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

## CBA/ABC ANNUAL MEETING, JUNE 14 - 18, 1987

THE 1987 ANNUAL MEETING OF CBA/ABC WILL BE HELD FROM JUNE 14 TO 18 AT THE UNIVERSITE DE MONTREAL, MONTREAL.

IT IS NOW TOO LATE TO SUBMIT AN ABSTRACT FOR PRESENTATION AT THE MEETING, BUT IT IS NOT TOO LATE TO REGISTER FOR ATTENDANCE.

DON'T DELAY - REGISTRATION WILL ALLOW YOU TO ATTEND A VARIED SERIES OF SYMPOSIA ON "THE DIVERSITY OF FORM IN THE VASCULAR PLANTS", "SYSTEMATICS AND ECOLOGY OF THE GENUS CAREX", AND "MYCORRHYZAE".

DO YOU REQUIRE FURTHER INFORMATION? CONTACT:

PROFESSOR LUC BROUILLET,
INSTITUT BOTANIQUE,
UNIVERSITE DE MONTREAL,
4101, RUE SHERBROOKE EST
MONTREAL (QUEBEC)
H1X 2B2

WE ARE LOOKING FORWARD TO SEEING YOU THERE!

## OFFICERS OF CBA/ABC 1986-1987

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| Editor Bulletin: (ex off.) | Dr. Luis Oliveira<br>Univ. British Columbia |
| Archivist: | Dr. Erich Haber<br>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

**1987 CBA Annual Meeting - Ecology Symposium**

"New and contrasting approaches to the study of ecological pattern"

Ecology has been defined as the study of pattern in the distributions of organisms. After description of a pattern, the next level of inquiry may be to determine its causes. Predictions can then be made about changes in pattern with changes in environmental factors. Further, apparently unrelated patterns may have similar underlying causes. If true, then the behaviour of a particular individual, species, population or community may not be a unique case, and the lessons learned from one system might provide insight into the functioning of another. The objective of this symposium is to illustrate new advances in the study of the causes of ecological pattern. Examples include a variety of methods, ranging from the description of variability in abiotic factors to experiments in growth chambers.

Invited speakers and tentative topics:

Lonnie W. Aarssen, Dept. of Biology, Queen's Univ., Kingston, Ontario, K7L 3N6. 613-545-6133. Selection for competitive combining ability: multigeneration experiments.

Pierre Dansereau, Univ. du Québec à Montréal, C.P. 8888, Succ. A., Montréal, Quebec, H3C 3P8. 514-282-3045. Patterns revealed by life-form classification.

Paul A. Keddy, Dept. of Biology, Univ. of Ottawa, Ottawa, Ontario, K9N 6N5. 613-564-3447. Field experiments: extrapolating from the particular to the general case.

Norm C. Kenkel, Dept. of Botany, Univ. of Manitoba, Winnipeg, Manitoba, R3T 2N2. 204-474-8267. Competition-driven selection in an even-aged jack pine stand.

I. Michael Weis, Dept. of Biology, Univ. of Windsor, Ontario, N9B 3P4. 519-253-2724. Predicting climatic variation from latitude: life history implications.

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

Mycology Section
Chairman: J. E. Traquair, Harrow Res. Station, Harrow, Ont. NOR 1GO

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, Univ. Toronto, Toronto, Ont. M5S 1A1

Systematics & Phytogeography Section
Chairman: Paul Catling, Agricult. Canada, Biosystematics Research Centre, Ottawa K1A 0C6

## CBA/ABC REPRESENTATIVES TO BCC

| | | |
|---|---|---|
| Executive | Member: | L. Brouillet |
| Council | | K. Denford<br>I. Brodo |

## CALL FOR "EMERGENCY RESOLUTIONS"

Members are reminded that, in accordance with By-law 76, " "Emergency resolutions" may be submitted to the Board of Directors at any time prior to their meeting immediately before the annual meeting. The Board of Directors will then declare whether they conform to the general guideline for resolutions ... ".

Resolutions submitted under the By-law 76 must be received by the Secretary 10 days before the annual meeting (NO LATER THAN MAY 25, 1987). "Emergency resolutions" can only be admitted if they deal with an emergency situation that leaves no time for preparation of a normal resolution.

Send "Emergency resolutions" plus all relevant material to the Secretary: Dr. Gordon Thomas, Secretary CBA/ABC, Research Station, 5000 Wascana Parkway, P.O. Box 440, Regina, SK S4P 3A2.

## MEMBERSHIP RENEWAL

Membership renewals were due on January 1, 1987. This then your last chance to renew your membership or no more issues of the bulletin will be forthcoming to you.

## A PALEOBOTANICAL SECTION IN THE CBA/ABC?

Recently, the Board of Directors of the CBA/ABC discussed the possibility of establishing a Paleobotanical Section. It was hoped that if activities within a Paleobotanical Section were to be sufficiently broad, the palynologists and Quaternary paleobotanists in Canada might become more active in the CBA/ABC. I would like to report the results of a letter that I sent to 10 paleobotanists in good standing in the CBA/ABC to request their feelings on a Paleobotanical Section.

Generally, feelings were mixed. Most felt that a "critical mass" of Canadian paleobotanists is lacking to merit representation as an independant section. Pre-Quaternary paleobotanists find the Paleobotanical Section of the Botanical Society of America to be the primary paleobotanical meeting in North America. Quaternary paleobotanists usually prefer to participate in meetings such as the American Quaternary Association, or more regional meetions such as those of the Canadian Quaternary Association or the Association Quebecoise pour l'etude du Quaternaire. The Canadian Association of Palynologists is a newsletter organization which does not hold meetions, and the majority of these people prefer to meet with geologists.

The best suggestion at this time is to include stronger paleobotanical content in presently existing sections such as the Phytogeography and Systematics or the Ecology Sections. I believe that if we can spark some paleobotanical interest at this level, then we might want to reconsider a Paleobotanical Section a some future date. I have contacted the organizers of the various section symposia to ask that a paleobotanical type presentation be included in their programmes for 1987. Perhaps section or special symposia with a strong paleobotanical theme can be planned for future CBA/ABC meetings.

Barry G Warner,
Director, CBA/ABC,
Department of Earth Sciences,
University of Waterloo,
Waterloo, Ontario N2L 3G1

## ECOLOGICAL COLLECTIONS AND LONG-TERM MONITORING

H.V. Danks, G.B. Wiggins, and D.M. Rosenberg

Biological Survey of Canada (Terrestrial Arthropods)

### Introduction

Ecological collections that decument species present at a given time and place allow habitat changes over time to be monitored. Although some voucher specimens and faunal assemblage collections are held by various organizations in Canada, there is no national, regularized provision for such collections. As impacts on natural environments raise increasingly serious problems, this deficiency ought to be remedied. The Biolgical Survey of Canada (Terrestrial Arthropods) recently considered possible overall guidelines for ecological collections, and the ideas developed are summarized in this article in order to make them available more widely.

Ecological collections are potentially invaluable data points to document biotic and habitat change. They are important in a long-term context, and are especially relevant to some recent concerns, such as how the biological effects of expected climatic change or the impacts of acid rain might be assessed. Sound scientific princeples support the concept of such collections.

Two main elements are required for the initiation and establishment of properly based ecological collections. First, collections of assured value can be obtained only on the basis of detailed practical protocols for site selection, sampling, and subsequent maintenance of the collections. Second, means are required to ensure that permanent support will be available for

such an undertaking, which is necessarily of very long term.

General principles

In order to interpret long-term environmental changes, the biota needs to be documented in given places, and at different times over a significant interval. Much of the information from earlier sampling is lost unless collections are permanently available to document the species then present; these collections can also be used to improve identifications later as knowledge increases, and to resolve particular problems with earlier identifications. Such problems are a common occurrence in work on arthropods becouse the group is so diverse. At the same time, however, arthropods are especially valuable for assessing changes, because their diversity reflects a wide range of ecological roles (Rosenberg et al. 1986). In addition, specific attention to long-term collections ensures that they are properly associated with particular sites that can then be re-sampled, validating the reality of any perceived change.

In brief, collections obtained and maintained in order to document habitat conditions in time and spece serve as resources for the future. They are national repositories of considerable long-term importance for evaluating biotic changes, and deserve attention and support commensurate with such importance.

Practical basis

How, then, should the work of acquiring ecological record collections be done? Collections would be obtained from specific habitats of interest and kept according to these habitat associations, rather than following the taxonomic arrangement of a general collection. Protocols for the work could be defined further through the additional reconnaissance and analysis allowed by a specific project. Decisions therefore are required about:

1. Choice of sites
2. Sampling procedures
3. Housing of collections
4. Funding for all phases
5. Nature of a trial project used to define further protocols

1. Choice of sites

Habitat type: The most suitable candidate habitats would have some of the following features:

- Limited general variability in conditions, so that longer term changes might be more easily seen. For example, habitats with buffered temperature regimes (e.g. deep lakes, springs).
- Particular sensitivity to environmental change. For example, systems with abundant lichens (sensitive to air pollution).
- Pre-existing interest in the habitat(s) by agencies of government.

Site location: Favoured sites would have some of the following features:

- Easily accessible for sampling
- Discrete and hence readily recognized for repeated sampling (careful protocols would be needed in many habitats to ensure site constancy).
- Likelihood of protection from artificial changes (e.g. parks, preserves; sites large and therefore buffered from surrounding artificial influences). Sites for long-term ecological research have already been provided for elsewhere (e.g. Callahan 1984). As well, specific sites with particular probability of exposure to extreme artificial environmental changes (e.g. waterways near industrial developments) might be chosen.

Number of sites

- "Replicates" to a given habitat type would be desirable, but the intensity of effort would depend on other factors.

2. Sampling procedures

Detailed methods (including the number, size and frequency of samples at a given site) would be expected to depend on individual habitats, and other factors. However:

- A sampling programme must be designed specifically with long-term monitoring in mind. Information should be collected for the purpose of such monitoring, using simple reproducible methods, with the same care as any other primary research project. This implies in particular that occasional "spot samples" are not useful; a more rigorous approach is needed. Several past attempts to assess change merely used any available information "left over" from other primary uses.
- The methods used would be kept constant over time to eliminate one potentially important source of variability. Much previous long-term work has been deficient because of alterations in the methods used during data collection. Standardization of techniques is critical to effective long-term work.
- Sampling might emphasize specific groups that would provide data of particular interest to the project as a

whole because of their biology, state of taxonomic knowledge, etc.

3. Housing of collections

Decisions are required about:

- Location of collections. For continuity and accessibility, federal and provincial governments should be encouraged to establish permanent repositories for ecological collections, which should be held in one or a few major locations. Collections maintained in several locations could be accessed through a central clearing-house for information on ecological collections. It might be possible to encourage the development or designation of one institutional repository in each province (or group of provinces or territories), in accordance with the Biological Survey's recommendations on regional (taxonomic) collections and the concept of regional centres (Danks 1981).
- Collection management and facilities. Maintaining collections associated with habitat information is very labour intensive. Adequate staff, collection storage, and data-processing capabilities would be required to maintain quality and accessibility. The selectivity of habitats and sites sampled (chosen on scientific grounds as outlined above) would prevent unbridled growth of the collections and maintain the quality of material: ecological reference collections should never become a routine dumping ground for unsorted mass collections of varying provenance. However, existing ecological collections of particular historical importance should be brought into the system.

4. Funding

- Long-term core funding. Any scheme for ecological collections would only be worthwhile if long-term funding to ensure the integrity of the collections is guaranteed. This suggests that the organization would have to be placed in a government department with a mandate for long-term studies on the Canadian biota. Nevertheless, given relatively modest core funding of this sort, additional support could be obtained from various sources to carry out sampling, identification, etc., in particular habitats of interest. The core funding would allow for curation and maintenance of the collections themselves.
- Project funding through fixed protocols. Funding could also stem from any active monitoring or assessment project if suitable protocols were developed and adopted: for example, funds for housing and curating collections should be an integral part of every study begun as environmental monitoring; and outside agencies might be funded only on condition that the recommended protocols are used and the collections placed in the designated repository.

5. Nature of trial project

- The most feasible trial projects would be those carried out in connection with known or anticipated changes and thus orientated in a clear conceptual framework. Two candidate trial projects - monitoring for climatic change and monitoring for changes in water quality produced by artificial impacts - would be especially valuable because the importance of these undertakings seems so fundamentally sound that the collection would be an essential and logical corollary to the study. Either project could thus be used to demonstrate a need for collections to maintain an ecological record, and the results would support the more general case for such collections. Many previous longer-term projects have suffered from an emphasis on earlier phases such as sampling, and a neglect of the later phases such as preservation of collections (Rosenberg et al. 1979).

## Long-term developments

These discussions logically would lead to a national reference collection of habitat data points. Established within a federal agency, for example, an ecological collection would operate according to protocols established by a trial study that included discussion among interested parties. Such a centre would require its own staff and additional resources. The proposal might even require the participation of all biologists, not just entomologists, to be successful, though it is the diversity of insects that makes it especially relevant for that group. Among federal agencies, the National Museum of Natural Sciences already has a mandate for the acquisition and dissemination of basic knowledge on the biota. The idea of properly established long-term ecological collections would reinforce such a mandate by applying it to an important ecological and sociological concern.

## References

Callahan, J.T. 1984. Long-term ecological research. BioSci. 34: 363-367.

Danks, H.V. 1981. Regional collections and the concept of regional centres. pp. 137-146 in D.J. Faber (Ed.),

Proceedings of 1981 workshop on care and maintenance of natural history collections. Syllogeus 44. 196 pp.

Rosenberg, D.M., H.V. Danks, J.A. Downes, A.P. Nimmo, and G.E. Ball. 1979. Procedures for a faunal inventory. pp 509-532 in H.V. Danks (Ed.), Canada and its insect fauna. Mem. ent. Soc. Can. 108. 573 pp.

Rosenberg, D.M., H.V. Danks, and D.M. Lehmkuhl. 1986. Importance of insects in environmental impact assessment. Environmental Management 10(6): 773-783.

## CBA DUES AND DONATIONS - TAX DEDUCTIBLE STATUS

Members should be aware that full membership dues (including both CBA and BCC) can be claimed as an income tax deduction, but that they should be claimed as a "Charitable Donation" rather than as an expense under professional income. I am attempting to clarify this because some members have asked for a separate tax receipt for donations to the Endowment Fund. Although I am willing to make out a separate receipt, this is not necessary, since both dues and donation are claimable as Charitable Donations.

## COTISATION ET DONS VERSÉS À L'ABC - DÉDUCTIBLES D'IMPÔT

Tous les membres doivent se rendre compte que la totalité des cotisations versées à titre de membre a l'ABC ou à la CCB est déductible d'impôt. Cependant, ils sont priés de noter que la déduction devrait être faite à titre de "Dons de charité" plutôt qu'à titre de frais imputés au revenue professionnel. Je désire clarifier ce point car certains membres ont demandé qu'on leur délivre un reçu d'impôt à part pour les dons qu'ils ont fait au Fonds de dotation. Bien que je sois disposé à préparer un reçu séparé, ce n'est pas nécessaire puisque les frais de cotisation et les dons peuvent tous deux être déduits à titre de dons de charité.

K. Winterhalder
Treasurer, CBA/ABC
Department or Biology
Laurentian University
Sudbury, Ont. P3E 2C6

## HUNTSMAN MARINE LABORATORY 1987 SUMMER FIELD COURSES

The Huntsman Marine Laboratory (HML), Canada's east coast university consortium, is dedicated to the study of coastal and marine environments and organisms.

The HML summer field courses, with over 130 contact hours, meet or exceed the requirements for semester credit at Canadian and U.S. universities.

Courses:

| | |
|---|---|
| Marine Aquaculture. | May 10-23. |
| Marine Parasitology. | May 17-30. |
| Field Ornithology. | May 31-June 13. |
| Biology of Marine Mammals. | August 2-15. |
| Biology of Fishes. | August 2-15. |
| Marine Biology. | August 15-30. |

For full information concerning these courses, write or call today:

Jean Louis Deveau,
Coordinator of Academic Education,
Huntsman Marine Laboratory, St. Andrews, N.B., E0G 2X0, Tel. (506) 529-8895.

## SUMMER OPPORTUNITIES FOR FIELD COURSES

The Organization of Biological Field Stations is a 100-plus member association of institutions which act as sites for field research and instruction in biology, wildlife conservation, ecology, animal behavior and many related disciplines. Most of them are associated with colleges and universities. Many offer summer courses for undergraduate and graduate students from the parent institution and from other campuses across the continent. Occasionally there are opportunities for adults interested in nature to study as well.

Summer opportunities for field courses in 1987 offered at Biological Field Stations are summarized in a poster prepared by the Organization of Biological Field Stations. Most offerings are intended for undergraduate and graduate students in Biology. For a copy, contact Dr. Richard W. Coles, Secretary OBFS, Washington University Tyson Research Center, P.O. Box 351, Eureka, MO 63025

## GROUPE POLYPHENOLS - 1988 INTERNATIONAL CONFERENCE

Brock University, St. Catharines
Ontario, Canada
August 15 -19, 1988

The 1988 International Conference of Group Polyphenols will be held on the Brock University campus, St. Catharines (Ontario) in the vicinity of Niagara Falls, August 15-19, 1988.

For further information contact:

Dr. Tibor Fuleki
Horticultural Research Institute of Ontario
Vineland Station, Ontario
Canada L0R 2E0

**PROFESSIONALISM AND THE NATURAL SCIENTIST: WHO WANTS TO BE A PROFESSIONAL!**

DATE : MONDAY, JUNE 15, 1987
TIME : 8:00 PM TO 10:00 PM
PLACE: 60 ST. GEORGE ST., PHYSICS DEPT., UNIVERSITY OF TORONTO

This is an evening meeting at the CAP congress open to all natural scientists. Make a point of attending. It has been organized by the CAP Committee on Professionalism to promote a discussion on the position of the natural scientist in the professional arena.

We have a lively keynote speaker Mr. Allan Leal. You will be entertained and provoked. You will hear both advantages and disadvantages of being governed by a professional statute. He has extensive experience in the area having chaired a 5-year review of some of the professional statutes of Ontario.

We have three practising scientists to outline some of their experiences in the professional arena:

* M. Michalski, a biologist working at his own consulting company
* R.W. Moore, a biochemist performing clinical work at a hospital
* M.J. Bronskill, a medical physicist practising at a cancer institute

For preparation you may ponder the following quote from George Bernard Shaw: "All professions are conspiracies against the laity".

Be sure to come. It is an evening to be entertained as well as to ask where should the natural scientist be in our society.

For further information contact Peter Kirkby, Research Division, Ontario Hydro at (416) 231-4111 EX 6957.

**NEW TITLES INFORMATION**

ENVIRONMENTAL ETHICS
Philosophical and Policy Perspectives

Philip Hanson, Editor

Simon Fraser University, 1986, 199 pp.
ISBN 0-80491-061-4
$12.00 Cdn.

This is a collection of papers by philosophers, scientists, and environmentalists which debate theoreticl and practical issues arising from recent calls for a new 'environmentsl ethic'. Featured are major contributions by John Livingston (A Planet for the Taking, the widely acclaimed CBC television series) and Tom Regan (The Case for Animal Rights, 1983).

Order from:
Institute for the Humanities
c/o S. Duguid
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Burnaby, British Columbia
V5A 1S6
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FIRST CANADIAN HOUSEPLANT NEWSLETTER

Quebec City - Canadian plant lovers will be pleased to learn of the existence of the first Canadian houseplant publication. Available only by subscription, HOUSEPLANT FORUM is a newsletter designed for the houseplant hobbyist who wants to go one step beyond what the average books teaches. The first issue will be mailed to subscribers early in January 1987 and will feature in-depth reports on houseplants of all categories: African violets, foliage plants, cactus and succulents, orchids, bonsai and many more. Each 14-page issue will be fully illustrated and will contain a wealth of information, including regular articles on insects and diseases and a column where readers' questions are answered. Subscribers will also have access to seed banks, offering an easy way to obtain unusual houseplants at a good price. At only $7.50 per year for 6 issues, HOUSEPLANT FORUM is certainly one of the most affordable ways of enjoying this fascinating hobby. And what better Christmas present could there be for the indoor gardener?

HOUSEPLANT FORUM is edited by Larry Hodgson, a regular contributor to both amateur and professional gardening publications in both the United States and Canada. After two years of publishing a similar French-language publication for the Quebec market and receiving numerous requests for an English version, he has finally decided to go ahead with the project. He is backed by collaboratots with many years of personal experience in growing plants in the home. This means the emphasis will be on plants and techniques that can be used by the average grower in the average - and often less than ideal - indoor gardening situation.

To subscribe, send a check or money order for $7.50 to:
Enterprises HortiCom enr.
1449 Ave. William
Sillery, Quebec
G1S 4G5.

## PERSONALIA

Dr. Rolf Mathewes, Dept. of Biological Sciences, Simon Fraser University, has been awarded a Master Teaching award. One of three awarded this month. He is a CBA member.

## BOOK REVIEWS

Collecting, Processing and Germinating Seeds of Wildland Plants by James A. Young and Cheryl G. Young. 1986. Timber Press, Portland, OR. 236 pp.

Although the title seems a bit cumbersom, this is a comprehensive guide to growing seed of predomenately native Western North American plants. The first author is a Reseach Scientist with the U.S. Department of Agriculture and the author of many other scientific papers on the subject.

There are chapters on What is a Seed?, Seed Collection, Post-Harvest Handling of Seeds, Seed Cleaning and Separators, Seed Storage, Seed Germination, Seed Technology, Germination of Seeds of Trees, Germination of Seeds of Shrubs, Germination of Herbaceous Species, and Germination of Seeds of the Grass Family. These last four chapters occupy a large part of the book and treat specific genera and/or species and their particular needs, examples being a listing for Achillea and Lupinus or specifically Holodiscus discolor or Cytisus scoparius. These chapters emphaize western North American Native plants but include a number of plants from other parts of North America and other temperate areas as well as popular ornamentals and weeds.

There are a very few line drawings, black and white photographs and tables. One of the strong points of the book is that it is a good compilation of references sited for further information on specific related subjects.

This will be a useful reference book not only for gardeners, but also for Botanical Garder staff and botanists who may be trying to grow a specific plant or group of plants from seed and need t know the treatments for successful collecting, storage or especially, germination of the seed.

Gerald B. Straley, University of British Columbia Botanical Garden, Vancouver.

Manual of Cultivated Broad-Leaved Trees and Shrubs by Gerd Krussmann. Vol I, A-D (1984), Vol II, E-Pro (1985) and Vol III, (1986). English edition, translated by Michael E. Epp, technical editor Gilbert S. Daniels, Timber Press, Portand.

Although I was asked to review Vol III, this can best be done by looking at all three of these large works (a total of 1755 pages, with 1221 black and white photographs and 990 line drawings). These are companion volumes to the late, Dr. Krussmann's Manual of Cultivated Conifers (1985). He was Director of the Dortmund Botanic Garden and Director of the German National Rosarium.

These three volumes cover more than 5000 species and over 6000 cultivars in nearly 800 genera of cultivated, woody broad-leaved plants. Although a few subtropical plants are included, the major emphasis is on temperate plants. The first 32 pages provides a Guide to Terminology with line Drawings and definitions of plant parts and terms used in the text. There is also a list of words with their equivalents in Latin, German, French and Dutch that is particularly useful for understanding cultivar names. Another useful section covers the hardiness zones of the British Isles, and hardiness zone maps of Europe, North America, and China and Southeast Asia, although this latter map is over-simplified. It is the first book of its kind that I have seen which allows one to compare these different areas and their minimum winter temperatures, thus making it easy to relate to plant species likely to be hardy under cultivation. The main text of the volumes is alphabetically by genus, species and cultivars, and in some cases subgeneric groups are outlined. There are some distribution maps for geners or species.

The numerous line drawings are variable in quality, obviously done by a number of different artists, but are adequate for helping to show salient features, from habit to branches, leaves, flowers, flower parts, fruits, seeds or trichome types. There are a number of plates of leaf outlines or cleared leaves. Some of the photographs are not very well reproduced and at least 4 are upsidedown. There are amazingly few typographic errors for the size of the works.

Keys to a taxa have been included. The books would be more useful if all the genera had keys, but had this been done, the books likely would not be in print today. However, many of the larger genera are divided into subgeneric groups, aiding in the identification of species.

One purely botanical criticism is that the Cycads are included with the broadleaved shrubs, eventhough Ginkgo and Ephedra are included with the conifers where they should be.

Understandably, cultivars emphasize those found in Europe, especially Germany, while many Japanese and North American cultivars are omitted. However, in a general reference work, it would

not have been practical to include all known cultivars.

It is a monumental work that will be a valuable addition to the library of all botanical gardens, serious nuresrymen and others interested in woody plant material. It is especially useful for us in North America if used in conjunction with Hortus III and W.J. Bean's Trees and Shrubs Hardy in the British Isles.

Gerald B. Straley, University of British Columbia Botanical Garden, Vancouver.

The Flora of New Brunswick. 1986. by Harold R. Hinds. Publ. Primrose Press Fredericton, New Brunswick.

Harold Hinds has produced a well written, very useable flora which should appeal to layman and professional alike.

Interested students of plant taxonomy will find this text unintimidating, unlike many other floras. There is a well written section regarding the physiography, glacial history, climate and general historical overview to introduce the novice to the region covered by the flora.

The organization of the text (double spacing, line length, etc.) makes the use of keys very clear with very little chance for confusion. The appendix includes close to 1,500 useful line drawings of taxa plus over 900 distribution maps whose clarity is extremely good for their size.

The only improvement I personally would like to see would be the inclusion of cytotaxonomic data (if available) or at least an indication of ploidy levels in each taxon.

Overall this is a useful contribution to our understanding of the Canadian flora.

Keith E. Denford, Professor and Chairman, Dept. of Botany, University of Alberta, Edmonton T6G 2E9

Studies in Plant Demography: A Festschrift for John L. Harper. Edited by J. White.

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 proritted 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.

Mitochondria in Higher Plants: Structure, Function and Biogenesis by Roland Douce. American Society of Plant Physiologists Monograph Series, 1985. Academic Press.

One advantage of reviewing a book two years after publication is that the reviewer has both time to consider comments from others and opportunity to determine if the initial impressions survive the test of use and extended scrutiny.

Dr. Douce's remarkable contribution to the ASPP Monograph Series was hailed from the outset as a masterful statement and synthesis. In my view the initial favorable comments were more than justified. The book is a classic in its time. The 5 chapters are clearly written and make remarkably easy, almost relaxing, reading. The illustrations are useful to support the text and the tables and diagrams provide synthesis as well as information. The book is probably of passing interest only to systematists but the short section on mitochondrial origin and that on the structure of the genome are of use to any who would 'dabble' in plant evolution.

For the plant physiologist and biochemist, this book is a major land mark in plant bioenergetics, because it not only outlines the progress of research on a plant system but provides a synthesis that opens up many exciting and challenging questions. It will inevitably become outdated, but it will stand as a classic for a long time.

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Handbook of the Canadian Rockies. Geology, plants, animals, history and recreation from Waterton/Glacier to the Yukon by Ben Gadd. Corax Press, Jasper, Alberta. 896 pp.

Available at last: a comprehensive naturalist's guide to the entire Canadian Rockies area, from Liard River on the Yukon boundary through Glacier National Park, Montana. This is not just another souvenir book about the Canadian Rockies. This is the real thing. It replaces a stack of single-topic guides, yet it's small enough to slip into a pack pocket. Totalling 896 pages, the book is only 28 mm thick -- a little over an inch.

**Handbook of the Canadian Rockies** contains a variety of Reader's aids, a Recreational section, and covering different aspects of the: Geology, Geography, Ecology, Botany, Insects and Spiders, Birds, Amphibians and Reptiles, Mammals, and Human history.

**Handbook of the Canadian Rockies** is written in everday language, at the high-school-graduate level. Yet it has enough depth to appeal to specialists. Anyone with an interest in the Rockies will find this book genuinely useful, whether in class, on the job in the mountains, during a vacation or out for a short hike.

## PROBLEMS OF PET KEEPING

A British garden centre bought a young alligator as a mascot (and publicity?). They applied for a "Dangerous Pet licence" -- but the alligator meanwhile came across an electricity cable and decided to try to eat it. End of pet!

## INCREASING WILD PLANTS

A lady in Derbyshire, England, has devoted her garden and time for the last four years to cultivating 40 species of native wild fowers, including endangered species such as cowslips, ex-eye daisies, yellow rock roses and meadowsweet. She then gathers the seeds and makes them available to local schools, farmers and anyone interested in preserving the environment. These "volunteers" then distribute the seeds throughout the Peak District National Park to ensure the survival of the species in one of the native habitats. The project wos voted runner-up in the 1986 U.K. National Conservation Awards.

## FOR THE WINE LOVER

Did you know that there were 488 ha of vineyards in England and Wales at the end of January 1986? Or that the total production of English wines in 1985/86 was 653,000 litres? One more thing to try next time you visit England!

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