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V. R. Vickery	Editor (Society Publications)
D. C. Eldt	Assistant Editor (Bulletin)

Cover Design: M. A. Sydor

Published by the
 Entomological Society of Canada
 1320 Carling Avenue, Ottawa

ENTOMOLOGICAL SOCIETY OF CANADA

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- Editor: D. P. Pielou, Dept. of Biology,
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CHANGE OF ADDRESS

The headquarters of the Entomological Society are now located at 1320 Carling Avenue, Ottawa, Ontario K1Z 7K9. All correspondence to the Treasurer and Managing Editor and all correspondence dealing with dues, missing and back issues of *The Canadian Entomologist* or the *Bulletin of The Entomological Society of Canada* and especially changes of address should be sent to the new address.

E. C. Becker
Treasurer

CONTRIBUTIONS

Contributions and correspondence should be sent to: D. C. Eids, Editor, *Bulletin of the Entomological Society of Canada*, P. O. Box 4000, Fredericton, New Brunswick. Inquiries about subscriptions and back issues should be referred to the Treasurer, Entomological Society of Canada, 132 Carling Ave., Ottawa, Ontario, K1Z 7K9.

DEADLINE

The deadline for the next issue, Vol. 5, No. 2 for June 1973 is 15 May.

Editorial

So much has been said about Banff, the setting for this year's Annual Meeting, that superlatives fail. The Entomological Society of Alberta last hosted the Society at the same place in 1966 with notable success. A first-class committee promises a first-class program; first-class diversions are assured.

ANOTHER WATERSHED

The Society is in the process of establishing a Silver Medal Achievement Award which would differ from the Gold Medal in that to qualify, potential recipients must be under forty years of age. It's a watershed of sorts, this fortieth year, like the age of majority, the age of transition to full fare on Air Canada, and the age limitations on events at the school track meet. While thinking about the Board of Directors deliberating the matter, we happened to look at their group photograph (*Bulletin* 5(1): 5) and not one of them is under forty.

FREE BULLETINS FOR RETIRED MEMBERS

While in Charlottetown last month, I just happened to be short of cash. I stopped at a bank and there was Fred Cannon, retired entomologist, as busy as he had ever been before retirement. He said something about making a deposit for a friend. They cashed my cheque without hesitation because "no identification is as good as knowing Fred Cannon".

The point of all this is that Fred dropped his membership in the ESC on retirement and did not know until I told him that he was entitled to receive the *Bulletin* free of charge by virtue of being retired. He is interested in the activities of his old associates and would be pleased to receive it. How many retired members do you know who are no longer members but would be interested in getting the *Bulletin*? Ask them to write the Treasurer at 1320 Carling Avenue, Ottawa K1Z 7K9.

D. E.

LETTERS TO THE EDITOR

CANADIAN FOREST ENTOMOLOGIST

Sir:

Since the size of the *Canadian Entomologist* is becoming far too unwieldy and since the subject of a split in the Journal will be coming up for discussion at the next Annual Meeting, perhaps the opinions of a former Editor could be aired for what they are worth. I have been thinking about the problem for over ten years, because even in my time as Editor the problem was looming around the corner with a journal size of 1344 pages.

I favor the Society budding off a new journal to be called "Canadian Forest Entomologist". There are a number of advantages: (1) the proposed split falls better into the modern trend toward problem orientation in research. (2) Over the years about 40% of the articles in the *Canadian Entomologist* have been quite clearly oriented toward forestry problems, so a 60-40 split is quantitatively reasonable. (3) Many of the members and an especially high proportion of those outside Canada are interested in the *Canadian Entomologist* primarily because it is one of the world's leading journals for publication of forest entomology research papers. The number of submissions from outside the country in this field are notable. (4) Any splitting of the Journal based upon discipline, or on basic versus applied level of research will become increasingly difficult to define as research is moving into a multidisciplinary approach at various levels and the levels themselves are becoming increasingly obscure. Furthermore it will obviate any problems of prestige for publishing in a "basic" versus an "applied" Journal.

The division I offer will not eliminate grey areas but I know of no sensible division that will. Perhaps the author himself could be allowed a choice in some cases.

I don't think this letter is the proper place to go into the logistical problems; I merely wish to suggest another method of splitting the Journal.

W. R. M. Mason

CANADIAN JOURNAL OF ECOLOGY

Sir:

The Ecology Section of the Canadian Botanical Association is trying to establish a Canadian Journal of Ecology. We have progressed with the preparations to quite an extent.

To further our chances of success we have solicited and received the help of organized groups of biologists (e.g. the Canadian Association of Environmental Biologists) and single researchers. The proposed journal is to be of the widest possible interest and should cover all branches of ecology.

I believe this to be an opportune time to inform you of our efforts because I have heard that the Entomological Society of Canada has been considering the establishment of a new journal. You may wish to take this into consideration in any action you may take.

H. van Groenewoud
Chairman, Ecology Section
Canadian Botanical Association

POST GRADUATE DEGREES

Sir:

In Bulletin 4:2, a list of the first 13 graduates (12 M.Sc.'s and one Ph.D.) in entomology from the Pestology Centre was published. Of 11 subsequent graduates from the Centre, 8 (5 M.Sc.'s and 3 Ph.D.'s) have written theses in the area of entomology. They are listed below with their graduation date, dissertation title, supervisor and present position.

At present there are 29 graduate students in research programs at the Centre (19 in the M.Sc. and 10 in the Ph.D. program). Of these, 23 (16 M.Sc.'s and 7 Ph.D.'s) are doing research in entomology or closely related areas.

J. H. Borden
Simon Fraser University

- J. M. HARDMAN, Ph.D. November 1972. Supervisor: A. L. Turnbull. Dissertation: The hunting tactics of an unspecialized predator, *Pardosa vancoveri* (Araneae: Lycosidae) with reference to spatial heterogeneity and the components of the functional response. Research Scientist, Stered Products Pests, CSIRO, Canberra, Australia.
- A. MACQUEEN, Ph.D. May 1973. Supervisor: B. P. Beirne. Dissertation: Horn fly breeding, nitrogen loss and nutrient immobilization associated with cattle dung in the southern Interior of British Columbia. Research Scientist, Biological Control of Cattle Dung, CSIRO, Brisbane, Australia.
- S. N. THOMPSON, Ph.D. June 1972. Supervisor: J. S. Barlow. Dissertation: Aspects of fatty acid metabolism in ichneumonid parasitoids and their hosts. Assistant Professor, Department of Biological Control, University of California, Riverside.
- S. M. CRAIG, M.Sc. March 1973. Supervisor: J. M. Webster. Dissertation: The host-parasite relationship between *Mermis nigrescens* Dujardin and the desert locust, *Schistocerca gregaria* Forskål. General Manager, Fraser Valley Mosquito Control Board, Vancouver.
- D. M. HUNTER, M.Sc. November 1972. Supervisor: J. M. Webster. Dissertation: The biology of the botfly, *Cuterebra grisea* (Diptera: Cuterebridae) infesting deer mice (*Peromyscus maniculatus* ssp. *austerus*) and observations on related botfly species. Going to University of Queensland to work towards Ph.D. degree.
- D. F. MAYER, M.Sc. April 1973. Supervisor: B. P. Beirne. Dissertation: Leaf roller (Lepidoptera: Tortricidae) host plant and parasite relationships in the Okanagan Valley of British Columbia. Senior Experimental Aide, Alfalfa Pest Management, Department of Entomology, Washington State University, Pullman.
- D. P. OSTAFF, M.Sc. March 1973. Supervisor: J. H. Borden. Dissertation: Sex attraction and reproductive biology of *Lambdina fiscellaria lugubrosa* (Lepidoptera: Geometridae). Research Officer, Eastern Forest Products Research Laboratory, Canada Department of the Environment, Ottawa, Ontario.
- D. M. WILSON, M.Sc. April 1973. Supervisor: P. C. Oloffs. Dissertation: Studies on the residual properties of high-purity chlordane (Velsicol HSC-3260) in soils and crops. Pesticide Evaluation Officer, Production and Marketing Branch, Canada Department of Agriculture, Ottawa.

NEW HONORARY MEMBER



George P. Holland

In recognition of his dedicated service to entomology, the Entomological Society of Canada has elected George P. Holland an Honorary Member, his reception and the presentation of the Certificate to take place at the Annual Meeting at Banff, Alberta, 2 October 1973.

Dr. Holland has been successively Head, Insect Systematics Unit and Director, Entomology Research Institute from 1948 until 1970, when he resigned the Directorship for reasons of health. His leadership and wise guidance in these positions have been of fundamental importance to the very extensive exploration of the insect fauna of Canada and development of the Canadian National Collection that has taken place in this period, and the long series of major taxonomic studies that has been published. He is himself a leading authority on the Siphonaptera, a group on which he has published numerous papers including a widely known monograph of the Canadian fauna and another on that of New Guinea.

Dr. Holland was President of the Entomological Society of Canada in 1957-58, and Chairman of the Centennial of Entomology in Canada that was celebrated by the Society in 1963. He served on the Advisory Committee on Entomological Research, Defence Research Board, from its establishment in 1948, and was Chairman from 1963 to 1967. He is a trustee of the Lyman Collection, McGill University, and a member of the Permanent Committee of the International Congresses of Entomology. In all these and numerous other positions of trust and responsibility in entomology, he has served with great distinction.

In 1963, Carleton University conferred on him the degree of Doctor of Science *honoris causa* and in 1967 he was elected a Fellow of the Royal Society of Canada.

Dr. Holland is continuing his active career of studies on the systematics of fleas at the Entomology Research Institute, and is at present engaged in a revision of his Canadian monograph in preparation for a new edition.

NEW HONORARY MEMBER



George F. Manson

In recognition of his distinguished career as an entomologist and research manager, the Entomological Society of Canada has elected George F. Manson an Honorary Member. He will be received by the membership and presented with the Certificate at the Annual Meeting at Banff, Alberta, 2 October 1973.

Mr. Manson joined the Canada Department of Agriculture at Lethbridge in 1927. He served in various positions and worked on a multitude of problems, notably wheat stem sawfly with reference to strip farming, pale western cutworm, and vegetable, sugar beet and greenhouse pests.

From 1942-45, he was Secretary of the Pesticides Requirements Committee, Wartime Prices and Trade Board. In 1944, he became Officer-in-Charge of the Lethbridge Entomology Laboratory and, in 1947, began the organization of the first integrated Science Service Laboratory at Lethbridge.

In 1948, Mr. Manson became Director of the Entomology Laboratory at Chatham, Ontario. Much of the research program dealt with fitting the newer, post-war insecticides to the needs of the farming community. He also spent a year (1961-62) in Rome with FAO as an insecticide-use expert in the Crop Protection Branch.

Perhaps Mr. Manson's greatest contribution was the early realization that many of the problems facing entomologists could be solved only through an interdisciplinary team approach. He began to build such a team in the mid-1950's and, within 10 years, the Chatham laboratory had become internationally known for its contributions in the fields of economic entomology, insect physiology, ecology, toxicology, and residue chemistry, and for pioneering work in the field of pesticide pollution.

Mr. Manson is a past President (1951-52) and Honorary Member of the Entomological Society of Ontario. He was also active in the Entomological Societies of Canada and America, and the Agricultural Institute of Canada. He now lives in retirement at Seeley's Bay, Ontario.

Entomological Society of Canada Medal



for

Outstanding Achievement

Presented to



Brian Hocking

Banff, Alberta, October, 1973

The Entomological Society of Canada Gold Medal for 1973 is awarded to Brian Hocking in recognition of the quality and variety of his contributions to Canadian entomology that have included scientific research, education, public relations and public service.

Brian Hocking was born in London, England, 22 September 1914. His early education was obtained at North Ealing Boy's School, London and Christ's Hospital, Horsham, Sussex. His higher education was obtained at the Royal College of Science, Imperial College of Science and Technology, London, at which he took a B.Sc. (Special in Biology) with Honours and the Associateship of the R.C.S.

Brian Hocking and Jocelyn Hicks were married in Edinburgh, Scotland, in 1938. They have two boys and one girl. The older son, Martin, is assistant professor of Chemistry at Victoria University, British Columbia. Drake is a member of the staff of the Canadian Forestry Service, at Edmonton, Alberta. Linnet, the daughter, is a grammar school teacher at Halifax, Nova Scotia.

Hocking's entomological career began in India during World War II when he served as an entomologist in the Indian Army. His work there was largely applied, and dealt mainly with the control of timber and stored products pests, both of which were interfering with the Indian war effort.

The Hockings came to Canada in 1946 when Brian took up the post of Assistant Professor of Entomology at the University of Alberta under Professor E. H. Strickland. It was here that his wide range of interests received full scope as evidenced by the range of topics in the 110 papers published since his arrival in Canada. These include contributions in ecology (insect-host plant relationships, mosquito and black fly populations); physiology (flight, nutrition, vision); behavior (termites, roaches, ants, bees, beetles, insect behavior in relation to smell); medical entomology (onchocerciasis, filariasis); insect pests and control (lice, biting flies, insecticides, repellents). The summers of his first few years with the University of Alberta saw development of his interest in biting flies. Under the sponsorship of the Defence Research Board, he studied the ecology, physiology and behavior of mosquitoes and black flies at Churchill, Manitoba. This work resulted in publications on these topics, on methods of control of biting flies with insecticides and on personal protection against their attacks. This work also provided the thesis "Some aspects of the biting fly problem in Canadian Subarctic regions" for his M.Sc. awarded by the University of Alberta in 1948 and laid the foundations for extensive reviews published some years later in the *Annual Review of Entomology* (1960 "Northern biting flies"; and 1971 "Bloodsucking behavior of terrestrial arthropods").

The biting fly work led to questions about dispersal and this resulted in his classic "The intrinsic range and speed of flight of insects" which formed the basis for much of the practical work on insect flight carried out since then. It formed the thesis for his Ph.D. awarded by the University of London in 1953. This study embraced the entire spectrum of flying insects and expanded Hocking's interests beyond pest species. Flight studies, in turn, led to questions about "fuel" and Dr. Hocking turned his attention to nectar and thus to insect-plant relationships.

On a sabbatical leave in Africa in 1960-61, Professor Hocking's interest in biting flies and medical entomology led to a study of onchocerciasis and its black fly vectors in the Sudan. His interest in social insects, developed originally from his work on termite control in India, by way of research on honeybees, was expressed in studies of termite aggregations. His interest in insect-plant interrelationships was combined with his interest in social insects in his work on the obligatory association of certain species of ants with certain species of acacias. Always a keen observer, his paper on "fire melanism" published in 1964 resulted from observing the behavior of certain grasshoppers near grass fires

on the African savanna. In 1964, on the invitation of the World Health Organization, Professor Hocking studied vector aspects of the filariasis problem in Rangoon, Burma, and made recommendations that were published in 1967.

During another sabbatical leave in 1968-69, he started a study of flight behavior in relation to diurnal winds, especially land and sea breezes on the shores of islands and lakes. This was taken further during two terms as Visiting Professor at the University of Queensland in 1972 and continues as opportunity offers.

In the educational field, 30 graduate students, 17 M.Sc. and 13 Ph.D., have taken degrees with Professor Hocking. A number of laboratory manuals are tangible evidence of his commitment and effort to improve biological education in Alberta high schools. His attempts to improve biological education for a broader audience are embodied in three books ("The Ultimate Science: a layman's account of Biology"; "Biology or Oblivion"; and "Six-Legged Science") and encyclopedia articles on flight, butterflies and moths, and beetles. Professor of Entomology and Head of the Department, University of Alberta, since 1954, this department under his guidance has come to be a leading center of graduate training and research in entomology.

At the present time, the Entomological Society of Canada is concerned with bringing the meaning and importance of entomology before the people of Canada. Professor Hocking has been leading the way in this important activity for 25 years during which he has given 69 broadcast talks including radio, TV and a CBC University of the Air series of lectures. Professor Hocking's ability and willingness to serve his community are seen in his long-term membership of the Advisory Committee on Entomological Research to the DRB, in his contributions to, and editorship of, the Armed Forces Manual on Pest Control, his membership on the Province of Alberta's High School Curriculum Committee on Biology and as an advisor on mosquito control to the City of Edmonton. His appreciation of his obligations to science are seen in his present and past membership in 18 biological societies in many of which he has served on the executive including the Entomological Society of Alberta (President, 1967) and the Entomological Society of Canada (President, 1960). Professor Hocking was elected to the Fellowship of the Royal Society of Canada in 1968. Under his editorship, *Quaestiones entomologicae* which first appeared in 1965, is now in its ninth volume, its pages including a series of thoughtful, delightfully written editorials whose subject matter extends over the spectrum of human endeavor.

The Entomological Society of Canada honors Professor Hocking for the breadth of his contributions and the distinction and recognition they have brought to entomology in Canada.

MEDALLISTS

1962 R. F. MORRIS	1968 W. G. WELLINGTON
1963 A. W. A. BROWN	1969 K. E. F. WATT
1964 R. GLEN	1970 C. S. HOLLING
1965 M. L. PREBBLE	1971 J. G. REMPEL
1966 C. W. FARSTAD	1972 R. W. SALT
1967 B. N. SMALLMAN	1973 B. HOCKING



Are You Bugged on Bugs? Etes-vous Ecrivain?

There is still lots of time to enter for the E.S.C. Writing Prize. 31 December 1973 was chosen as a closing date so that those who like to leave things until the last minute would have something useful to do over the Christmas holidays!

If you like insects, if you think what you are doing is interesting and important, if you are "bugged on bugs", why not try to convey some of this enthusiasm to the people who eventually pay the bills?

We would like to show people that insects interact with man and have important social effects. Who can trace the effects of plague on the history of Europe? Or, perhaps, the entomologist as "hero", struggling to protect the peoples' food without damage to the environment.

We would like to show entomology as an interesting subject in its own right where men can see, dramatically displayed, the beauty and wonder of the living world around them.

To the few lost souls unmoved by altruistic motives we might suggest that winning one of the prizes could very well advance the career of any hopeful entomologist. The pain and anguish of writing could be eased by joyful thoughts of spending a share of the \$1500 prize money on wine, women and song — or collecting boxes.

Entries may be in French or English.

For information and entry forms contact:—

K. S. McKinlay,
Research Station,
Research Branch, Agriculture Can.,
University Campus,
SASKATOON, Sask., S7N 0X2.

ENTOMOLOGICAL SOCIETY OF CANADA GOVERNING BOARD

The Regional Director for the Société Entomologique du Québec is M. Gérard Rioux, not Dr. W. Smirnoff as previously announced.

FINANCIAL STATEMENTS

Year ended 31 December 1972

To the Members of the
ENTOMOLOGICAL SOCIETY OF CANADA

We have examined the balance sheet of the Entomological Society of Canada as at December 31, 1972 and the statement of financial activity for the year then ended. Our examination included a general review of the accounting procedures and such tests of accounting records and other supporting evidence as we considered necessary in the circumstances.

As is usual in organizations of this kind, it was not possible to completely verify the revenue from all sources and therefore the statements show the recorded revenue.

Subject to the foregoing, we report that in our opinion these financial statements present fairly the financial position of the Society as at December 31, 1972 and the results of its operations for the year then ended, in accordance with generally accepted accounting principles applied on a basis consistent with that of the preceding year.

George A. Welch & Company
Chartered Accountants

FINANCIAL ACTIVITY, YEAR ENDED DECEMBER 31, 1972 (with comparative figures for year ended December 31, 1971)

REVENUE

	1972	1971
Regular memberships	\$ 12,967.05	\$ 13,108.55
Student memberships	1,096.25	952.32
Sustaining memberships	400.00	400.00
Subscriptions	28,605.17	27,409.68
Sale of reprints including page charges	64,688.45	67,837.82
Sale of back issues	2,160.28	2,440.77
Publishing Memoirs	27,142.45	65,117.50
Interest earned — net	6,282.52	5,206.85
	<hr/> 143,342.17	<hr/> 182,473.49

EXPENDITURE

Publishing costs — Canadian Entomologist	45,937.62	53,610.46
— reprints	6,435.51	8,821.74
— Memoirs	21,308.40	55,744.45
Annual meeting — grants	3,715.48	750.00
— travel expense	5,133.40	3,848.99
— miscellaneous	—	192.31
Biological Council of Canada — dues	2,292.00	814.00
— delegate	1,399.05	870.16
Salaries	20,236.50	17,036.04
Directors' expenses	3,764.54	3,017.65
Canada Pension	156.94	148.99
Unemployment insurance	61.82	—
Professional fees	500.00	350.00
Postage and office supplies	1,427.94	1,535.91
Telephone	299.45	116.80
Bulletins	3,691.43	3,908.71
General expense	650.28	110.10
	<hr/> 117,010.36	<hr/> 150,876.31

NET REVENUE FOR YEAR

\$ 26,331.81 \$ 31,597.18

BALANCE SHEET DECEMBER 31, 1972
(with comparative figures for December 31, 1971)

ASSETS

	1972	1971
Cash	\$ 83,722.26	\$ 59,385.73
Receivable re reprints and back issues	13,112.50	14,544.50
Term deposit — 8 3/4% — due September 18, 1973	10,000.00	10,000.00
Term deposit — 8% — due December 29, 1973	10,000.00	10,000.00
Government and government guaranteed bonds— at cost — (Quoted value — \$49,735.00)	54,673.03	54,673.03
	<u>\$171,507.79</u>	<u>\$148,603.26</u>

LIABILITIES AND SURPLUS

LIABILITIES		
Accounts payable and accrued liabilities	\$ 10,668.23	\$ 12,900.90
Prepaid memberships, subscriptions and reprints	22,671.50	23,866.11
	<u>33,339.73</u>	<u>36,767.01</u>
SURPLUS		
Balance, December 31, 1971	111,836.25	80,239.07
add:		
Net revenue for year	<u>26,331.81</u>	<u>31,597.18</u>
Balance, December 31, 1972	<u>138,168.06</u>	<u>111,836.25</u>
	<u>\$171,507.79</u>	<u>\$148,603.26</u>

REPORT OF THE ELECTION COMMITTEE

The ballot counting committee composed of R. K. Stewart, T. Smith and K. G. Davey (convenor) examined on 16 July 1973, the ballots received before midnight 15 July for the 1973 election of Officers and Honorary Members of the Entomological Society of Canada.

Ballots mailed: 832. Ballots cast: 388. For President-Elect; ballots spoiled (blank): 9. For Directors-at-Large, ballots spoiled (blank in 3 or more spaces): 34. For Honorary Members, ballots spoiled (blank for 1 or both candidates; 1 voted yes and no): 76.

The successful candidates were:

President-Elect:	C. R. Harris
Directors-at-Large:	F. L. McEwen I. W. Varty
Honorary Members:	G. P. Holland G. F. Manson

The election committee hereby certifies that all of the ballots were accurately counted and that the results are correct.

K. G. Davey

WILLARD ROSS ALLEN 1913-1973



Willard Ross Allen died suddenly at Winnipeg, Manitoba, on 10 June 1973, at the age of 60.

Willard was born in Toronto on 10 January 1913, and as a child lived briefly in Ottawa and Charlottetown where he completed his primary education. The family later moved to Winnipeg where Willard completed his secondary education in 1932. In that year, he entered the University of Manitoba, Faculty of Agriculture, where during his undergraduate years he was awarded an Isbister Scholarship. Willard specialized in entomology and upon graduation with a B.S.A. in 1936 was awarded the University of Manitoba Gold Medal for general proficiency. Willard received his M.Sc. degree from the University of Manitoba, in 1939, where he studied under Prof. R. A. Wardle and the

late Prof. A. V. Mitchener. The master's thesis was on the ecology of grasshoppers. He later continued graduate work under Prof. A. Glen Richards, at the University of Minnesota where, in 1952, he was awarded a Ph.D. degree with a major in insect physiology and a minor in biochemistry. The doctoral dissertation was on the enzyme systems of insect muscle.

In his undergraduate years, Willard worked with his father, the late Dr. J. A. Allen, Provincial Pathologist, Manitoba Game and Fisheries Branch; the Entomology Department of the University of Manitoba; and the Dominion Entomological Laboratory, Brandon, Manitoba.

After bachelor's graduation, Willard joined the staff of the Dominion Entomological Laboratory where, until 1942, he was engaged in research on the ecology of grasshoppers. At this point, his interests led him to the field of chemical control of insects and, in 1946, he was seconded for a year to the Entomology Section, Defence Research Board, Ralston (Suffield), Alberta, to evaluate and select new insecticidal agents. On his return to Brandon, he was made responsible for the planning and direction of research on the chemical control of insects of field crops and vegetables. In 1957, he was transferred to the Agriculture Canada Research Station, Winnipeg, as toxicologist, a position he held until his death. In recent years, his main interest was in soil insecticides.

Willard was the author of numerous research and technical papers which attest to his stature as a scientist. However, the most lasting impression to colleagues, students, and the general agricultural community will be his generous off-the-record assistance. Although Willard was a member of the much maligned "spray and count" tribe of entomologists, he was acutely aware of the impact of insecticides on society. Indeed he objected strenuously to the registration of some of the "hot" compounds long before some of the sensational biologists began to worry about "ecology".

In his early years, Willard was active in sports, particularly hockey and golf, dramatics and debating; latterly, he took a keen interest in art and took up painting as a hobby. He always had a great zest for life and the tales he told and embellished with each retelling will always bring pleasure to those who knew him.

Willard was a member of the Kinsmen Club of Brandon, the K-40 Club of Winnipeg, and the Society of Sigma Xi. He was a charter member and past

president of the Entomological Society of Manitoba, a member and former director of the Entomological Society of Canada, and a member of the Entomological Society of America. He had many friends in the insecticide development industry and in research institutions in North America.

Willard was married in 1940 to Phyllis Parry. Two sons, Richard and Gregory, also survive. The family resides at 120 Linacre Road, Winnipeg.

Askew-Westdal

FORTHCOMING MEETINGS

Société Entomologique du Québec, 25-26 septembre 1973, à la Forêt Montmorency, une poste de la Faculté de Forêt et Géodésie, Université de Laval, à peu près de 35 milles au nord de la ville de Québec.

Entomological Society of Saskatchewan, 19-20 October 1973, Regina. Dr. Cedric Gillott, Program Chairman.

Biological Council of Canada, 24 and 25 October 1973 in Ottawa.

Entomological Society of Ontario, 30 October to 2 November 1973, Queens University, Kingston.

Eastern Branch, Entomological Society of America, 31 October to 2 November, Commodore Hotel, New York City.

Entomological Society of Manitoba, 1-2 November 1973, Winnipeg. Program Chairmen: Dr. S. R. Loschiavo (technical), Dr. G. L. Ayre (general).

Entomological Society of America, jointly with the Southwestern Branch ESA, 26 to 29 November, Statler Hilton Hotel, Dallas, Texas.

American Mosquito Control Association, 23-27 February 1974, Disneyland Hotel, Anaheim, California. Deadline for titles: 30 November 1973. M. L. Oldham, Program Chairman, 429 Ash Street, Red Bluff, California, U.S.A. 96080.

First International Working Conference on Stored-Product Entomology, Savannah, Georgia, U.S.A., 7-11 October 1974. The conference will include symposia, panel discussions, and submitted papers on all phases of stored-product entomology. Address queries to: Organizers, Working Conference on Stored-Product Entomology, c/o Stored-Product Insects Research and Development Laboratory, ARS-USDA, P.O. Box 5125, Savannah, Georgia, 31403, U.S.A.

Entomological Society of Canada, jointly with the Acadian Entomological Society, 26 to 29 August 1974. Address communications to C. Roger MacLellan, Agriculture Canada Research Station, Kentville, Nova Scotia.

VIII International Plant Protection Congress, 21-27 August 1975, Moscow, USSR. K. S. Nazarenko, Chairman, Organizing Committee, 1/11 Orlikov Rereulok (room 478), 107138 Moscow, USSR.

ARMCHAIR ECOLOGISTS AND THE GREAT PLAINS PROJECT

The Great Plains Project consists of a group of businessmen and scientists of special expertise in the arts of economic development, who have been organized to devise developmental concepts that would offer, to the plains areas of the Canadian west and north, opportunities to diversify their economies. The majority of the members hold senior executive positions in the petrochemical, transportation and mineral exploration industries and financial institutions. In May, the Project sponsored a conference in Churchill, Manitoba with the theme "The Churchill Arctic Corridor". The purpose of this conference was to extract a consensus from senior development people in Canada regarding development and transportation of northern resources. I accepted an invitation to attend the conference in hope of gaining firsthand knowledge of the extent northern developers are concerned with northern ecology. I had the opportunity of discussing such matters with many of the delegates. I soon found that to begin such discussions, a prime requisite was not to mention any interest or knowledge of northern ecology!

The conference began with a session on the philosophy of northern development, which unfortunately was concerned mainly with how development will immediately effect the economic welfare of northerners. Little time was spent philosophically examining the need for or long-range effects of increased search and extraction of fossil fuels, which to the developers is justified simply by the fact that North American use of energy is growing exponentially. Perhaps the session could have been enlightened by exposure to the Club of Rome philosophy.

The appellation "armchair ecologist" arose on numerous occasions and referred to emotional individuals opposed to development which may harm fragile northern ecosystems. Anger and frustration often were expressed by delegates when such individuals were mentioned. Armchair ecologists were considered burdensome threats to development requiring constant attention.

It is interesting to speculate who the armchair ecologists actually are. As far as I can determine, many are amateur naturalists and conservationists. Most probably have little understanding of northern ecology, but the interesting point is that as a group, the armchair ecologists to an extent have been effective in dealing with northern developers. In many instances, armchair ecologists have been successful in temporarily blocking schemes that potentially could damage important ecosystems. For these efforts the armchair ecologists, whoever they may be, must be commended. Many members of the Sierra Club undoubtedly are armchair ecologists, but few would dispute the Club's important role in society.

As I see the situation, developers of the north are concerned with northern ecosystems, but for the wrong reasons. They are cautious in proceeding with ecologically dangerous programs in order to keep the armchair ecologists off their backs. Unfortunately armchair ecologists are always in danger of losing their credibility and often are hard pressed to supply ecological data to support their claims. Here is where the professional ecologist should play an important role. If professional ecologists would convey more of their results and knowledge to the public, the emotional appeals by the armchair ecologists would receive more serious attention. More substantial results would be achieved and many of the wild schemes planned for the north would receive proper attention before being initiated. The public has been well exposed to talk of "fragile

ecosystems", but few realize the true meaning of the concept and the consequences if such systems are destroyed. The media now exist in Canada, through natural history societies, the Canadian Nature Federation, etc. for professional ecologists and entomologists (most of whom are well versed in such matters) to better inform the public. We need more action by professional ecologists to support and substantiate the good efforts of the 'armchair' types.

J. D. Shorthouse

PRAIRIE GRASSHOPPERS IN 1876

"There are no woods on the immense prairies between Red Deer River and Bow River Post, but both rivers are abundantly bordered with trees and their number increases at the approach to the source. On every bank of these rivers there are magnificent lowlands provided with clear sources supplying excellent water, winter and summer. The soil looked rich and fertile but the grasshoppers destroy everything growing on this soil. Beginning at the Red Deer River, down to this place (Fort Calgary) and even as far as (Fort) Benton (Montana), there reigns real devastation. I think that this fact constitutes the only obstacle to the colonization of this country.

"Next day, the 26th (June 1876), I went with the Reverend Scollen to Fort Macleod and we arrived there on the 29th at noon. All the way we had to cross a real desert. But we also crossed three nice little rivers in the vicinity of Bow River, namely: Fish River, the Pine and the Sheep, all of them nicely bordered with trees and watering, as much as I could see, excellent land which was unfortunately infested by grasshoppers. There is also the Highwood River, likewise surrounded by woods. . .

"Fort Macleod is located on the Oldman River . . . I was surprised to find quite a fort and at least 200 private inhabitants on the island. I really do not know what they are doing there. Agriculture would probably be less likely to succeed here than in other districts. Everything looks as though it is burned by the heat and devoured by the grasshoppers . . . The soil is, I believe, excellent and several tests have proved it to be productive, but unfortunately the grasshoppers are devouring everything even before it is ripe.'

— from a letter written by Bishop Vital Grandin, 6 July 1876 (translated and published in the *Alberta Historical Review*, Vol. 21, No. 1, Winter 1973).

I suspect these excerpts from Bishop Grandin's letter may be the earliest description of a grasshopper outbreak in the extreme northwestern Great Plains. The devastation must have made quite an impression on the Bishop, as he kept referring to it throughout his short travelogue.

This instance of nature on the rampage happened, of course, three decades or so before man in that region began messing around to any great extent with nature's so called "balance". Could that mean that we really do need ecologists as well as "ecologists"? It seems there was drought, too, ninety-seven years ago in Alberta.

N. S. Church

A NATIONAL POPULATION POLICY FOR CANADA

From the convocation address given by E. J. LeRoux B.A., M.Sc., Ph.D. at McGill, 2 June 1973 on the occasion of the receipt of a Doctor of Science degree, honoris causa.

The problem we are concerned with may well have arisen as a result of a providential instruction given in Genesis, chapter 1, verse 28: "And God blessed them, and God said unto them, be fruitful, and multiply, and replenish the earth, and subdue it; and have dominion over the fish of the sea, and over the fowl of the air, and over every living thing that moveth upon the earth." Man heeded that call, to the point that there exists in the world today an accelerated population growth of unprecedented rate, moving stealthily and rapidly towards what many refer to as a catastrophic global crisis. The most successful animal the world has ever known threatens to overrun his environment, destroying in the process not only many of his fellow creatures but perhaps himself as well. His present rate of growth, 11 more individuals every five seconds, assures a doubling of the 3.5 billion people now living on this planet by the first decade of the year 2000.

Early Warning

A general warning of the problem was given by Thomas Malthus in 1798 when he predicted that man would outstrip his limited food supply and face decimation of his numbers, as a result of starvation, a general breakdown of law and order, from war and pestilence.

Malthus, a prophet ahead of his time, correctly interpreted the results of the impending population explosion but was ignored. And man could ignore the warnings of Malthus in 1798. To-day, one hundred and seventy-five years later, he can no longer afford to be oblivious to a warning that he is on a one-way street to a cataclysm — that the problems attendant on excessive population growth are real and near immediate.

The Global Problem

The problem is first and foremost a global one and one primarily of numbers. Too many people taking up too much of the land that ought to be producing their food; demanding too many manufactured objects; polluting too much of the land, air and water; consuming too much of our raw materials and energy and requiring more food, which if provided, invites the birth of still more and more people. Because such growth has a fixed doubling time, the number of earth inhabitants, which seemed negligible for centuries, is, in a mere instant of history, about to reach the global limit. We are on course for a population explosion and the results of this explosion will not be pleasant. Predictable effects are that population growth will stop, either because people will starve, or raw materials will give out, or pollution will surpass liveable limits, or the stresses of overcrowding will provoke war or other ills. At such a juncture in time, the world population will drop by as much as a fifth in a single generation, while the bottom will drop out of life as we know it for the rest of us. Real-life, biological models of insect and mouse populations confirm the undesirable consequences of unchecked growth in man. One lifetime is all that is required for the completion of the event and judging from the overwhelming demographic evidence available to us, the crisis is some 40 to 50 years away — your lifetime and that of your children — with total collapse predicted for the year 2100, that is, in the lifetime of your children and your children's children.

The Canadian Problem

Much of the growth and environmental stress affecting the world is already being felt in Canada and pollution is being used as the indicator. Yet the call for planned growth based on a sound population policy for Canada seems to many to be premature. Why, after all, should we have a planned population growth in a country the size of Canada whose 22 million inhabitants are at present on a zero growth course. The reasons are many.

Canada cannot dissociate itself from the global population problem. A solution at home gives guidance to a solution to the global problem. If a technically advanced country such as Canada is to convince the world that we should work cooperatively towards a global zero growth, we must be credible and show that we practice that which we preach.

Canada's present zero population growth is unplanned and temporary and it will be negated by renewed growth that is about to be generated by the high number of those under 25 years in our population. This group, alone, assures Canada of an increased growth for the next 20 years. For example, by the mid 1980's, it is estimated that from domestic sources alone, Canada's total labor force will have increased by 50 per cent.

Canada's 22 million inhabitants have a pattern of resource use, that is a life style, that is typical of a technologically advanced country and because we live in a cold country our per capita energy demand is at least 50 times greater than that of an individual in India. Stated another way, our 22 million inhabitants make demands on our environment considerably greater than that made by 46 million inhabitants elsewhere. Our ability to support humans at this energy level is being sustained, at present, by large fossil fuel reserves located within our borders. These reserves are finite and it is predicted that they will become scarce and possibly exhausted in 30 to 50 years.

Canada also is facing a land crisis, due to the loss of valuable productive agricultural lands to urban sprawl. Few recognize that only 7 per cent, or 140 million acres, of Canada's total land mass of 3.8 million square miles is high quality, arable, crop land. Under our climatic conditions, three acres of this land is required, on the average, to sustain one Canadian. On this basis, we could at best support a future population of 40 million inhabitants.

Canadian growth is mainly along the border with the United States where problems of density, ground-water contamination, arable land decrease, and waste disposal are already nearly insurmountable. If present trends continue, monstrous super cities will dominate eastern Canada from Quebec City to Windsor within 30 years and it is estimated that 94 per cent of all Canadians will live in this corridor. On present standards, this megalopolis world will be alienating, noisy and will devour resources at a staggering rate. Experts claim that such cities in the rich countries alone will consume so much of the world's resources, and at such a rate, that it will be impossible for poorer countries to become industrialized. The rich will continue to become the over-developed, the poor the never-to-be-developed. A preview of things to come can be seen in the United States where, at present, only 6 per cent of the world's population accounts for nearly 50 per cent of the global consumption of essential minerals. By 1980, the figure will have risen to 70 per cent.

Any action on planned growth requires a lead time of 40 to 60 years before it can take effect. Since Canada's population 20 years hence has already been determined by the present number of those under 25 years, every year that action is postponed, lessens the options for effective population planning.

Planned population growth must be based on reliable knowledge of the parameters involved. These are many and complex, including distributional, biological, demographic, and economic factors. The critical parameters will be our national and individual attitudes towards family size, family planning, regionalism and racialism.

Solution to the Problems

There are at least two alternatives to the growth problem. There are those who argue we should do nothing, since the seas will provide the fish, the manna be provided by the green revolution, and physicists will open the door to unlimited energy by harnessing hydrogen fusion. Doing nothing means unlimited growth and this alternative has to be rejected outright since it overlooks the true key factor of the population explosion problem, namely, numbers of people.

Our collective experience, leads us to conclude that, among those whose special knowledge lies in the fields closely relevant to this question, there is indeed a consensus that Canada's problem is one of over- rather than under-population. Present Canadian population growth trends leave little doubt that, in the next two or three decades, Canadians will experience a serious reduction in resources and in quality of life, with increased environmental problems, if we continue to encourage growth, human expectations, and resource use. Taking the "laissez faire" approach to the problem would constitute a serious abrogation of our responsibility towards the needs and aspirations of the people who will be living in Canada 20 to 30 years from now, and of those in other less fortunate countries who might stand to benefit from a successful experience by us in stabilizing our numbers. Those who contend that Canada is under-populated are mainly individuals who by their occupation, private or collective, are already committed to the extraction or utilization of a non-renewable resource, or to the continued growth of industry and energy-consumption. These persons by tradition are accustomed to focus on the short-term rather than the long-term consequences of human actions.

Stabilize Population Size

The only acceptable solution to the problem is to stabilize population numbers. The environment we live in has only a limited capacity to provide our resource needs and to accommodate to our waste. In short, Canada's life support system is finite and the size of its human population must eventually be limited by the capacity of the environment to sustain it. For the present, the Canadian population relies on a large temporary subsidy of its non-renewable resources to maintain its high standard of living. These resources must dwindle in the long run, leading to a reduction of Canada's carrying capacity. Since continued growth is not a solution to the Canadian population problem, our national objective must be to reduce the rate of growth and size of Canada's human population and stabilize it at a level that can be sustained.

Call For A Population Policy

In view of the impending seriousness of the Canadian population problem, a national policy on planned growth must be developed without delay. Such a policy should be as all-inclusive as our Bill of Rights. It must be a legislated policy that will give guidance to subordinate policies on energy use, technology, family planning and land use, as well as to other policies — Federal and Provincial — that have implication for the welfare of present and future generations of Canadians.

The Federal Government has been appraised of the need for a National Policy by such eminent individuals as Dr. Solandt. Collectively, more than 20 Canadian biologists, including myself, submitted a brief to the Prime Minister informing him and his government of our concern. We were and remain concerned over the lack of reaction as well as action. We recognize, however, that, politically, this is an extremely sensitive issue, appearing to threaten the moral as well as economic bases of our society.

We should be encouraged by the fact that a population policy was discussed recently at the Man and Resources for Canada National Workshop, at Montebello, in Quebec in November 1972. The relevant recommendation was "that, by 1975, the Federal Government of Canada enunciate a population policy aimed at the achievement of a stabilized population by the year 2000." This workshop, part of a national conference program sponsored by the Canadian Council of Resource and Environment Ministers has as its principle objective "to provide a national forum for debate concerning the formulation and recommendation of guidelines to achieve and sustain an optimum balance of social and economic benefits derived from the natural resource base". The focal point of the two-year program will be the Man and Resource Conference in Toronto in November 1973, where population, growth ethic, and social value are three of the many issues to be publicly debated.

Implementation

If Canadians wish to change the direction of their population growth, they must address themselves to the authority that will be most effective in implementing this change and, in my view, this authority is the Federal Government. Our national government has, at its disposal, a myriad of ways — some psychological, some economic — to bring about successful action in any field, be it alone or in concert with provinces and private citizens. The population issue is of such fundamental concern to present and future generations of Canadians that the successful issuance and implementation of a Canadian population policy is the responsibility of the national government. How else can we ensure that associated economic and social policies such as immigration, health, education, housing, urban development, resource management, will emanate from the tenets of the policy and not vice versa.

Stumbling Blocks to Implementation

We must recognize that a population policy for Canada will not be easy to enunciate and implement. Growth, for the sake of growth, has been an ideology of our civilization to the point that, today, our society has a vested interest in population growth; in growth of the gross national product, in growth of industry, and in all those other areas of growth that are sacred in traditional political and economic dogma.

The human mind finds it difficult to accept that a relationship exists between population numbers and even the most obvious of our environmental ills. The problem is further compounded by the fact that population control would mean decisions that may well reduce our present standard of living in order to provide a better life for future generations.

There is also that strong desire in certain sectors of our society that they should not be assimilated as in the melting pot concept. An increase in their numbers assures them of not being so absorbed.

There are also many who firmly believe that population control is an infringement on individual rights.

Finally, in regard to impediments, the Canadian position of power in the world would be reduced if our population was held at its 22 million while other nations are on a population growth binge.

Conclusions

I would like to reiterate that, when half of the people of the world are still going hungry, if not every day of the week at least several times a week, Canadians cannot remain complacent about population growth. The growth problem is one which all countries contribute to and are influenced by. Since we live in the same world as the "starved", we must question seriously our right to our greater share of the resources and energy that belong to all. A population policy for Canada would serve to establish the credibility of the Canadian nation's concern for the world's numbers problem both at home and abroad and to the seeking of a lasting solution to this problem.

THE ENTOMOLOGICAL SOCIETY OF QUEENSLAND

The President,
The Entomological Society of Canada,

I send warmest greetings to the Entomological Society of Canada on the occasion of the Jubilee celebrations of the Entomological Society of Queensland. This Society was founded in 1923 and with a membership of over 320 is the oldest continuously-active entomological society in Australia and was a prime mover in the formation of the Australian Entomological Society which conducted the recent highly successful 14 International Congress of Entomology. The Journal of the Entomological Society of Queensland, volumes 1-5, 1962-1966 was the forerunner of the national journal now published by the Australian Entomological Society.

The celebrations of the Society will culminate in a Symposium entitled "Changing Patterns in Entomology" to be held on September 22, 1973 and I enclose a brochure setting out details. It is appreciated that attendance by members of your Society is most unlikely unless they happen to be travelling in Australia at that time. However, I would draw your attention to the possibility of ordering the proceedings of the Symposium which may be of interest to your members or your librarian and provides an alternative form of participation.

Yours sincerely,

B. F. Stone, President

President Kevan has sent greetings and good wishes on behalf of The ESC membership — Ed.

INFLUENCES ON THE DEVELOPMENT AND EVOLUTION OF BIOLOGICAL CONTROL IN CANADA

At one time, biological control was largely an administratively distinct subject in Canada. It is now largely a part of integrated control or pest management. That is, the basis for administrative classification has shifted from the procedure to the pest. This could happen elsewhere. Consequently it might be useful to identify the influences that seem to have been primarily responsible for the rise and fall of biological control as a separate subject in Canada. The following are some personal conclusions.

1. The beginnings

Biological control in Canada started in 1882. The attempts during the first 24 years were intermittent and usually casual adjuncts to pest-based work that apparently had no lasting consequences. Continuous biological control work started in 1910 when a major pest infestation, of the larch sawfly, *Pristiphora erichsonii* Htg., coincided with the appearance of an official with the interest and the power to do something about it: C. G. Hewitt, the newly appointed Dominion Entomologist who had worked with the larch sawfly in England and who imported parasites from England in 1910-13 for liberation in Canada.

Obviously the administrative climate was favorable to biological control. What was needed to trigger development was the *Vedalia* effect: a striking success that would demonstrate the value of biological control and thereby facilitate the establishment of a biological control agency. The brown-tail moth, *Nygmia phaeorrhoea* (Don.), supplied the need. A widespread and severe infestation had appeared in eastern Canada and was causing alarm. A biological control program against it was started in 1912, more or less as a continuation of a program conducted in the United States in 1905-11. Under J. D. Tothill, various parasites and predators were liberated, chiefly in 1913-15, against this moth and in anticipation of an invasion by the gypsy moth, *Porthetria dispar* (L.), that never materialized. The infestation started to decline from a peak in 1914, and by 1927 the brown-tail moth apparently had disappeared as an inhabitant of Canada. Subsequently the role of the introduced parasites in controlling the brown-tail moth infestation was questioned because there is no evidence that they were in fact primarily responsible for the decline of the infestation. However, at the time and for years afterward this was regarded as a successful biological control attempt. It was soon followed by two other apparent successes: the control in British Columbia by agents transferred from eastern Canada of the oystershell scale, *Lepidosaphes ulmi* L., in 1917 and of the woolly apple aphid, *Eriosoma lanigerum* Hausm., in 1921.

2. The development

These successes showed that biological control was a valuable procedure. The brown-tail moth and the fear of the gypsy moth were responsible for the establishment of the first biological control laboratory, The Natural Control Investigations Laboratory, at Fredericton, New Brunswick, and the appointment of the first full-time biological control workers, including A. B. Baird who was to lead and to promote with unrelenting tenacity the interests and development of biological control in Canada for more than 35 years.

The development of biological control was then facilitated by the successive appearance of new pests of critical importance, notably the European corn borer, *Ostrinia nubilalis* (Hbn.), in 1920, the Oriental fruit moth, *Grapho-*

litha molesta Busck, in 1925, the European spruce sawfly, *Diprion hercyniae* Htg., in 1930, and the European pine sawfly, *Neodiprion sertifer* (Geoff.), in 1939. They became subjects of major biological control projects. The first three were important influences that resulted in the establishment of a laboratory at St. Thomas, Ontario, in 1923, the move to a larger laboratory at Chatham, Ontario, in 1925 (after the laboratory at Fredericton had been closed), a further move to still larger premises at Belleville, Ontario, in 1928, and the construction of the elaborate temperature- and humidity-controlled Quarantine Building (then known as the Dominion Parasite Laboratory) at Belleville in 1936. The expansions in facilities and staff that were promoted by the major projects enabled additional projects to be started. Thus, the number of pest species that were subjects of biological control attempts increased after the move to Belleville in 1928 and increased again after the Quarantine Building was completed.

After the Second World War and especially in 1949-51, the number of biological control workers more than doubled and additional biological control laboratories were established at Vancouver, Quebec City, and Kingston, Ontario. This post-war expansion does not seem to have been because of any unusual merit attributed to biological control but was part of a general expansion of resources for agricultural research.

3. The peak

By the early 1950's, biological control had reached what, in hindsight, may be regarded as its zenith in Canada as a distinct subject. The Unit of Biological Control Investigations of the Canada Department of Agriculture had a staff of about 40 scientists, distributed between a headquarters at Ottawa and the laboratories at Belleville, Kingston, Quebec, and Vancouver. However, morale was not high, in part because the relatively highly trained post-war recruits were not satisfied with routine parasite-production work and in part because the DDT era was at its peak and biological control as a subject had become eclipsed in apparent value by chemical controls.

By that time, three other centers of work in or related to biological control had developed in Canada.

What is now the Commonwealth Institute of Biological Control had its Headquarters in Canada for about 20 years. The Headquarters was moved from Farnham House, in England, at the beginning of the Second World War to Canada where it was given accommodation in the Belleville Laboratory. This arrangement sometimes caused misunderstandings abroad: it was sometimes assumed, incorrectly, that the C.I.B.C. was an agency of the Canada Department of Agriculture, or, equally incorrectly, that the Dominion Parasite Laboratory, Belleville, belonged to the C.I.B.C. It also caused misunderstandings at Belleville, and after five years it became expedient to move the C.I.B.C. Headquarters to Ottawa, where it remained until 1961 when it was moved to Trinidad after F. J. Simmonds had succeeded W. R. Thompson as Director.

The chief concentration of work in insect pathology was not in the Biological Control Investigations Unit but in what was then the Forest Insect and Pathology Unit. It had developed there initially because of the introduction of a virus disease that was of major significance in contributing to the control of the European spruce sawfly and that was first studied by the forest biologists. That disease had earlier been sent from Europe to Belleville where the diseased material was incinerated, rather than studied, for fear that it would harm parasite production (T. Finlayson, personal communication). This incident may have had the long-term effect of concentrating work in insect pathology

at what is now the Insect Pathology Research Institute, Sault Ste. Marie, instead of possibly at Belleville.

The third main center where work related to biological control was in progress was the Fruit Insects Laboratory of the Canada Department of Agriculture at Kentville, Nova Scotia. There A. D. Pickett was developing what would now be termed a pest management program (he termed it harmonizing chemical and biological controls) for orchard insects. Though this work was done virtually independently of biological control work elsewhere in Canada, the principles that it demonstrated were ultimately to have an important indirect influence on the organization and practice of biological control in this country.

4. The evolution

While the Biological Control Investigations Unit was reaching its zenith in size, a sister agency, the Forest Insect and Pathology Unit headed by M. L. Prebble, was developing rapidly. It was expecting to be moved out of the Department of Agriculture into a new Department of Forestry and was consolidating its resources accordingly (the move actually occurred in 1961; the new Department later became the Department of Fisheries and Forestry and is now the Department of the Environment). In 1954, there was an interaction between the two Units that, in hindsight, proved to be the beginning of the end for biological controls as an administratively distinct subject in Canada.

The interaction was an agreement under which the Forest Biologists became responsible for all work within Canada on the biological control of forest insects as part of its work on forest pests. This had a critical impact on the Biological Control Investigations Unit as the research activities of about half its staff were on or related to forest insects. Moreover, it took from that Unit the primary responsibility for decisions on biological control attempts against forest insects.

The agreement left to the Biological Control Investigations Unit the responsibility for obtaining any material and information required from abroad. A reaction to this by the Unit was to start organizing its own staff to study and collect abroad, that is, to do work that since about 1928 had been assigned to what is now the C.I.B.C. As Canada was a supporter, by policy and with funds, of the Commonwealth Agricultural Bureaux of which the C.I.B.C. is an agency, this meant that Canada was supporting financially two biological control agencies overseas of which only one was needed to do the job.

In 1955, retrenchments were imposed from above. The Unit disappeared as such, to become part of an Insect Systematics and Biological Control Unit under G. P. Holland. The biological control work was concentrated at Belleville, where a new laboratory building had just been completed, by closing the outlying laboratories and transferring their staffs to Belleville. B. P. Beirne was put in charge at Belleville, succeeding A. Wilkes who had succeeded Baird in 1948 when Baird became Unit Head.

The research program at Belleville was then reorganized to provide projects for the new staff that was recruited in the early 1950's and to provide replacement projects for those who had lost theirs through the agreement with the Forest Biologists or by being transferred to Belleville from the laboratories that were closed. Belleville staff ceased to do work abroad, and the responsibility for such work was reassigned to the C.I.B.C. following a protracted dispute between Beirne and Thompson about procedures.

In 1959, there was a major reorganization of the Department of Agriculture. The Units were abolished and Belleville became a relatively auto-

mous Research Institute with research on principles of biological control its primary function. This was the post-Sputnik era when basic research was much favored. The Institute also had a service function: to obtain, process, and supply any biological control material or information required in Canada from abroad.

By this time, the concept of control as a single entity instead of as a number of separate subjects was beginning to develop. The research at Belleville had begun to extend beyond the limits of biological control, notably into physical controls. The title suggested for the new Institute, "Biological Control Research Institute", was thus considered to be too restrictive; Beirne wanted "Entomology Research Institute, Belleville". The result was a compromise, "Entomology Research Institute for Biological Control", with which Belleville was afflicted until it could be changed to the virtually unrestricted "Research Institute, Belleville".

The Institute was to exist for less than 15 years. It died primarily from consequences of geographical isolation without strong work reasons for the isolation, and of specific location in the Belleville district. While it existed, it was highly productive in terms of research publications.

Some of the Belleville scientists felt that geographical isolation produced intellectual and cultural isolation, and some were concerned because geographical isolation meant that their expertise was not available to students. A consequence was that scientists often moved as opportunity permitted, or tried to move, from Belleville to places where they considered the living environment to be more stimulating and less conducive to a tendency to vegetate than that of Belleville. In its first 10 years, the Institute lost 18 of its scientists to posts in universities or in research centers at or near universities.

Eight of the eighteen, including Beirne, resigned as a group in 1967 to develop pest management programs at Simon Fraser University. This happened after the failure of proposals by Beirne that the Institute be moved to some university where staff could assist in student training in subjects related to pest management. P. S. Corbet succeeded Beirne as Director and most of the vacant positions were filled.

The post-Sputnik era was reaching an end and, in 1969, the Department of Agriculture ruled that its research must be mission-oriented, that is, related to Canadian agricultural problems. This necessitated partial realignment of the research program of the Institute; it may have drawn attention to the fact that the Belleville district was not a good center for mission-oriented agricultural research as it was neither an important crop center nor an important pest center.

The 1954 agreement with the Forest Biologists was one of two decisions that were crucial to biological control in Canada. The other was made 27 years earlier but its consequences were not to become apparent for a long while. It was the 1927 decision to locate a laboratory at Belleville. There are various legends and retroactive rationalizations about why Belleville was selected. In fact it was selected by chance (the late G. Wishart, personal communication). It seems that Baird and others were driving from Chatham to Ottawa looking for a site. They chanced to arrive in Belleville when it was time to stay the night. In the evening, they strolled around the town and chanced upon a large house that was for sale. They decided that it would make a suitable laboratory and initiated arrangements to have it bought. (Incidentally, a different house became the laboratory, as the original house had been sold and converted into an undertaker's establishment by the time official arrangements to purchase

had been made.) The laboratory became a fixture at Belleville with the completion of the elaborate and expensive Quarantine Building in 1936.

Belleville was undesirable as a location for a research center as such because of influences of isolation on staff; and it was unsuitable as a center for mission-oriented research in agriculture because it was not in an important crop area. In addition, it was rapidly becoming untenable as the location for the Canadian center for the importation and distribution of living biological control material. That center was at Belleville because the Quarantine Building was there; that building was there because the laboratory was there; and the laboratory was there by chance. The material was transported between Belleville and airports at Toronto (120 miles) or Montreal (250 miles) by rail express. At one time, there were six trains a day in both directions that would take express freight. They were gradually reduced to one, and there were rumours that that train would be cancelled, which would make Belleville untenable as the importation and distribution center. Meanwhile problems related to the quarantine function were impending: the Quarantine Building, by then 35 years old, was deteriorating physically.

That was the situation when, in 1970, two occurrences created the need for a decision on the future of Belleville: the resignation of Corbet, to go to a university post; and a proposal for a costly renovation of the Quarantine Building. The decision was to close the Institute, a possibility that had been discussed in the mid-1950's and advocated in the mid-1960's. The scientific staff were transferred to various research stations elsewhere, mostly for pest-based research on their specialities. The largest group went to Winnipeg, Manitoba, primarily to work on aspects of the integrated control of cereal and oil-seed insects. The specialists in biological control of weeds, headed by P. Harris, continue their work, but from Regina, Saskatchewan. The importation, quarantine, and distribution activities were moved to Ottawa, with J. S. Kelleher in charge.

Thus, by 1972 most biological control work in Canada was being done as aspects of broader studies on the management of particular kinds of pests or of pest situations rather than independently. The evolution of the work, from segregated procedure-based controls to integrated pest-based controls, and its decentralization do not apparently imply or indicate any planned or expected reduction in its amount. The rate of the evolution was hastened by consequences of some purely administrative decisions, so that the final result happened sooner than if the evolution had been based on scientific justifications alone.

Brian P. Beirne
Pestology Centre
Department of Biological Sciences
Simon Fraser University

SOCIEDAD CHILENA DE ENTOMOLOGIA

The Entomological Society of Chile, the oldest society of its kind in Latin America, celebrated its Jubilee (50 years), 18 to 23 June in Santiago. An appropriate congratulatory telegram was sent to their President, Dr. Luciano E. Campos S. on behalf of the ESC by President D. K. McE. Kevan.

BUSY AS A BUMBLEBEE



Hymenopterists and other entomologists know Dr. Herbert Edward Milliron as "Herb" and immediately associate him with research studies on the bumblebees and chalcids. After 12 years of taxonomic research at the Biosystematics Research Institute (formerly known as Entomology Research Institute), he retired on 1 September 1973.

Herb was born in Dubois, Pennsylvania, 25 February 1913. In his early years, he moved to West Virginia and was reared on a farm, obtaining experience in farm management.

As a youth, he spent many hours during his free time roaming the hills and meadows collecting insects and studying their biologies in his room, which he called a "little research laboratory".

He graduated from West Virginia University in 1936 with a B.S. Agr., from Michigan State University in 1938 with a M.S. (Ent.), and from the University of Minnesota in 1942 with a PhD (Entomology-Plant Pathology). During his graduate studies at Minnesota, he was a recipient of a Caleb-Dorr Fellowship (1941-42).

Dr. Milliron's first job after graduation was as Assistant Professor in Entomology at Purdue University from 1942 to 1946. His career at Purdue was interrupted for 4 years while served with the U.S. Army Medical Corps, as a medical entomologist. Returning from the Service in 1946, he took a job with the United States Department of Agriculture, Division of Forest Insects, as Field Entomologist. A year later he moved to the Division of Bee Culture with the same Department. In 1947 he joined the staff of the University of Minnesota serving the next two years as an Instructor in entomology. Pursuing better opportunities, he moved to the University of Delaware as an Assistant Research Professor from 1950 to 1957.

He was employed in 1958 by the Bernice P. Bishop Museum, Honolulu, Hawaii, as field collector in the Philippines. In the same year, returning from the Pacific, he moved to The Academy of Natural Sciences of Philadelphia (Pa.), as Assistant Curator. About a year later, he received an appointment as Associate Professor in Biology at the Lycoming College, Williamsport, Pennsylvania.

Herb has many interests in entomology and plant pathology but his greatest interest concerns the systematics and biology of Apoidea, Symphyta and Chalcidoidea. In his early years of research, he worked on the biology of beetles of economic importance in Agriculture and their parasites. In his long and distinguished career in entomology, he has solved many interesting and difficult systematic problems in the bumblebees. As a result of hard endless studies, he has written 42 scientific papers including a five-part monograph on bumblebees of the Western Hemisphere of which a bibliography and two parts have been published as *Memoirs of the Entomological Society of Canada*.

To pursue his research and fulfil his love for nature, he travelled to many parts of the world, including many islands in the Pacific, the Orient, and North, Central and South America in search of insects, especially the bumblebees, so that he could understand their biology, distribution, and phylogeny. He

has also travelled to the major museums and institutions in Europe, the United States, Canada and South America, studying the types of bumblebees.

In his entomological career, he was recipient of two research grants supported by the Penrose Fund from the American Philosophical Society and one from the National Science Foundation, Washington, D.C. He is a research associate at the Carnegie Museum, Pittsburg, Pennsylvania, and a member of Sigma Xi and the Entomological Society of Canada.

Herb will retire to Glen Dale, West Virginia, where he plans to complete his "A Monograph of the Western Hemisphere Bumblebees" he plans to continue his entomological research on the bumblebees and possibly travel again to South America.

Carl Yoshimoto

"AYE IT WERE CHAMPION"

Harry Bailey Wressell was born in Illingworth, Yorkshire, England on 2 November 1908. In April 1922, he came to Canada and settled at Ancaster, Ontario where he worked as a farmer for eight years. His innate urge to better his education guided him to the Agricultural College at Guelph where he graduated in 1936 with the degree of B.S.A. (Toronto). This was followed by two years post-graduate work at the University of Toronto.

During the summers of 1936-38, Harry worked at the Entomological Laboratory, Chatham, under Dr. G. M. Stirrett. In 1939, Harry began full time work at Chatham as a Technical Assistant. After some reorganization of the Laboratory, Harry was appointed to the new Research Scientist class. In 1961, in the absence of the Director, Harry was made "Acting Director" of the Laboratory for the year.

With the exception of minor periods of work at Montreal and Vineland, Harry's service was all at the Chatham Laboratory. His major project throughout was on corn insects with special emphasis on the ecology and control of the European cornborer. The northern corn rootworm was later added to his problems. Investigations of forage and bean insects, with special emphasis on the potato leafhopper, were also under Harry's direction in his final years with the Department.

Harry, like many of his associates over the years, witnessed a marked change in the approach to investigations of entomological problems. This passed from what is often called the "Naturalist Approach" to that of an integration of a complex of scientific specialties, unparalleled previously in entomology.

Harry published 15 scientific papers and a like number of miscellaneous papers dealing with entomology and agriculture.

He is a member of several professional and local societies that reflect his interests: Entomological Society of Ontario (President 1961-62), Entomological Society of Canada (Chairman, Committee on Common Names of Insects 1970-72), Entomological Society of America (Chairman, Committee on Common Names of Insects 1972-74), Chatham Horticultural Society, Kent Nature Club, Chatham-Kent Museum Board (Secretary), Chatham and Kent Historical Society (President), Federation of Ontario Naturalists, and others.

If it is possible to imagine him having any spare time left, he might be found gardening, travelling, reading, studying local history or natural history,

taking photographs and developing them, talking to groups about any of these, and even doing two or more at the same time.

Harry continues to be active in entomological work as Chairman of the Committee on Common Names of Insects for the Entomological Society of America. The list published by his Committee standardizes common name usage throughout English-speaking North America.

In 1942, Harry married Patricia Alexander. Harry and Pat have one daughter, Annalee, and two grandsons.

On the night of 30 March, a large representative group of agriculturists gathered at the Harrow Research Station to honor Harry and Pat, and Margaret Ronson, longtime secretary at the Chatham Laboratory, who was also retiring. It was most gratifying to see and hear the recognition of Margaret and Harry's contributions to the Agricultural industry of southwestern Ontario and beyond.

We, their friends and associates, wish Harry and Pat many years of "hobbying" and continued sharing of their talents with their community.

In Harry's own words "Looking back after 35 and more years with Canada Agriculture, taking everything into consideration, remembering friends made (some now gone), places visited, events experienced, I can say using the Yorkshire idiom, 'Aye, it were champion'."

George F. Manson
R.R. #3
Seeley's Bay, Ontario

BIOLOGICAL COUNCIL OF CANADA

Whereas members of the Entomological Society of Canada are automatically members of the BCC and receive their Newsletter, it may be redundant to quote extensively from it. The BCC has been particularly active of late and some of the resolutions and recommendations from the 1973 Annual Meeting in March have strong implications for ESC members.

It was resolved that "the BCC should participate in and strongly support SCITEC, and apply for admission to the House of Science and Technology, thus accepting responsibility for providing an active voice for biology and all its member societies". Also, in responding to Science Council of Canada Report No. 18, Policy Objectives for Basic Research in Canada, the BCC adopted the SCC resolutions that:

"Agencies supporting basic research should recognize that such research serves the dual purposes of providing knowledge and/or professionally trained personnel.

"Good basic research should be supported whether it arises in universities, government departments or industry and in order to take advantage of the educational value of research there should be the greatest possible liaison between these institutions.

"Agencies supporting basic research should recognize centers of excellence where they arise and should support them at a level which would increase the differential in funding between such centers and those centers of competent research where the prime objective is that of producing professionally trained personnel.

"Basic research, in keeping with the arts, should be recognized for its cultural contributions to the nation."

In responding to Science Council of Canada Report no. 17, *Lifelines, Some Policies for Basic Biology in Canada*, the BCC rejected the SCC suggestion that the NRC should reduce research support, and developed six recommendations:

"The BCC recommends that the NRC be encouraged to proceed with its policies with respect to 'in house' research, which enables this organization to continue to be both a reservoir of scientific personnel and expertise in Canada and a stimulating example for other research institutes throughout the country.

"The BCC recommends the establishment of a joint committee of BCC, CFBS and the NRC Advisory Committee on Biology to work out the practical steps to be taken in establishing immediate and future priorities in biological research in Canada.

"The BCC recommends that it is essential for individual scientists to have access to more than one granting agency. These agencies should consider each application on the basis of scientific merit within the framework of science policy considerations. The applicant should decide to which agency the application should be directed. If such criteria were adopted for funding, the present administrative structure, which evolved historically, would need to be modified accordingly.

"The BCC recommends that a study be made of current structures and procedures for granting biological research in Canada. It should be the purpose of the study to recommend improvements in the mechanisms of funding with special reference to possible inequities of funding as presently administered by the Canadian granting agencies. Support for this study should be obtained from the Science Council of Canada.

"The BCC recommends that strong support be given to the close association of research and teaching functions in universities and that co-operative funding schemes be worked out to avoid the detrimental results of the segregation of these two functions.

"The BCC recommends that a study be made of the current channels of exchange of information between scientists, advisory bodies, and government, with the purpose of improving and expanding their effectiveness."

CANADIAN ENTOMOLOGIST 100 YEARS AGO

It was scarcely kind of Mr. Couper to give me no hint of the terrible state of excitement under which his friend, poor Mr. Strecker, was at that time laboring, boiling over, as he evidently was, with indignation towards one who was perfectly innocent of all knowledge of his wants. Had I known the state of his mind my sympathies would at once have been aroused and I should written promptly, when I suppose this formidable bull of his would never have been fulminated against me, and I should have been spared from being impaled on the sharp end of Mr. Strecker's irony, where, like a beetle on a pin, I am now supposed to be wriggling and writhing in great discomfort. — Wm. Saunders (5:118-119)

BOOK REVIEW

An Index to the Described Life Histories, Early Stages and Hosts of the Macrolepidoptera of the Continental United States and Canada. Harrison Morton Tietz. Published by A. C. Allyn for the Allyn Museum of Entomology, Sarasota, Florida, 1972, iv + 1041 pp., 2 volumes, cloth bound. Distributed exclusively in North America by Entomological Reprint Specialists, P. O. Box 77971, Dockweiler Station, Los Angeles, California 90007, U.S.A. \$25.00 per set.

It is a pity that this bibliography could not have been published when it was completed by the author over 20 years ago. Though its value in indexing the literature up to about the end of 1950 is in no way diminished by the lapse of time, the work has been lost to a whole generation of entomologists who might have made excellent use of it.

A brief introduction by William D. Field and J. F. Gates Clarke outlines the scope, arrangement, and importance of the book. A forward by A. C. Allyn, the publisher, notes that the galleys were checked against the manuscript, but that the latter has not been checked against original sources.

The bibliography itself is divided into two parts, the first dealing with insects and the second with hosts, mostly plants. Part I is divided into three sections. Section A lists the works consulted. These include 226 periodicals and serials, 127 separate works, and 9 bibliographies. Section B, 33 pages long, lists common names of macrolepidopterous species, with scientific equivalents. Section C, which takes up 636 pages, is the most important part of the book. Here the Macrolepidoptera are listed alphabetically by scientific specific, sub-specific, or infrasubspecific name (infrasubspecific names are incorrectly listed as "ssp"). For each species considered valid, a list of references to life-history information and a list of food plants are given. For synonyms and for sub-specific and infrasubspecific names, cross-references are given to the corresponding valid specific names, under which a synonymic list is also given. The references are listed alphabetically under each of the three categories distinguished in Section A, i.e., periodicals, separate works, and bibliographies. A one- or few-word characterization indicates the content of most references. The food plants are listed alphabetically by scientific name, generic name first; English equivalents are sometimes added in parentheses.

Part II, dealing with hosts, begins with a short Section A, which has four entries on animals or animal matter, a surprisingly small number. Section B gives common names of plants and scientific equivalents in 109 pages. Section C lists 6 pages of "indefinite designations" of plant, by categories such as "bark", "ferns" or "fruit trees," with families and species of Macrolepidoptera arranged under each category in the same order as they are under plant species in Section D. Section D is a list of scientific names of host plants, with common names in parentheses, and with a list of Macrolepidoptera that feed on each plant species. The names of Lepidoptera are arranged alphabetically by specific name within family and the families are arranged under each plant species in taxonomic order according to McDunnough's Check List. This is a long section, occupying 213 pages. Section E, of 12 pages, lists some changes in accepted scientific names of host plants.

Omissions and errors are to be expected in an index of this length and complexity, prepared by others after the original author's death. Although the range of sources is extensive, it is not exhaustive. Dickerson's and Eliot and Soule's books are cited, for example, whereas Ellen Robertson-Miller's and Gene Statton Porter's are not. The *Canadian Entomologist* is cited, but not the

Canadian Insect Pest Review nor the proceedings of the various regional societies. There are various misspellings: "Kots" for "Klots" and "*krautwormi* Holland" for "*krautwurmi* Holland" on p. 378, selected at random. There is a rather large number of typographical errors, including an irritating number of extra letters, numbers, and signs, appearing apparently at random in line spaces, word spaces, and margins. Skipped, compressed and double-typed letters are also frequent.

Despite these imperfections, the **Index** will be an indispensable source for students of the life histories and host relationships of North American Macrolepidoptera.

Eugene Munroe

BOOK REVIEW

Biologische Schadlingsbekämpfung. J. M. Franz and A. Krieg. Verlag Paul Parey, Berlin and Hamburg, 1972, 208 pp., illustr., DM 24.00.

The book attempts to summarize the basic principles and methods of biological control addressing itself specifically to the interested lay person. It is the result of a collaborative effort between Professor Jost Franz and Dr. Aloysius Krieg who, respectively, are the Director and a senior staff member of the Institute for Biological Control of the Federal Republic of Germany, at Darmstadt.

The authors make no pretense at assessing all the known information but, instead, present selected examples in a spirited defense of the past achievements and the future potential of integrated control programs in Europe. In organization and much of its contents the book follows Franz' (1961) text on biological control (reviewed in *Can. Ent.*, 97: 222-223, 1965). The first 3 of a total of 12 chapters deal with some general concepts of population dynamics and provide a comparison between "classical" biological control and physical, chemical, and cultural pest control methods. Chapters 4 to 6 describe methods useful for work with beneficial insects and other arthropods and, briefly, some uses of vertebrates, helminths, and gastropods. Chapter 7, one of two written by Dr. Krieg, summarizes microbial pest control methods including microbial rodent control. There are 5 pages (Chapter 8) on biological control of weeds. Chapter 9 discusses autocidal controls and Chapter 10 (by Krieg) the use of various types of attractants and repellants.

Chapter 11 is on integrated control and includes some interesting observations on integrated control approaches available to hobby gardeners. Gardeners are advised to rely on such labor-intensive practices as weeding and the manual collection of phytophagous caterpillars and beetles in preference of labor-saving but potentially harmful, because of undesirable side effects, pesticide applications.

The final chapter is headed review and prognosis. The authors admit that they may have been optimistic about what biological and other non-chemical methods of pest control can achieve given some common sense; however, on close reading, Franz and Krieg show a commendable degree of balance between their enthusiasm for biological control and economic realism. Perhaps some of the assumptions and conclusions should be understood in the context of the particular European agro-political situation. Other recommendations apply more broadly. For example, ecologists and pest managers in general will find it interesting to read Franz' comments on injury levels and their applicability. He

predicts that with increasing demands by the general public for the preservation of a natural environment, biological control will become the method of choice in multiple-use forests, vacation areas, and in private gardens. In concluding, the authors urge government and the private sector to place greater emphasis on ecological research than they do now. Seven specific areas are identified that are expected to yield timely and applicable results; among them are the following: the systematic use of pesticide-resistant predacious arthropods and vertebrates, such as the mosquito fish *Gambusia*, in contaminated environments; the mass-production of beneficial organisms for short-term control; biological control in greenhouses; and the development of insect virus preparations that permit storage over long periods.

Readers wishing to obtain additional information on a particular aspect of biological control will find a good selection of about 200 mainly recent references. There is also an appendix giving the addresses of 10 international organizations that are concerned with biological control; and of the stations for plant, forest, and bird protection in the Federal Republic of Germany. And finally, there is a list of available (in Germany) films and slide series on beneficial organisms and biological control, and of commercially available microbial pesticides.

M. Mackauer

BOOK REVIEW

Emperor Moths of South and Central Africa. Elliott Pinhey. C. Struik (Pty) Ltd., Cape Town, 1972, xi + 150 pp., 42 pl. (15 col.). Exclusive agents for North America, Julian J. Nadolny and Co., 35 Varmor Drive, New Britain, Connecticut 06053, U.S.A. \$12.95 U.S.

This attractive and informative book deals with the approximately 40 genera and 100 species of Saturniidae known from the southern part of Africa, that is, the region between the Cape of Good Hope and the northern borders of South-West Africa, Zambia, Malawi, and Mozambique. The African fauna of this family is rich and diverse, and the genera mostly belong to endemic tribes or subfamilies. There have been many interesting taxonomic and biological discoveries in recent years. An up-to-date and profusely illustrated account is therefore extremely welcome. The amount of life-history information is particularly impressive. It is also good to see clear pictures of the male genitalia of most of the species. Unfortunately, the female genitalia are not figured. The plates of adults vary from adequate to excellent. Those of larvae are in general not quite so good, though most of them will suffice for recognition; the fine details of morphology and pattern often do not show clearly.

Dr. Pinhey has written for a variety of readers. Consequently he gives notes on collecting methods, biology and terminology that will be helpful to the beginner and also detailed descriptions of structure and color that will be of more use to the specialist. The style is informal and often chatty. There are interesting anecdotes, unusual facts, such as the use of caterpillars of various species as food, and practical hints and well-organized technical information. The evidence of continued progress in our knowledge is particularly encouraging. I can remember well my excitement on first seeing Tams' description of the long-tailed *Antistathmopetara daltonae* when it was published in 1935. A few months later, I was fortunate enough to be able to see the unique type-specimen itself in the British Museum. Now the species is relatively well known and a southern subspecies has been distinguished. A more recent, but almost equally striking, discovery is the luna-like *Argema kuhnei* Pinhey, first

described as recently as 1969. The present work contains the description of a new and distinctive species of *Burnaeopsis*, *B. saffronica* Pinhey.

In general, the classification follows those of Bouvier and of Rothschild and Jordan, as amplified and modified by subsequent contributions, including several important ones by Dr. Pinhey himself. Though my acquaintance with the family is rather superficial, I detected no major errors. The comparison of larval characters with adult classification is useful and emphasizes some questionable features of the latter. Certain nomenclatorial errors may be noted. The priority of family-group names is determined by their own dates of publication and not by those of their respective type-species, as is implied on p. 26. *Attacus* Linnaeus dates from the twelfth edition of the *Systema Naturae* in 1767 and not from the tenth edition in 1758, as indicated on the same page. The substitute subgeneric name "*Falcipennae*" for the preoccupied *Drepanoptera* Rothschild is unfortunately proposed in a plural form, in violation of Article 12(f) of the *International Code*. No doubt this name, though apparently not "a noun in the nominative singular", could "be treated as such" within the language of Article 12(f), but such a disposition would hardly be convincing, and resulting combinations such as *Epiphora (Falcipennae) vacuna* would be less than felicitous. Incidentally, *Falcipennae* is correctly indicated as "nom. nov." on p. 30, but wrongly as "Subgenus . . . nov." on p. 33. There are inconsistencies in the style of citing new taxa on pp. 30, 33 and 108.

Dr. Pinhey missed a golden opportunity to amend what may have been my first appearance in the entomological literature, in the name "*Ludia orinoptena monroei*" Rothschild and Jordan, 1938, based on a single female collected by me in the Woodbush in 1936 and presented to the Tring Museum. Lord Rothschild and Dr. Jordan generously named the moth for me as captor, but inadvertently spelled my surname incorrectly in both the scientific name and the citation of the data for the holotype. I prefer not to propose an amendment in a book review, but some future author may wish to make the change.

The typography of Dr. Pinhey's book is clear and accurate and refreshingly free of printer's errors. Some minor particulars of style might be criticized. Capitalization of the initial in "the Author" (p. xi *et al.*) and italicization of family names such as "*Lasiocampidae*" seem unusual. It would have been useful to have had a list of new taxa and other classificatory changes in some prominent place. The coining of English names for all the species is of questionable value, particularly in a work dealing with the fauna of a highly multilingual region. It is too bad that wings had to be cropped marginally as in Pl. 30 or the already reduced Pl. 17, when a small variation of scale would have made the cropping unnecessary. Full figures or those with the wings of one side completely cropped as in Pl. 3 or Pl. 4 are more satisfying.

The book is very moderately priced and it should find many buyers. It should prove rewarding not only to specialists in Saturniidae or in the African fauna but to all who are interested in large, attractive and biologically noteworthy Lepidoptera.

Eugene Munroe

NOTICE OF PUBLICATION

Symposium on Biting Fly Control and Environmental Quality. Copies of the Proceedings of this Symposium held at the University of Alberta, Edmonton, 16-18 May 1972 are available from Dr. Brian Hocking, Dept. of Entomology, University of Alberta, Edmonton, Alberta.

REVIEW

Science Council of Canada, Annual Report 1972-1973. 48 pp. Available from Information Canada.

The Report gives a detailed description of the activities of the Council during the year. A chapter on the government's "contracting out" policy gives the Council's views on the Federal Government's "Make or Buy" policy for R. & D. In his report, the President comments on a wide range of matters and poses questions about policy changes, decision making and government support of R. & D. His views on the place of science policy at the provincial level are also given.

Other Science Council of Canada Publications:

Report No. 20, Canada, Science and International Affairs.

Special Study No. 27, Essays on Aspects of Resource Policy. I. Science Expenditures and the Contributions of the Resource Industries to the Canadian Economy. II. The Systems Approach to Resource Allocation. III. Jurisdictional Problems in Natural Resource Management in Canada. IV. Resources: Implications of Ownership.

Special Study No. 28, Education and Jobs.

CANADIAN NATIONAL COMMITTEE INTERNATIONAL UNION OF BIOLOGICAL SCIENCES

On 23 March, the Canadian National Committee for I. U. B. S. met in Ottawa. The resignation of the Chairman, Dr. W. B. Mountain, Agriculture Canada, Ottawa, was accepted and Dr. A. C. Blackwood, Macdonald College, was elected Chairman. Other members of the committee include Dr. B. G. Cumming, University of New Brunswick, Dr. N. E. Gibbons (*ex-officio* in his capacity as an executive member of I. U. B. S.), Dr. J. G. Lafontaine, Laval University, Dr. S. M. Martin (Secretary), N.R.C., Ottawa, and Dr. H. E. Welch, University of Manitoba. Several additional candidates were nominated to expand the coverage of the Committee. Dr. Gibbons reviewed recent activities of I. U. B. S. and noted the appointment in January of a permanent Executive Secretary resident in Paris. Ways and means of establishing better liaison between I. U. B. S. and Canadian biologists were discussed.

The XVIIIth General Assembly of I. U. B. S. will meet in Ustaoset, Norway, from 27 September to 2 October 1973. Drs. Blackwood and Welch will be Canadian representatives at the General Assembly.

The Assembly will be important to Canadian zoologists as the Assembly will probably ratify recommendations for the continuance of the International Congress of Zoology in a modified form, and will also consider the status of and acceptance of reports from the International Commission of Zoological Nomenclature.

The scientific program of the XVIIIth Assembly will include symposia on the genetic systems of prokaryotic organisms and their application to eukaryotic systems, and the biological implications of diversity of gene pools.

PERSONALIA

Noubar Bostanian recently joined the Pesticide Information Office of the Research Branch, Agriculture Canada. Noubar has an M.Sc. in residue chemistry from the American University of Beirut and a Ph.D. in insect toxicology from McGill. With a diversified background in research and as a consultant, he will provide advice and guidance on insecticide research and use.

POST GRADUATE DEGREES

McMaster University

THOMSON, A. J. 1972 Ph.D., Supervisor D. M. Davies. Dissertation: The ecology of *Pollenia rudis* (Diptera: Calliphoridae) and its host earthworms (Lumbricidae), with special reference to the host-parasite relation between *P. rudis* and *Eisenia rosea*. (Now at Institute of Animal Resource Ecology, Vancouver, B.C.).

TROUBRIDGE, D. A. 1973 M.Sc., Supervisor D. M. Davies. Dissertation: Seasonal distribution, diurnal periodicity and physiological age of host-seeking tabanids (Diptera, Tabanidae).

EMPLOYMENT

The Entomological Society of Canada maintains a list of employment opportunities in Canada for members, and has an employment office at annual meetings of the Society. Positions wanted and available are published in the *Bulletin*, for details see *Bulletin* 4(4):114.

POSITION WANTED

Ph.D. with experience in insect ecology, biological and integrated control, and pollination ecology is particularly interested in teaching, research or extension position in ecology or biological and integrated control. Ref. No. 37-3-73.

Please direct all inquiries and correspondence to: S. R. Loschiavo, Chairman, Employment Committee, Entomological Society of Canada, 25 Dafoe Rd., Winnipeg, Manitoba. R3T 2M9

Do not direct inquiries to the *Bulletin*

PERSONALIA

Aly Ahmed Osman, post-doctorate fellow at the Vineland, Ontario Research Station of Agriculture Canada has been working with D.C. Herne for nearly a year. He is studying predaceous mites in Ontario fruit orchards and their resistance to pesticides, his basic interest being integrated control programs. Aly Ahmed is on leave from the Faculty of Agriculture, Shebin El-Kom, Egypt, where he works and lectures on the ecology and control of mites on crops.

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Mikio Chiba of the Agriculture Canada Research Station, Vineland, Ontario, returned in April from a year's post doctorate transfer of work at the Tokyo University of Agriculture, where he worked with Dr. Izuru Yamamoto, and studied degradation of organophosphorus insecticides in plants. Dr. Chiba, author of the book (in Japanese) "PCB Residues in the Environment and their Analyses", tells his story in the June issue of **Tableau**, Agriculture Canada's Research Branch internal newspaper.

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Dr. E. J. LeRoux was honored by McGill University, who conferred on him the degree of Doctor of Science *honoris causa* at the Convocation on 2 June. Dr. LeRoux was introduced to the Chancellor by Professor Frank O. Morrison, who asked that he might be awarded the degree "For his distinguished contributions to science and to the teaching of science, for his tireless dedication and infectious enthusiasm . . .". Ed LeRoux is Assistant Director-General, Planning and Coordination, Research Branch, Agriculture Canada. He delivered the Convocation Address, which is published elsewhere in this issue.

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Ian Williams, Pesticide Chemist, Entomology Section, Agriculture Canada, Vancouver, is on a transfer-of-work to Rothamstead Experimental Station, Harpenden, Herts., England. He is working with new systemic fungicides after their application to soil.

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Gordon Guyer, President of the Entomological Society of America, has accepted appointment as Assistant Dean of Agriculture and Director for the Cooperative Extension Service for Michigan State University. He also holds the position of Professor of Entomology.

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F. L. McEwen, Professor and Chairman, Department of Environmental Biology, University of Guelph, has taken on the additional responsibility of Extension Entomologist for the Province of Ontario. Until his retirement, the position was held by Harold W. Goble.

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A. W. A. Brown is the first John A. Hannah Distinguished Professor at Michigan State University. He is associated with the Department of Entomology and Pesticide Research Center.