THE CANADIAN BOTANICAL ASSOCIATION

EDITOR: USHER POSLUSZNY
ASSOC. EDITOR: JEAN M. GERRATH

BULLETIN

L'ASSOCIATION BOTANIQUE DU CANADA

ISSN 0008-3046

April 1989 Volume 22 Number 2 Guelph

Patron

Her Excellency The Right Honourable Jeanne Sauvé, P.C., C.C., C.M.M., C.D., Governor General of Canada

Patron

Son Excellence la très Honorable Jeanne Sauvé, C.P., C.C., C.M.M., C.D., Gouverneur général du Canada

CONTENTS

EDITORS' FORUM:

The next few months will be very crucial for CBA/ABC. We are about to celebrate our 25th anniversary, we are hosting AIBS in Toronto this summer and we are facing a decision about an amalgamation with the Canadian Federation of Biological Societies which will entail a hefty increase in our annual dues. I guess that we can say that our Association has come of age and is now hoping to play a larger role in determining and influencing science policy in Canada.

As editors of the CBA/ABC Bulletin we're hoping that we can help members of the Association discuss the current issues and also reflect on the past 25 years. We will be devoting the next issue of the Bulletin to reminiscences and anecdotes from past members. We welcome all stories (if they are publishable) about the Association's past and all comments and criticisms about the Association's future.

With the AIBS meeting scheduled in Toronto in August (the first AIBS outside of the United States), several members of CBA/ABC who are on the organizing committee (Nancy Dengler and Jim Ritchie) have been working extremely hard in order to make sure that everything works out perfectly. Our compliments and sympathy to all of you in the Department of Botany at the University of Toronto...the word on the grapevine is that it will be a fantastic meeting. The Bulletin, in this and the next issue, will provide update information about the CBA/ABC sessions as well as last minute details that may not have made it into the general AIBS mailing. Abstracts will be published along with the Botanical Society of America and mailed out prior to the meeting.

Remember to register early. This is our chance to be a strong force at the meetings, and to really celebrate our 25th anniversary.

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 By-law 76 **must** be received by the Secretary 10 days before the annual meeting (NO LATER THAN JULY 31, 1989). "Emergency Resolutions" can only be admitted if they deal with an emergency situation that leaves no time for the preparation of a normal resolution.

Send "Emergency Resolutions" plus all relevant material to: Mrs. Sylvia Taylor, Secretary CBA/ABC,Botanical Garden, The University of British Columbia, Vancouver, B. C. V6T 1W5.

❀

JOINT BSA/CBA BANQUET

The banquet listed in the AIBS Program (p. 17) for Wednesday, August 9th as BSA-sponsored should read BSA/CBA. Plan to attend, since our major awards will be presented at this time.

AIBS: LIST OF SYMPOSIA

This is an update to the AIBS circular which has been recently sent out.

Monday, August 7

MORNING

Environmental Impact of Global Change (AIBS)
Flora of the Andes I (ASPT)
Remote Sensing of Land Use Changes in the Tropics (ATB)
Biophysical Factors in Plant Growth and Development I (CBA/BSA)
Experimental Manipulation (CBA/BSA, ESA)
Past as Key to Global Change (ESA)
Germination of Spores (MSA)
Sex Allocation and Sex Change: Experiments and Models I (SMB)

AFTERNOON

Flora of the Andes II (ASPT)
Nutrient Dynamics in Streams Draining Caribbean Rain Forests (ATB)
Evolution of Plant Reproductive Systems (CBA/BSA)
Biophysical Factors in Plant Growth and Development II (CBA/BSA)
Effect of Land Use Change on Atmospheric CO_2 Concentrations (ESA)
Combining Theory and Experiments: Some Examples (ESA)
Computational Ecology (ISEM)
Modelling and Simulation with Computers (ISEM)
Sex Allocation and Sex Change: Experiments and Models II (SMB)

EVENING

Molecular Biology of Fungal Development (MSA)

Tuesday, August 8

MORNING

The Role of Cryptogamic Communities in Ecosystem Processes (ABLS)
The Lycopods (AFS)
Coastal Barrier Biosphere Reserves on the Atlantic Coast (AIBS)
Systematic and Reproductive Biology of the Maloideae (CBA/BSA)
Biophysical Factors in Plant Growth and Development III (CBA/BSA)
Molecular and Genetic Organization of Plant Chromosomes (CBA/BSA)
Space and Time Scales in the Boreal Landscape (CBA/BSA)
Climate Change and Arctic Ecosystem Response (ESA)
Air Pollution and Forest Health: Current Understanding (ESA)
Spatial Modelling I (ISEM)
Teaching Mycology in the 1990s (MSA)
Conservation Education (SCB)

AFTERNOON

The Role of Cryptogamic Communities in Ecosystem Processes II (ABLS)
The Lycopods II (AFS)
Flora of North America (ASPT)
Space and Time Scales in the Boreal Landscape II (CBA/BSA)

(continued on next page)

(continued)

Landscape Boundaries in Management and Restoration of Changing Environments (ESA)
Strategies for Reaching the Public (ESA)
Spatial Modelling II (ISEM)
Algal Genetics (PSA)
Community Responses to Removal of Top Predators (SCB)

EVENING

Numerical Analysis in Fungal Systematics (MSA)

Wednesday, August 9

MORNING

Gymnosperms (ASPT)
Paleobotany (CBA/BSA)
Essential Botanical Knowledge (CBA/BSA)
Wetlands, Sensors of Environmental Change (CBA/BSA)
Roots - Interaction with the environment (CBA/BSA)
Stebbins - New Developments in Plant Evolution (CBA/BSA)
Interference Patterns, Resonances and Harmonics as Unifying Concepts in Communities (ESA)
Ecological Cost Accounting in Plants and Animals (ESA)
Modelling Ecotones (ISEM)
The Ecology of Periphytic Algae and Acidification (PSA)
Maintaining Ecosystem Integrity in a Rapidly Changing World (SCB)

AFTERNOON

Gymnosperms II (CBA/BSA)
Wetlands, Sensors of Environmental Change II (CBA/BSA)
Methods for Translating Ecological Information (ESA)
The Cost of Reproduction in Animals and Plants (ESA)
Model Aggregation Techniques and Traps (ISEM)

Thursday, August 10

MORNING

Demographic and Community Implications of Vegetative Reproduction (CBA/BSA)
Microbial Transformation of Pollutants in Soil Ground Water (ESA)
The Science of Ecology in a Changing Environment (ESA)
Expert Systems in Ecology (ISEM)

AFTERNOON

Long Term Monitoring for Global Change (ESA)
Adaptations of Herbivores to Plant Chemical Defenses (ESA)

THE ROYAL BOTANIC GARDEN

While you're in Ontario for the AIBS meetings in Toronto in August, don't forget to set aside some time for a visit to the **Royal Botanical Gardens** in Hamilton, Ontario. Or you might want to take advantage of the field trip to the garden organized by AIBS (FT. No. 11). The Garden is easily accessible from Toronto, via the Queen Elizabeth Way, Highway 403, and Highway 6 North (and conspicuous signs). The Garden contains 50km of nature trails through woodlands, as well as greenhouses and outdoor horticultural and botanical displays. The whole Garden consists of some 1,000ha. There are several categories of membership. The single membership is $25. For more information, contact either: James S. Pringle, or Freek Vrugtman

Royal Botanical Gardens
Box 399
Hamilton, Ont. L8N 9Z9
Phone (416)527-1158
FAX (416) 577-0375

NEWS AND NOTES

Authors Needed for Rare Species Status Report

The Subcommittee for Plants of The Committee on the Status of Endangered Wildlife in Canada (COSEWIC), is always looking for potential authors of plant status reports. At present we are working with a list of about 500 Canadian species of rare plants that are candidates for report preparation, but only 53 have so far had status reports prepared and have received official status designations by COSEWIC.

Contract funds for the preparation of a limited number of plant status reports are available each year. These are valued generally around $1500-$2000. For some members of the association, it might be more advantageous to write a status report for a tax credit which we can also arrange in lieu of cash payment.

(continued on next page)

(continued)

The candidates list includes species from all provinces, and has a particularly large number from southwestern Ontario. There are at least 20 species from this region that are represented in herbaria only by historical collections dating back to the late 1800's or early part of this century. We would very much like to solicite the help of local botanists in this part of Ontario so that we can determine through field verification whether or not some of these species are in fact extirpated. A contract or tax credit payment could be arranged for reports on such species.

Asclepias variegata, for example, was collected only once in Canada, around Hamilton, in 1859, and *Desmodium ciliare* was last collected in the Niagara area in 1891. Are they extirpated? We would like to know.

The preparation of a status report on a suitable species, in any province, would make a good masters degree project. The information required for a status report is wide-ranging in scope and would give the student practice in such areas as: bibliographic searches, systematics, field studies on populations, phytogeography, autecology, and aspects of plant conservation. In essence, what is wanted in a report is all information that is known about a species and in particular any threats to it so that a suitable conservation status may be given by COSEWIC. The information required includes published data as well as whatever an author can do that is original work, especially field evaluation of populations. This leaves plenty of scope for a masters project.

By undertaking to write a status report on a species that is on our candidates list as part of the thesis requirements, the student or supervising professor on behalf of the student could increase the financial support for the project.

Guidelines for authors, candidate species lists, and examples of report can be obtained from Subcommittee members who would also be glad to discuss potential projects leading to status reports with anyone interested.

Subcommittee members: John Ambrose, University of Guelph Arboretum; Luc Brouillet, Institut Botanique, Montréal; Karen Johnson, Museum of Man and Nature, Winnipeg; Paul Keddy, Biology, Université d'Ottawa; Gerald Straley, UBC Botanical Garden.

Erich Haber
Chairman, Subcommittee for Plants
Botany Division, National Museum of Natural Sciences
P.O. Box 3443, Station D, Ottawa, K1P 6P4

❀

Institut Botanique, Université de Montréal. Nouveaux numéros de téléphone.

Les numéros de téléphone ont changés à l'Institut depuis la dernière parution (1988) du "Directory" de l'ABC-SCPV.

Les numéros actuels sont les suivants:

BOUCHARD, André	872-1435 (8489 labo)
BROUILLET, Luc	872-8490
CAPPADOCIA, Mario	872-8493
LAUBLIN, Geneviève	872-8493
SAINI, H. (Deep)	872-8491 (8497 labo)
VIETH, Joachim	872-8487
Herbier Marie-Victorin a/s HAY, Stuart	872-8496
Laboratoire de culture in vitro a/s LAUZER, Denis	872-8494
Bibliothèque de botanique a/s TAILLEFER, Nicole	872-8495

❀

PEOPLE

Dr. Simon Shamoun recently accepted a cooperative research grant under FRDA to conduct studies in Forest Weed Biological Control with Dr. Ron Wall and staff, Pacific Forestry Centre, Victoria, B. C. His investigations will deal principally with definition and testing of mycoherbicides for control of *Rubus* spp. and with *R. parviflorus* in particular.

Dr. Shamoun completed his Ph.D. in Plant Pathology in 1988 under the direction of Professor Derald A. Slack, Head, Department of Plant Pathology, University of Arkansas, Fayetteville, Arkansas, USA. His research involved isozyme analysis of loblolly pine inoculated with *Cronartium quercuum* f. spec. *fusiforme*.

Thomas N. Sieber-Canavesi began one year as Visiting Scientist in October, 1988, at the Pacific Forestry Centre, Victoria, British Columbia. Dr. Sieber recently completed his dissertation; "Endophytic Fungi in Winter

(continued next page)

(continued)

Wheat (*Triticum aestivum* L.)" under Prof. Drs. Orlando Petrini and Emil Müller at the Eidgenössische Technische Hochschule, Mikrobiologisches Institut, Zürich, Switzerland. The Swiss National Research Council will fund Dr. Sieber's research. He will investigate the taxonomy and biology of endophytic fungi of *Acer macrophyllum* in collaboration with Charles E. Dorworth of P.F.C. as part of Dorworth's study: "Biological Control of Forest Weeds".

Jennifer Shay has recently been appointed a member of the Order of Canada, a well-deserved honour. Members of CBA have benefitted from her hard work and commitment to this organization, especially during her term as President. Her initiative in launching our Conservation Commitee was an important beginning for the plant conservation movement in Canada. However, not all of us are aware of the key role she played as instigator, founder, and Director of the University of Manitoba Field Station, nor do we know of her efforts on behalf of the establishment of Prairie National Park. These achievements, as well as many others, add up to a committed botanist who has really made an impact on Canadian ecology, of which she can be justly proud. Congratulations from all of us.

Robert E. Bowden was appointed director of horticulture for the Missouri Botanical Garden, effective January, 1989. He is responsible for all of the Garden's outdoor displays, the Climatron and other greenhouses, and the several floral displays held each year.

The **Missouri Botanical Garden** has been awarded a 1988 Conservation Project support grant of $US25,000 by the Institute of Museum Services. The matching grant will be used by the Garden to conduct a horticultural survey of woody outdoor plants. Once the survey is completed, the information will be used to develop a computerized database. The Institute of Museum Services is an independent agency within the National Foundation on the Arts and the Humanities, and was established by the US Congress in 1976 to assist museums in their educational role, and to help them modernize their methods and facilities.

GRAD STUDENT NEWS

Luc C. Duchesne of the Department of Botany, University of Guelph, recently received his Ph. D. degree in Botany under the joint supervision of Dr. Larry Peterson and Dr. B. E. Ellis. Luc's dissertation was entitled, "Suppression of *Fusarium* root rot by the ectomycorrhizal fungus *Paxillus involutus*". He is presently an NSERC Postdoctoral Fellow at the University of Toronto, Erindale Campus, working with Dr. J. Anderson.

Jean M. Gerrath recently received her Ph. D. degree in Botany, with distinction, from the University of Guelph. Jean worked under the supervision of Dr. U. Posluszny on a thesis entitled, "Morphological and Anatomical Development in the Vitaceae". Having received an NCERC postdoctoral Fellowship she is currently working with Dr. Nancy Dengler in the Department of Botany, University of Toronto.

Hugues B. Massicotte has also just received his Ph. D. degree in Botany, with distinction, From the University of Guelph. Hugues worked under the supervision of Dr. Larry Peterson on a thesis entitled, "A comparative structural and developmental analysis of a range of ectomycorrhizal associations". He is now working with Drs. R. Molina and J. Trappe at the Department of Forest Science, Oregon State University, Corvallis, Oregon. U. S. A. on an NSERC Postdoctoral Fellowship.

Robin W. Scribailo of the Department of Botany at the University of Toronto has just this past month completed his Ph. D. under the supervision of Dr. Spencer Barrett. Robin's thesis was entitled, "The developmental and structural basis of trimorphic self-incompatibility in the genus *Pontederia* L. (Pontederiaceae)". He is presently working with Dr. P. B. Tomlinson at the Harvard Forest, Petersham, Mass., U. S. A. on an NSERC Postdoctoral Fellowship.

AN OPEN LETTER FROM IAIN TAYLOR: EDITOR, CANADIAN JOURNAL OF BOTANY

It was a great honour for me to be invited to become the Editor of the Canadian Journal of Botany. My sincere thanks to all who sent greetings and friendly advice, to the Associate Editors who have agreed to work with me, and to Taylor Steeves (Editor, 1980-1988) who is truly my mentor in scientific editing.

I am very much aware of the strong support that CJB receives from botanists both in Canada and abroad. The start of a new Editor's term provides an opportunity to evaluate where we are, and to ask the community for advice on our course for the future.

CJB is a general, botanical journal. Its 'competition' lies in the other international, general journals of Botany such as **New Phytologist**, **Annals of Botany**, **American Journal of Botany**, and **Plant, Cell and Environment**. CJB has its traditional strengths, but it also has a role as an outlet for the scientist who hopes to be read by a large cross-section of the botanical community.

CBA/ABC and CSPP/SCPV are the major botanical socie-

(continued on next page)

(continued)

ties in Canada. Taylor Steeves began regular consultation with the societies, particularly when openings occurred on the Editorial Board. Derek Bewley and Larry Peterson have been most helpful to me as I started my job, and I look forward to continuing and expanding the communication between CJB and the societies.

Most of you know that I have taken over a very well run operation. The 600+ manuscripts submitted to CJB each year are edited by specialist Associate Editors (approx. 25 individuals), who give substantial amounts of time and effort on our behalf. Many of you provide the rigorous reviews that ensure high scientific standards. Many of you are authors whose work is published in CJB.

Our science is changing rapidly. The new molecular techniques are being applied in all aspects of botany. There is a major initiative to produce and publish a Flora of North America. There are even more grand schemes to undertake a continent-wide Biological Survey. There is a general realization of the need to study global ecology. The invention of increasingly sophisticated and sensitive biochemical and microscopic techniques provides levels of resolution that were not imagined even 10 years ago.

I suspect that every one of you has some opinions as to how CJB can cater to the continually changing publication needs within the botanical community, and how it should react to the changing face of Botany.

My own goals are:

1. to continue the quest for the highest scientific quality of papers in CJB.
2. to encourage submission of papers that recognize the changing horizons of our science.
3. to shorten publication time.

Please take a few moments to put down your advice. Give me one or two reasons why you do, or do not, send your work to CJB. State briefly our strengths and weaknesses as you perceive them. I will do my best to reply quickly. CJB is not the official journal of either CBA or CSPP, and editorial policy will remain in the hands of NRC. However, the Editorial Board is the final arbiter of the scientific content. We will do our job better if we know your priorities.

Send your comments to: Iain E. P. Taylor
Editor, Canadian Journal of Botany
2206 East Mall
University of British Columbia
Vancouver, B. C. V6T 1W5

IUBS NEWS

In the last issue of the Bulletin, we reported Iain Taylor's election to the Executive of IUBS. At the time we realized that few CBA members knew much about the organization. Ian has filled in some of the gaps in our knowledge with the first of his reports on the workings of this society.

International Union of Biological Sciences (IUBS)

All of us are members of at least one national scientific society and we recognise several tangible benefits (to attend meetings, become involved, receive a free or discounted journal).

The benefits and functions of international scientific affiliations are less obvious, but each of us is represented in the international arena by both national and scientific organizations. Many Canadian Botanists attend the International Botanical Congress (an IUBS event) every 6 years; many are members of International societies (such as the International Association of Plant Taxonomists or the International Society for Systematic and Evolutionary Biology) which are scientific members of IUBS. Thus, perhaps unknowingly, they are already affiliated with the International Union of Biological Sciences (IUBS).

IUBS has 45 national members (each country being represented by its national academy or national research council) and 69 scientific members (either as an international society or as a Congress). On-going operations of IUBS are the responsibility of a Secretariat (in Paris) and an Executive Committee that is elected at the triennial General Assembly.

The goals of IUBS are:

- to promote the study of biological sciences
- to facilitate and coordinate research and other scientific activities that require international cooperation
- to ensure the discussion and dissemination of results through international conferences
- to assist in the publication of results.

Brian Hall, a member of the Canadian National Committee of IUBS, has referred to IUBS as a 'brokerage house' for international biological science.

IUBS has identified international issues and sponsored international programmes for cooperative action to address major problems. This success has come from recognition of concerns, location of scientific resources to address the problems, and support for the cooperating scientists in their search for funding.

(continued on next page)

(continued)

IUBS is over half way through the Decade of the Tropics. There are on-going programmes on Bioindicators, Biological Nomenclature, and Biological Education. The executive meeting in April will hear a proposal from the United States for a new programme on Biodiversity. Many Canadian biologists were involved in the International Biological Programme (IBP) during the 1970s.

IUBS programmes begin as initiatives from individuals or small groups who have a major concern and bring it to IUBS through either the Executive or the General Assembly. Frankly, IUBS has never made a big effort to solicit ideas, rather it has relied on a 'network' to identify worthwhile programmes.

In Canada, the National Research Council appoints the Canadian National Committee of IUBS, which meets twice a year and has three roles.

1. To provide an effective, informed voice on international programmes in Biology, and on Canadian involvement in these programmes
2. To identify the constituency within Canada.
3. To develop effective methods to publicise to Canadian biological scientists the opportunities for collaboration in international research efforts.

The Canadian delegation went to the IUBS General Assembly (held last October in Canberra, Australia) to find out how IUBS worked, and to increase Canada's involvement. We managed to get a Canadian (Iain Taylor) elected to the executive Committee, and we hope that this will improve our understanding of IUBS.

We hope to report to all Canadian biologists, at least twice a year, through society newsletters. Our first observation is that IUBS provides excellent opportunities for Canadian scientists to find, and collaborate with, scientists throughout the world. We welcome your reactions and questions.

Canadian National Committee of IUBS

Iain Taylor, UBC, Botany, Vancouver, B. C. V6T 2B1
Brian Hall, Dalhousie, Biology, Halifax, N. S. B3H 4J1
Robin South, Huntsman Marine Centre, St. Andrews, N. B. E0G 2X0
Geoff Eales, Manitoba, Zoology, Winnipeg, Man. R3T 2N2
Bill Seabrook, UNB, Biology, Fredericton, N. B. E3B 5A3
Anwar Nasim, NRC, Biological Sciences, Ottawa, Ont. K1A 0R6
plus 2 vacancies to be filled shortly.

BOOK REVIEWS

Stomatal Function. Edited by Eduardo Zeiger, G. D. Farquhar and I. R. Cowan. Stanford University Press, Stanford, California, 1987. 503 pp. $US65.

Studies of stomatal structures benefit from the fact that the cells of interest are spaced in reasonably uniform packages on the surface of the leaf. This, together with the ease with which the opening of the pore can be measured, means that concerns about role specificity, which still bedevil many cellular investigations, can, with caution, be set aside. As a clearer picture of the operation of guard cells emerges, an understanding of the integration of guard cell movement with metabolism elsewhere in the plant and with the effect of environmental shifts can be studied in a very productive way. Stomatal physiology has long served as one of the best examples of the necessity to take results from a wide variety of experimental approaches.

By the late 1960s the application of technical advances in anatomy, physiology, biochemistry and biophysics had laid the foundation for an advance in our understanding of stomata and prompted a large number of younger scientists to make their contribution. The chapters in this volume reflect the diversity and the vigour of the work during the subsequent fifteen year period.

This book arose from a conference held in Hawaii in 1983, and finally saw publication in 1987. It falls - not too awkwardly - between the two stools of being both a conference proceedings and a multi-authored advanced text. There are no references to literature after 1985; although, in fairness, the bases for most publications in later years are to be found in this volume. The measured publication schedule has allowed for a good standard of writing, very few typographical errors and an overall high quality at a reasonable price - all attributes that stand in marked contrast to those of many conference proceedings published with undue haste.

When considered as a multi-authored text, the book suffers from the lack of a firm editorial hand. While the full diversity of approaches to the study of stomatal function is well illustrated, the diversity in depth and perspective between individual contributors remains.

The first chapter, by Hans Meidner, is an excellent review of three centuries of work on stomata. This is followed by discussions of stomatal evolution, structure and mechanics. Chapters on the effect of light (with a separate contribution of blue light), ionic relations and the bioenergetics of guard cells show the considerable progress made in these

(continued on next page)

(continued)

areas by a number of laboratories. The stomatal responses to carbon dioxide, reviewed by James Morison, remain an enigma and will continue to challenge.

One of the more interesting discoveries of the late 1960s was the effect of the plant growth hormone, abscisic acid, on stomatal movement which led to a burgeoning literature on regulators. The effects of ABA are reviewed by Klaus Raschke, followed by chapters on cytokinins and auxins. There would seem to be no good reason why all of the regulators were not considered in a single chapter.

The later part of the book deals with the "whole-plant" physiology of stomatal responses to humidity and drought, diurnal variations, the "reverse-phase" patterns of stomatal opening in plants exhibiting Crassulacean acid metabolism and the effects of leaf age. Final chapters consider the role of stomata as part of the plant-canopy transfer system, and detail the methodology of calculating carbon dioxide and water vapour concentrations at leaf surfaces.

Hamlyn Jones has written a thoughtful chapter on the possibilities and pitfalls of attempting to improve crop yield by breeding for specific stomatal characterisics.

Stomatal physiology has been repeatedly reviewed over the past twenty years but the continued activity has made the area worthy of such attention. The well-indexed chapters in this volume collectively provide excellent coverage of the literature. In that the authors have taken pains to point out directions for future research, this volume will stand as a valuable source of information and ideas for some years. Apart from the intrinsic importance in the life of plants and plant communities, stomata provide useful systems for the study of some of the more intractable problems in plant science - including the nature of the blue light receptor, the structure and operation of hormonal binding sites, and the regulation of ionic flux. This book is a very good, reasonably priced, well-produced addition to any plant science library.

Roger F. Horton, Department of Botany, University of Guelph, Guelph, Ontario. N1G 2W1.

Plantae Wilsonianae Edited by Charles S. Sargent. Dioscorides Press, Inc., 999 SW Wilshire, Portland, OR 97225. 1988. 3 volumes: 611 pp., 661 pp., and 666 pp. Price: US$110.00 + US$6.00 shipping and handling.

Plantae Wilsonianae is a three volume set describing the collections made by Ernest Henry Wilson to western China in 1907-1908 and 1910. Edited by Charles S. Sargent and originally published from 1913-1917, Dioscorides Press has recently reprinted these volumes unaltered.

Wilson's trips to China were sponsored by the Arnold Arboretum of Harvard University. He concentrated on the collection of herbarium specimens, seeds, and cuttings of woody plants that showed potential for horticultural use in the Western World. *Plantae Wilsonianae* enumerates 2716 species of woody plants representing 429 genera in 100 families.

These volumes present the earliest descriptions of many taxa. Four genera, 382 species, and 323 varieties and forms from Wilson's collections are described for the first time. In addition, there are original descriptions for 150 previously undescribed species that were collected in China outside the region of Wilson's travels. Approximately 30 genera with potential horticultural importance have partial synoptical accounts, including species from eastern Asia and the Himalayas. Treatments of many taxa (species, varieties, and forms) include discussions of Wilson's collections, distinctive morphological characters, habitat and distribution, synonymies, and previous taxonomic citations associated with the taxon. A few genera contain keys to species

Two problems arise when one is using these volumes. The first is the lack of consistency of species treatments among families. Evidently, the many contributing authors were not directed to produce their treatments in a standard format. The second problem is the rather haphazard arrangement of families and genera within families among the three volumes. Family treatments are often broken up within and among volumes. For example, genera in the Rosaceae are in three difference sections of Volume I. Genera in this family can also be found in Volume II. Volume III contains corrections and additions to the Rosaceae treatment. There is no indication in the prefaces why families were treated in this manner. Workers referencing these volumes must keep in mind that they should always use the index in Volume III, the only index to all three volumes, to locate information on a family. With the reprinting of this historical work, *Plantae Wilsoniane* would have been a much more useful reference if all genera within a family had been brought together and families had been arranged in some practical fashion.

Terrence W. Walters, Department of Botany, University of Guelph, Ontario, N1G 2W1.

Biophilosophy, Analytic and Holistic Perspectives, by Rolf Sattler, Springer-Verlag, New York, 1986 284 pp. $30.00

"Truth is that which is. It cannot be communicated in words. It is in silence."
R. Sattler p. 253.

Is this statement the logical conclusion one could reach after reading **Biophilosophy** or is it one of the essential premises of the author's reasoning? In other words, is Sattler trying to convince his readers of the validity of his personal world view, based on examples taken from biology, or to demonstrate that the analysis of biological concepts leads to a world view which is akin to mysticism? The fact that these questions cannot be categorically answered introduces one of the most important ideas of the book: concepts, laws and theories no matter how objective, depend on one's own personal world view.

As stated by Sattler himself, this book is an introduction to biophilosophy: it is intended for biology students, researchers and an informed audience. Although a very good educational document, it is neither a textbook nor a philosophical treatise. The author presents his personal view of biology and the world and raises questions about concepts generally rejected by contemporary biologists who subscribe to reductionism. Sattler espouses an organismal concept of biology which he extends to the universe.

The book is divided into ten chapters which cover topics as diverse as the epistemological analysis of the notions of theory, law, hypothesis, biological classification, teleology, evolution and morphology. He also introduces his readers to various world views. A whole chapter is dedicated to an epistemological analysis of plant morphology with respect to the different concepts discussed in the book: theories, hypotheses, laws, explanations, predictions, data, concepts and continuum. As a rule, each chapter begins with the analysis of epistemological or biological concepts and ends with a discussion of social, religious and metaphysical concepts. In many chapters, the author draws a parallel between epistemological or biological concepts and oriental philosophies, in particular Zen Buddhism. This oriental influence is evident throughout the book. Sattler wants to show that the scientific world view is but one part of a totality where neither subjects or objects of experience exist. Each chaper ends with a very useful summary including definitions of philosophical concepts and the main conclusions drawn from the analysis.

The book has four main themes: the concepts of continuum, complementarity, the notion of system and the concept of chaos. The analysis of these concepts in a biophilosophical perspective raises fundamental problems which lead to new avenues of research in theoretical biology. The concepts underlying the global and integrating vision presented by Sattler could also be analysed with respect to recent developments in other fields such as the thermodynamics of dissipative structures and the catastrophe theory, that is the emergence of discrete structures from continuous structures when a certain threshold is reached.

In the analysis of biological phenomena, continuity and discontinuity depend upon the size of the observer. Sattler uses the example of the cellular membrane. Let us imagine a traveller of molecular or atomic size who moves from one cell to another through cytoplasmic bridges. He crosses no boundaries and does not perceive any discontinuity between cells. Thus, at the same time, a system is either continuous or discontinuous depending on the scale of the observer. Continuity and discontinuity are therefore different perspectives that are complementary to each other.

This idea of continuum can also be found in his concept of reality. For him, reality is "neither physical nor spiritual, but the Unnamable" (p. 80). It is, in Weiss' terms, a "patterned continuum". Since it is a continuum it forms a unity, but since it is patterned, elements can be distinguished" (p. 80). Hence, the various categories of entities (atoms, molecules, cells, organs) do not seem to be real independent of our conceptualization. This can also be applied to systematics. According to the author, neither a phylogenetic nor a phenetic system can be natural, in the sense of an integral representation of nature, independent of our conceptualization.

In order to explain the notions of continuity and discontinuity, Sattler uses the example of plant morphology. In morphology, the classical paradigm emphasises the discontinuous aspect of nature, whereas the continuum model, the new paradigm, focusses mostly on its continuous aspect. Sattler points out that these views could be considered complementary and it would be progress to interpret plant form and structure from both viewpoints.

But does the existence of intermediate forms between fundamental categories such as leaves and shoots imply that there is a morphological continuity between the two structures? Can we expect to find all the intermediate forms in nature? And do all these forms have the same probability of existing? For Sattler, the typical form is the most frequent. But nothing indicates *a priori* that the recognition of intermediate forms proves the existence of a continuum. It depends on the definition given to the concept of continuum. Unfortunately, Sattler never defines it clearly. The concept of continuum is probably different when analysed

(continued on next page)

(continued)

from a biological, physical, semantic or mathematical point of view. For example, the concept of morphological continuum can be represented by a mathematical formalism, à la Thompson, whereby a change in coordinates allows a passage from one morphological form to another. In my opinion, however, this type of continuum is different from that in which we find an intermediate form possessing qualitative characters which belong to the two extreme forms, for example an intermediate structure between the shoot and the leaf.

According to Sattler, there is no absolute discontinuity in nature. Our concepts give us the impression of discontinuity. But what happens when we go from one morphological or physical state to another? With respect to this, physico-chemical data indicate that changes can occur abruptly. Some mathematical formalisms (singularity theory, bifurcation theory, catastrophe theory) are applicable to discontinuous phenomena. One can therefore ask if in biology, a continuum can generate a discontinuum or if, as Sattler maintains, these are two views of the same reality.

Along this line of thought, the catastrophe theory could be useful to the study of plant morphogenesis. Sattler considers that the elementary catastrophes described by Thom are equivalent to unchanging eternal forms. He asks himself if an unchanging framework is required to describe change. If so, is this conceptual framework only a methodological tool or does it indicate that there might be something in reality that does not change? As we know, the catastrophe theory makes reference to the notion of archetype. Thus, one can ask if the elementary catastrophes (in the sense used by Thom) are to morphogenesis what typical forms are to plant morphology. In fact, Thom (1980 "Paraboles and Catastrophes") mentions that, following Goethe, 'archetype' usually designates the original image (Urbild) of an organ or a set of organs. According to him, in order to (p. 157) "restore scientific status to the notion of archetype, it must first be defined in simple, i.e. abstract, situations." Contrary to the archetypes of morphology, the catastrophe theory allows for both continuity and discontinuity. It shows that the same frame of reference can be used to account for continuous and discontinuous phenomena. In this sense, it is possible to believe that in nature certain discontinuities are intrinsically linked to the system and therefore independent of the scale of the observer.

Sattler extends his concept of complementarity to nature as a whole. He looks upon order and chaos as complementary views of nature. Each represents an aspect or perspective of nature, but neither alone represents nature as she is. Nature is neither completely chaotic nor rigidly ordered: "she is Unnamable" (p. 113).

The other important aspect of this book is the notion of system. According to Sattler, it is important to think in terms of biological systems since living organisms represent a network of various interrelations. Similarly, order in nature is more appropriately represented by a network of sets (a net of fuzzy sets or injunctions) than by a system of classes. In the analysis of physical, psychological and social systems, parts cannot be dissociated from the whole.

With respect to the concept of system, Sattler espouses the idea of "network causality" whereby the occurrence of an event depends on the initial conditions of the system as a whole. However, doesn't network causality depend on the scale of the observer? Isn't the number of organizational levels proportional to the structure being analysed? For example, as the scale gets larger, the number of possible interrelations between elements increases and it becomes difficult to trace the number of causal links between the elements. One can ask if network causality does not call for a probabilistic rather than deterministic explanation.

The importance given to the notion of network is also readily apparent in his vision of living organisms. For Sattler, the goal-direction observed during the development of an organism results from the interactions between the genome, the cytoplasm and the environment. This leads him to accept the notion of orthogenesis in a systemic perspective.

Sattler views the explanation of living systems in a holistic perspective: the system has properties which the parts do not possess and can only be understood through the integration of the parts. Moreover, "The unification of science (eg. biology, chemistry and physics) is not possible through reduction, but must occur by other means, it if is possible at all." According to Sattler, this unification could be achieved by the general theory of systems. But one can think of other avenues, in particular the theory of dissipative structures and the catastrophe theory. An analysis of morphogenesis according to these theories would certainly enlighten our understanding of the development of organisms.

In this book, the author exposes important concepts, such as the epistemology of biology, in a pedagogical way. Moreover, he proposes a world view and raises problems which can lead to stimulating research in the field of theoretical biology. But one of the greatest interests of this book lies in the the analysis of classical concepts of biophilosophy with respect to the idea of continuum. Sattler's analysis makes us revise our conception of biology; isn't the biological world a huge continuum which can only be represented, indeed explained, by subdividing it into discrete units?

Denis Barabé, Jardin botanique de Montréal et Institut bonique de l'Université de Montréal.

MEMBERSHIP IN CBA/ABC

RENEWAL/RÉABONNEMENT ☐ **NEW MEMBER/MEMBRE NOUVEAU** ☐

Name/Nom:_____ Telephone/Téléphone: _____

Address/Adresse:*_____

_____ Postal Code Postal: _____

TYPE OF MEMBERSHIP/CATÉGORIE	**AMOUNT/MONTANT**
Regular/Régulier	$32.00 _____
Student/Étudiant(e)	$12.00 _____

Signature of Sponsor/Parrain _____

Retired/Retraité(e)	$12.00 _____
Life Member/Membre à Vie	$400.00 _____

Donation to the John Macoun Travel Bursary/
Dons au Fonds John Macoun** _____

Donation to the Weresub Fund/Dons au Fonds Weresub** _____

SECTIONAL AFFILIATION/SECTION D'AFFILIATION:
(Indicate one or more/indiquez votre (vos) choix)

Ecology/Écologie ☐ Mycology/Mycologie ☐

General/Générale ☐ Phycology/Phycologie ☐

Systematics & Phytogeography/Systématique et Phytogéographie ☐

Structure and Development/Structure et Développement ☐

***Please use your professional address if possible.**
Veuillez indiquer votre adresse professionelle si possible.

****Receipts for income tax/reçus pour dons de charité**

Return with cheque payable to CBA/ABC to:
Retournez avec chèque payable à L'ABC/CBA à:

Keith Winterhalder
Department of Biology
Laurentian University
SUDBURY, Ont. P3E 2C6

THE LAST WORD:

We will try to contact the founding members of CBA, to include their reminiscences in the July (25th Anniversary) issue. Since we don't have a complete list of early members, feel free to include your recollections or photographs of those early days. We intend to feature this issue at the CBA Booth during the AIBS meetings, and want it to be a complete and worthy souvenir of our activities. In addition, please send us the names, supervisors, and thesis titles of recently-graduated PhD students. We don't want the Grad News to be so heavily dominated by Guelph graduates in the next issue. **NOTE: The deadline for the July issue is June 1.**

The Bulletin of the Canadian Botanical Association:
EDITOR: DR. U. POSLUSZNY
DEPARTMENT OF BOTANY
UNIVERSITY OF GUELPH
GUELPH, ONT. NIG 2W1
(519) 824-4120 EXT. 2745
NETNORTH BOTUSH @ UOGUELPH.CA
FAX (519) 767-1656

Issued quarterly in January, April, July and October, and sent to all members of the Association. Non-members may subscribe at a price of $25.00 per annum ($5.00) per issue) post free. Cheques or money orders (in Canadian funds ONLY) should be made payable to "The Canadian Botanical Association" and addressed to the Editor

Advertisements for **Positions Open** and **Classified** categories may be placed at a cost of $10.00 Cdn. per published column inch. Advertisements by individual members of **Post-doctoral Opportunities** and **Positions Wanted** are carried free

To ensure prompt delivery of the Bulletin please notify the Treasurer (**Prof. Keith Winterhalder, Dept. of Biology, Laurentian University, Sudbury, Ontario. P3E 2C6**) of any change of address as soon as possible.