THE CANADIAN BOTANICAL ASSOCIATION

BULLETIN

L'ASSOCIATION BOTANIQUE DU CANADA

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PATRON

HER EXCELLENCY THE RIGHT HONOURABLE JEANNE SAUVE,
P.C., C.C., C.M.M., C.D., GOVERNOR GENERAL OF CANADA

PATRON

SON EXCELLENCE LA TRES HONORABLE JEANNE SAUVE,
C.P., C.C., C.M.M., C.D., GOVERNEUR GENERALE DU CANADA

PROBLEMS! PROBLEMS! PROBLEMS!

All of you possibly noticed a major delay in receiving the April issue of the Bulletin. Some of you may even be woundering what happened to the Bulletin. Well, the problems are with the mailing lists and Eureka!!! we think we have the solution.

In the past there have been two address lists. One maintained by the Treasurer to make sure we get your dues, the other by the Secretary to ensure delivery of the Bulletin. When these officials change, the lists must travel to a new place and then coordinating them does not prove to be an easy task. The obvious solution to all these problems is to work from a single mailing list. The Treasurer's list.

This policy started with the mailing of the April issue of the Bulletin. It was the switching of lists that caused the major delay in mailing that issue. For that we appolagize. However, what we need to know is if we are still missing someone. If you know of anyone in these circumstances, please advise that person to contact the Treasurer. To make the whole system still more reliable please notice that any address changes should now be sent to the Treasurer:

Prof. Keith Winterhalder
Department of Biology
Laurentian University
Sudbury, Ontario
P3E 2C6

Our appoliges for all the inconvenience caused. Your cooperation in rectifying these problems is greatly appreciated.

LUIS OLIVEIRA, EDITOR

CBA/ABC EXECUTIVE MEETING NOTES

The executive took part in the annual conference call on March 16, 1987. The call connected 6 members of the executive. Following are extracts from the minutes of this call.

The President (L. Brouillet) reported on the subject of Nominations for National Committees that very few nominations were received. This is a very important responsability and the association often needs to react quickly to requests. Therefore, it was moved by K. Denford, seconded by I. Taylor and approved that all members of the Board be asked if thay would be willing to serve on National Committees and to send their CV's to the Secretary -- The International Association of Ecology - INTERCOL (P. Maycock, secretary) has recommended to the CBA that the Ecology Section should nominate a person to serve as a Canadian representative on the executive of this organization. The Ecology Section executive will be asked to nominate a person at the Montreal Meeting.

The Past-President (I. Taylor) reported on the Manual of Policies and procedures that should be soon ready for distribution to the Board members. He also indicated that a package has been prepared for mailing to potential corporate sponsors for the Endowment Fund and that the publication of CBA and CSPP meeting abstracts in the Canadian Journal of Botany is still a possibility, but there was little progress achieved on the subject. Regarding this last item L. Brouillet agreed to write to D. Ormrod, President of the CSPP to see what can be done.

The President-Elect (K. Denford) indicated that he investigated changes in the timing of the meetings and did not obtain additional suggestions.

The Treasurer (K. Winterhalder) reported on the membership numbers (227 regulars, 41 students and 28 retired members). These represent 100 fewer members than last year and he emphasized the need for a recruitment campaign. The suggestion of a poster and a brochure to attract new membership was all received. K. Denford agreed to look further into this matter.

FUTURE MEETINGS

- Victoria (1988) - The meeting will be hosted jointly by the University of Victoria and the BC Provincial Museum. The CSPP will also participate in the meeting. R. Hebda is in charge of local arrangements and the meeting has been scheduled for June 12 to 16.
- Toronto (1989) - No additional information.
- Laval (1990) - P. Morisset will represent the CBA on the BCC organizing committee for the Second Congress of Canadian Biology.
- Edmonton (1991) - Planning has started and a local arrangements committee has been formed. The official invitation from the University of Alberta will be sent to the CBA in the near future.

SYMPOSIUM ON ABIOTIC POLLINATION

A full day symposium consisting of 30 minute talks, poster sessions, and panel discussion, is tentatively planned for 1989. The symposium will treat the issue of abiotic pollination (anemophily, hydrophily, and gravity-pollination) from a variety of prospective participants are asked to submit a brief description of their work to the organizing committee. An emphasis on new experimental research and hypothesis-testing is encouraged. Panel discussants will be invited to address issues such as the random versus non-random nature of abiotic pollination, selective pressures leading to abiotic pollination, phenology of pollen release and capture, and the ecological significance of anemophily and hydrophily. If you or your students are interested in participating, please write to Mary E. Barkworth, Department of Biology, Utah State University, Logan, Utah 84322-4500 or Karl Niklas, Section of Plant Biology, Plant Science Building, Cornell University, Ithaca, New York 14853-5908.

INTERNATIONAL ORGANIZATION OF PLANT BIOSYSTEMATISTS

Items of interest to botanists on an international level should be sent for publication in the IOPB Newsletter. The editor is Dr. Krystyna Urbanska, Geobotanische Institut, E.T.H., Zurichbergstrasse 38, CH-8044, Zurich, Switzerland. Membership in IOPB, for the period 1987-1989, is U.S. $20.00 payable to IOPB and sent to Dr. Liv Borgen, Secrtary-Treasurer, IOPB, Botanical Garden and Museum, Trondheimsveien 23B, 0562 OSLO 5, Norway.

OFFICERS OF CBA/ABC 1987-1988

President:	Dr. K. Denford Univ. of Alberta
Past-President:	Dr. L. Brouillet Universite de Montreal
Vice-President:	Name not submitted

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(ex off.) Univ. Br. Columbia

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Nat. Mus. Nat. Sci.

NEWS FROM THE SECTIONS

Ecology Section
Chairman: Bruce A. Roberts, Can. Forestry Serv., P.O. Box 6028, St. John's, Nfld A1C 5X8

General Section
Chairman: D. R. Lee, Dept. Biology, Memorial Univ., St. Johns, Newfoundland, A1B 3X9

Mycology Section
Chairman: J. E. Traquair, Harrow Res. Station, Harrow, Ont. N0R 1G0

Phycology Section
Chairman: Lewis M. Brown, Dept. Plant Scis., Univ. Western Ontario, London, Ontario N6A 5B7

Structure & Development Section
Chairman: N. G. Dengler, Dept. Botany, University of Toronto, Toronto, Ontario M5S 1A1

Systematics & Phytogeography Section
Chairman: K. E. Denford, Dept. Botany, University of Alberta, Edmonton, Alberta T6G 2E9

CBA/ABC REPRESENTATIVES TO BCC

Executive Member: L. Brouillet
Council K. Denford
I. Brodo

CALL FOR NOMINATIONS - EXTERNAL AWARDS 1988

The CBA/ABC invites its entire membership to make nominations for the following two Awards by other organizations. All nominations will be considered by the CBA/ABC Awards Committee, and one name for each award will be submitted to the appropriate organization, assuming sufficient merit for endorsement of the nomination by the Association. All nominations should be as strong as possible.

Biological Council of Canada Gold Medal

The Gold Medal Award of the BCC is made annually to a member of a constituent society who has made **outstanding contributions to the advancement of biology in Canada.** Such contributions are not intended to be solely in scholarship; significant service in national agencies, institutions and societies will also be recognized.

The individual societies are expected to forward nominations from their members to the BCC Gold Medal Committee, and this is taken as endorsement of the nominee(s) by the Society. Nominations for the Award must be submitted in writting, and will stand for 3 years, although they should be revised annually and may be renewed.

A nomination for the Gold Medal must contain a citation drawing attention to all the achievements that should be considered by the Gold Medal Award Committee, with stress laid on those of particular significance. This must be accompanied by an up-to-date curriculum vitae (information about graduate students and post-doctoral fellows supervised is important), and a list of publications. It is not necessary to have extra letters of support from individuals.

John and Alice Tyler Ecology/Energy Prize

This international prize is awarded to **individuals or organizations for outstanding achievements benefiting mankind.** Nominees can be associated with any field of science. The term "organization" includes universities, foundations, corporations or other types of organizations.

Prizes are awarded for the protection, maintenance, improvement and understanding of ecological and environmental conditions anywhere in the world; or for the discovery, further development, improvement or understanding of known or new sources of energy.

Nominations must include the name and address of the nominee (or administrative office of an

organization), summary of accomplishment, detailed description of the contribution (including publications or other evidence), and 3 letters of recommendation plus the names of 3-5 further referees. Nominations will stand for 2 years.

Please submit nominations for either of these Awards to the Chairman of the CBA/ABC Awards Committee before December 31, 1987, with all necessary documentation:

Dr. K. Danford
Department of Botany
University of Alberta
Edmonton, Alberta
T6G 2E9

AGRICULTURAL RESEARCH SERVICE OF THE USDA

I am pleased to announce that the Agricultural Research Service of the USDA has signed a cooperative agreement with Utah State University for the production of a new, illustrated, identification manual for North American Grasses. The editorial board, which consists of myself (chair), Drs. Christopher Campbell (University of Maine), David Hall (University of Florida), and Hugh Iltis (University of Wisconsin), is currently in the process of identifying individuals to contribute treatments and/or review manuscripts. We are particularly interested in having the keys tested by those who expect to be using the final product; that is the only way we can really be sure they are effective. If you would be interested in helping in either way, please let me know as soon as possible. Such assistance is vital to the success of the manual and will be formally acknowledged. Unfortunately, the level of funding provided precludes offering a financial reward for such work. Mary Barkworth, Department of Biology, Utah State University, Logan, UT 84322-5300.

REPORT ON THE 19th PLANT DEVELOPMENT WORKSHOP HELD AT THE UNIVERSITY OF WESTERN ONTARIO, LONDON, SATURDAY, 4, 1987

Approximately 60 researchers from southern Ontario met for the presentation of 8 platform research papers and 5 poster presentations. In addition, a special lecture/discussion session led by Dr. Michael Christianson, Zoecon Corporation, Palo Alto, California on "Unravelling Plant Development -- What's Involved" completed the program.

Papers presented included:

Bommineni, V.R. and R.I. Greyson (U.W.O.)
Maize ear inflorescence culture. I. Maturity of anthers and pollen production. II. Ovary and embryo sace development (Poster).

Bommineni, V.R., R.I. Greyson, D.B. Walden and B.G. Atkinson (U.W.O)
Polypeptide differentiation with maturation of maize flower organs (Poster).

Dengler, N. (Toronto)
Comparison of shoot vascular organization in isophyllous and anisophyllous species.

Hodson, M.J. (Glendon College, York)
The development of the lemma of the grass Phalaris canariensis L. with particular reference to its silicified macro hairs.

Kudirka, D. (U.W.O.)
The indirect effect of exogenous auxin on initiaion of cell divisions in wheat root explants (Triticum aestivum L.) During callus induction.

Ockenden, I. and J.N.A. Lott (McMaster)
Storage of calcium and other minerals in embryos of Cucurbita maxima, C. andreana and their reciprocal hybrids.

Rees, C., A. Gullons and D.B. Walden (U.W.O.)
Lannate induced changes in gene expression in Zea mays (Poster).

Rucher, C.J. and K. Zachariah. (Waterloo)
The influence of bacteria on Dactyella heterospora.

Shorthouse, J.D. (Laurentian)
Damage and modifications by the beetle Sphenoptera jugosbanica within the roots of diffuse knapweed.

Stewart, A.*, H. Nield and J.N.A. Lott (McMaster and Guelph*)
Studies of minerals in barley and seedlings.

Tam, A.S.K. and R.B. van Huystee (U.W.O.)
Effect of tunicamycin and monensin on peanut extracellular proteins in suspension cell culture (Poster).

Trudel, M.-C. and C. Peterson (Waterloo)
Development of PHI thickenings in the Cruciferae and Caprifoliaceae.

Zabulionis, R.B., J.D. Procunier and D.B. Walden (U.W.O.)
Oncogene related sequences in maize (Poster).

ASSOCIATION OF ZOOLOGICAL HORTICULTURE

The Association of Zoological Horticulture (AZH) is holding their Annual Conference August 17 through August 21, 1987 at the Calgary Zoo, Botanical Garden and Prehistoric Park. For information and registration contact:

Don Peterkin, Horticulturist
Calgary Zoo
Box 3036, Station "B"
Calgary, Alberta
Canada T2M 4R8

The Association of Zoological Horticulture is a non-profit organization dedicated to the advancement of Horticulture in Zoological Parks and Aquariums.

GARDEN CENTER FOR MAJOR SCIENTIFIC PROJECT

St. Louis...The Missouri Botanical Garden announced today the launching of a major project to catalog the plants of North America, will for the first time provide full descriptions and range distributions for the plants of the United States, Canada, Greenland, Saint Pierre and Miquelon. Completion of the project is expected to take 12 to 13 years.

Dr. Nancy Morin, director of the Flora of North America project, said the project will provide information needed by conservationists, land managers, agriculturists, health scientists and biologists. "It is remarkable," Morin said, "that such a work has never existed for North America, although similar publications are available for the U.S.S.R. and Europe, and are in process for the People's Republic of China and Australia."

Morin attributed the new interest in the project to an increased awareness of the importance of conserving genetic diversity and of protecting rare and endangered organisms.

The Flora of North America will be available both in publication format and as a computerized data base. The first volume, containing information of ferns, conifers and their relatives, will be completed in 1989. The final volume is expected in the year 2000.

Participating institutions include: National Museums of Canada, University of Ottawa, University of Montreal, University of Alberta, University of Western Ontario, University of Alaska, University of California, Carnegie Mellon University, Carnegie Museum, Harvard University, Jacksonville State University, Kansas State University, Northern Kentucky University, New Mexico State University, University of Oklahoma, University of Texas, Utah State University, and University of Wyoming.

NEW TITLES INFORMATION

The Moreas of Southern Africa, by Peter Glodblatt, 1987.

"The Moreas of Southern Africa," a fully illustrated monograph researched and written by Missouri Botanical Garden scientist Peter Goldblatt, has been published and released for distribution.

The publication cuminates over 15 years of work by Goldbatt, the Missouri Botanical Garden's B. A. Krukoff Curator of African Botany since 1975. Goldblatt was born in Johannesburg, South Africa and received his Ph.D. from the University of Cape Town, South Africa.

It is the first volume of the "Annals of the Kirstenbosch Botanic Garden" which seeks to document southern African flora. Financial support for the research and field work was largely provided by the United States Science Foundation.

Co-sponsored by the Missouri Botanical Garden, the monograph is a systematic study of the genus Moraea, a member of the plant family Iridaceae. The genus is sometimes referred to as wild irises, and there are 103 species found in southern Africa. The Missouri Botanical Garden is the designated center in North America for the study of African botany.

The publication is significant for several reasons: scientifically because of the vast amount of knowledge in one document, including descriptions of four new species; horticulturally due to the beauty and economic uses of the genus; and for its educational and conservation value because so many of the species are threatened with extinction in the wild.

Each species listed in the book is accompanied by a scientific description, notes on cultivation and botanical history, and a distribution map. In addition to South Africa, the publication includes species found in Zimbabwe, Transkei, Botswana, Lesotho, Namibia and Swaizland.

Fay Anderson, a well known botanical artist, painted the watercolors that accompany Goldblatt's text.

Keys to the Benthic Marine Algae of British Columbia, Northern Washington and Southeast Alaska, by P.W. Gabrielson, R.F. Scagel and T.B. Widdowson, 1987. Phycological Contribution Number 2, Dept. of Botany, Univ. British Columbia, Vancouver, iii + 197 pages. $6.50 (Can.) + Postage and Handling.

To order this comprehensive key on the Benthic Marine Algae of British

Columbia, Northern Washington and Southeast Alaska, contact:

Dr. R.F. Scagel
Department of Botany
Univ. of British Columbia
#3259-6270 Univ. Blvd.
Vancouver, B.C. V6T 2B1

BOOK REVIEWS

Studies in Plant Demography: A Festschrift for John L. Harper, by J. White, 1986. Academic Press Canada. $86.50

Few people have influenced the study of plant population biology as pervasively as John L. Harper. In recognition of his momentous contribution, several of Harper's former students and colleagues (representing nine countries) have been assembled by James White to present this collection of papers in honour of Harper's 60th birthday. In the Preface, White indicates that only visitors to Bangor who have co-authored at least one paper with Harper between 1970 and 1982 were invited to contribute. The authors of eight of the chapters however do not appear in the list of Harper's publications included with this volume. Harper's distinction is aptly reviewed in a Foreward by G. Ledyard Stebbins and G.R. Sagar provides a savory profile of Harper's life and career.

One of Harper's most noteworthy achievements is in bringing to focus the merits of the reductionist-level of concentration in the study of plant populations (The 'Harperian' approach) and this, not surprisingly, is the most unifying theme that emerges from this book. The 24 chapters are divided into six major areas of research, none of which have escaped Harper's infulence. Most chapters are brief, between 13 and 16 pages. The majority of chapters review data recently published elsewhere, mostly by the authors. Ten chapters report original data. The largest number of chapters (9) focus on population dynamics in natural or agricultural environments. These make up the first two sections of the book together with three chapters which present studies of population variation and differentiation - in Plantago lanceolata (by van Groenendael), Trifolium repens (by Turkington) and Panicum miliaceum (by Cavers and Bough). Trenbath uses a modelling approach to consider alternative management practices for controlling weeds which have both deleterious and beneficial effects. Turkington reviews recent evidence for a precise specialization of Trifolium repens genotypes in their ability to grow in association with particular genotypes of Lolium perenne. Turkington envisages a "tri-symbiosis" in which particular neighbouring genotypes of clover and grass are intimately associated with a particular local strain of Rhizobium bacteria.

Five chapters deal with different aspects of modular demography. In an experimental study, Jones demonstrated that the effects of adjacent neighbours on each other can be described in terms of effects on patterns of modular demography in different parts of the crown. Birth rates and mortality rates of modules (buds) were affected differently on branches closest to neighbours compared with branches furthest away from neighbours. The way in which a plant enters, through growth, into the sphere of influence of its neighbours is modelled by Bell in which effects of branching angle, linearity, initial orientation and germination time are tested using computer simulations.

Three chapters are devoted to the effects of pathogens and predators. Sections on neighbour effects and reproductive ecology have two chapters each. Based on evidence available in the literature, White concludes that the well known self-thinning rule appears also to be applicable to complex mixtures of species. Bazzaz and Reeke present an insightful synthesis of conceptual and methodological difficulties in the study of reproductive effort.

One of Harper's trademarks is his decorative style of writing in developing new perspectives, which characterizes especially his book and many of his review and "ideas" papers (twenty of which are cited throughout this collection of papers). It is inspiring to see a similar writing style in some chapters of this volume (most notably in the one by Bell). Regrettably however, some chapters would have profitted by a heavier editorial hand and in some cases it is difficult to decifer the conclusions. Nevertheless, the book as a whole provides a useful overview of recent developments in plant population ecology.

Lonnie W. Aarssen, Queen's University.

Review of the Lilies of China, by Stephen C. Haw, 1986. Timber Press, Portland, OR, 172 pp.

Almost half of all species of the "lilies" in the genus Lilium and the closely related genera, Cardiocrinum, Nomocharis and Notholirion occur naturally in China. The author of this book is not a professional botanist, but rather a student of the Chinese language, with a long interest in plants and gardens. While travelling, studying and later teaching in China, he became a serious enough student to write his observations of these genera and to translate descriptions of the species written by Liang Sung-Yun from Flora Reipublicae Popularis Sinicae. These transltions make up about one-forth of the text of this book. The author points

out that this information is rarely available to the Western World.

The book includes 22 black and white line drawings taken from the Flora as well as eight pages of colour plates of lilies. There are easily usable artificial keys to all the Chinese species of Lilium (37), Cardiocrinum (2), Nomocharis (6) and Notholirion (3), descriptions, flowering times, distribution, history of cultivation and cultural requirements. There are brief comments on, or descriptions of, the sections of the genus Lilium as well as descriptions of new sections named by the author. A brief bibliography and list of lily societies completes this attractively done volume. It is good to see a book that presents new or otherwise generally unavailable information, rather than merely a rehash of well-know information. This book will remain a valuable source of information to any student of the popular group of garden plants.

Gerald B. Straley, Research Scientist, University of British Columbia Botanical Garden.

Review of Creating a Chinese Garden, by David H. Engel, 1986. Croom Helm Ltd., Brenham, Kent and Timber Press, Portland, OR, 159 pp.

This book is a bit too small and there is too much text for it to be a coffee table book, but it is very attractive and enjoyable just to thumb through. The high quality colour plates (12) and black and white photographs (129) were taken mostly by the author while travelling in China.

There have been many similar books done on Japanese gardens, including two by the author, but very little has been published on the superficially similar Chinese gardens. The author, an American landscape architect, shows and describes the philosophy and more practical aspects of these gardens.

There are chapters on the similarities and differences between Chinese and Japanese gardens, planning and practice of development of a Chinese garden, garden features and materials (design and construction techniques) and an annotated plant list. There is also a fairly lengthy, 5-page bibliography.

A particulatly facinating part of the book is found in the materials chapter, in wich the author shows paving patterns, strangely-shaped rocks, containers for plants and views through "moon gates", doorways and windows. This book will be a worthy addition to the library of landscape architects or anyone interested in Eastern plants, gardens or philosophy.

Gerald B. Straley, Research Scientist, University of British Columbia Botanical Garden.

Review of A Handbook of Annuals and Bedding Plants, by Graham Rice, 1986. Croom Helm, London and Timber Press, OR, 272 pp.

Many small, general books have been written on the subject of annuals over the years, but this book is one of the few that is much more comprehensive. It is written primarily for Great Britain, but will be uesful for Northa America. The only problem with applying it to our gardens is that some of the terminology is not commonplace with us, although it usually can be decifered. And, names of chemicals and the varieties and cultivars of annuals mentioned sometimes includes those sold only in Britain and not readily available from North American sources.

The book is not one for beginners who want to see a lot of pictures of annuals and basic descriptions. There are 20 colour plates and 44 black and white photographs and line drwings of flowers and techniques. There is a great deal of information for the gardener who already knows the general, basic information. Chapters include raising the plants, cultivation, pests and diseases, display, colour, containers and A-Z annuals and bedding plants. Some of the names listed do not reflect currently accepted scientific names, but rather those commonly used in seed catalogues. It would have improved the value of the book had the author used both. There are appendices including lists of the European Fleuroselect metal winners, All-American Selection winners, sources of annuals, growing overseas (hardiness zone maps), recommended books and chemical brand names.

One of the interesting aspects of the book is in the A-Z listing of annuals, which occupies a large portion of the book and covers more than the usually basic information on the plants covered. This contains many useful facts about the origins of species and cultivars and tips on their propagation and especially on combining them with other flowers to be at their best advantage in the landscape. This is where I feel the book excells.

Gerald B. Straley, Research Scientist, University of British Columbia Botanical Garden.

Review of The Bernard E. Harkness Seedlist Handbook, compiled and updated by Mable G. Harkness and Deborah D'Angelo, 1986. Timber Press, Portland, OR. Paperback, 428 pp.

This is a new, updated edition of the Seedlist Handbook, first published by the late Mr. Harkness in 1974. To glance at the title or to thumb quickly through the pages it is not at all apparent what the book is all about. The subtitle is "A Guide to the Plants Offered in the Major Plant Societies' Seed Exchange". The purpose of the book

is to offer gardeners, especially those interested in alpines, a guide to further information on a particular plant offered from seed in the various plant societies' seed lists, particularly the American Rock Garden Society, Alpine Garden Society (England) and the Scottish Rock Garden Club.

The bulk of the text is made up of a listing of genera and species of ornamental vascular plants with a single line of largely coded information. Until familiar with the book, the reader is constantly flipping back to the beginning to see what the abbreviations mean or to the end to see to what the reference numbers refer. After each name there is an abbreviated reference to the habit of the plant, followed by approximate height, distinguishing ornamental characteristics, especially flower colour, the plants nativity and finally two columns of references, the first is termed "main" references and the second "supplemental" references. I feel that these two should have been combined into one column.

A major criticism of the book is that it becomes outdated very quickly, Not only will the seed offered by the societies change, but a number of the citations refer to seed or plant catalogues of a particular year. How many gardeners can still locate the Park's Seed Catalogue of 1980, even if they did receive it that year? Also, unless one has access to a major horticultural-botanical library many of the references will not be available to even the most avid gardener. Many recent taxonomic references and currently accepted names are not listed. There are many typographic or other errors, such as inclusion of Cupressus, Chamaecypari and Juniperus in the Pinaceae, a mistake in the key to the symbols and in the spelling of "Gesnariaceae, Caryphyllaceae and Xanthorrhoegeae", to mention a few. In spite of these criticisms, I do find that I refer to the book frequently if I want to find a reference for the botany or culture of Kirengeshoma or Alstroemeria, for instance.

Gerald B. Straley, Research Scientist, University of British Columbia Botanical Garden.

Biological Museum Methods. Vol. 2, by G. Hangway and M. Dingley, 1986. Academic Press Canada. $84.95.

Biological Museum Methods provide the reader with a rather comprehensive treatment on techniques and equipment needed for effective preparation and display of both botanical and zoological specimens. The information is given in two volumes. Volume 1 deals with the Vertebrates, while volume 2 encompasses plants and invertebrates. However, due to the nature of the subject, only the plant section will be reviewed here in some detail.

The Biological Museum Methods' section on Plants will appeal to both amateur and professional preparators. It is a good book to have for easy and fast information with regards to plant preservation.

Museum preparation of the vascular plants is well discussed especially the dry preservation method which included the making of a plant press, valuable for those who cannot afford the luxury of commercially available ones. The Lichens and Mosses are well taken except for a bit of information not included, that is they are better kept in packets made of at least 85% rag content after thay are dried. The algae and fungi do not have any information on dry preparation, which gives the impression that they are only kept in liquid preserve. The size and rag content of Herbarium sheets were not mentioned. It would also be helpful if they included glueing materials that may be used to attach Herbarium specimens.

How to display Botanical specimens always poses a problem to the uninitiated and this book gives lots of good tips how to go about it and what to do with solving certain problems in what one wishes to display. The discussion on artificial plants is most interesting. Overall a good set to have by people interested in the field.

Julie Oliveira, University of British Columbia

SEED STORAGE

Scandinavian scientists have set up a gene bank in the Arctic wastes of Spitzbergen. The bank, a 1.8 x 1.8 x 3.6 m metal container in a cave 183 m below a mountain, contains test tubes filled with seeds of about 50,000 plants (edible, non-edible and ornamental) native to Scandinavia. The scientists believe that the bank will help any nuclear war survivors to restart agricultural and horticultural production. Every test tube is labelled with the name and specification of the seeds inside. An existing gene bank set up about 7 years ago in southern Sweden was considered to be too exposed as a severe power failure could destroy years of work and millions of seeds stored in freezers. The new store is considered to be free from the effects of nuclear weapons and from power failures -- the latter because of the inherent cold of the location. The container is locked with an ordinary simple padlock and chain.

DIRECTORY OF STRUCTURAL AND DEVELOPMENTAL BOTANISTS AT CANADIAN INSTITUTIONS

A. UNIVERSITIES:

1. Carleton University

Biology Department

(i) Principal Investigator - M.E. McCully

Research Interests - Plant development with emphasis on structural and functional studies of roots; and histochemistry and immunocytochemistry of plant tissue.

Undergraduate and Graduate Courses Offered - Plant Structure and Function, Experimental Studies of Plant Development, Plant Cell Biology.

Current Graduate Students - Frederique Guinel

Graduate students in the last five years - J. Vermeer-MacLeod and F.L. Stoddard

(ii) Principal Investigator - M.J. Canny

Research Interests - Translocation; roots; water movement and ion uptake in relation to xylem development; and leaf vein structure and function.

Current Graduate Students - Kim James and Karen Kerekordes

Graduate students in the last five years - D.P. Altus and X.D. Wang

2. Lakehead University

Biology Department

(i) Principal Investigator - Alastair D. MacDonald

Research Interests - Developmental morphology and anatomy of reproductive and vegetative structure of trees.

Current Graduate Students - D. Gresko

Graduate students in the last five years - J.C. Caesar

(ii) Principal Investigator - Ladislav Malek

Research Interests - Seed development and senescence; chloroplast development and senescence at the molecular level.

Undergraduate and Graduate Courses Offered - Plant Physiology, Plant Biochemistry (Undergraduate), Chloroplast/Seed Biology (Graduate).

Current Graduate Students - I. Kozieradzki, A. Karscnti, C. Mroz

3. Laurentian University

Biology Department

(i) Principal Investigator - J.D. Shorthouse

Research Interests - Development of plant organs inhabited by phytophagous insects; development of plant galls.

Undergraduate and Graduate Courses Offered - Insect Ecology (Undergraduate), Insect-plant Relationships (Graduate).

Current Graduate Students - M.J. Kelleher and K. Barbour

Graduate students in the last five years - A. West, R.G.Lalonde and P.D. Thibodeau

4. McGill University

Biology Department

(i) Principal Investigator - R. Sattler

Research Interests - Developmental and theoretical plant morphology; philosophy of biology.

Undergraduate and Graduate Courses Offered - Dynamics of Plant Structure, Philosophy of Biology, Modern Biology and the Predicament of Man.

Current Graduate Students - Malcolm Gardner

Graduate students in the last five years - C. Lacroix, C. Cooney-Sovetts, S.M. Lieu and L. Perlin

5. McGill University, MacDonald College

Biology Department

(i) Principal Investigator - Danielle Donnelly

Research Interests - Epigenetic variation during acclimatization (Rosaceous spp.); plant tissue culture.

Undergraduate and Graduate Courses Offered - Plant Propagation, Landscape Plant Materials (Undergraduate)

6. McMaster University

Biology Department

(i) Principal Investigator - D. Davidson

Research Interests - Meristem growth regulation; induction and segregation of plastic mutations.

Undergraduate and Graduate Courses Offered - Plant Development, Cytogenetics, Cell Biology.

Graduate students in the last five years - S.W. Armstrong

(ii) Principal Investigator - John N.A. Lott

Research Interests - Protein bodies in seeds; mineral storage in seeds, energy dispersive x-ray analysis; and cryogenic sample preparation for SEM.

Undergraduate and Graduate Courses Offered - Plant Kingdom, Plant Structure and Function, Cell Ultrastructure.

Current Graduate Students - I. Ockenden

Graduate students in the last five years - Ernest Spitzer

7. Nova Scoctia Agricultural College

Biology Department

(i) Principal Investigator - A. Randall Olson

Research Interests - Pollination ecology; post-pollination gynoecial development; biology of angiosperm placentae; and experimental embryology.

Undergraduate and Graduate Courses Offered - Structural Botany

8. Queen's University

Biology Department

(i) Principal Investigator - **Willian Newcomb**

Research Interests - Development and ultrastructure of Angiosperm embryo sacs and nitrogen-fixing root nodules.

Undergraduate and Graduate Courses Offered - Cell Biology, Developmental Biology (Undergraduate), Plant Ultrastructure, Plant Morphogenesis, Electron Microscopy for Cell Biologists (Graduate).

Current Graduate Students - Susan Wood

Graduate students in the last five years - Guy Charkonneau

9. **Simon Fraser University**

Department of Biological Sciences

(i) Principal Investigator - **Lalit M. Srivastava**

Research Interests - Hormonal control of plant development; physiology and chemistry of seaweeds.

Undergraduate and Graduate Courses Offered - Cell Biology and Biochemistry, Vascular Plants, Biological Electron Microscopy.

Current Graduate Students - Z.H. Liu, Jian-xin Meng and N. Yalpani

Graduate students in the last five years - M.L. Shih, R.G. Smith and M.A. Amat

10. **University of Alberta**

Biology Department

(i) Principal Investigator - **David D. Cass**

Research Interests - Reproductive biology; fertilization in angiosperms; <u>in vitro</u> pollination in poppies; and bacterial infection of canola roots.

Undergraduate and Graduate Courses Offered - Developmental Biology, Plant Structure and Development, Plant Microtechnique, Biology of Economic Plants, Advanced Plant Structure and Development.

Graduate students in the last five years - M.W. Folsom and S.D. Russell

11. **University of British Columbia**

Biology Department

(i) Principal Investigator - **Jack Maze**

Research Interests - Nature of biological change as manifested in ontogeny and phylogeny.

Undergraduate and Graduate Courses Offered - Plant Anatomy, Plant Systematics (Undergraduate).

Current Graduate Students - Mishtu Banerjee and Brian Compton

Graduate students in the last five years - K.A. Robson and R.K. Scagel

12. **University of Calgary**

Biology Department

(i) Principal Investigator - **Edward C. Yeung**

Research Interests - Embryogenesis; seed development; and floral

Biology of Orchids.

Undergraduate and Graduate Courses Offered - Plant Anatomy, Botanical Microtechniques, Dynamic Aspects of Plant Ultrastructure.

Current Graduate Students - Mason Robertson

13. University of Guelph

Biology Department

(i) Principal Investigator - R. Larry Peterson

Research Interests - Structure and development of root symbioses, particularly ectomycorrhizae and vesicular-arbuscular mycorrhizae.

Undergraduate and Graduate Courses Offered - Plant Anatomy, Dynamic Aspects of Plant Ultrastructure, Plant Microtechniques, Plant Morphogenesis.

Current Graduate Students - Hugues Massicotte, Luc Duchesne, Debbie Blair, Sharon Lackie, Jessica Thomson and Melissa Farquhar

Graduate students in the last five years - Darwin Burgess, Hugues Massicotte, Mark Brundrett, Doug Grenville, Blaine Hussey and Alexandra Smith

(ii) Principal Investigator - Usher Posluzny

Research Interests - Developmental floral and vegetative morphology; aquatic monocotyledons; Vitaceae; phenology; and architecture.

Undergraduate and Graduate Courses Offered - Plant Biology, Developmental Morphology of Vascular Plants, Plant Microtechniques (Undergraduate), Theoretical Plant Biology (Graduate).

Current Graduate Students - Jean M. Gerrath, Christian LaCroix, and Monna Yip.

Graduate students in the last five years - Robin W. Scribailo

14. Universite de Laval

Centre de Recherche En Biologie Forestiere, Faculte de Foresterie

(i) Principal Investigator - Sylvie Laliberte

Research Interests - Tissue culture; trees; ultrastructure; and callus and cell differentiation.

15. University of Lethbridge

Department of Biological Sciences

(i) Principal Investigator - Job Kuijt

Research Interests - Structure and systematics of parasitic angiosperms, especially mistletoes.

Undergraduate and Graduate Courses Offered - Introductory Botany, Plant Anatomy, Plant Morphology, Field Botany.

16. University of Manitoba (Faculty of Agriculture)

Department of Plant Science

(i) Principal Investigator - W.R. Remphrey

Research Interests - Plant architecture and development; silviculture.

Undergraduate and Graduate Courses Offered - Starting in 1988: Growth and Development of Horticultural Plants.

Current Graduate Students - Bert Innes

17. **University of Moncton**

Department - Ecole de sciences forestieres

(i) Principal Investigator - Guy E. Caron

Research Interests - Spacial and temporal patterns of tree morphogenesis; tree reproduction.

Undergraduate and Graduate Courses Offered - Tree Development, Tree Improvement and Forest Genetics, Tree Physiology.

Biology Department

(i) Principal Investigator - Albert L.F. Alexander

Research Interests - Plant cell and tissue cultures; plant virology; and DNA and RNA technologies.

Undergraduate and Graduate Courses Offered - Plant Anatomy, Plant Physiology, Plant Pathology.

18. **University of Montreal**

Biology Department

(i) Principal Investigator - J. Vieth

Research Interests - Morphologie florale; vitroculture et organogenese, radiomorphoses de vitro-plantes.

Undergraduate and Graduate Courses Offered - Anatomie des Plantes Vasculaires, Angiospermes Morphologie Comparee, Vitroculture et Morphogenese Vegetale, Microtechnique Vegetale.

Current Graduate Students - Charles Bertrand, Sandrine Duprez, Denis Lauzer and Christiane Dufresne.

Graduate students in the last five years - Louise Chretien, Michel Labreque and Sylvie Laliberte.

(ii) Principal Investigator - Luc Brouillet

Research Interests - Evolutionary systematics of genus Aster (Asteraceae) and the family Begoniaceae, including comparative development of the plant and of vegetative and reproductive organs and phenotypic plasticity.

Undergraduate and Graduate Courses Offered - Floristics, Taxonomy of Angiosperms (Undergraduate), Systematics of Angiosperms (Graduate).

Current Graduate Students - Alain Cuerrier, Anne Charpentier and Francine Houle.

(iii) Principal Investigator - Mario Cappadocia

Research Interests - Plant Genetics; Biotechnology.

Undergraduate and Graduate Courses Offered - Microevolution, Genetique Generale, Vitroculture: Techniques, Amelioration des Plantes par les Biotechnologies (Gradue).

Current Graduate Students - Mamar Ahmim, Gilles Vincent, Alcina Nascimento and Snaheen Janjua.

19. **University of New Brunswick**

(i) Principal Investigator - Richard T. Riding

Research Interests - Development of conifers.

Undergraduate and Graduate Courses Offered - Introductory Botany, Introductory Biology, Plant Anatomy, Plant Morphology, Plant Morphogenesis (Undergraduate), Morphology of Conifers (Graduate).

Current Graduate Students - Ewa Mellerowicz

Graduate students in the last five years - Ewa Mellerowicz

20. University of Regina

Biology Department

(i) Principal Investigator - M.V.S. Raju

Research Interests - Plant morphology, anatomy and embryology.

Undergraduate and Graduate Courses Offered - Plant Morphology (Vascular and Non-vascular), Plant Anatomy and Plant Morphogenesis, General Botany and Biology, Plant Taxonomy (Undergraduate), Plant Morphogenesis, Plant Embryology (Graduate).

21. University of Saskatchewan

Biology Department

(i) Principal Investigator - T.A. Steeves

Research Interests - Vascular plant morphology and development.

Undergraduate and Graduate Courses Offered - Plant Development, Plant Cells and Tissues, Evolutionary Survey of Vascular Plants, Economic Botany (Undergraduate), Control of Plant Growth and Development (Graduate).

Current Graduate Students - Rosemarie A DeClerck and Patricia A. Hayes.

Graduate students in the last five years - William R. Remphrey and Richard G. St. Pierre.

(ii) Principal Investigator - V.K. Sawhney

Research Interests - Flower development with special emphasis on male sterility; control of lateral root formation.

Undergraduate and Graduate Courses Offered - Botany, Plant Development, Plant Cells and Tissues (Undergraduate), Control of Plant Growth and Development (Graduate).

Current Graduate Students - P.L. Polowick, R. Rastogi, and S.A. McIsaac.

Graduate students in the last five years - K.N. Chandra Sekhar and E.B. Nave.

Department of Crop Science (Crop Development Centre)

(i) Principal Investigator - Alan McHughen

Research Interests - Plant regeneration following genetec modification of cells <u>in vitro</u>.

Undergraduate and Graduate Courses Offered - Plant Tissue Culture and Its Application to Plant Production (Graduate).

Graduate students in the last five years - B.R. Orshinsky, N.C. Jordan, L. Boyd, R. Kapor, D.J. Williams and L.J. Hughes.

22. University of Toronto

Biology Department

(i) Principal Investigator - Nancy G. Dengler

Research Interests - Developmental basis of leaf form; heterophylly; anisophylly; phenotypic plasticity; and relationship between leaf structure and function, particularly in C4 grasses.

Undergraduate and Graduate Courses Offered - Plant Anatomy, Morphology of Vacular Plants (Undergraduate), Plant Development (Graduate).

Current Graduate Students - Jane P. Young

Graduate students in the last five years - Arturo A. Sanchez-Burgos and Petra A. Mueller.

University of Toronto (Scarborough Campus)

Life Sciences Division

(1) Principal Investigator - **Ronald E. Dengler**

Research Interests - Structure and development of leaves with an emphasis on C4 species.

Undergraduate and Graduate Courses Offered - Plant Anatomy, Plant Kingdom, Cell Ultrastructure.

23. University of Victoria

Biology Department

(1) Principal Investigator - **John N. Owens**

Research Interests - Conifer development and reproduction.

Undergraduate and Graduate Courses Offered - Vascular Plants, Developmental Plant Anatomy, Plant Microtechnique, Biology of Conifers (Undergraduate), Selected Topics in Conifer Biology (Graduate).

Current Graduate Students - Anna Colangelia, Joane MacDonald, Andrea Eastham, Margaret Dawkins and Marek Krazowski.

Graduate students in the last five years - Derek Harrison, Anne Johnson-Flanagan, Peter Fielder and Conor O'Reilly.

24. University of Waterloo

Biology Department

(1) Principal Investigator - **Carol A. Peterson**

Research Interests - Transport pathways in plant roots.

Undergraduate and Graduate Courses Offered - The Living Plant, Plant Anatomy and Morphogenesis, and Transport Phenomena in Plants.

Current Graduate Students - M.C. Trudel, Daryl E. Enstone and Elida Stasorski.

Graduate students in the last five years - G.J. Moon, C.J. Perumalla, C.A. Weerdenburg and C.Y. Shih.

25. University of Western Ontario

Department of Plant Sciences

(1) Principal Investigator - **R.I. Greyson**

Research Interests - Factors regulating flower development.

Undergraduate and Graduate Courses Offered - Plant Growth and Development, Plant Tissue Culture, and Advanced Plant Morphogenesis.

Current Graduate Students - D.R. Pareddy, V.R. Bommineni and D. Dales.

Graduate students in the last five years - P.C. Cheng, T.W. Blaker, P.L. Polowick and B.F. Schroeder.

26. **York University**

Biology Department

(i) Principal Investigator - **I. Brent Heath**

Research Interests - Cytoskeleton; mitosis; cell wall synthesis; and protist phylogeny.

Undergraduate and Graduate Courses Offered - Advanced Cell Biology.

Current Graduate Students - Sandy Jackson

Graduate students in the last five years - Lisa McKerracher

B. GOVERNMENT LABORATORIES

1. **Agriculture Canada Research Station, Fredricton, N.B.**

(i) Principal Investigator - **Warren K. Coleman**

Research Interests - Potato tuber dormancy; water relations of potatoes; and cold hardiness.

Current Graduate Students - George S. Read

(ii) Principal Investigator - **J.E.A. Seabrook**

Research Interests - Morphogenesis of the potato (*Solanum tuberosum* L.); tissue culture; regeneration; and environmental effects on growth.

2. **Agriculture Canada Research Station, Regina, Sask.**

(i) Principal Investigator - **Gordon McIntyre**

Research Interests - Role of water and nutrition in plant development; weed biology.

3. **Canadian Forestry Service, Fredericton, N.B.**

(i) Principal Investigators - **J.M. Bonga and P. Von Aderkas**

Research Interests - Tissue culture of conifers, i.e., haploid embryogenesis, micropropagation of mature diploid material.

4. **Plant Biotechnology Institute, National Research Council, Saskatoon**

(i) Principal Investigator - **Kutty K. Kartha**

Research Interests - Tissue culture and morphogenesis; cryobiology; *in vitro* selection; and somatic cell hybridization.

Current Graduate Students - Narender Nehra and Alison Baillie.

(ii) Principal Investigator - **Friedrich Constabel**

Research Interests - Cytodifferentiation; phytochemistry; and plant cell culture.

C. OTHER BOTANISTS

1. Investigator - **Mary I. Moore**

Research Interests - Development of ovule and seed in Pinus banksiana Lamb. from initiation in the bud to seed maturation.

Address - 6 Laurier Ave.
P.O. Box 159
Deep River, Ont.
K0J 1P0

2. Investigator - **Art Davis**

Research Interests - Bee-plant relationships; anatomy and physiology; the nectar secretion process; and the potential for increased nectar production in crop plants.

Address - 549 Glancaster Road
R.R. #1
Mount Hope, Ont.
L0R 1W0

3. Investigator - **Conor O'Reilly** (Postdoctoral Fellow)

Research Interests - Vegetative and reproductive development in conifers.

Address - Biology Department
University of Victoria
Victoria, B.C.

4. Investigator - **A. Fazal Muhammad**

Research Interests - Developmental anatomy; Mesozoic woods of Alberta.

Courses Offered - Plant Form and Function (Undergraduate).

Address - Mount Royal College
Department of Chemical and Biological Sciences
4825 Richard Rd. S.W.
Calgary, Alberta
T3C 6K6

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Editor:- Dr. Luis Oliveira
Department of Botany
The University of British Columbia
3529-6270 University Blvd
VANCOUVER, B.C., V6T 2B1

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