development, dispersal, and seed quality using genetic, epigenetic, biochemical, cellular, and molecular approaches
- Knowledge and conservation of genetic diversity of sexual and asexual reproduction and seed development
- Adaptation to a changing climate using reproductive and seed development traits
- Evolution of reproductive strategies and co-evolution between plants and pollinators
- New resources and methods to improve reproductive success and seed quality in crop breeding
- Discussion and review articles on reproduction and seeds
- Conservation of rare species and habitat restoration

**Submission deadline:** May 12, 2025

**Guest Editors:** Mark Belmonte, Sonia Gazzarrini, Liang Song

## Discover new research and a home for yours

*Botany* is published by Canadian Science Publishing, a not-for-profit and community-driven publisher dedicated to making high-quality, peer-reviewed scientific knowledge discoverable and accessible for everyone. Join us on our mission by engaging in these opportunities:

- Participate in publishing webinars and workshops
- Gain experience as a peer reviewer or editor in programs for early career researchers
- Collaborate with peers in curated special issues and collections
- Advance research by serving on the editorial board or as a peer reviewer
- Receive support through society meeting sponsorships and awards
- Engage in community-driven initiatives
- Publish your research with our [open access publishing options](#).

## Have an idea or want to get involved? We want to hear from you!

- Dr. Liette Vasseur, Co-Editor-in-Chief: [lvasseur@brocku.ca](mailto:lvasseur@brocku.ca)
- Dr. Shelley Hepworth, Co-Editor-in-Chief: [shelley.hepworth@carleton.ca](mailto:shelley.hepworth@carleton.ca)
- Matt Swift, Journal Development Specialist: [matt.swift@cdnsiencepub.com](mailto:matt.swift@cdnsiencepub.com)
- Editorial office: [botany@cdnsiencepub.com](mailto:botany@cdnsiencepub.com)

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## 2025 Annual Meeting Announcement

Hello CBA/ABC members,

We are extremely excited to announce that our 61st annual meeting will take place at Memorial University of Newfoundland in St. John's in June 2025 (see poster on following page). The theme of the conference is "*Botany on the rock for conservation and sustainability*." The conference logo portrays a drawing of our provincial flower, the pitcher plant, drawn by one of the founders of our herbarium, Agnes Marion Ayre.

The [conference website and registration page](#) will be live at the beginning of January 2025. Until then, here are some details to help you plan your trip. On-campus housing in dormitory style rooms is inexpensive and convenient since most of our activities will all take place in the St. John's campus. We anticipate an early registration deadline for February 28th, 2025 and abstract submission deadline for March 7th, 2025.

In addition to the highlights given on the poster, we currently have three section-specific symposia planned. Titles are, from the Systematics, Evolution and Biodiversity section: "Genomics for plant evolution, ecology and conservation"; from the Mycology section: "Fungi in Canadian forests"; and from the Ecology and Conservation section: "Plant ecology at the edges: ecotones and range limits."

If we are lucky, we might see icebergs in June. That said, bring your jacket and hat! Beware – first time visitors to NL might get "screeched-in."

~Julissa Roncal, Vice-President

Canadian Botanical Association



L'Association botanique du Canada



Canadian Botanical Association / L'Association Botanique du Canada  
61<sup>st</sup> Annual Meeting and Conference  
June 10-14, 2025  
Memorial University of Newfoundland, St. John's, Canada

***“Botany on the rock for conservation and sustainability”***

**Weresub Speaker**

Dr. Yolanda Wiersma,  
Memorial University

**Flora of NL - Public talk**

MSc. Susan Meades  
Great Lakes Forestry Centre

**Main Symposium Speakers**

Development: Dr. Danve Castroverde, Wilfrid Laurier Univ.

Ecology and Conservation: Dr. Carissa Brown, Memorial Univ.

Mycology: Dr. Az Klymiuk, Univ. Manitoba

Syst. Evol. and Biodiver.: Dr. Edeline Gagnon, Univ. Guelph

Teaching: Dr. Laura Super, UBC

**Field-trips**

- Cape Spear Hike
- MUN Botanical Garden
- Exploring ecosystems of the Avalon



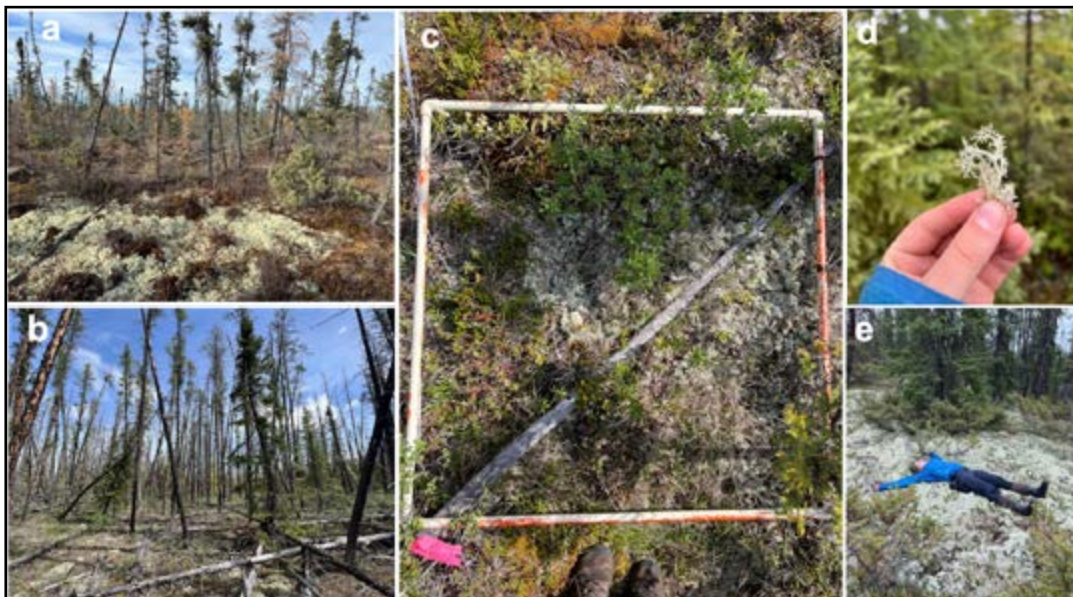
Sarracenia purpurea. Photo: Susan Meades

# Laurie Consaul Northern Research Scholarship – Report

Katerina Coveny, Wilfrid Laurier University

I am a master's student at Wilfrid Laurier University in the Forest Ecology Research Group led by Dr. Jennifer Baltzer studying how permafrost thaw and fire affect caribou lichen, *Cladonia sp.*, populations across the Northwest Territories. I was fortunate enough to spend the summer in the Northwest Territories (NWT) with funding from the Laurie Consaul award assisting in financing this work. Caribou lichens are a group of ground-dwelling lichens with incredible diversity and resilience in harsh climates. They persist in the harsh northern environment by requiring low levels of water and nutrients, and can enter periods of dormancy when conditions are not favourable. They are extremely slow growing. Caribou lichens are found throughout the boreal forest and are an important food source for Woodland Caribou across their range. However, caribou lichens are being affected by climate change through wildfire disturbances, northern shrub encroachment, and increased rates of permafrost thaw. Caribou habitat loss is widespread, and the slow recovery of caribou lichens post-disturbance may lead to further reductions in caribou habitat and forage availability.

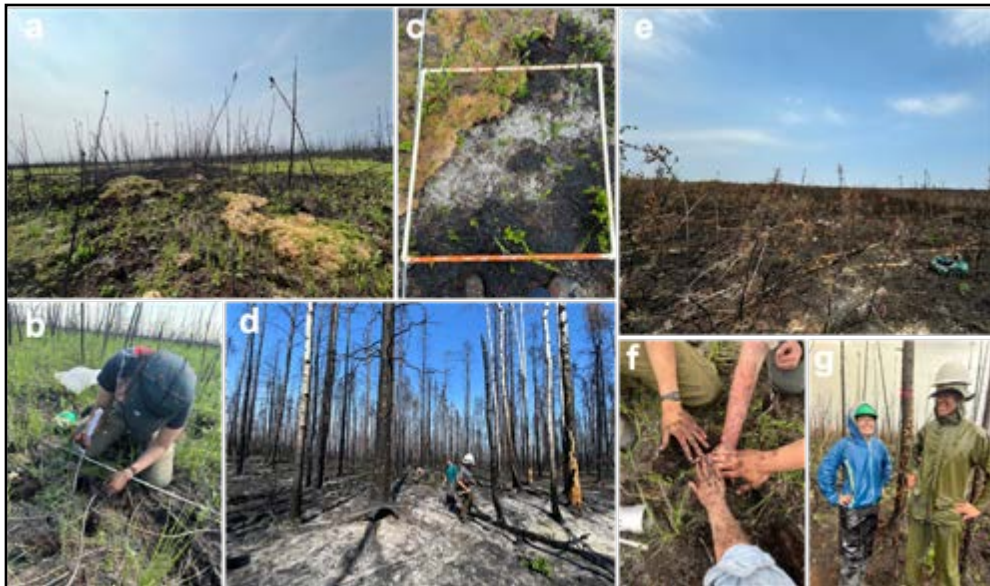
My field team and I spent the summer in the South Slave region of the NWT conducting fieldwork to assess the impact of both permafrost thaw and fire on caribou lichen. **June** was spent in lush old growth forests that had been undisturbed for 70-200 years. While these trees don't look very old, they are likely around 100 years old, as the rate of growth is much slower than down south. These forests were full of downed trees, terrestrial and arboreal lichen, thick moss layers, and a wide diversity of plant species. At these sites, we conducted vegetation surveys, identifying and quantifying non-vascular ground cover species, vascular plant species, and trees using quadrats and transects. This, along with long-term permafrost monitoring will allow us to understand how the rate of permafrost thaw influences caribou lichen biomass across the NWT.



**Figure 1:** a) A black spruce dominated site with a lot of caribou lichen covering the ground surface. b) A jack pine dominated stand with downed wood and lichen covering the ground. c) A vegetation quadrat with a lot of caribou lichen. d) A piece of caribou lichen (*Cladonia sp.*). e) Katerina lying in a large patch of caribou lichen.

**July** was spent in newly burnt forests. 2023 was a record fire year for Canada and the NWT, which resulted in many of our lab's long-term vegetation plots burning. While this could be seen as a negative, it provided us with the unique opportunity to have pre-fire vegetation data to compare to post-fire vegetation, something that is not common with fire ecology. At these sites we quantified residual caribou lichen and measured fire severity using adventitious roots (measuring the height of these roots compared to the soil height) and soil organic thickness

measurements (the thickness of the organic layer). These measurements will be used to find lichen refugia and investigate the relationship between pre-fire lichen biomass and fire severity. These new burns were very interesting to spend time in. There was a wide diversity in burn severity and spread between different forest types, but one constant was that they were all very dirty, we would leave everyday covered in ash and soot from head to foot.



**Figure 2:** a) A black spruce dominated stand with a lot of burnt *Sphagnum*, b) Katerina measuring soil organic layer thickness, c) a vegetation quadrat with living sphagnum and burnt caribou lichen, d) a burnt stand with a thick layer of ash on the ground surface, e) a burnt black spruce stand, f) the field teams hands after digging many holes to measure soil organic layer thickness, g) Katerina and Kyle in the rain in a burnt forest.

Lastly, in **August** we had various chances to participate in community and local events. While in Kakisa we had a wonderful time at the school teaching the students about fire ecology and how forests recover. We went to Fort Smith and collaborated with the Wildlife Research and Monitoring team of the GNWT-South Slave Region to assess fire severity at their small mammal trapping sites. The sites here had burnt twice in the span of 10 years, which can have interesting effects on forest regeneration. Our team had the opportunity to join the Aurora College Environment and Natural Resources Technology Program (ENRTP) students at their fall field camp, where we setup long-term forest monitoring plots in and around the camp. These plots will be revisited to see how the forest changes and recovers after fire! Students learned how to determine burn severity of the soil, combustion of the tree canopy, how to identify tree species and measure the size of individual trees. We felt very welcomed by the people we met while in the NWT this summer.



**Figure 3:** a) The field team in a burnt sinkhole in Fort Smith. This site burnt two times in the past ten years. B) Measuring fire severity at the ENRTP field camp near Fort Smith.

# The unexplored research potential of tree-related microhabitats in North America

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Understanding the relationships between biodiversity and habitats in forest ecosystems is essential for biodiversity conservation and sustainable forest management. The value of using habitats as indirect biodiversity indicators lies in their capacity to encompass a wide spectrum of species, organismal, and taxonomic groups under a single concept (Bunce et al. 2013). Furthermore, biodiversity inventories are often costly, time-consuming, scale-limited, and require solid taxonomic expertise (Leponce et al. 2010; Roy et al. 2012). Using effective indirect biodiversity indicators can thus greatly extend our knowledge of ecosystems and improve their monitoring. As a key habitat, trees play an important role in supporting biodiversity, whether in forest, agricultural or urban landscapes (e.g., Bütler et al. 2013; Lundquist et al. 2022; Barrios et al. 2018). For instance, areas with scattered trees host a greater diversity of arthropods, vertebrates, and woody plants than open areas (see Prevedello et al. 2018). Hence, tree-related biodiversity is of importance regarding the conservation of biodiversity and its associated ecological functions, all the more in the current global change context.

Biodiversity associated with trees is not only conditioned by the presence of trees but is also influenced by tree-level characteristics, such as tree species, diameter, alive/dead statuses and decaying stages (Bütler et al. 2013). For example, the influence of tree species and diameter on biodiversity metrics has already been exemplified with several taxonomic groups, like birds, saproxylic beetles, lichens, and wood-inhabiting fungi (e.g., Thor et al. 2010; Jonsell et al. 2007; Küffer et al. 2008; Basile et al. 2021). Scientists have further realized the importance of smaller-scale tree features, also known as micro-structures, as important habitat providers for specific biodiversity. To standardize biodiversity inventories and allow accurate comparison between studies, some of these micro-structures found on trees have been formally identified, described and collectively termed “tree-related microhabitats” (hereafter TreMs).

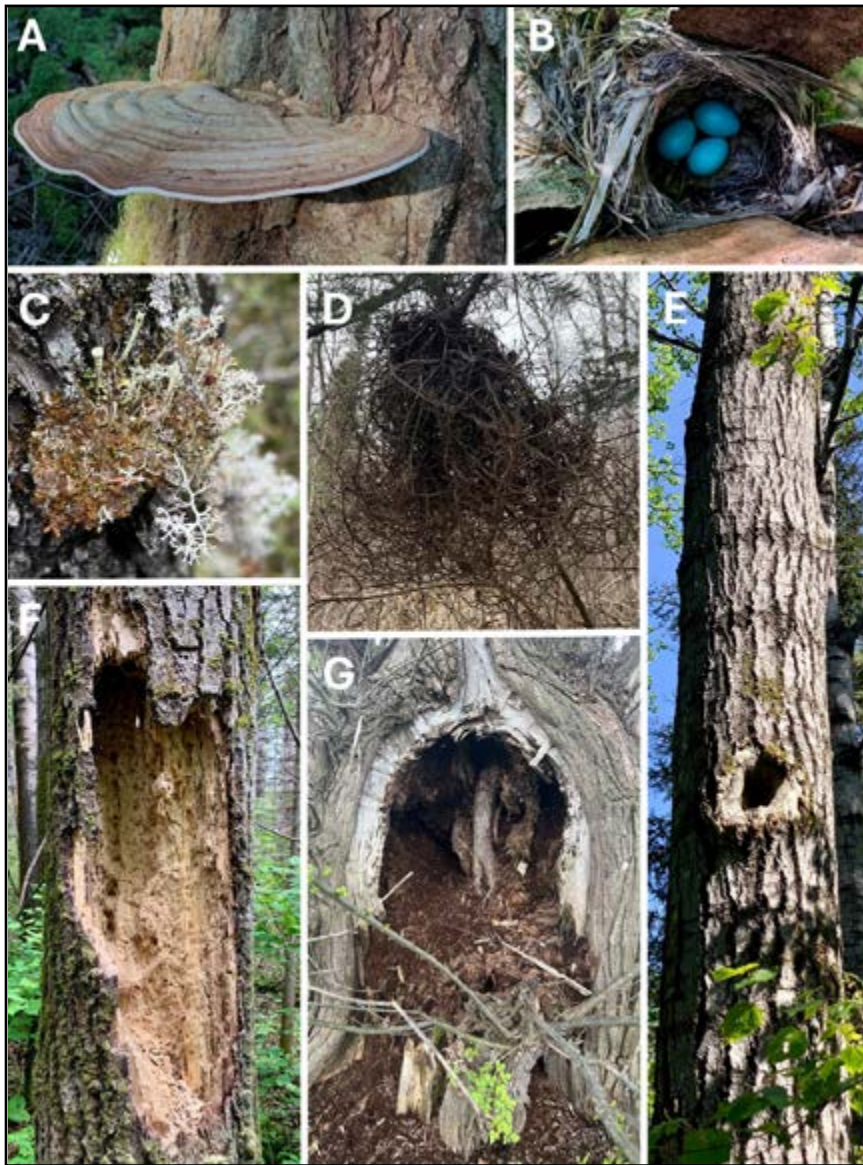
Initially described in Europe, a TreM can be defined as “*a distinct, well-delineated structure occurring on living or standing dead trees that constitutes a particular and essential substrate or life site for species or species communities during*



**Figure 1:** Old-growth forests of Quebec. **A.** Old-growth forest in the feather moss bioclimatic domain, Saguenay-Lac-Saint-Jean. **B.** Deciduous-dominant boreal forest initiated by fire in 1944, Lake Duparquet Research and Teaching Forest. **C.** Canopy gaps, mixed boreal forest initiated by fire in 1847, Lake Duparquet Research and Teaching Forest. Credits: A: Marie-Ève Jarry; B, C: Lucas Chambon.

at least a part of their life cycle to develop, feed, shelter or breed” (fide Larrieu et al. 2018, p.195). Thus far, the most recent up-to-date standardized typology established for Mediterranean and temperate forests included 47 TreM types gathered in 15 groups (Larrieu et al. 2018). Recently, a total of 52 TreM types under 17 groups have been proposed for boreal and hemiboreal forests (Bütler et al. 2024). As a growing research subject, 15 new types of TreMs were described for tropical forests this year (Nußer et al. 2024) and more structures are expected to be added to the typology. Typical examples of TreMs include woodpecker cavities, cankers, insect galleries, polyporous fungi and epiphytic organisms.

### Tree-related microhabitats as indirect biodiversity indicators



**Figure 2:** Illustrations of several tree-related microhabitats in Quebec. **A.** Perennial polypore *Ganoderma applanatum* (Pers.) Pat., on *Populus tremuloides* Michx., Lake Duparquet Research and Teaching Forest. **B.** Two TreMs in one, an epixylic structure of a vertebrate nest built into a bark pocket, on *Populus tremuloides* Michx., Lake Duparquet Research and Teaching Forest. **C.** Close-up of foliose and fruticose lichens on a snag. **D.** Witch’s broom, on *Abies balsamea* (L.) Mill., Lake Duparquet Research and Teaching Forest. **E.** Large woodpecker breeding cavity in *Populus tremuloides* Michx., Lake Duparquet Research and Teaching Forest. **F.** Large hollowing resulting from a woodpecker foraging excavation, on *Populus tremuloides* Michx., Lake Duparquet Research and Teaching Forest. **G.** Trunk rot-hole, on *Salix babylonica* L. Credits: A, B, F, E: Lucas Chambon; C, D, G: Marie-Ève Jarry.

TreMs are increasingly recognized as significant indicators of forest biodiversity that can be leveraged for biodiversity conservation and forest management (Asbeck et al. 2021a; Martin et al. 2022). Several studies have already highlighted the importance of TreMs for animals (vertebrates and invertebrates), bryophytes, fungi and lichens (e.g., Larrieu et al. 2018, 2022; Spina et al. 2024). Many TreMs support species that are highly specialized and are dependent on these specific ecological niches for them to thrive (Martin et al. 2022), such as the preference of *Limoniscus violaceus* P.W.J. Müller—a beetle species listed as endangered according to the Red List criteria (Méndez et al. 2010)—towards large, well-decayed and mold-filled cavity trunks (Cottais 2022; Larrieu et al. 2016) and specialized invertebrates associated with dendrotelms (Kirsch et al. 2021). Stem breakage also provides habitats for specialized Diptera and Heteroptera, as well as ivy and lianas with specialized epiphytic fungi and bark microsoil with specialized saprotrophic fungi (Bütler et al. 2020).

Our current understanding of the relationships between TreMs and biodiversity is, however, currently biased toward certain taxonomic groups, such as bats, birds and insects (e.g., Basile et al. 2020; Paillet et al. 2018). Even for species or taxonomic groups empirically known to be associated with specific TreMs, these relationships remain often variable, noisy, and lack solid quantitative support (Asbeck et al. 2021a). Moreover, some TreM types remain less studied regarding their

association with specific diversity assemblages. Molecular tools are increasingly useful in assessing hidden forest microbial diversity and could be pivotal to addressing current global changes (Ladin et al. 2021; De Léon et al. 2023). Still, to the best of our knowledge, studies have rarely attempted to document the microscopic biodiversity associated across TreM types and the potential of TreMs to indirectly predict this hidden part of forest biodiversity. Therefore, the potential of TreMs as an indirect indicator of forest biodiversity at multiple spatial scales, from tree-level specific TreMs to stand-level TreMs and covering both macroscopic and microscopic organisms, has yet to be further developed.

### **Tree-related microhabitat occurrence and controlling factors**

Beyond the relationships between TreMs and biodiversity, a growing body of research seeks to understand the factors that control TreM presence (e.g., tree size, vigor, or species; stand disturbance history and naturalness and environmental characteristics; Martin et al. 2022). The occurrence of TreMs is primarily influenced by tree characteristics, including major determinants such as tree species, dimensions and live status (Asbeck et al. 2021a). Indeed, TreMs are known to be abundant and diversified in old-growth forests with low human-induced impacts and that contain trees with large diameters, often being senescent (Wirth et al. 2009). For most TreMs, the larger the diameter of the tree, the more likely the tree is to support a greater variety of tree-related microhabitats while increasing the likelihood that these microhabitats co-occur (Larrieu et al. 2021). However, not all tree-related microhabitats are favored by increasing tree diameter. For example, the formation probability of bark-loss and dendrotelm decreases with increasing tree diameter (Courbaud et al. 2022).

Tree age also plays a key role, although less important than diameter (Körkjás et al. 2021b; Kozák et al. 2023). Older trees accumulate more stochastic disturbances to which they can survive and that can create TreMs. Old and large trees are already recognized as important attributes of old-growth forests, and their strong links with TreMs abundance and diversity increase again their ecological and conservation value. These relationships between TreMs, tree diameter, and age are however not universal, since the oldest trees are not systematically the largest ones, particularly in uneven-aged forests (e.g., Palvin et al. 2021). In coniferous boreal forests, some tree species will invest in fast growth, resulting in large young trees. Contrastingly, in North America, black spruce is a slow-growing tree that will often be of small diameter even when old (Bergeron and Harper 2009, Martin et al. 2020). Given the specificities of North American boreal forests in terms of tree and stand-level characteristics, the factors that control the occurrence of TreMs remain to be determined therein. Specifically, TreM's likelihood of being found on large and old trees must be tested in North American boreal forests. Other factors exterior to the tree also influence TreMs occurrence including management practices and environmental factors (e.g., elevation) (Zakrajšek 2024). In total, 21 factors related to environmental, stand and tree features were suggested to potentially control the formation of tree-related microhabitats (Larrieu et al. 2022).

Old-growth forests are particularly important for biodiversity due to low human interference and their spatial complexity—representing high conservation values (Spies et al. 2006; Wirth et al. 2009). Old-growth forests are composed of multiple tree cohorts due to natural senescence and minor disturbance (Franklin et al. 2002). The presence of trees of multiple species and multiple ages complexifies the vertical and horizontal structure of old-growth forests. This complexity allows them to support many different ecological niches and to foster biodiversity that is often not supported in younger forests (Franklin et al. 2002; Sabatini et al. 2010). As an example of their rich and often unique biodiversity, they contain numerous large and fragile senescent trees that develop more TreMs (Paillet et al. 2017). On trees with similar features, the ones located in old-growth forests bear more TreMs than the ones in managed forests (Asbeck et al. 2021b). Changes in structure and composition along forest succession and secondary disturbances influence TreM dynamics, with diverging disturbance pathways leading to different TreM assemblages (Körkjás et al. 2021a; Martin et al. 2021; Zemlerová et al. 2023). Therefore, complex and diverse old-growth forests contain more TreMs, thus highlighting their importance for biodiversity (Asbeck et al. 2021b; Przepióra and Ciach 2023).

## Standardizing and expanding tree-related microhabitat surveys and research

However, as a relatively recent concept, several interrogations remain concerning (1) our ability to conduct TreM inventories over large areas, (2) the potential of TreMs to comprehensively predict forest biodiversity, and (3) the applicability of the TreMs concept across different forest ecosystem types. Gaining better insights into these gaps would support the development of TreMs as a game-changing tool in forest biodiversity management and help achieve the biodiversity conservation objectives set by the Kunming-Montreal Global Biodiversity Framework.

TreMs are intended to be field-friendly and are applied at the stand level. Field guides and apps are being developed to allow untrained naturalists to record TreMs. However, the often large forested areas that need to be covered in biodiversity inventory campaigns can make documenting TreMs at broader scales challenging, especially in North America. The recent development of remote sensing technologies, such as Light Detection and Ranging (LiDAR)—which can capture the structural complexity of forest stands—presents a promising tool for predicting TreM abundance and diversity over large and remote forest territories (Santopuoli et al. 2020). Such technologies would be particularly relevant given their potential for directly or indirectly sensing biodiversity (Muller and Brandl 2009). TreM prediction tools are being developed in Europe using the individual tree detection approach which is a relevant means for small, forested areas or conservation efforts at a small resolution. Considering the extensive size of North American forests, these tools are hard to apply to the Canadian landscape. LiDAR models developed for our forests usually use an area-based approach which creates rasters with cell sizes of 200 to 600m<sup>2</sup> (White et al. 2017). Combining LiDAR data with TreM inventories could potentially allow biodiversity insights into remote areas at a low cost.

Initially developed in Western Europe (mostly in France, Germany and Italy) (Martin et al. 2022), in temperate and Mediterranean forests, the TreMs concept has seen limited application worldwide. Few other countries and forest ecosystem types, such as the boreal forests of North America, have had TreM surveys and research. The potential for applying TreMs to North American forests remains to be explored. TreM-related research holds particular promise in North America, where many forests have a higher level of naturalness in comparison to Western and Central Europe, which have a longer history of forest management (Wallenius et al. 2010; Watson et al. 2018). The establishment of a collaborative network could support the development of a typology suited to the diversity and complexity of North American forest ecosystems. Such large-scale initiatives could focus on (1) testing the applicability of TreMs and fine-tuning the typology for North American forests, and (2) evaluating their effectiveness in accurately predicting forest biodiversity across various taxonomic groups and spatial scales. In North America, scattered and isolated research has been carried out on TreMs between 2000 and 2020 (Michel et al. 2009, 2011), but the concept seems to have just caught on. In recent years, research conducted by Professor Maxence Martin's laboratory at the Université du Québec en Abitibi-Témiscamingue aims at revitalizing TreMs research. The combination of this new initiative with major efforts to standardize TreMs typologies and adapt them to boreal forests could help them become a key ecological concept in North American forests.

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# The Southern Ontario-Based Plant Development Workshop

## A Retrospective of 31 Years (1977-2008)

Contributors in alphabetical order:

Nancy Dengler, Tim Dickinson, Jean Gerrath, Larry Peterson

Recently, while cleaning out his office at the Royal Ontario Museum, Tim Dickinson (a former Treasurer of CBA/ABC) came across a thick blue binder that contained a complete record of all 41 Plant Development Workshops held mainly in Southern Ontario from 1977 to 2008. The binder contents have been deposited with University of Toronto Archives and Records Management Services, where they can be accessed as **B2024-0024 – Plant Development Workshop fonds**. In addition, the workshop programs have been scanned, and the text of the programs has been captured and organized into a searchable database. This digital archive of the Plant Development Workshops is accessible online at <https://discoverarchives.library.utoronto.ca/index.php/plant-development-workshop-fonds>. In the near future this site will also provide access to the scans of the workshop programs themselves, courtesy of the Internet Archive.

The Plant Development Workshops were an important forum for developmental botanists in Southern Ontario and arose out of several fortuitous circumstances. By the late 1960s and early 1970s there were eight universities in southern Ontario within driving distance of each other, which meant that labs interested in plant development could reasonably meet for one-day sessions. In addition, six of those universities had recently hired faculty whose research programs emphasized plant development. Coincidentally, five of the six faculty had received their PhDs from the Botany Department of the University of California Davis within a year or so of one another and were already in contact<sup>1</sup>.

The idea of establishing a one day semi-annual or annual Plant Development Workshop grew out of informal meetings in the early to mid-1970's between the research groups of Richard Greyson and David Walden at The University of Western Ontario and Larry Peterson's research group at the University of Guelph. Discussions centered around current research projects, graduate training, and teaching methods in plant development. After a few meetings it became apparent that there was a unique opportunity to involve other research groups.

Before they went forward, they established the goals of such a workshop, which were to: a) promote interaction among faculty members interested in plant development, b) provide a forum for graduate and senior undergraduate students to interact and present their research in oral or poster format, c) exchange ideas

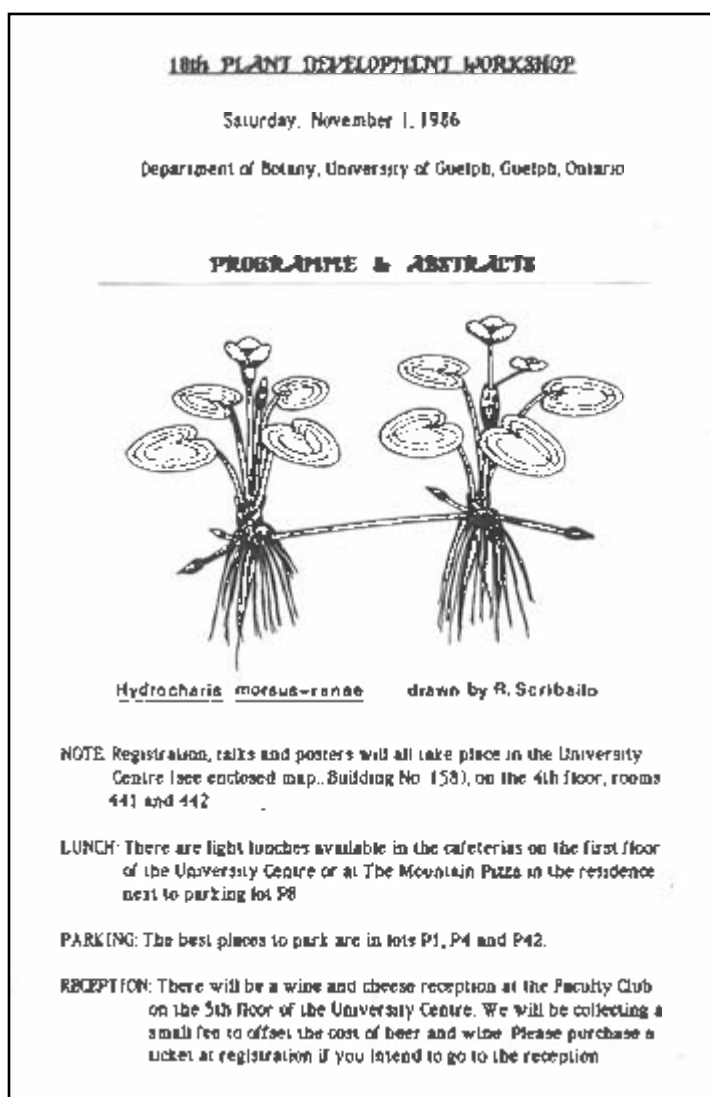


Fig. 1. Program cover for the 18th Plant Development Workshop, Nov. 1, 1986, University of Guelph.

concerning the teaching of plant development, and d) inform the research community of the expertise and equipment available for research in plant development at southern Ontario universities.

David Walden knew Douglas Davidson at McMaster University from other meetings and was impressed by his enthusiasm for research and teaching. He suggested that the founders should consult Douglas about the goals of the proposed workshop and the feasibility of establishing a workshop. David, Richard, and Larry met with Douglas over lunch in Hamilton. He was very positive and offered to organize the first meeting at McMaster in the fall of 1977.

The 1st Plant Development Workshop was held at McMaster University on October 29th, 1977. Although attendance was quite small, with 36 attendees and 11 talks, participants were from McMaster University, the University of Western Ontario, the University of Toronto, and the University of Guelph. As chairman of the meeting, Douglas discussed the goals of the Plant Development Workshop and asked for input. He sent a report of the meeting to John Morton, editor of the CBA/ABC Bulletin, for publication. That issue of the Bulletin also contains an article about how to obtain CBA/ABC support for local or regional one-day workshops (CBA/ABC Bulletin Vol 11(1) Jan. 1978, pp 8-9), accessible online at <https://www.cba-abc.ca/resources/bulletin/page/12/>

As early as the 3rd Workshop hosted by Ron Dengler a year later in October 1978 at Scarborough College of the University of Toronto, it was obvious that interest was increasing. There were 19 presentations in total, but not only by faculty and students from Southern Ontario. Presenters also came from Carleton University and Lakehead University in Ontario, McGill University in Quebec, and University of Louisville, Kentucky in the US. Already the goals of the Workshops were beginning to be met.

Methods of teaching plant development were also shared. For example, at the second Workshop, Dick Greyson led an afternoon session discussing experiences in the teaching of plant development. At the 7th Workshop, John Lott at McMaster University organized a half-day workshop on techniques, methods and approaches used in teaching plant development. Posters at many of the workshops included details of methods and experimental approaches that were very useful for the teaching of plant development.

At the time, microscopy was central to plant development research. The Workshops were a chance to see and exchange information and locations of instruments such as light microscopes with fluorescence imaging or adapted for epi-illumination, transmission and scanning electron microscopes (some with energy dispersive microanalysis capabilities), and confocal laser scanning microscopes. This led to many inter-lab collaborations among labs at the eight universities.

As the Workshops continued, the original host universities of Toronto (two campuses), Western Ontario, Guelph, McMaster, and Waterloo were joined by more venues. These included the Royal Ontario Museum/University of Toronto, Trent University, Wilfrid Laurier University, Carleton University, and the Agriculture Canada/



Fig. 2. Program cover for the 41st Plant Development Workshop, Nov 17, 2005, Carleton University.

Horticultural Research Institute of Ontario at Vineland Station. Two Workshops were held in Montreal: The 27th meeting in 1992 was hosted by Denis Barabé and Luc Brouillet at Jardin botanique de Montreal and in 1998 (32nd) Denis Barabé and Dwight Beebe hosted a second one at the Jardin. The opportunities for the exchange of ideas and a wider forum for participants increased, further meeting the Workshop goals.

By the 21st meeting, held in May 1988 at the University of Waterloo, the number of overall presentations (20) had not increased significantly since the early meetings, but they were now almost evenly divided between oral (11) and poster (9) presentations. Graduate students and senior undergraduate students in increasing numbers were giving oral and poster presentations. As the years passed, there was more inclusion of other disciplines that used some aspect of plant development in research. Examples in plant systematics were the research on the Vitaceae by Jean Gerrath and Usher Posluszny, studies of the Scrophulariaceae by Judith Canne Hilliker, and Tim Dickinson's research on the Rosaceae. Examples of the interaction of fungi with plants included Michelle Heath's plant pathology studies and Larry Peterson's studies of mycorrhizal associations. Plant physiologists such as Roger Horton included some aspects of plant development in their research and presented their work to the Workshops. Developmental geneticists such as Thomas Berleth reported on the role of auxin signalling in vascular development. There were many opportunities for faculty to exchange research and other experiences, including sources of funding and techniques for writing grant proposals.

It was not unusual for the Workshops to include discussion sessions led by Ontario scientists. Such was the one at the 5th meeting led by Joe Shorthouse from Laurentian University on insect galls and plant morphogenesis. Invited speakers began to be included later, such as Michael Christianson from Zoecon Corp. in Palo Alto California at the 19th meeting in 1987, whose talk was titled 'Unravelling Plant Development—What's Involved?' Other invited speakers included Barry Tomlinson, Harvard University, at the 22nd meeting; Rolf Sattler, McGill at the 27th meeting in 1992; Ernst Steudle, University of Bayreuth, Germany at the 33rd meeting; and Quentin Cronk University of British Columbia. His talk was titled 'Evolution and molecular development of bird pollinated flowers' at the joint Canadian Society of Plant Physiologists/Plant Development Workshop meeting, December 2008.

As the Workshops continued, many changes took place. An increasing number of taxonomists, physiologists, biochemists, molecular biologists, and geneticists began to include developmental processes as a focus of their research programs, albeit from quite different perspectives. Plant developmental research based on microscopy alone waned in importance. It became increasingly challenging for presenters to speak to such a disparate audience, and for the audience members



**Fig. 3.** Photographs taken at the Plant Development Workshop in 2003, McMaster University. **3a (top).** Group photo of some of the founding members of the Workshops. L-R. John Lott, McMaster University; Nancy Dengler, University of Toronto; Larry Peterson, University of Guelph; Carol Peterson, University of Waterloo. **3b (bottom).** John Lott and lab members. L-R John Lott, Lan Lim, Irene Ockenden and Lauren O'Malley.

to fully appreciate the presentations. Also, there have been radical changes in communication since the 1970s. When the Plant Development Workshops were initiated, communication was by telephone or mail. The early Workshop programs were painstakingly typed on Gestetner sheets, or photocopied (Fig. 1). By the early 2000s the programs were professionally printed and spiral bound (Fig. 2). Visiting in person used to be the only way to interact with members of other labs, but that is not so today. Technology today allows people to communicate in ways that no one dreamt of in the 1970s. In-person meetings may not appear to be so necessary.

Many of the people who had been instrumental in the success of the early workshops became involved in other societies. As examples, Nancy Dengler was involved with both the CBA/ABC and the Botanical Society of America and was president of both societies (at different times). Carol Peterson served on the executive of the Canadian Society of Plant Physiologists and played a pivotal role in the establishment of Plant Canada, an umbrella organization that brought smaller societies together. Larry Peterson served on a committee to establish the International Mycorrhiza Society, becoming its first interim president, and subsequently the president. He also served as president of CBA/ABC. Over time, the Workshops were replaced by other venues for communicating with colleagues.

An attempt to keep the Workshops going was made, and Joint meetings of The Plant Development Workshop and the Canadian Society of Plant Physiology Eastern Regional Meetings were held in 2006 and 2008. However, very few participants of earlier Plant Development Workshops registered. It became clear that this would not be a solution. The 41st and final standalone Plant Development Workshop was hosted by Shelley Hepworth at Carleton University in 2007. There were two Plenary talks. One was by Xuemei Chen (University of California Riverside) “miRNA Biogenesis and Roles of miR172 in Flower Development” and the second was by Vivian Irish (Yale University) “Petal Development: variations on a theme.” There were 12 other oral presentations and 26 posters, and 100 participants were listed at the back of the program. Participants came from seven Ontario universities (Carleton U, U of Ottawa, Nipissing U, U of Ontario Inst. Technology, McMaster U, U of Toronto, and U of Waterloo), three Quebec universities (McGill U, U of Montreal, and Concordia U), and one from Nova Scotia, (Dalhousie U). The two plenary speakers were from the United States. There were also several participants from Agriculture Canada.

The Plant Development Workshops served a very important role over 31 years in mentoring students, many of whom went on to successful careers in plant biology. The Workshops also fostered interactions among plant development researchers with different backgrounds at a time when communication was not as easy as it is now. It was an important part of southern Ontario’s botanical culture for three decades, and no doubt many people who participated in them will remember their importance.

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<sup>1</sup> Nancy Dengler, University of Toronto, St. George Campus; Ron Dengler, University of Toronto, Scarborough Campus; John Lott, McMaster University; Larry Peterson, University of Guelph; and Carol Peterson, University of Waterloo. The sixth person hired was Usher Posluszny, a McGill graduate who was hired in 1977 by the University of Guelph.

# The Botanical Society of Canada

## The societal, scientific, and political seas in which it launched...and sank

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2. Curator, Botany, Canadian Museum of Nature

We are in 1860 – Queen Victoria has been monarch since 1837 and will reign over the British colonies for another 40 years; Sir Edmund Walker Head is Governor General of the Province of Canada, which was created in 1841 by the union of Upper and Lower Canada via the Act of Union; and the province’s population is 1,396,091 (Census, Statistic Canada). In 1861, Sir Head will be replaced by Viscount Charles Monck who, a year later, will be elected Patron of the Botanical Society of Canada (BSC; Daily British Whig, 1862).

That summer, Kingstonians are stinging from a last-minute political decision by the future King Edward VII, conducting the first ever official Royal visit to Canada, to skip their stop on his grand steamer tour. At Queen’s College, George Lawson is readying for the December 7th launch of the BSC. In the present instalment of this ongoing series on the history of the CBA’s Lawson Medal, we explore the societal context in which this launch took place, touching on: 1. The rigidly class-based culture of Victorian Britain, which prized the curiosity of its middle class; 2. The industrialization of North America, which drove an explosion of scientific endeavours to explore and assess the resources of newly-acquired colonies; 3. The politics that gripped the Province of Canada, leading up to confederation in 1867.

### 1. SOCIETY

#### **The Victorian era and Great Britain’s learned societies**

The organization of Victorian society was mainly class- and gender-based (<https://www.britannica.com/event/Victorian-era>, accessed May 17 2014). The working class, the members of which lived only on their wages, was the largest, representing about 75% of the population. The remaining quarter of the British population were the leaders of the society. Whereas the upper class, living off land and rent, led local and national politics, the middle class, living on salaries and profits, provided its moral compass. Members of the middle class were largely interested in science, to which they were introduced via museums, botanical gardens, and scientific exhibitions. Many became natural historians as they spent time outside, examining and collecting specimens, and recording their observations. Fueled by that curiosity and enthusiasm, early in the 1800s, learned societies formed around natural sciences (as they did around other disciplines), quickly becoming forums where amateurs and professionals could exchange ideas and specimens, and present the results of their studies. These could be published either in local newspapers for the public or in scientific journals for academics abroad, or both.

Learned societies were run and populated overwhelmingly by men. Victorian society relied heavily on the “doctrine of separate spheres”, whereby gender was thought to be biologically-based, determining most of the potential and character of an individual. Botanical activities, such as gardening, visual arts, and collecting, were considered a perfect fit for the ideals of femininity (Allen, 1980). Upper- and middle-class girls were encouraged at a young age to partake in these endeavours to promote industry and discipline (Allen, 1980; Connor, 1986), to foster self-betterment, and to instill good morals (Zimmerman, 2024) befitting a pious life (Kennedy, 2010). Many British women in the early 1800s demonstrated a real interest in preserving specimens they collected in nature, in identifying them, and in examining them under a microscope. They were also much involved in exchanging specimens at local meetings (Zimmerman, 2024). However, in general, they were not granted membership in learned societies; when they were, it was often more for their elegance than for their scientific contribution (Allen,

1980; Zimmerman, 2024).

Learned societies were a significant avenue by which knowledge was produced and communicated. Their environment, much like a gentleman's club, was convivial and propitious for debates (Ellis, 2017). To become a member did not necessitate high birth or wealth, just intellectual stamina and good character (as well as the luxury of time to pursue one's interests). One could belong to more than one such society, and knowledge quickly spread between participants interested in more than one science (Ellis, 2017). Until the scientific disciplines became more partitioned in the 1900s, this 'cross pollination' promoted new knowledge and ideas (Rousseau and Dore, 1966).

By the early 1830s, the science of botany began to develop a growing division between botanists and "botanophiles," between scientific Florists and general readers, and between lovers of botany and lovers of flowers (Shteir, 1997). This led to the distinction between "polite" and "serious" botany, whereby women and amateurs were considered to be undertaking the former, while men of science participated in "serious" study (Glassman, 2022). John Lindley, Professor of Botany at the University of London, was in 1829 the first to promote publicly the cause of making botany a "true" science worthy of "men of enlightened minds" (Shteir, 1997). This new approach marked a turn from observations and identifications to "serious" hypothesis-testing (Shteir, 1997; Zimmerman, 2024).

### **Learned societies in the Province of Canada**

Canada's oldest learned society, the Literary and Historical Society of Quebec (LHSQ) was established in Lower Canada in 1824 under the patronage of then Governor Lord Dalhousie, and it is still in existence today. At the time of its founding, some people considered the society elitist, as it welcomed only affluent, English-speaking members. This prompted the creation of the more democratic Society for the Encouragement of Sciences and the Arts (SESA) in 1827 (Shteir and Cayouette, 2019). With policies articulated in both English and French, it welcomed Anglophone and Francophone members of all genders (Shteir and Cayouette, 2019). One of the SESA's influential founders, lumber merchant William Sheppard was, with his wife Harriet, very much interested in botany (Shteir and Cayouette, 2019; Glassman, 2022). Although it was short-lived, the SESA's closure in 1829 inspired the LHSQ to become a bit more inclusive ([https://fr.wikipedia.org/wiki/Literary\\_and\\_Historical\\_Society\\_of\\_Quebec](https://fr.wikipedia.org/wiki/Literary_and_Historical_Society_of_Quebec), accessed August 16, 2024). For example, and in contrast to the practice in Great Britain, its door opened to women and to presentations of their work.

In Upper Canada, no such society yet existed when Lawson arrived at Queen's College in 1858. He duly began setting up the Botanical Society of Canada, seemingly attempting to attract both "polite" and "serious" botanists to one cause. For "serious" members, it offered an academic university setting (albeit with Presbyterian orientation). For "polite" members, it welcomed anyone interested in Botany and professed to accept and treat women ("Lady Members") on an equal footing with Fellow (male) members.

### **BSC membership: inclusive ideal creates tension**

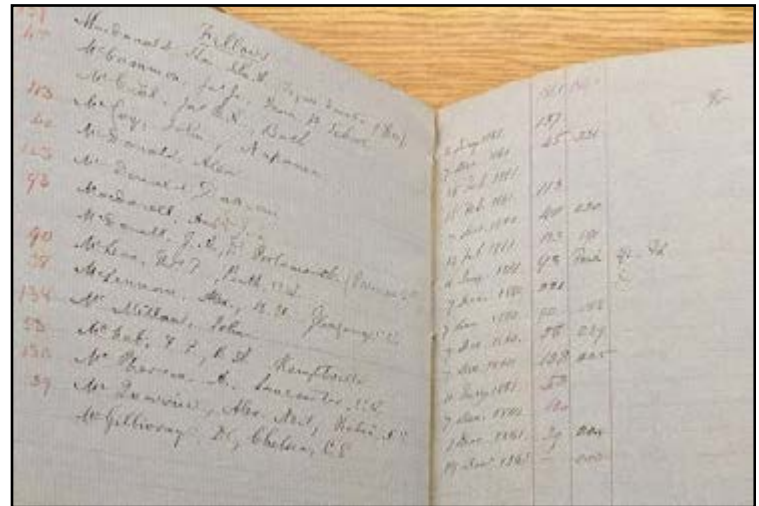
The BSC was an instant success in some respects, with membership quickly rising above 200. At its inception, Lawson clearly shared his vision of a scientific setting where botanists and diverse members of the community would meet regularly, exchange specimens, conduct experiments, and present results worthy of publication in journals of international standard (Lawson, 1861). The classes of membership as defined by the BSC Laws reinforced his priority of including both amateurs (annual subscribers) and botanical experts (Honorary Members, Fellows, and Corresponding Members), participating together in the BSC endeavour. Lawson's aspirations were to have "serious" and "polite" botanists collaborate in creating knowledge of Canadian plants.

Yet, Lawson was well aware of taking a risk in opening the BSC to the public; in the Society's inaugural speech (Lawson, 1861), he revealed his misgivings: "*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*

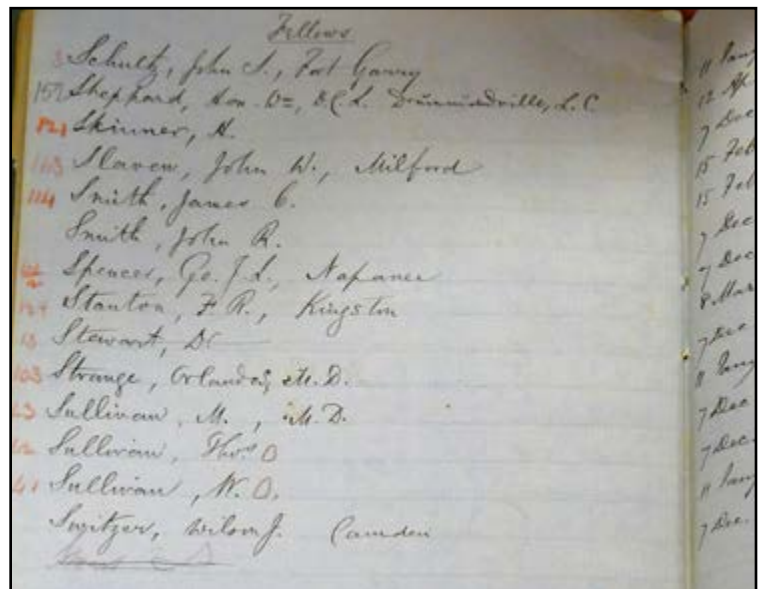
of the few who are engaged in the prosecution of original discovery.” Indeed, for the majority of the members, BSC meetings may have offered a platform for dilettantes to be seen, to climb the social ladder, and to knit social networks (Connor, 1986; Kennedy, 2010). In the BSC membership, as indicated in the Annals’ attendance reports, one could find (among others) a cemetery superintendent, a penitentiary manager, several reverends, bankers, barristers, city clerks, and medical doctors. Some authors (e.g., Kennedy, 2010) point out that at least some of these individuals, in paying their subscriber dues, likely expected to gain some cultural capital. To Zeller (2003), this is evidenced by the fact that some members added the initials FBSC (Fellow of the Botanical Society of Canada) next to their names to demonstrate their affiliation.

It is indeed doubtful that all of the members were interested in botany. One example would be that of John A. MacDonald, listed in the Annals as Attorney-General West Quebec, who likely became a member for political reasons. MacDonald (then a resident of Kingston) is listed as a Fellow (Fig. 1) and therefore would have been obliged to present the Board with “either an original Memoir on a Botanical subject, containing the results of (his) investigations, or specimens of plants discovered by him” (BSC Annals, p 15). Unfortunately, no details exist on this submission. We know that he attended the second meeting of the Society but his name does not appear in the written records anywhere else. True, at the time, he must have been rather busy, as he was joint-premier of the Province with George-Etienne Cartier, and was preoccupied with defending his choice to form a union with French Canada, against opposition led by George Brown (<https://www.thecanadianencyclopedia.ca/en/article/sir-john-alexander-macdonald>, accessed May 14 2024).

Another example would be that of J.P. Lichtfield, Professor of Medical Jurisprudence at Queen’s College and Physician-Superintendent of the Criminal and Female Asylums for Lunatics in Rockwood (and a colourful charlatan, as detailed by authors such as Gibson 1954), whose botanical activity in the Society does not appear to have been vigorous. Although he contributed as a Board member in 1861, and as Vice-President in 1863 and 1864, Lichtfield is only mentioned twice in the Annals as a contributor: he read a poem written by John May at the Dec. 19 1861 meeting, and presented that same day a paper entitled “On the aquarium” (BSC Annals, p 171), which was never published in the Annals. This speaks more of pleasure than of scientific endeavours, more of polite botany than of science. He surely catered to a very broad view of botany when, at the inaugural meeting of



**Fig. 1** - Ledger listing the names of the BSC Fellows. Macdonald is the first of the list under the letter Mc; he became a member on Jan. 11 1861. Next to his name, it is indicated that he gave a sum of \$14 to the Society, when the cost of being a Fellow was of \$2. This may explain why there was not the mention “paid” in front of his name for the year 1862.



**Fig. 2** - Ledger listing the names of the BSC Fellows. Sheppard was elected Fellow on April 12 1861. In the ledger, his name, on the second line, is cited as Sheppard Hon. W., D.C.L. Drummondville, LC (Lower Canada).

the society, he presented his ideas on the creation of a botanical garden in Kingston. On that day, he painted an idyllic tableau of the future garden: “*From the balcony, in fine weather and during exhibitions, addresses and announcements might be made to members and visitors on the terrace beneath. In the College class-room lectures might be delivered, and scientific meetings and conversaciones held. The balcony would serve the purpose of a music stand when music is deemed desirable.*” (BSC Annals, pp 9-11).

However, other members *were* truly interested in botanical study. We can cite here William Sheppard, the active LHSQ member from Lower Canada, who became a BSC member early on (Fig. 2). Not only was Sheppard a Fellow, but he was also deeply involved in the Society. He presented a paper on the distribution of Canadian conifers on Jun. 14 1861 (BSC Annals, p 111), which was later published (Sheppard, 1861). He also sat as a Council member for the years 1863 and 1864 (Weekly British Whig (WBW1 &WBW2), 1863).

## 2. SCIENCE

### Advancements in Natural History in the 1800s and their impact on the BSC

The middle-class, in Great Britain as well as in its colonies, was able to approach natural history as it did in the Victorian era largely because of advancements in taxonomy. Furthermore, as the 18th century unrolled, new scientific fields opened. Based on Lawson’s inaugural speech (Lawson, 1861), the following events must have been particularly important among those that guided the establishment of the BSC.

1. In 1735, Linnaeus’ *Systema Naturae* transformed classification. With the publication of *Species Plantarum* in 1753, Linnaeus’ ideas became internationally renowned. His simple way of categorizing plants, based on the sexual parts of the flower, gained rapid popularity in the middle- and upper-classes of society (Shteir, 1997). It laid the foundations for a practical means by which people could easily exchange information (Roberts, 2024). For Lawson, taxonomy was the basis of botanical knowledge: “*With respect to a herbarium, or collection of dried plants, this is justly regarded by every Botanical Society as absolutely necessary to enable members to refer specimens correctly to their species.*” (Lawson, 1861)

2. In 1805, von Humboldt and Bonpland published an influential book, “*Essay on the geography of plants,*” which had a lasting effect on how botany was taught. Unlike Linnaeus, von Humboldt had a holistic view of nature. In this book and in his later publications, he developed the idea of ecosystems, although at the time this term had not yet been coined; he argued that the surroundings of the plant were crucial to its adaptation and survival. In effect, he was thinking that an individual species was not fixed but could adapt in response to climatic factors. Lawson must have had von Humboldt in mind when he wrote “*... our position in a comparatively new country points out to us a special path of research which it will be our duty to follow - that which has for its object the investigation of the species botany of Canada, the geographical and local distribution of the plants.*” (Lawson, 1861)

3. In his 1829 lecture given at the University of London, Lindley described Linnaeus’ ideas as “static” and “superficial” (Shteir, 1997). He advised botanists to move beyond mere plant identification to study their morphology and physiology, a trend that was in turn promoted throughout Europe. A year later, Lindley introduced an alternative classification system to that of Linnaeus, explaining that it was more natural to organize plants “according to the likeness they bear to each other” (Buggs, 2021). A ferocious advocate for a clear separation between polite and serious botany, Lindley assigned the Linnean system to the former in contrast to his own, which he saw as the latter (Shteir, 1997). When explaining his vision, Lawson appealed to those who espoused Lindley’s views: “*It is proposed that our Society shall have for its object the advancement of Botanical Science in all its departments - Structural, Physiological, Systematic and Geographical;...*” (Lawson, 1861)

Then, in 1858, as Lawson arrived in Kingston after having completed his PhD in Germany, Charles Darwin and

Alfred Russel Wallace read to the Linnean Society of London their proposal of the theory of evolution by natural selection; this was followed in 1859 by Darwin's publication "On the origin of species." From then on, ideas about evolution spread in Great-Britain and its colonies, as well as in continental Europe (Rousseau and Dore, 1966).

In the publications of the Annals, there is evidence that the works of both Lindley and von Humboldt were known to many BSC members. Lindley was in fact one of the six British Honorary members of the Society (BSC Annals, p 18; Fig. 3). Moreover, several members used his classification to identify their collected specimens and a few called upon his expertise to discuss their findings. As for von Humboldt, who died in 1859, he is mentioned twice in the Annals.

With regard to Darwin, one can see signs in the Annals that while some members supported his views, others opposed it. According to Connor (1986), founding BSC President Leitch was an anti-evolutionist, referring to Darwin's theory as "speculations" (BSC Annals, p 178). In contrast, there was a strong defender of Darwin among the BSC Fellows: Joseph Antisell Allen (Fig. 4), an Anglican clergyman living on Wolfe Island near Kingston, and teaching at Queen's College (Connor, 1986). He resigned from the ministry in 1861, and in 1887 he is known to have hosted Wallace when the latter visited Kingston to lecture on Darwinism (<https://www.queensu.ca/academia/forsdyke/romanes3.htm#End%20Note%20Feb%202015>).

Lawson, for his part, showed openness to seeing his work through a Darwinism lens (Zeller, 1990), although historians differ with respect to when. For Connor (1986), Lawson became receptive to Darwin's ideas only in the 1880s; for Zeller (1990) and Reynolds et al. (2020), it may have been sooner. However, they all agree that he never entirely adhered to it.

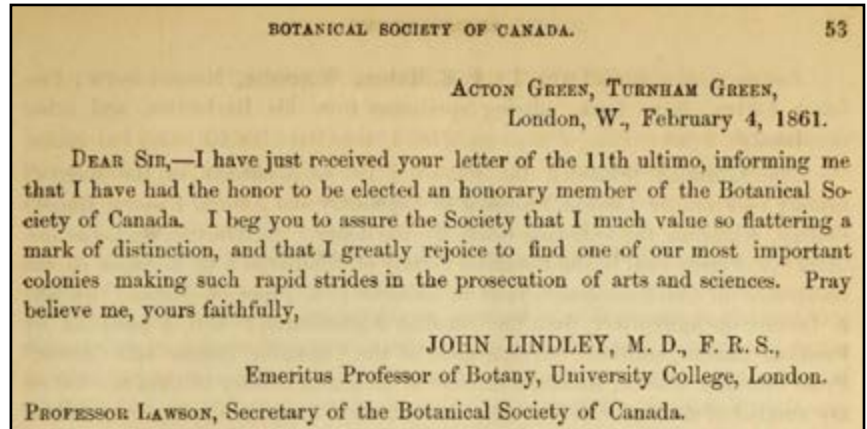


Fig. 3 - Lindley's thank-you note, published in the BSC Annals, read by Lawson at the meeting of March 8 1861.

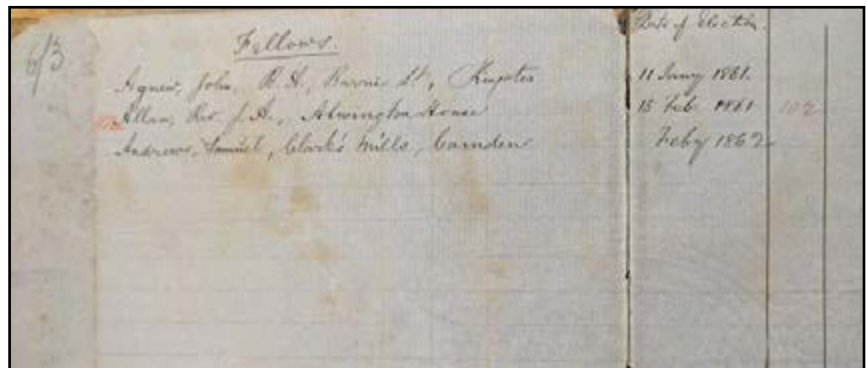


Fig.4 - Ledger listing the names of the BSC Fellows. Allen was elected Fellow on Feb. 15 1861. In the ledger, his name, on the second line, is misspelled as it is entered as Allan. However, the address (Alwington House) and the initials J.A. (for Joseph Antisell) correspond to those of Allen.

### 3. POLITICS

#### Confederation and industrialization for the Empire

The vast majority of British colonists shared respect for royalty (as demonstrated during the Prince's tour in Lower Canada), a deep allegiance to British institutions and a wish to maintain a connection with their mother country. At the same time, they believed in a strong central government to promote economic development, take control of the west, and withstand the growing power of the United States. For many, the creation of a confederation would help in defending the nation's existing boundaries and in attracting colonists from the British Isles. This would ensure their survival on the North American continent and enable them to assume a more important place in the Empire. These thoughts led the British North American colonies during the 1860s to work towards achieving this

confederation.

Lawson came to Kingston with a strong will to help build wealth for and from the land he emigrated to. He knew how instrumental botanists could be in surveying some of the natural resources of his new country (Zeller, 2003), and he ensured that the mandate of the BSC clearly stated this. In the BSC, Lawson saw a means to highlight, for the public as well as for the government, the richness of the Canadian provinces in terms of biodiversity and economic potential. He notably focused the BSC inquiry on the practical uses of plants, in service of Canada's economic gains. Inspired perhaps by organizations such as the Geological Survey of Canada (initially founded in 1842 to explore and map Canada's mineral wealth), he called upon BSC members to survey British North America far and wide. This ambitious national scope contrasted sharply with those of Lawson's contemporary natural scientists (e.g., William Hincks, Professor of Natural History at the University of Toronto), who tackled smaller areas, with more focussed teams (Zeller, 1990).

The government responded positively to Lawson's call and understood the potential benefits the BSC could bring to industrialists and farmers (Connor, 1986). There are a few instances in the Annals demonstrating that some BSC members followed Lawson's lead. One example would be that of F.W. Hart, a Canadian doctor, who in 1862 contacted Denis Godley, Secretary of the Governor General Lord Monck, about the potential use of the silk obtained from asclepiad seeds to replace cotton. Monck contacted Lawson to ask his views on the matter; Lawson knew *Asclepias incarnata*, which he had collected in 1861 (Fig. 5). He responded the following to Godley: "One of our Canadian species, *A. incarnata*, has been experimentally cultivated with a view to the production of fibre, and the results of the experiments have been given by Judge Logie in the second part of the BSC annals." Logie, a Fellow member, having documented the presence of *A. incarnata* in swamps close to Hamilton, had been in contact with a Dundas paper manufacturer to test the usefulness of its fibres (BSC Annals, pp 87-89). In his final letter to Godley, Lawson mentioned that "it is not unlikely that both *Asclepias flax* and *Asclepias cotton* may ultimately become important materials of export from Canada" (Lawson, 1863).

To conclude, you can please some of the people all of the time...

In appealing to Kingstonians' appetite for community, the BSC clearly filled a need, as demonstrated by its huge local membership. The society's scientific ambitions, based on the organization's international acclaim, appear to have been well-placed: there was so much to describe and survey, and to make available to the global scientific community for study and testing. However, the varied, high expectations of those within and outside the organization would have been difficult to meet even if science and Canadian politics (layered upon local and university politics!) had been more stable, and if science and society had been more inclusive. The territory was massive, making the interested / available workforce seem even tinier. Lawson was aware of the challenges the BSC would face, and he attempted to head off unrealistic hopes by fostering a long-term vision and diligent work



**Fig. 5** - Lawson's 1861 specimen of *Asclepias incarnata*, collected in a "Hard Wood creek" (as indicated in his hand-writing at the bottom corner of the herbarium sheet) and now housed at the Canadian Museum of Nature.

CAN224598. Photograph © Canadian Museum of Nature, by Nathan Stevens-Cocco.

ethic: “Let us not be disappointed, therefore, with our first results. Let us lay a foundation, and persevere in the work, and workers will gather around us as they have done before in the Botanical Societies of other countries. To organizations of this kind, more than to any other means, are we indebted for the advanced state of botanical science at this day; and in a country such as this, it is especially needful to have a wide-spread organization in order to elicit satisfactory results. In an attempt to organize a Society such as this, we may confidently appeal to many classes of the community.” (Lawson, 1861). With this optimistic course charted, the fledgling organization pushed off into stormy societal, scientific and political seas. Unfortunately, not long after its establishment, the BSC went under.

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*Liatris cylindracea*  
Photo by Mihai Costea

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