

THIS ISSUE

Editorial	89
President's Report	90
The Great Pesticide Controversy	96
Future Congresses, Conferences	98
Montage - 1970 Annual Meeting	99
1970 Photo Salon B. & W.	100
Color	101
Feature Photograph	102
Acadian Entomological Society	103
Entomological Reminiscences of Thailand	104
G. G. Dustan retires	106
Crop Losses or Gains?	107
Olfaction and Chemoreception	108
Periodical Literature Used by Entomologists	110

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## *Editorial*

The dust is finally settled from the 1970 Annual Meeting at Winnipeg. The President's Report, one of the Society's key documents is printed in this number. We are pleased to reproduce the winning photographs in the 1970 Photo Salon, but regret that we could not provide color reproduction.

### GOVERNMENT AUSTERITY AND ENTOMOLOGY

The letter from the President to the Prime Minister, that was published in the last number of the *Bulletin*, describes in a very lucid fashion the state of our profession and our concern over the possible impact of Government austerity. Encouraging letters were received from the President of the Treasury Board and from the Minister of Agriculture. Although they promise nothing, they acknowledge the points made by the President, particularly the importance of our science to the country. A reply has not yet been received from the Minister of Fisheries and Forestry, at least the *Bulletin* is not aware of one. This is regrettable because the Department of Fisheries and Forestry is the second largest employer of entomologists in Canada.

### PESTICIDES POLICY

In the last issue of the *Bulletin* there appeared a summary of the brief "Pesticides and the Environment", which will soon be published in full in the *Bulletin*, and which will represent a definitive contemporary statement by the Society on this subject. P. S. Corbet's name was incorrectly appended to the summary. He was commissioned by the Governing Board to synthesize views and material on the subject from a representative sample of Society members. Accordingly Dr. Corbet wishes it to be understood that he is the compiler and not the author of the brief.

### EDITORIAL BIAS

This was the subject of earlier comment in this column. A regional bias in the direction of the editorial office of the *Bulletin* is perhaps inevitable, and the Acadian Entomological Society has received good publicity for its activities in 1970. The Acadian Society was encouraged because it is the object of the Entomological Society of Canada "to study, advance, and promote entomology". We hope other Regional Societies will see the possibilities and take advantage of it. A series of articles on Regional Societies describing their history, objectives, and current activities would be of wide interest and value. How about it Regional Societies?

### CORRESPONDENTS

The next issue may be a lean one because it is at the far side of the year from the Annual Meeting. It will be a particularly good opportunity to get your material or that of your colleagues published.

Most contributors will note changes in their articles — these may or may not improve them but they do give the editor a great feeling of power.

The deadline for the next issue, Vol. 3, No. 1 for March, is 5 February 1971.



E. J. LeRoux  
President 1969-70

# REPORT OF THE PRESIDENT TO THE TWENTIETH GENERAL MEETING

WINNIPEG, MANITOBA  
26 AUGUST 1970

## MEETINGS OF THE BOARD OF DIRECTORS

During my term of office as President I met three times with the Board of Directors. The first meeting was held on 29 August 1969 at Guelph, Ontario, to act on recommendations and decisions taken at the Annual Meeting the day previous, to outline plans for the conduct of the Society's affairs during the year 1969-70 and to appoint officers to Boards, Councils, Committees and Working Parties.

A second meeting was held in Ottawa 29-30 January 1970 to consider action on matters carried over from the first meeting and on new business arising during the period August 1969 - January 1970. Progress reports from appointed officers were heard and content fully discussed. All Directors but one were present and their active participation in discussion and in decisions taken was invaluable to the success of the meeting.

The Board held its third meeting on 23 August 1970, at Winnipeg. Final reports for the year were received and action taken where needed. Matters requiring further study were left for the consideration of the incoming Board.

## INTERNAL AFFAIRS

### Revision of By-Laws

On 11 September 1969, the Board received approval of the revision of the Society's By-Laws, effective 14 August 1969, (i.e., approval of amendments which constitute this general revision) from the Department of Consumer and Corporate Affairs. Members will be asked later at this meeting to approve five changes in the Society's Standing Rules and Regulations made obsolete by this revision. By-laws have been published in the Bulletin and distributed to all members for their information.

### Membership

Active membership was down slightly in 1970, mainly as a result of increased fees which went into force on 1 January 1970. A review of the situation just prior to this meeting indicated that the reduction is temporary and similar to that experienced following previous membership fee increases.

Honorary members now count ten, which is the full number that can be elected to the Society. The last two members named, Dr. R. D. Bird and Professor J. G. Rempel, were elected this year and will be honored at this year's Annual Banquet. Dr. J. J. Cartier, Chairman of the Honorary Membership Committee, will continue to hold a watching brief on potential candidates to be brought forward for election when vacancies arise.

The Board asked the Membership Committee to examine the need for Emeritus Membership. The Committee's report has been referred to the new Board.

The Board discussed at length the desirability and feasibility of establishing Fellows of the Society, noting the existence of Gold Medalists and Honorary Members. The matter was referred for detailed study to the incoming Board.

## Finance

An audited statement for the year 1969 showed the Society's revenues for this period to be less than expenditures. However, the statement presented to the Board for the period January - July 1970, which included revenues from increased dues, showed the Society's financial position to be: total assets \$140,763.04 and total liabilities \$81,330.10. Accordingly, the Board authorized the Treasurer to increase the Society's investment by the sum of \$10,000 from the \$59,432.44 on hand.

The Board, on 23 August 1970, instructed the Treasurer to begin direct collection of membership dues beginning January 1971. Provincial Societies were informed early in 1970 of the National body's intended action and were found to be in general agreement with direct collection of dues by the E.S.C.

## Publications

**Canadian Entomologist** - The Canadian Entomologist continues in quality and quantity to maintain its place as an entomological journal of first-rate national and international reputation. Manuscripts continue to pour into the editorial office and a 12-month backlog has necessitated, on two occasions a 18-page increase of the Journal to its present 144 pages. The nature of the manuscripts received is such that the Society is still not quite justified to proceed to a second journal to accommodate economic or other type papers. The Society, however, should now consider the possibility of producing the Canadian Entomologist more than once a month.

**Bulletin** - Dr. D. C. Eidt took over full responsibility for the Bulletin beginning with Vol. 2, No. 1, with responsibilities for style, printing and production of the Bulletin. He will perform the duties of Bulletin editor from Fredericton, New Brunswick, where he resides. Three issues have appeared so far under his editorship.

Contributions to date have only been sufficient to fill the 24-page issues on time. The success of the Bulletin as a communication medium depends primarily on the members since the Editor has little time or assistance to actively seek contributions. Members are urged to volunteer articles on any subject they feel will be of interest to the membership generally. In future, highlights of the Society's affairs resulting from the Annual Meeting or from activities of the Board and the Executive will be communicated to the membership via the Bulletin.

**Editorial Board** – Because of the day to day problems of dealing with the Canadian Entomologist and Memoirs, the Editor has requested that his additional task as Chairman of the Editorial Board be assigned to someone else. As a result, the Board has agreed that in the future the duties of the Editor and that of the Chairman of the Editorial Board should not reside in the same person, but be kept distinct and vested in different people. The Editor should be responsible for the Journal, the Editorial Board for the policy on publications.

As a result of this action, you will be asked to revise Rule 8.1 of the Society's Standing Rules and Regulations to read, "The Editorial Board shall consist of a Chairman and four members, two members being from Ottawa and two from other regions. The Editor shall be an *ex officio* member of the Board".

### Management Review

During the past year, the Board retained the services of Mr. Jean Dupuis, Management Services Division, Canada Department of Agriculture, to review the Society's financial management procedures. Actions taken on Mr. Dupuis' recommendations were (a) the appointment of professional auditors and (b) the direct collection of the Society's membership dues. Mr. Dupuis' assessment that the services of a management consultant were not required was accepted by the Board.

### Archives

Very little material has been added to the Archives of the Society in 1969-70 and the Chairman, Dr. Louis C. O'Neil, proposes to publicize archives material through notes on the material on hand to the Bulletin to improve this situation. Follow-up action will include identification, dating and classification of material held, as well as the publication of biographies of distinguished entomologists and their works in the Bulletin. Anyone holding material that could legitimately be placed in the Society's Archives or interested in helping Dr. O'Neil in the development of these resources should contact him directly. We are very fortunate in having both professional input and accommodation for our Archives at Sherbrooke University.

### Achievement Award and Procedure

As you are aware, Dr. G. S. Holling was chosen as this year's Gold Medal Award winner. The Board approved that in future the identity of the recipient of this award be made known to the Board at its midwinter meeting, and then immediately following, announced to the members and general public.

### Program of Annual Meeting

Pertinent to future Annual Meetings the Board felt that operations of the E.S.C. National Program Committee should (a) evaluate annually the planning operation of the Annual Meeting, (b) prepare an annual report identifying crucial areas of planning, suggesting method of organization timetables, pitfalls in planning of such Annual Meetings, (c) draw up guidelines for affiliated Societies involved in the Annual Meeting, (d) act more intimately and more effectively with affiliated Societies in the planning of the National Society's needs for program locale, photo salons, publicity for the Gold Medalist and for other members to be honored. It is suggested that in future the National Program Committee Chairman ask the Regional (or affiliated) Planning Committee to submit plans a year ahead of the Annual Meeting so that the Board can be apprised of the progress and difficulties met well ahead of the appointed date of the meeting and so that corrective action can be taken.

## EXTERNAL AFFAIRS

### Biological Council of Canada and SCITEC

The Society continues to be a major supporter of the Biological Council of Canada. Present delegates are: Dr. J. L. Auclair (alternate Dr. W. G. Friend) and Dr. J. A. Chapman (alternate Dr. P. Harris). Our representatives were instructed by the Board to support the affiliation of the Society to SCITEC via the B.C.C. The Governing Board is to review annually for the next three years the effectiveness of this method of SCITEC affiliation versus direct affiliation. It was felt that affiliation with SCITEC, through the B.C.C., was critical to the continued support the B.C.C. should receive from affiliated Societies in becoming a major focal point of strength for affiliated Societies. The B.C.C. has drawn heavily on the E.S.C. for representatives it has named to the SCITEC Lamontagne Report Committee. The Heritage for Tomorrow Conference and for the Environmental Committee it has been actively supporting.

Dr. West and I continue to be the Society's representatives to the Congress of SCITEC. I was elected to the SCITEC Council in January 1970, and more recently, to the SCIT C Executive as Honorary Treasurer.

Action and plans for action by the B.C.C. and SCITEC for the immediate future will be communicated to the membership as soon as possible via the Bulletin as well as directly from these Organizations.

### Pesticide Use Policy

The Board felt that the Society which includes amateur entomologists as well as those from industry, the universities and government should issue an official statement which analyses the problem, places it in perspective and proposed short-term palliative and long-term solutions. Under the chairmanship of Dr. P. S. Corbet, a document was prepared which will appear in the Bulletin as the official E.S.C. policy position on the matter of pesticides. I made a brief announcement of our position on policy in resume at the opening of this Annual Meeting, of what this position on policy is, and the resume will be published first followed by the *in extenso* statement.

### National Science Policy

A letter to the Prime Minister of Canada was forwarded during the year on the matter of science policy as it affects entomologists, their training and employment, and the serious conflicts in these areas between Government action and that of the Society. The letter to the Prime Minister and replies received are to be published in the Bulletin. This action will continue with the new board and is an action of major importance to the survival of the discipline in the future. Your personal views on action on this matter should be made known to your President and Board.

### Fisher Report

A submission from the E.S.C. to the Lamontagne Senate Committee on Science Policy was prepared under the chairmanship of Dr. A. S. West and presented to the Senate Committee through the B.C.C. as part of the Fisher Report. This Report was very well received and will be instrumental in placing before the country the E.S.C. position on the need of our discipline for the national good, and the maintenance of new recruits through planned training

and use of entomologists in government, industry and university agencies of this country to research and advise on protection of health as well as food and fibre.

### Common Names Committee

During the past year eleven common names of Canadian insects were considered by the Committee of which nine were accepted. Of these latter, eight were subsequently accepted by the E.S.A. Committee. Our record with this Committee for 1969-70 was 89 percent acceptance of names proposed. The Board requested A. F. Hedlin of our Committee to express our concern to the E.S.A. Committee over the use of the terms "booklouse" and "psocid" to describe essentially the same insect.

I have been unsuccessful in my attempts, through correspondence with the President of the Entomological Society of America, to get agreement on the formation of an E.S.A.—E.S.C. joint North American Committee on common names. The Board is not satisfied with the present monolithic structure of the E.S.A. Committee and has asked Dr. H. F. Madsen, a member of the Governing Board of the E.S.A., to investigate delays on resistance on the part of the E.S.A. Committee in the matter and to report to the E.S.C. Board at the January 1971 meeting.

### Student Encouragement

Following a report by Dr. F. O. Morrison that his Committee had been unable to develop an effective program that would reach the majority of students at the primary and secondary school levels, I wrote to Provincial and Regional officers in April 1970, of the Society's continued desire to be active in student encouragement and of the E.S.C. Board plan. The Board agreed that the allotment of \$1,000 per annum for this activity be apportioned amongst our affiliated Societies on the basis of the population they serve. The Societies would make known to youth organizations in their regions that cash awards or prizes for entomological activities would be available. Societies were enthusiastic about this plan and are now in the process of making contacts for awards.

Dr. F. O. Morrison is to oversee this program to affiliated Societies on behalf of the national body. It is the Board's hope that Canadian entomology will benefit considerably from this program.

### Gift Subscriptions

A Committee on Gift Subscriptions was appointed in April 1970, with Dr. H. J. Teskey of Ottawa as Chairman. The Committee was charged with the responsibility of obtaining gift subscriptions from Canadian entomologists desirous of giving to foreign colleagues or institutions requiring them, the journals and memoirs they could otherwise not afford. Preliminary enquiries have resulted in a list of forty potential recipients of such gift subscriptions and several offers of donations. You are invited to participate in this venture and should contact Dr. Teskey for further information on this new, worthwhile activity of the Society.

### Continuing Appointments

- (a) Through its representative, Mr. J. A. Downes, the Society continues to be informed on water pollution research through the activities of the Canadian Committee on Water Pollution. A meeting was attended by Mr.

Downes on 20 March 1970. At the meeting—as at the one previous in 1969—the Committee was mainly concerned with organization, status of membership in relation to the international parent body and the dispensing of funds in support of Canadians selected to present papers at the next International Conference of this body in San Francisco. Funds used by the Canadian Committee come, for the present, mainly from an annual grant from the Department of Energy, Mines and Resources. While little action has been taken to date on technical and scientific matters relating to water quality or water pollution, it is expected that such should be forthcoming and that the E.S.C. should retain membership in the Canadian Committee.

- (b) Canadian Committee on Animal Care. Dr. A. S. West, the E.S.C. representative on this Committee reports no action for 1970 by this Committee. We shall continue to keep a watching brief on matters as they relate to the terms of reference of this Committee.
- (c) The International Congress in Biometeorology. Dr. W. O. Haufe is the Society's representative to this Congress. He reports that the next congress (the sixth) will be held, in all likelihood, at Stressa, Italy, September 3 - 9, 1972. Clarification is still being obtained by our representative on the possible relation between the Biometeorological Program and the United Nations Conference on Environmental Quality to be held in Stockholm in 1972. This point and the extent of the E.S.C. representative's involvement in the Congress at that time will be further clarified during the coming year.
- (d) Committee on Technician Training. Dr. H. E. Welch of the University of Manitoba has been unable to accept the Chairmanship of this Committee but we are grateful to him for having researched the background needs of the Committee and it is felt that the Committee should be active, particularly regarding training of technicians for university and government and industry needs with the proper autonomy requirements. Further action on this Committee was deferred to the incoming Board.
- (e) Population Control. The Board recommended that the Society, through its President, actively support and encourage the development of a national policy for the limitation of Canada's human population and the stabilization of that population at an ecologically acceptable level, that is, a level at which a reasonable standard of living can be sustained for future generations with the resources available. This subject is to be brought before you later for discussion and vote. You will be asked, in this instance, as on many other instances from now on, to give advice and support to your Board's actions.

In conclusion, I think that you will agree that the Society's activities, on behalf of its members and of Entomology, are becoming both numerous and diverse. This is inevitable as we begin a decade in which science policy and the deployment of scientific resources are subjects of national debate. Led by our Governing Board and ably supported by our appointed officers, we must all be prepared to contribute our energy and knowledge to the promotion of the aims of our Society.

E. J. LeRoux



# THE GREAT PESTICIDE CONTROVERSY

## THE ENTOMOLOGIST'S ROLE

*Taken from C. R. Harris' introductory remarks as chairman of the symposium Insecticides — Past, Present, and Future, at the Annual Meeting, Winnipeg, 24 August 1970.*

Twenty years ago the name DDT was a common household word. The communications media carried glowing reports of the tremendous increases in crop yields and vast advances which were being made in controlling insect vectors of diseases, such as malaria, as a result of the development of DDT and the other synthetic organic insecticides. Entomologists wrote glowing reports on the advantages of these ultimate insecticides that would eliminate the various species of insect pests. The man who discovered DDT was awarded a Nobel Prize.

Today, 20 years later, DDT is still a household word. But no longer is it spoken of as a saviour of mankind. The communications media, fickle as they may seem, condemn DDT and its relatives both in news reports and on the editorial pages. The insect species which DDT and other organochlorine insecticides were to eliminate have instead become resistant, and survive in even greater numbers. In addition, because of their persistence and mobility, some of these compounds are causing serious environmental side effects, and biologists and conservationists, the public, and consequently the politicians, are up in arms over residues occurring in Coho salmon and the decline of the bald eagle and the peregrine falcon. There is strong pressure to restrict drastically, or even to ban, all pesticides and to rely completely on "biological control", and in a number of provinces, states, and countries partial bans on the use of persistent pesticides are already in effect.

Knowledgeable scientists concede, however, that with the majority of pest control problems biological control is at present impractical if not impossible. More hopefully, it is now, or soon will be, possible in a number of instances to utilize chemical insecticides more sparingly by adopting techniques of integrated control involving the use of narrow spectrum chemicals combined with natural biological control, or with commercially available biological control agents. However, even with integrated control the possibilities are limited. Consequently, for at least the next 10 to 20 years, chemical insecticides will continue to be the first line of defence in controlling insect pests.

The development of new, less hazardous insecticides will not occur overnight, and it will be necessary to rely largely on materials now in use, but using techniques of application which will ensure a minimum of environmental contamination. To accomplish this, we will certainly require more stringent regulation of pesticide use. And, if we are to develop narrow spectrum insecticides, whether they happen to be chemical or biological control agents, there is an immediate need for a vastly expanded research program involving a co-operative approach between Industry, Universities, and Government.

These three agencies each represent different points of view but in addition, we have a group present representing a fourth. With the exception of a few vociferous, and perhaps misguided individuals such as myself, however, the membership of this group has remained largely inconspicuous and uncommitted in the pesticide controversy. I am, of course, referring to all of you in the audience — that is, the entomologists, and through you, your professional society. The pesticide controversy, at present, has become extremely

polarized), with the pro-pesticide groups pitted against the anti-pesticide forces, and with absurd claims, charges, and counter-charges being made on both sides. It is high time that knowledgeable, impartial individuals stepped into the void which has been created and put forward some constructive suggestions to help solve the problems which do exist, and I feel that this is your responsibility, either as individuals or through the Entomological Society of Canada.

The Entomological Society of Canada is particularly well-suited for this task because it does not represent just the pro-pesticide forces. In fact, it has a broad spectrum of membership encompassing not only economic entomologists, but physiologists, toxicologists, pathologists, systematists, ecologists, and also presents a cross-section of members drawn from industries, government, and universities, and through amateur entomologists, the public. In fact, it represents a group of well-trained and concerned biologists who are probably more cognizant of the pros and cons of pesticide use and the possibilities for the future than many of the individuals who are presently dominating the public discussions on pesticide use.

Surely, you as individuals and through the Society have a responsibility to put forward to the public, and to our Governments realistic suggestions for solving the pesticide problem. You might argue that because of the wide diversity of interests and affiliations, it might not be possible to come up with an opinion on which the majority could agree, but I doubt if this is the case. For example, those of you who deal directly with insect control know that there is no way that we can do without chemical insecticides in the vast majority of cases. At the same time, many of you will admit privately that insecticides have been grossly misused, that you have serious reservations about the adequacy of the present procedures for registration of chemical insecticides at the Federal level, and about the laxity of regulations controlling pesticide use in most of the Provinces, and that you are seriously concerned about the failure of the Canadian Universities to train specialists in economic entomology to help solve the problem. On the other hand, entomologists concerned with the development of biological control agents will generally admit to the limitation of these techniques, but at the same time protest bitterly over the limited research support for this approach and the severity of the requirements for registration of biological control agents.

Finally, entomologists are basically biologists and naturalists at heart and are as concerned about environmental side-effects as anyone. Consequently, I feel that up to the present, you have been neglecting your responsibilities by not contributing either individually or through the Society, realistic suggestions to the solution of the problem.

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### CANADIAN ENTOMOLOGIST 100 YEARS AGO

Around my currant bushes were playing during the summer months, innumerable "Ichneumon flies". I never saw so many congregated within a similar space before. They were of different sizes and colours. I noticed one of the larger ones, of a steel-blue colour, with a linear body, entangled in a spider's web. Madame Arachne, however, soon discovered that she had "caught a Tartar"; for, after a few ineffectual struggles to escape, the Ichneumon managed to insert her ovipositor into the body of the spider, retaining it there for a longer period than would have sufficed for the deposit of an egg — probably the original intention — in fact, until the spider was, or appeared to be, dead. I need scarcely add, that I always welcome the appearance of the Ichneumons, cruel as is their mode of propagation.

# INTERNATIONAL UNION OF FOREST RESEARCH ORGANIZATIONS

The IUFRO Congress is to be held in Gainesville, Florida, 14-21 March 1971. This is an international congress not just in name because delegates will attend from around the world. The Congress is organized in sections (e.g. forest diseases, site factors in forestry) and communication between sections is provided for.

Five intensive sessions concerned with insects are planned:

- integrated or harmonious control in forest entomology.
- population dynamics of forest insects.
- joint sessions with tree breeders on host resistance through provenance and genotype to insect attack.
- joint sessions with forest pathologists and ecologists concerned with site factors.
- a general session on host resistance and general control methods.

The chairman of the working group on international cooperation in forest insect research is:

R. W. Stark,  
Coordinator of Research and Dean,  
Graduate School,  
University of Idaho  
Moscow, Idaho 83843, U.S.A.

## JOINT MEETING NORTHEASTERN FOREST INSECT WORK CONFERENCE ACADIAN ENTOMOLOGICAL SOCIETY

6 - 7 April 1971

Lord Beaverbrook Hotel, Fredericton, N.B.

### Symposium. 6 April

Communication of research: Are we bridging the gaps between biologists, resource managers and the public?

- Communication: its tools and how to use them effectively
- Are entomologists and resource managers tuned in on the same wave length?
- Journal publications — input and output
- Are you, the biologist community, short-changing the public?

### Workshops. 7 April

Concurrent workshops or discussion groups.

If you are not a member of one of these groups and would like to receive the notices and other information, write:

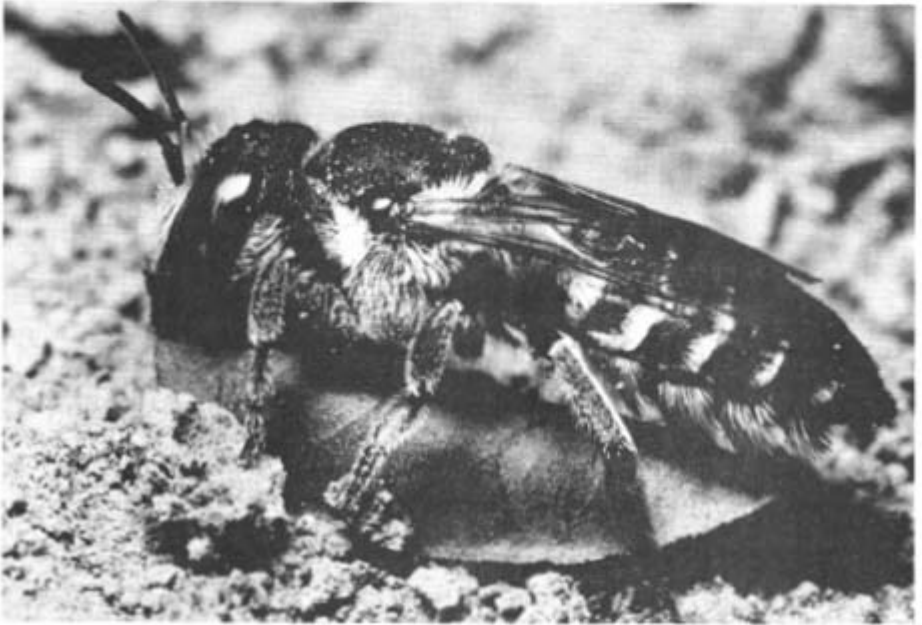
Mr. E. G. Kettela, Registration Chairman,  
N.E.F.I. — A.E.S. Work Conference,  
P.O. Box 4000,  
Fredericton, N.B.



**20th**  
**ANNUAL**  
**MEETING**  
WINNIPEG  
**1970**



1970 PHOTO SALON  
BLACK and WHITE



- FIRST** — *Rotundata Resting with Leaf Cutting*  
E. T. Cushul, CDA Research Station,  
Lethbridge, Alberta
- SECOND** — *Wheat Stem Sawfly Ovipositing*  
E. T. Cushul
- THIRD** — "Balloon Wing" in *Musca*  
T. H. Stovell, Belleville
- HONORABLE MENTION** — *Clover Leaf Miner Feeding on Wolf Willow*  
E. T. Cushul

1970 PHOTO SALON  
COLOR



**FIRST** — *Coral Hairstreak Resting*  
W. Petrie, Canadian Defence Research,  
London, England

**SECOND** — *Lesser Migratory Grasshopper*  
R. W. Cheale, Winnipeg

**THIRD** — *An African Saturniid after Emergence*  
W. Petrie

**HONORABLE MENTION** — *Chrysomela scripta*  
R. W. Cheale

## FEATURE PHOTOGRAPH



The inquiline *Periclistus pirata* (Osten Sacken), Cynipidae, ovipositing in an immature gall of *Diplolepis polita* (Ashmead), Cynipidae, on *Rosa acicularis* Lindl., x7. Photo by J. D. Shorthouse, Department of Biology, University of Saskatchewan.

*Periclistus* spp. inhabit only the galls of *Diplolepis* spp. Larvae of *P. pirata* replace the gall-forming *D. polita* larva and, as a result of their feeding activities, both enlarge and structurally modify the host gall.

## ACADIAN ENTOMOLOGICAL SOCIETY



*Dr. Ellen MacGillivray, President, and Dr. B. B. Migicovsky, keynote speaker, continue the amicable discussion during a recess at the 1970 Work Conference of the Acadian Entomological Society.*

The highlight of the recent Annual Meeting of the Acadian Entomological Society was a symposium entitled: Integrated Resource Management — The Entomologists' Role.

Dr. B. B. Migicovsky, Director General, Canada Department of Agriculture Research Branch, gave the keynote address on the meaning and definition of the term "Integrated Resource Management". Other symposium speakers were: Dr. P. S. Corbet, Director, Research Institute, Belleville; Dr. i. C. M. Place, Maritimes Regional Director, Canadian Forestry Service; Mr. David Brack, Department of Energy, Mines and Resources, Ottawa; Dr. A. J. Howitt, Michigan State University; Mrs. D. Young, Home Economist, Fredericton; Dr. R. M. Strang and Mr. K. L. Runyon, Canadian Forestry Service, Fredericton.

Dr. I. W. Varty was chairman of the symposium and he moderated a lively discussion which followed the presentation of invited papers. The discussion tended to polarize on two issues; (a) the use and misuse of insecticides in the production of food for exploding human populations, and (b) environmental quality problems associated with high population densities and the need for population control. The Society President appointed a committee to review current legislation on the use of pesticides with the view of modifying or changing such legislation to control harmful side effects.

C. A. Miller



## ENTOMOLOGICAL REMINISCENCES OF A YEAR IN THAILAND

On 30 June 1969, my wife and I left Canada to spend a year at Khon Kaen University, 275 miles northeast of Bangkok, in Thailand. On 30 August 1970, we returned to Winnipeg, having spent 13 months at Khon Kaen, and having travelled around the world and visited 16 countries.

Since 1965, the University of Manitoba has been sending advisors in Engineering and Agriculture under a Colombo Plan contract, to assist in the establishment of this new university in northeast Thailand. When I was there I was the only Canadian advisor in the Faculty of Agriculture of KKU and my special responsibility was to the Department of Plant Protection.

At the first opportunity, I visited entomologists in Bangkok, to meet them and to learn something of the status of entomology in Thailand. Most of the entomologists are located on the campus of Kasetsart University. The main laboratories of the Department of Agriculture of the Ministry of Agriculture, Entomology Section and Plant Pest Control Section, are on the campus. Also here is the Entomology Section of the Rice Department, studying the pests of rice. The Department of Entomology of Kasetsart University, under Dr. Sutharn Areekul, is strong and vigorous, but temporarily slowed down because so many of the staff are abroad studying for higher degrees. Elsewhere in Bangkok, some very good research in medical entomology is under way in the medical research laboratory of SEATO, and there are occasions when personnel of FAO, NRC, USOM, UNDP, and the Rockefeller and Ford Foundations deal with problems of insect control.

Outside Bangkok, some studies on insect control are necessary at the research stations of the Department of Agriculture and the Department of Rice. Chiangmai University has one entomologist on its teaching staff, and there is an Entomology Section of the Thai Tobacco Monopoly Research Centre near Chiangmai. Khon Kaen University has four entomologists, two of whom are now at the University of Manitoba for graduate studies. The Agricultural Centre North East is located about seven miles from KKU, and has a "twinning" arrangement with the University of Kentucky. Dr. Fred Knapp from the University of Kentucky has recently completed two years at ACNE, where he established the nucleus of a strong research group of young Thai entomologists.

There is no entomological society in Thailand, and no medium of publication exclusively for entomology. I believe that entomology in Thailand would take a giant step forward if a national society were formed, and some opportunity or incentive were available for publication. Almost all Thai entomologists in Thailand are civil servants; even members of the faculty of Universities are government employees.

Sericulture fascinated me. It is a cottage industry in northeast Thailand, but there are also some large factories for silk production. I was able to take several good photographs of all stages of the silkworm, and of the mulberry, and of pretty young ladies unwinding silk from the cocoons. The Government of Thailand has small sericulture and mulberry research centres throughout the country, some of them profiting very greatly from the advice of experts from Japan.

As far as I could ascertain there is no beekeeping in Thailand. There have been two or three abortive attempts to establish commercial apiaries. There are five colonies of honey bees, plus some new equipment, at KKU, a

gift from the government of New Zealand. Mr. Yongyoot Waikakul of KKU is now at the University of Manitoba studying beekeeping under Prof. S. C. Jay, with the intention of developing apiculture in Thailand after his return home.

My duties at KKU were far from onerous, and I spent considerable time looking for aphids. I use the word "looking" rather than "collecting" because aphid collecting in Thailand was very unrewarding. In one ordinary summer day in Manitoba, I could collect as many species as I was able to find in a year of collecting in Thailand! I sent home about 450 samples in alcohol, but from this will come records of probably only 50 species. *Aphis gossypii* was collected on 80 different plants, and thus represents 80 samples! Many of the samples which I thought might be woolly aphids are now mounted on slides, and are scale insects or mealybugs! I presume that aphids are not as numerous in species in hot countries as they are in north temperate climates.

As well as being unrewarding, collecting was unpleasant because of the heat. There are 12 species of poisonous snakes in Thailand, and at first I was wary and fearful of an encounter with any of them in the "jungle". As I watched young children, and others, moving about with impunity as they herded water buffalo through the vegetation, I realized that the snakes were more afraid than I was, as long as I let them know I was coming. My worst enemy was a species of large red ants. These made nests in the trees by webbing leaves together. They seemed to be everywhere, and I had only to stop for a moment to examine a leaf or stem, and I would be immediately attacked.

Each morning, before 8 am when classes started, I used to walk around the four floors of the Agriculture Building at KKU and collect the many species of insects that remained on walls and floors after being attracted to the lights of the building during the previous night. There are no Mantidae in Manitoba, so you can imagine the pleasure I had in collecting at least seven species during my stay at KKU. I brought home to our Department of Entomology five double boxes of Thai insects, nearly all collected before 8 am on many, many mornings.

There are several good insect collections in Thailand, but only two or three entomologists are working in taxonomy. One national collection, supported by several well-trained taxonomists is needed. Material collected in Thailand and sent abroad for identification, may or may not be returned, even if identified. I plan to place at least three sets of my slides of aphids in various museums in Thailand, to help someone get started in aphid taxonomy.

From the non-entomological point of view, I made two important findings. I learned how very pleasant and delightful the Thai people are; they have a philosophy of life and of living that we could profit from by studying it. And, I learned what I should have known previously, that we in Canada are a very fortunate people, and that Canada is a very fine place to live.

A. G. Robinson

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## OBITUARY

Ralph R. Hall died 25 July 1970. A graduate of Queens University, he was employed by the Department of Health and Welfare since 1957, as a biologist in the Zoonosis Laboratories of the Canadian Communicable Disease Centre.

## DEAN OF ORCHARD ENTOMOLOGISTS RETIRES



C. Gordon "Dusty" Dustan retired 16 October after a varied and productive career as entomologist with the Ontario and Canada Departments of Agriculture.

Born in Dartmouth, Nova Scotia, he attended public and high schools in Halifax. He spent two years at the Nova Scotia Agricultural College and two years at the Ontario Agricultural College to obtain his B.S.A. in 1927. In 1929 he proceeded to the University of Minnesota where he obtained his M.S. in 1930. In 1936 he married Elizabeth Catchell of Baltimore, Md. They have three children.

During his student days he scouted for the apple sucker in Nova Scotia and the gypsy moth in Quebec for the Canada Department of Agriculture and investigated the European corn borer in southwestern Ontario for the Ontario Agricultural College. At the time of his graduation in 1927 the oriental fruit moth threatened to destroy the Ontario peach industry; Dusty was employed by the Fruit Branch of the provincial Department of Agriculture to assist in cooperative investigations on the moth under the general direction of W. A. Ross of the Dominion Entomological Laboratory at Vineland Station. For several years Dusty headed a team that intensively studied the life history, ecology and control of the moth and aided the Belleville Parasite Laboratory in the successful introduction of the parasite *Macrocentrus ancylivorus*. As a consequence he became recognized as a leading authority on the moth.

In 1935, as the threat of the fruit moth temporarily waned, Dusty was transferred to the Ontario Agricultural College as Research Assistant under Prof. L. Caesar. There he worked on onion maggot control and other problems, spending the summers at Vineland and the winters at the College where he also lectured part-time.

Many difficult insect problems affecting the flower industry led the CDA to establish a new position as entomologist at the Vineland Station Laboratory. Dusty was appointed to this position in 1940 and soon developed an extensive research and extension program. However, wartime exigencies changed priorities and he, like others of the Vineland staff, was assigned to a crash program for developing alternatives for insecticides that threatened to become in short supply. The first small supplies of DDT to reach Canada under war-time secrecy were assigned to this team, and Dusty played a large role in the early development of this insecticide in Canada.

In 1947 Dusty was appointed Officer-in-Charge of the Vineland Station Laboratory when W. A. Ross relinquished the position to devote full time as head of the Fruit Insect Unit at Ottawa. After the amalgamation of the Vineland Entomology Laboratory with the St. Catharines Plant Pathology Laboratory to form the present Research Station in 1960, Dusty became Head of the Entomology Section. At later reorganizations he became Head of the Pesticide Section and Program Leader of the Pesticide Group.

For years Dusty has been the acknowledged dean of Ontario orchard entomologists. More than any other person he has been responsible for the

advice on fruit insect control supplied to growers, both directly from the Research Station and through the annual spray calendars prepared jointly by the Ontario and Canada Departments. His advice will be greatly missed. Despite his administrative duties he has published more than thirty scientific papers as well as many extension publications. He is a member of the Entomological Society of Ontario (President 1957-58), the Entomological Society of Canada, and the Entomological Society of America.

Only those who have served under him fully realize his kindly and generous nature. More generally known are his keen sense of humour and his ability as a raconteur. Any affair with Dusty as master of ceremonies is a certain success.

Many of Dusty's colleagues and numerous visiting scientists from other countries will remember with pleasure the cordial hospitality of the Dustan household. Their many friends will be pleased to know that Dusty and his wife Elizabeth will continue to live at their home on Victoria Avenue, Vinceland Station.

Wm. L. Putman

## CROP LOSSES OR GAINS?

The Seventh International Congress of Plant Protection was held in Paris, France, 21 to 25 September 1970. There were more than 1500 participants, including entomologists, plant pathologists, nematologists and weed specialists, most of whom were Europeans. Sixty participants were from the United States and only six from Canada.

Fourteen sessions covered subjects ranging from crop losses to aerial application of pesticides. The five papers presented at plenary sessions discussed "Economic Aspects and Developments in Plant Protection", "Mycoplasmas and Mycoplasmosis", "The Toxicologist's Views on Chemical Pest Control", "Modern Weed Control and its Impact on Agricultural Production Techniques", and "New Trends in Pest Control". This collaboration between the various disciplines concerned with plant protection is invaluable and one in which our European colleagues are much more advanced than we are in North America.

The session on the economics of plant protection, concentrating mainly on crop losses, was the most intensive. It was interesting to note that three of the papers were presented by agricultural economists. One of these recommended that those of us who are engaged in the study and promotion of plant protection should forsake our negativism and adopt a positive approach, emphasizing that our goal is crop gain from crop protection. Several papers in this and other sessions reflected a trend in this direction, stating the results of pest and disease control experiments not only in pest and disease reduction but in productivity gains, and drawing their conclusions primarily from the latter. These, and other speakers stressed the need to relate these gains to the protection costs.

The "Summaries of Papers" (868 pp) has been placed in the Library of the Department of Agriculture, Ottawa.

D. G. Peterson

# OLFACTION AND CHEMORECEPTION

This past summer, I was very fortunate to be able to attend the "International Summer Course on Odour Perception: Multidisciplinary Research Methods" held in Utrecht, The Netherlands, from 23 August to 5 September.

The course was designed to stimulate the interchange of ideas among researchers in the field of olfaction. The present-day approach in this field is multidisciplinary including psychophysics, physical and organic chemistry, behaviour, anatomy and histology, and electrophysiology. The course was extremely useful because detailed knowledge of only one or two of these fields can be expected of any one researcher.

About one hundred persons from various parts of the world attended. The nature of the group and the general organization of the course made it possible to become involved in enlightening discussions with many prominent researchers. The course itself threw light on the varied technical approaches presently being used.

The following suggestions for the selection of stimulants are notes on a course presented by Dr. M. G. J. Beets, The Netherlands. I include this since it is an extremely useful guide for anyone contemplating research in olfaction or chemoreception.

## General

1. There is no panacea. Any research project in olfaction can only be expected to yield a maximum of information if the selection of stimulants is planned as carefully as other aspects of the experiment.
2. Anybody is free to select his own stimulants as long as he is aware of the implications but he must not select chemicals only because they happen to be on his shelf.
3. Anybody not chemistry-oriented, is advised to discuss his problem with an organic chemist.

## Selection

1. Avoid the use of stimulants with molecular weights below 70, of strong acids and of strong bases, unless there is a well-considered reason to use them. There are many reasons for these restrictions, mostly because of the physical, chemical and physiological characteristics of such chemicals.
2. Select series of chemicals on the basis of well-defined structural relationships.
3. Select stimulants with sterically well-accessible polar groups and rigid molecular structures rather than non-polar chemicals or chemicals with flexible structures. This reduces the complexity of the response pattern obtained.
4. Avoid chemicals with unknown structure or unknown configuration.
5. Use as many chemicals in an experimental series as you can.

## Purity

1. Use the purest chemicals you can get. The best are from G.L.C. traps but in most cases chemicals purified by efficient fractionation or recrystal-

lization are satisfactory. Always check the purity by G.L.C. unless your source is reliable.

2. Avoid chemicals suspected of having odours due to trace impurities (e.g. lower hydrocarbons).
3. Never trust the label on a bottle unless you have obtained the material from a reliable source. If you wish to obtain pure fragrance materials, contact the supplier's research department rather than its commercial department. Geraniol, for example, is notoriously variable.
4. Avoid using mixtures of stereo isomers since these frequently elicit widely different responses. Many chemicals such as unsaturated compounds, cyclic compounds or chemicals carrying the prefix iso- are frequently mixtures of stereo or other isomers.

### Check

When you interpret your final results check again with your chemistry-oriented adviser.

While in Europe, I also had the opportunity to visit the Anti-Locust Research Centre as well as the Entomology groups at Imperial College, London, and at Ascot.

The trip was financed in part by a NATO scholarship and in part by the School of Graduate Studies of the University of New Brunswick and by my supervisor, Professor W. D. Seabrook. I am extremely grateful for this support.

P. J. Albert

Mr. Albert is a student of insect neurophysiology and a candidate for the PhD in the Department of Biology, University of New Brunswick. He is a student member of the E.S.C. — Ed.

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### CANADIAN ENTOMOLOGIST 100 YEARS AGO

AN ODD PLACE FOR A HUMBLE BEE'S NEST — Our country butcher being for a long time annoyed in his shop with humble bees, was at a loss to find out where they all came from. His shop is a wooden erection, having a broad running beam at the top of the wall to support the roof. The windows are open in the summer and the apertures covered with hexagon wire netting. On carefully searching the premises, he discovered on the top of this beam, at the foot of a rafter, a thriving colony of humble bees, snugly ensconced among the wool in a sheep's tail which he had cut off and thrown there some time in the spring. At my request the butcher promised to preserve it, but unfortunately, when I next went to see it, I learned that some rats had found it out and destroyed it. — R. D. Cruden, in *Science Gossip*. (Last summer I observed a somewhat similar instance. In the spring I carelessly threw a buffalo skin over a beam in my barn, in such a way that the sides hung down with the hairy portions inwards. Sometime afterwards, suspecting the depredations of moths, I proceeded to beat the skin with a stick, and was considerably astonished to hear a great buzzing, and find myself attacked by some enraged humble bees, who had made their nest among the hair. After a time the skin was knocked down upon the floor, and the bees deserted their novel quarters. — C. J. S. B.)

## THE PERIODICAL LITERATURE USED BY ENTOMOLOGISTS

A year ago, I was asked to represent my discipline on a committee assigned the responsibility of assessing the quality of the University of Maine Library and making recommendations for resource acquisitions over the next five years. Those of us that were scientists were interested principally in journals. Some guide was required to indicate what periodicals a library should have to serve the research and teaching needs in each particular discipline, entomology in my case. Some committee representatives simply polled their colleagues, but some of us sought more objective methods. P. K. Anderson (*BioScience* 16:794-795, 1966) used the frequency of citation of periodicals in two major ecological journals as a guide to the most used, and therefore probably the most important, periodical resources in that field. This sort of citation analysis seemed well adapted to my needs. The results of my search are offered below as perhaps helpful to others assigned the task of evaluating entomology libraries or making recommendations for the establishment of new libraries.

The reference lists were searched in all papers published in the 1969 volumes of the three major North American journals of entomology, *The Canadian Entomologist* Vol. 101, *Journal of Economic Entomology* Vol. 62, and *Annals of the Entomological Society of America* Vol. 62. A total of 6955 citations encompassing 770 periodicals was recorded. Fortunately, Miss Victoria Field, a research assistant, was able to help on the initial tabulation.

As reported in similar studies (Anderson *loc. cit.*, Brown C.H. Assoc. Coll. Ref. Libr. Monog. 16, 1956), a small number of periodicals was heavily cited while half of the 770 journals was cited only once. The 10 most cited journals accounted for nearly half of the total citations. My data are compared with those of Anderson in Table I. The data for entomology compare most closely with those for botany and for physiology, disciplines which we expect would use a more restricted literature than ecology or zoology.

The most cited periodicals are presented in rank order in Table 2. I have arbitrarily included only those journals cited five or more times; a total of 161 journals, about 20% of the total journals cited. I do not necessarily recommend a cut-off level of 5 citations in 6955 for selecting the important journals for a library. Each individual must select his own cut-off level depending on the size of the library involved and the demands that will be made on it.

A few precautions in the use of the data should be mentioned. The citations tabulated involved not only journals in the strict sense, but also proceedings, transactions, and miscellaneous publication series. Other types of serials such as *Annual Review of . . .*, *Advances in . . .*, were not included even though heavily cited. Symposia were also excluded even though some are serial in nature, e.g. *Cold Spring Harbor Symposium*.

While the rank order of periodicals presented probably reflects the reading of a great many entomologists, it may be inappropriate for certain specialized groups, e.g. medical entomologists who use much medical literature and toxicologists who favor chemistry journals. The use of this list should therefore be supplemented by consultation with specialized colleagues.

The list gives poor appraisal of the usefulness of newer journals. As examples, the *J. appl. Ecol.* was cited only twice and the *J. med. Ent.* only five

times. Neither of these journals have existed long enough to accumulate a significant pool of papers to cite. The rank of these newer journals here is a poor reflection of their probable utility in the long run.

The abbreviations in Table 2 follow the World List of Scientific Periodicals, 4th Edition. A mimeographed list of the remaining, infrequently-cited journals found in this study can be obtained by contacting me at the Department of Entomology, University of Maine, Orono.

J. B. Dimond

Table 1

Periodicals ranked by percent frequency of citation in selected journals

Ranked Periodicals	Entomology	Ecology*	Zoology*	Botany*	Physiology*
1st 10	49	30	24	39	46
1st 25	58	43	39	56	67
1st 50	67	56	54	60	80
1st 100	84	69	66	63	91
1st 200	92	80			

\* Data from Anderson (*loc. cit.*)

Table 2

Periodicals most cited by entomologists; 161 journals and number of citations in 6955 in the three major North American entomology journals for 1969

J. econ. Ent.	1656	J. exp. Biol.	30
Ann. ent. Soc. Am.	578	J. N. Y. ent. Soc.	30
Can. Ent.	463	Mem. ent. Soc. Can.	30
Nature	156	Biol. Bull.	30
J. Insect Physiol.	135	Procs. intl. Congr. Ent.	30
Science	125	Smithson. misc. Collns.	30
Entomologia exp. appl.	81	Bull. ent. Soc. Am.	29
Can. J. Zool.	71	Proc. n. cent. Breth. ent. Soc. Am.	29
Bull. ent. Res.	69	J. Kans. ent. Soc.	27
Proc. ent. Soc. Wash.	67	Proc. U. S. natn. Mus.	27
J. agric. Food Chem.	66	Annls. Epiphyt.	26
Mosquito News	63	Z. angew. Ent.	24
Milgardia	60	Z. vergl. Physiol.	24
Trans. R. ent. Soc. London	51	Ann. Bot.	22
J. agric. Res.	50	J. Wash. Acad. Sci.	22
Ecology	49	Biometrics	22
Ann. appl. Biol.	42	J. expl. Zool.	21
Trans. Am. ent. Soc.	42	J. Ass. off. agric. Chem.	19
Pan-Pacific Ent.	40	J. For.	19
Ent. News	38	Parasitol.	19
Psyche	38	Proc. Hawaii ent. Soc.	19
J. Invertebrate Path.	36	Revue Ent.	19
Genetics	34	Agron. J.	18
Fla. Ent.	33	Can. J. Pl. Sci.	18
Phytopath	32	Iowa St. Coll. J. Sci.	18



J. Morph.	16	Botyu-Kagaku	7
J. biol. Chem.	17	J. Bact.	7
Analyt. Chem.	17	Dt. ent. Z. Iris	7
Forest Sci.	17	Gt. Basin Nat.	7
Ohio J. Sci.	17	Insectes soc.	7
Contr. Boyce Thompson Inst.	16	Proc. natn. Acad. Sci.	7
Proc. ent. Soc. Ont.	16	Q. Rev. Biol.	7
J. Parasitol.	16	Soil Sci.	7
J. Sci. Fd. Agric.	16	Syst. Zool.	7
Am. Midl. Nat.	15	Tijdschr. Ent.	7
Misc. Pubs. ent. Soc. Am.	15	Wien. ent. Ztg.	7
Physiol. Zool.	15	Zool. Jber.	7
J. Am. Chem. Soc.	14	Am. J. Hyg.	6
Biochem. J.	14	Analyt. Biochem.	6
Proc. zool. Soc. London	14	J. Am. Soc. Agron.	6
Proc. R. ent. Soc. London	14	Am. J. trop. Med.	6
J. Anim. Ecology	13	Acta chem. scand.	6
Agric. Chem.	13	J. Acad. nat. Sci. Philad.	6
Calif. Agric.	13	Bestr. Ent.	6
Radiat. Res.	13	Can. J. Genet. Cytol.	6
Am. Nat.	12	Dt. ent. Z.	6
Aust. J. Zool.	12	Entomologia Am.	6
Biochem. Pharmac.	12	Expl. Parasit.	6
Indian J. Ent.	12	Opusc. ent.	6
Proc. Calif. Acad. Sci.	12	Virology	6
Pest Control	12	Zool. Anz.	6
Ann. Mag. Nat. Hist.	12	Z. Morph. Oekol. Tiere	6
Proc. Am. Soc. hort. Sci.	11	Am. J. Bot.	6
Stain Technol.	11	Ent. Ber.	6
Scient. Am.	11	Z. Naturf.	6
Am. J. trop. Med. Hyg.	10	Anim. Behav.	5
Acarologia	10	An. Acad. Brasil. Cienc.	5
Ecol. Monogr.	10	J. Agric. Univ. Puerto Rico	5
Pl. Dis. Reprtr.	10	Acta Zool. hilloana	5
Scient. Agric.	10	Bull. Brooklyn ent. Soc.	5
Bull. U.S. natn. Mus.	10	J. Chromatogr.	5
Coop. econ. Insect Rep.	10	Cotton Trade J.	5
Entomologist's Mon. Mag.	10	C. r. hebdom. Seanc. Acad. Sci., Paris	5
Agric. Monogr.	9	Can. J. Bot.	5
J. Am. Oil Chem. Soc.	9	J. gen. Physiol.	5
Ann. trop. Med. Parasit.	9	J. hort. Sci.	5
Proc. ent. Soc. B. C.	9	Jap. J. appl. Ent. Zool.	5
J. Hered.	9	Micruent.	5
J. cell. comp. Physiol.	9	J. med. Ent.	5
Proc. Acad. Nat. Sci. Philad.	9	N. Z. J. Sci. Tech.	5
Aust. J. biol. Sci.	8	Oikos	5
Crop Sci.	8	J. org. Chem.	5
Calif. Citrograph	8	J. Protozool.	5
Coleopt. Bull.	8	Tijdschr. PIZiekt.	5
Experientia	8	J. Wildl. Mgmt.	5
M. Physiol.	8	Vehr. zool-bot. Ges. Wien	5
J. Physiol.	8	Zool. Zentbl.	5
Q. J. microsc. Sci.	8	Ann. ent. Soc. Queb.	5
Redia	8	Biol. Rev.	5
Bull. Am. Mus. nat. Hist.	7	Annls. Soc. ent. Fr.	5

