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ENTOMOLOGICAL SOCIETY OF CANADA

Bulletin



Vol. 8

SEPTEMBER 1976

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ACTION REQUESTED
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P.E. Morrison Editor (Society Publications)

B.J.R. Philogène Editor (Bulletin)

Cover Design: M.A. Sydor

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ENTOMOLOGICAL SOCIETY OF CANADA

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Cyanamid of Canada Ltd.
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Research Station, Agriculture Canada
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CONTRIBUTIONS

Contributions and correspondence should be sent to: B.J.R. Philogène, Bulletin of the Entomological Society of Canada, Department of Biology, University of Ottawa, Ottawa, Ontario K1N 6N5.

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Inquiries about subscriptions and back issues, and books for review should be sent to the Entomological Society of Canada, 1320 Carling Ave., Ottawa, Ontario K1Z 7K9.

DEADLINE

The deadline for the next issue Vol. 8, No. 4 for December 1976 is 15 November. The approximate date of mailing will be 15 December.

EDITORIAL

I would like to draw a parallel between an article which appeared in the March issue of the *Bulletin of the Entomological Society of America* and the Chairman's statement in the Annual Report of the Science Council of Canada (SCC) 1975-1976. The article was written by Prof. David Pimentel of Cornell University and is entitled "World Food Crisis: Energy and Pests". The author discusses shortages of energy, land and food and calls for more effective pest control, more effective in the sense that more food should be produced and less energy used in the process. "Successful pest control programs will be constrained by the critical demand for more food for a rapidly growing world population, by limited fossil energy, and by the need to continue to protect the health of man and maintain a quality environment."

The Chairman's statement in the Annual Report of the SCC deals with the development of a comprehensive energy policy for Canada to ensure long term energy supplies through the development of new resources and technologies and through conservation. "There must be adequate funding so that the sectors can coordinate their conservation efforts and create a good climate for the development of post-conventional energy technologies." The trouble is that "a good climate" does not exist right now for the *maintenance* of current research programs, particularly the more innovative ones. It is therefore difficult to envisage how a good or better climate can prevail for the development of "post-conventional energy policies" when the trend in government is to smother scientific entrepreneurship.

Entomologists recognize the need for more innovative, energy-saving methods of insect control; they are prepared to channel their energies in that direction. Will they — and other scientists in related fields — be given the means to modify their current research programs or start new ones? Or is this another Annual Report which will be often quoted and . . . conveniently shelved?

THE PRESIDENT WRITES TO THE PRIME MINISTER

Following is Dr. S. Cooper's letter to the R.H.P.E. Trudeau. It was pointed out in the June issue of the Bulletin (Vol. 8, No 2.) that no answer had been received by then. This situation is unchanged at the present time. Editor.

May 20th, 1976

The Right Honourable P.E. Trudeau
Prime Minister of Canada
House of Commons, Room 311-S
Parliament Buildings
OTTAWA, Ontario K1A 0A6

Dear Mr. Prime Minister:

The entomological Society of Canada is greatly concerned over the attitude being expressed by the existing Government toward fundamental and applied research in this country. A continual reduction in available research funds has occurred in recent years with further curtailment again this year. While the Society agrees that there is a need today to practice economy at all levels of government, university, and industry, it has always been false economy to curtail sound long-term research programs. Such false economy will greatly hinder solutions to our present problems and certainly will contribute, within the next ten years, to the faltering of Canada as a major food and fibre producer.

Even the most casual survey indicates that in recent years scientific research has been continually downgraded in Canada, especially at the working level. At the same time there has been a vast expansion in the administrative bureaucracy which only served to contribute to the further restriction of research experts. This trend must be reversed if Canada is to fulfil its role in an era when world food reserves are at a dangerously low level. Canadian research on insect control has been one of the key factors in making Canada a world leader in food production, but all too often this input has been overlooked or gone unheralded. A similar situation exists in the protection of our forests which, in many areas, are now in jeopardy. Increased research funds in forest management are needed immediately if future disaster is to be prevented. Development of the Canadian north necessitates adequate control of biting flies. Environmental studies on the effects of such control programs on beneficial insects and other organisms must be carried out. Much greater emphasis, not less, on entomological training and research is critically needed if we are to solve these problems.

A breakdown of the 1976-77 federal spending estimates indicates that many departmental budgets have increased substantially. Most increases appear to be due to increased administrative costs. While there may be slight increases in research budgets in some departments such as agriculture, these increases are by no means sufficient to offset the reduction resulting from inflation. This pattern that is demonstrated in 1976-77 has been apparent for the last several years. Continual erosion of the research dollars through inflation and the rising cost of administration is resulting in a serious curtailment of research projects. If this continues, effects on the immediate and long-term research will be disastrous.

Morale with the scientific community in Canada is extremely low. In general, Canadian scientists have little confidence in the science policy plans formulated by the existing Government. Many scientists are beginning to wonder whether you and many of your colleagues have any sympathy for scientific research. This may, in part, be caused by the ineptitude of administrative staffs who have little concept of the needs of science and scientists.

Research is further threatened by limiting the opportunity of scientists to communicate with their peers. Communication through publications has been restricted and attendance at scientific meetings well-nigh prohibited. The Treasury Board Circular 1976-2, TB No. 740-686 dated January 22nd, 1976 (copy attached) is one area where a false saving is being sought. The fact that only one delegate per year from any department may attend a non-governmental conference will eliminate most Government research scientists from participation in the scientific meetings of Canadian scientific societies to which they belong. One can only be amazed at Government policies which spend millions of dollars on "show-case" meetings such as Habitat, and on innumerable governmental conferences for numerous organizations and yet restrict attendance of the country's scientists at national scientific society meetings. This brings about a slow strangulation of such societies and destroys the morale of the scientists. Immediate consideration must be given to amend this directive. Do those responsible for such a directive fully understand or appreciate the impact that it has? Certainly, judgment must be exercised in the number of scientific meetings that each individual should attend outside of Canada, but restrictions on the number attended within Canada must be lifted. When research scientists are discouraged from attending scientific meetings within their own country, the very validity of research is being challenged. Free exchange of ideas and thinking is essential. To restrain or prevent such exchange will result in the destruction of the scientific community itself. Is this your objective?

The Entomological Society of Canada is certain that it is in the best interest of Canada and Canadians for the Federal Government to recognize the need for continued research and do everything possible to support it and keep it viable. It is also necessary to take immediate action to prevent the destruction of Canada's scientific societies and communities by permitting Government of Canada scientists to exchange scientific knowledge through the meetings of these societies. To grant this will be a further indication that your Government wishes to prevent social and moral decay that would result from such restrictions.

I trust that under your direction every effort will be made to correct the deplorable conditions we are currently experiencing and that research will move ahead, permitting Canada to meet the challenges of the future.

Yours very truly,

G.S. Cooper, Ph.D.
President

JACOB GERHARD REMPEL
1903 — 1976

Dr. Jacob Rempel, Emeritus Professor of Biology, University of Saskatchewan, died May 30, 1976, at Victoria, British Columbia. Renowned and honored for his inspirational teaching and his original researches, he will be equally remembered for his personal integrity, warmth, compassion, and loyalty. Through courage, determination and intellectual drive he overcame adversity and persecution in his youth to achieve a life abundantly fulfilled.



Jacob came from stout Mennonite stock with roots going back over the centuries to Holland, then Germany, and finally in the 1780's to the Ukraine region of Russia. There, his people were permitted to retain their native German language, learning Russian as a second tongue. Into this rural setting, Jacob was born in 1903, son of a substantial grain merchant. His peaceful childhood was shattered by the revolution in 1917. In the ensuing period of violence and deprivation, he lost his father and mother and came perilously close to losing his own life at age sixteen. Eventually he obtained a job teaching public school and, in 1923, he and his brother managed a hazardous emigration to Canada. They arrived at Langham, Saskatchewan, penniless, without knowledge of English and fearful of pursuit by the secret police.

Life in Canada began with work on a farm and an attack on the English language, largely from a dictionary while driving horses. Two years later, Jacob entered high school and the following year, 1926, won a gold medal while completing his senior matriculation. Later the same year he passed the requirements for teaching in Saskatchewan and took a position in a rural school. In 1928 he enrolled in the University of Saskatchewan at Saskatoon.

Jacob graduated in 1931, B.Sc. with High Honors in Biology and the Governor General's Gold Medal. The undergraduate years were financed by instructing in the biology laboratories, waiting on tables in the university dining hall, and assisting Professor Don Rawson with his studies of the lakes of northern Saskatchewan. In 1933, he completed his M.Sc. degree, specializing in freshwater biology with particular reference to the life history and morphology of *Chironomus hyperboreus* Staeg. Observations made at that time on the parasitism of chironomid larvae by nematodes and the sex reversal that resulted paved the way for subsequent studies at Cornell University for the Ph.D. degree in entomology, which was obtained in 1937.

Upon graduation in 1931, Jacob was appointed as Instructor in Biology at the University of Saskatchewan. In 1934 he transferred to Regina College which had been taken over by the University as the nucleus of a second campus. He returned to Saskatoon in 1946, was promoted to professor of Biology in 1951 and served in this capacity until his retirement in 1970. After moving to Victoria, B.C., the University of Victoria prevailed upon him to accept a one year appointment as Visiting Professor of Entomology. This assignment only temporarily interrupted the continuation of his beloved research.

Throughout this span of forty years, Dr. Rempel maintained more than usual interest in university affairs. He served as a member of numerous committees and chaired a number of key bodies that influences campus development. Likewise, the Rempel home served as a haven to a host of students, some of whom still talk about Mrs. Rempel's "fabulous chocolate cake".

Jacob Rempel has built his own memorial: in the hearts and minds of his friends and students, and in the literature of science. His lectures and writings were imprinted with his personal enthusiasm, meticulous care and artistry in preparation, ingenuity in presentation, and a total dedication of self to the task at hand.

Dr. Rempel was author or co-author of more than fifty scientific papers. He is favourably known for his contributions in the field of medical entomology: towards the solution of the problems caused by blackflies and on the role of mosquitoes as carriers of the virus that causes western equine encephalitis. These studies were reported in eighteen papers under joint authorship. However, the publications on encephalitis were supported by work done independently by Dr. Rempel, notably his two comprehensive reference papers on the identification of mosquito larvae and adults occurring in the region.

But Professor Rempel made an even greater impact on the science of entomology through his more fundamental investigations. His studies of intersexuality in Chironomidae was a pioneer contribution on the role played by hormones in controlling sex determination in insects. However, it was in insect embryology that he brought his distinguished career to a flourishing close. Detailed studies of the embryology of the bertha armyworm (*Mamestra configurata*), the black widow spider (*Latrodectus mactans*), and meloid beetles (*Lytta nutalli* and *L. viridana*) provided lecture and laboratory material for a unique and comprehensive course for advanced students and for some twenty papers of classic quality. Here, again joint authorship predominated especially in the meloid studies with Jacob's good friend, Dr. Norman S. Church of the CDA Laboratory at Saskatoon, but the ground work on the armyworm and the spider, that set all the rest in train, was undertaken by Dr. Rempel alone. Likewise, the last and very significant paper on "The Evolution of the Insect Head: the endless dispute" was achieved independently and published less than a year before his death. This final effort bids fair to end the endless dispute that ranged through twelve different theories in search of an explanation.

In addition to the academic gold medals already mentioned, Jacob won many honors. He was elected a Fellow of the Royal Society of Canada in 1956; appointed to the prestigious post of Rawson Professor of Biology at the University of Saskatchewan in 1962; and awarded Honorary Member status in the Entomological Society of Canada in 1970 and their coveted Gold Medal in 1971 (Bulletin 2:52; 3:42). He held membership in many professional societies and was elected President of the Entomological Society of Saskatchewan and of the International Conference on Diseases of Nature Communicable to Man. In addition, he served some ten years as Associate Editor of the Canadian Journal of Zoology and an equally lengthy period as a member of the Advisory Panel on Entomology of the Defence Research Board of Canada.

It was during his student days, while pursuing his freshwater biology studies, that he met and, in 1933, married Greta Halliday of Prince Albert. Greta now resides at 1450 Beach Drive, Victoria. Their two daughters, Helen and Elizabeth, live at Newmarket, Ontario, and Vancouver, British Columbia, respectively; and their son, Richard, at Hamilton, Ontario. For them, and all of us who knew Jacob,

cherished memories remain, memories largely shaped by the personal commitments of a gifted man.

Robert Glen

Recent Deaths

DUSTAN, Allan Gordon. Halifax, N.S. On 31 May, 1976, age 84. Former member ESC, ESO. Retired entomologist (vegetable crops), Canada Department of Agriculture.

FETTES, James J. Ottawa, Ont. On 10 July, 1976, age 61. Director, Chemical Control Research Institute, Canada Department of Environment.

FLEMING, Harry S. Ottawa, Ont. On 2 July, 1976, age 79. Retired, first forest insect ranger, Canada Department of Environment.

ACHIEVEMENT AWARDS

Members are reminded to submit, by 30 November 1976, their nominations for the Entomological Society of Canada Gold Medal for Outstanding Achievement in Entomology and for the C. Gordon Hewitt Award for recipients under 40 years of age. Conditions governing these awards were summarized in the Bulletin 8(2): 6. Eligibility for both awards may be based on research accomplishment of consequence to entomology in Canada or on service and dedication to research administration, extension, and education, and to the Society or its Affiliates. The Awards will be made only if suitable recipients are nominated.

Nominations marked "Confidential" may be sent to:

Dr. George H. Gerber
Secretary, Entomological Society of Canada
Research Station, Agriculture Canada
195 Dafoe Road
WINNIPEG, Manitoba
R3T 2M9

Alan G. Dustan
1892-1976

Alan Gordon Dustan died suddenly at Halifax, N.S., on 31 May at age 84. Not many entomologists in Canada were better known, better liked, and more highly respected than Mr. Dustan. Modest, friendly, generous and genuinely interested in people and their affairs he was "Alan" or "Dusty" to most of his acquaintances in the Entomology Division from junior staff up. Energetic, quick, impatient of delay he was an effective researcher and administrator.

Although Alan was born and raised in the City of Halifax his first interest was fruit farming, and for two years, 1910-11, he worked on a farm in the Annapolis Valley. He attended the Nova Scotia Agricultural College for the next two years and then the Ontario Agricultural College (B.S.A., 1915) and Macdonald College (M. Sc., 1922).

In 1915, having worked on fruit insect studies as a student for two summers with the Nova Scotia Department of Agriculture, and for one summer with the Ontario Department, he began his 37 years with the Entomology Division. He studied fruit insects at the Annapolis Royal laboratory for three years and forest insects at the Fredericton laboratory for another two. From 1920 to 1925 he was in charge of the laboratory at Wolfville, N.S., working on diseases of the apple sucker and the "green apple bug". For his studies there on entomophthorous fungi he was granted a substantial scholarship for advanced study by the National Research Council.

In 1925 he was placed in charge of the Ottawa laboratory at the Central Experimental Farm and began the work on vegetable insects that formed the greater part of his career. Producing numerous publications on vegetable insects and other garden pests he was soon recognized as an authority in his field. His 1933 bulletin "Vegetable Insects and Their Control" was for years one of the leading works of its type.

From his first days at Ottawa, Mr. Dustan was unofficially assistant chief of the Division of Field Crop and Garden Insects and in 1945 became associate head of Field Crop Insect Investigations. He was placed in charge of vegetable insect studies in Canada, a neglected field in some of the provinces. Seven laboratories in Eastern Canada came under his direction. He quickly co-ordinated and developed the vegetable insect work in Canada, giving it a long-lasting impetus. This, and promoting good staff morale were perhaps his greatest contributions.

In 1952 he retired from the service at age 60, but not from entomology. For the next decade he worked each winter for the Bermuda Department of Agriculture, publishing 15 or more papers on a diversity of studies. These included studies on the harlequin bug, the green shield scale on oleander, mites on lily bulbs, land crabs, herbicidal control of weeds, and chlorosis of lilies. In 1952 and 1953 he also worked each summer for the Commonwealth Institute of Biological Control, with headquarters at Ottawa.

In 1932 he married Marguereta Dunham, also on the staff of the Entomology Division, who predeceased him in 1971. Alan left Ottawa in 1972 and returned to Nova Scotia where he was remarkably active, charitable as always, and seemingly in good health until shortly before he died.

W.G. Matthewman

FINANCIAL STATEMENTS
Year ended 31 December 1975

To the Members of

ENTOMOLOGICAL SOCIETY OF CANADA

We have examined the balance sheet of the Entomological Society of Canada as at December 31, 1975 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.

In our opinion, subject to the foregoing, these financial statements present fairly the financial position of the Society as at December 31, 1975 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.

Geo. A. Welch & Company
CHARTERED ACCOUNTANTS.

Ottawa
June 16, 1976.

BALANCE SHEET

DECEMBER 31, 1975

ASSETS

	<i>1975</i>	<i>1974</i>
Cash	\$ 50,821.57	\$ 39,150.49
Accrued interest on bonds	4,011.25	2,671.75
Accounts receivable	20,883.09	15,770.00
Term deposits — 8 3/4% due January 15, 1975	—	25,000.00
— 10 1/4 % due January 17, 1975	—	25,000.00
— 10 % due February 3, 1975	—	15,000.00
— 8 3/4 % due December 29, 1978	10,000.00	10,000.00
— 9 3/4% due January 15, 1980	25,000.00	—
Government and government guaranteed bonds — at cost — (quoted value \$41,400; 1974 \$43,156)	49,848.03	49,848.03
Other bonds — at cost — (quoted value \$73,000; 1974 \$23,800)	75,000.00	25,000.00
	\$235,563.94	\$207,440.27

LIABILITIES AND SURPLUS

LIABILITIES		
Accounts payable and accrued liabilities	\$ 17,413.70	\$ 16,416.67
Prepaid memberships, subscriptions and reprints	22,719.48	28,049.50
Scholarship fund	—	76.00
Unearned portion of National Research Council grant	4,758.50	—
	44,891.68	44,542.17
SURPLUS		
Balance, beginning of year	162,898.10	159,303.82
Add:		
Net revenue for year	27,774.16	3,594.28
Balance, end of year	190,672.26	162,898.10
	\$235,563.94	\$207,440.27

STATEMENT OF FINANCIAL ACTIVITY
YEAR ENDED DECEMBER 31, 1975

	<i>1975</i>	<i>1974</i>
REVENUE		
Regular memberships	\$ 15,880.87	\$ 13,790.50
Student memberships	1,416.00	1,304.00
Sustaining memberships	—	400.00
Subscriptions	39,001.15	31,205.15
Sale of reprints including page charges	60,677.37	44,450.10
Sale of back issues	4,693.78	3,307.60
Publishing "Memoirs"	21,245.00	15,602.00
Interest earned — net	14,864.18	11,938.14
	157,778.35	121,997.49
 EXPENDITURE		
Publishing costs — "Canadian Entomologist"	60,802.32	48,161.28
— bulletins	4,367.95	6,025.72
— reprints	3,249.76	4,976.93
— memoirs	16,041.91	11,994.69
Annual meeting — grants	2,533.21	3,597.03
— travel and expense	3,441.75	5,102.33
Other societies — dues and grants	1,350.00	3,592.00
— delegates	1,289.73	1,057.15
Salaries	25,890.67	24,071.79
Directors' expenses	2,223.25	3,194.50
Canada pension and unemployment insurance	532.64	460.20
Student encouragement	987.64	200.00
Professional fees	1,475.00	450.00
Postage and office supplies	2,110.50	2,593.61
Telephone	293.51	291.66
Rent	2,776.81	1,811.92
General expense	637.54	822.40
	130,004.19	118,403.21
 NET REVENUE FOR YEAR	 27,774.16	 3,594.28

Insectes, microclimat et fruits: une innovation

Dr. Robert Trottier, entomologiste au ministère de l'Agriculture de Canada, à Vineland, Ontario, a mis au point une méthode de prédiction de la date de cueillette des fraises et des pêches pour l'Ontario. Cette méthode basée sur les degrés-jours et les heures d'ensoleillement permet d'avertir deux ou trois semaines à l'avance les agriculteurs et les acheteurs des grandes chaînes alimentaires de la date des récoltes. Dr. Trottier étudie depuis les cinq dernières années l'influence du microclimat sur le développement des ravageurs des pommeraies afin d'établir un réseau d'avertissement phytosanitaire.

Où trouvera des renseignements plus détaillés sur cette intelligente application de nos connaissances écologiques dans le feuillet "Information for Extension Personnel" publié par "Ontario Ministry of Agriculture and Food" de Mai 1976 (Agdex No. 232/50)

'MAC' MacCARTHY RETIRES

H.R. 'Mac' MacCarthy, Head of Entomology at Vancouver for 21 years, retired on June 22, after 26 years with Agriculture Canada.

Mac began his career in agricultural research in 1948 as a student assistant at the Field Crop Insect Laboratory at Kamloops. This followed 9 years as a cattle rancher at Princeton, B.C., and 6 years war service in the Canadian Infantry Corps.



After returning from war service in 1946, Mac attended the University of British Columbia, receiving his B.A. in 1950. He went directly on to graduate study at the University of California at Berkeley and was awarded his Ph.D. in 1953.

He returned to Kamloops and worked there until 1955 when he was appointed Officer-in-Charge of the Field Crop Insect Laboratory on the campus of the University of British Columbia. He was named Head of the Entomology Section of the Vancouver Research Station in 1959.

Mac's research was largely on the transmission of potato leaf roll virus by aphids. Collaborative work by him and other scientists at the Station has led to almost complete control of the spread of potato leaf roll in the province.

At his retirement parties he was presented with his certificate of long service, a suitcase, books and records. He also bought himself a retirement present — a fire-engine red BMW 2002!

Mac didn't really retire, however, because 2 days after he left the Station he was teaching in the Master of Pest Management program for Simon Fraser University, where he is now a Sessional Lecturer. He also continues as Editor for the Entomological Society of British Columbia and Associate Editor for the Canadian Journal of Zoology.

R. Forbes



CANADIAN FAUNAL SERIES

During the last several years the staff of the Biosystematics Research Institute has been active in initiating a series of identification guides dealing with the arthropods of Canada. The Canadian Faunal Series is designed to permit the identification of organisms by the general biologist, senior technician or advanced amateur. Usually a single family will be covered in an individual contribution, but larger or smaller taxonomic units will also be treated.

The first contribution (number 2 in the series) which considers the bark beetles of Canada has recently been published. The first volume, however, which will be a handbook of entomological techniques, has been delayed by the preparation of illustrations. A number of other contributions to the series have been submitted for publication or are in late stages of preparation.

CRICKET-FIGHTING IN HONG KONG

According to a recent (29.IV.1976) article by Li Fêng entitled "Tao Shuay" ("Fighting Crickets"), in a magazine with the intriguing title, *Se Huey Hsing Wen Chou Kan (Secrets of High Society)*, 6, p. 40, the ancient Chinese sport of cricket-fighting is still much in vogue in Hong Kong (even if it is discouraged in the Peoples' Republic of China, where any form of wagering or gambling is strongly discouraged). As the article is entirely in Chinese, and not likely to come to the notice of Western entomologists, it might perhaps be worth summarizing this item of "cultural entomology" for their benefit.

Li Fêng observes that there are still many people in Hong Kong who indulge in the sport for the purpose of gambling. The crickets¹ there come from two regions: Hsing Chieh (in Hong Kong) and mainland China. The former may be obtained from Fêng-Ling, Yuan-Lan and Liu-Fo-San, but the fighting ability of these is much inferior to that of crickets from China proper. According to the punters, the crickets from Chin-Yuan, Tsong-Hua and Hua-Shian — called *Po-Chiang shuay*, or "northern-river crickets", — are the best fighters. The next would be the *Ting-Chiang shuay*, or "eastern-river crickets", which come from Tzeng-Chen and Ting Goan². Last are those from Hsing-Chieh.

Among the "northern-river" and "eastern-river" crickets the bravest fighters are the *jen-tou shuay* ("human-head" crickets) and the *se-tou shuay* ("snake-head" crickets). The former are so called because they live in human skulls among overgrown grave-yards³. They are very difficult to catch because there are seven holes in the human skull and the crickets can escape through one hole into another. The only way to catch them is to immerse the whole skull in water, when they will be sure to emerge. "Snake-head" crickets are so called because they live in caves inhabited by poisonous snakes. (There would be certain problems involved in catching these also!) Some of the crickets from Hsing-Chieh are of the "human-head" and some of the "snake-head" variety, but they are no match for the same kinds of crickets from mainland China.

Summer and autumn are the seasons to catch and sell crickets, but people in Hong Kong continue to gamble on them in the winter. There are two forms of betting on cricket fights there: (a) ordinary, in which the individual cricket owners (and their supporters) wager \$10 to \$20 (per fight) against each other; and (b) gambli-

¹Fighting crickets belong to several species, most commonly *Teleogryllus mitratus*, but it is difficult to identify them accurately by their vernacular nomenclature, as minor colour variants and populations from restricted localities, even if they belong to the same species, are known by different names. —D.K.

²All the places mentioned for mainland China are in Kwangtung Province, N.W. of Hong Kong. The rivers referred to flow into the delta of the Si Chiang. The "northern" rivers are the Po Chiang and Liu-Chi Ho. Chin-Yuan lies on the lower part of the former, Tsong-Hua about the middle of the latter; Hua-Shian lies south of Chin-Yuan, between the rivers. The "eastern" rivers are the Tzeng Chiang and Ting Chiang; Tzeng-Chen lies on the middle reaches of the former, Ting-Goan on the lower part of the latter. —C.-C.H.

³The old custom was to re-use graves (excavated into the sides of slopes) by removing the bones (after all the flesh had decomposed), and placing them (especially the "skull and cross bones") outside the entrance. There would thus be a fairly abundant supply of skulls available. —D.K.

ing organized by certain clubs. In the latter case, people assemble at what are called "cricket hunting meets". Those participating use the words *pin* ("cake") and *chu* ("pig") to indicate the size of their stakes. The former means \$5; the latter, \$200. Except that the owners of the contestants wager against each other, all the gamblers under this system may bet on either side. Many people are as obsessed by this form of gambling as others are by horse-racing.

—D. Keith MCE. Kevan and Chia-Chi Hsiung

Mass stranding of *Pristiphora erichsonii* (Hartig) in Labrador.

In late June 1976 Mr. R. Hooper of this department collected a number of adult *Pristiphora erichsonii* which were crawling out of the river at North West River, Labrador. This was in the tidal part of the river, but the water which they were leaving was fresh. A number of them were still alive when he brought them back to St. John's a few days later.

On 5 July 1976 Mr. A. Bradley and Miss L. Green found large numbers of the same species on the beach at Indian Cove (near Cartwright), Labrador. They said that the insects floated for miles on the sea surface until they were driven ashore by high winds. They were still alive and were crawling around the beach in great numbers. Mr. Bradley sent 2 1-lb. jars full of the insects to St. John's. The determination of the material was checked by Mr. R. Clark of the Newfoundland Forest Research Centre (Environment Canada), St. John's, and the occurrence is being investigated by a forest ranger from that organisation.

P. erichsonii is not known to be a serious pest in Labrador and it will be interesting to hear what might have been the source of this infestation. The few specimens that have been dissected were all females and all contained fully-developed eggs.

J. Phipps
Memorial University,
St. John's,
Newfoundland

MEMOIRS OF THE ENTOMOLOGICAL SOCIETY OF CANADA

No. 97. Revisionary notes and keys to World genera of Scelionidae (Hymenoptera: Proctotrupoidea). 87 pp. by Lubomir Masner.

Issued 14 June 1976

BOOK REVIEWS

Macrolepidoptera of Fiji and Rotuma: a Taxonomic and Biogeographic Study. Gaden S. Robinson. 1975. E.W. Classey Ltd., Faringdon, Oxon, England. vii + 362 pp. + 15 maps, 357 plate figs., 173 text figs., 6 pp. index.

Dr. Robinson's impressive study deals with the butterflies and larger moths of one of the most interesting Pacific island groups, justly characterized by Poulton as "the gateway through which Polynesia was invaded" by Lepidoptera. The taxonomy of 400 species is considered; biological and distributional information is given so far as available for each; photographs of 349 species are reproduced, supplemented by 173 line drawings of significant genital characters. Two genera, 72 species and 10 subspecies are described as new. The basic taxonomic and distributional information is supported by a short chapter on the publications on and collections of Lepidoptera of Fiji and adjacent islands, a longer and very informative chapter on the geography, geology, climate, vegetation and fauna of Fiji, with excellent illustrations of habitat types, and a clear and concise chapter on methods. This substantial body of information is used to develop a quantitative analysis and qualitative interpretation of the habitat relations and geographical differentiation of the fauna.

The taxonomic section is straightforward and "conventional." It is well organized and apparently comprehensive, and contains a great deal of new information, as can be judged from the fact that nearly 25 percent of the species are new to science and that many of the others are figured for the first time. Keys are given to the species of some genera, presumably where the author thought they were most required, but not to others, and there are no keys to genera or families. A diagnosis is given for each species, but not for genera, subfamilies or families. Considering the restricted number of species and the numerous illustrations, these omissions should not cause serious inconvenience.

The chapter on literature and collections appears to be adequate, and certainly fulfils its main purpose of showing what information from previous workers was available to the author. Small collections in the Museum of Comparative zoology and in the Canadian National Collection were overlooked, but these would probably not have added much of importance.

The chapter on natural history is concise, readable, and contains a well-balanced selection of material, accompanied by maps of present and possible Pleistocene geography. The geological section in particular is up-to-date for the time of writing and its biogeographic implications are intelligently assessed.

The methodology chapter outlines both sampling and subsequent analytic procedures. Further light is shed on these in the chapter that details the actual results. The enterprise, organization and sheer hard work applied to obtaining the field data can perhaps be appreciated only by those who have themselves been involved in such activities. The samples obtained are exceptionally representative geographically and by habitat, and their tabulation is exceptionally thorough. In interpreting his data, Dr. Robinson has shown a clear understanding of the questions he was trying to answer, and a grasp not only of the methods available for handling quantitative data but also of their proper uses and potential limitations. In particular he has shown by simple but pleasing tests the weaknesses of the Williams index of diversity and the Lloyd-Ghelardi equitability index under the conditions of his sampling program. He has gone on by means of cluster analysis to identify

habitat-related elements on the two large islands, Viti Levu and Vanua Levu. These are compared, by means of similar analyses, with the faunas of the smaller Fijian islands, of Rotuma and of the New Hebrides. As expected, the large islands of the Fiji group are richer in species, have a larger number of habitat-related elements and are relatively richer in endemic species than the small islands of the same group. Rotuma has a poor fauna with remarkably little habitat differentiation. The New Hebrides show both similarities to and differences from Fiji in their lepidopterous fauna. The Fijian fauna is overwhelmingly of Papuasian affinity, but has a high proportion of endemic species or subspecies. Even allowing for size of islands, the fauna of Fiji is less impoverished than those of Samoa and Tonga, and much less impoverished than those of islands lying to the north and east of these two groups. If only poorly dispersing "Heterocera B" are considered, the dividing line is shifted to the west, with Samoa and Tonga falling in the impoverished group. Many further interesting features emerge from Dr. Robinson's analysis, for the details of which the reader is referred to the original.

The book has been reproduced directly from the typescript of Dr. Robinson's Ph.D. thesis, which obviously was prepared with the needs of publication in mind. It is too bad that this practice is not a universal requirement for the doctoral degree. The script is well arranged and remarkably clean, only a very few typographical errors and omissions having been noted. The photographs of both moths and habitats are excellent, but they have lost contrast in reproduction, probably because of insufficient intensity in the dark tones. One could wish some of the moths to have been better aligned with their background grids. The drawings are adequate, though not of the elegance of the photographs, and their reproduction is good. The binding is of flexible cloth-textured material, attractive in colour and design. The subdued map of Fiji and adjacent islands on the back cover is a particularly nice touch.

In sum, Dr. Robinson has given us a highly usable taxonomic reference and a very interesting biogeographic analysis. The project was an ambitious one, and there is evidence of unusual insight, energy, organization, determination and resourcefulness at every stage from initial planning, through field and museum work and quantitative and qualitative biogeographic analysis to the final stage of publication in unconventional but possibly pioneering form. We look forward to further work of the same calibre as Dr. Robinson's career progresses.

Eugene Munroe
Biosystematics Research Institute
Agriculture Canada
Ottawa

Insect Muscle, edited by P.N.R. Usherwood. Academic Press, London, New York and San Francisco. £14.50 (\$38.25). 1975

This book presents a comprehensive account of insect muscle. There are 10 chapters which range over fine structure through physiology and pharmacology to mechanics and biochemistry.

The book has two main aims. Firstly to present a review of previous and current literature on insect muscle and its nervous control for entomologists. Secondly, it aims to introduce physiologists, pharmacologists and biochemists to insect muscle in order to demonstrate the advantages of this material for investigating the fundamental properties of muscle.

Both aims have been achieved, but to some extent the data presented for the entomologists may seem somewhat obscured in places, by the detailed comparison and discussion of vertebrate systems. It is of course important for entomologists to know how peculiar their organisms might be, but the casual reader should be aware of the general discussions to be found especially in Chapters 5, 6 and 8. Nevertheless, the book presents for the entomologists, the most up to date account of the form and function of insect muscle.

Chapter 1 by Elder gives a brief, though thorough synoptic account of the structural features of insect muscle, and lays the groundwork for more detailed considerations of some aspects in later chapters. It points out that insect mastery of the terrestrial and aerial environment has dictated a high precision of muscle control and the speed and power of muscle response to match: such precision, speed and power is of course unnecessary in the aquatic environment.

While it is a well known fact that all insect muscle, including cardiac and visceral muscle is cross striated, it is pointed out that this does not mean that it is all structurally and functionally identical. Indeed, the structural and physiological diversity of insect muscle far exceeds that of vertebrate striated muscle. The flight muscle of insects is especially peculiar, and is the most metabolically active tissue known.

Of course, insect muscles are peculiar in their mode of oxygen supply. The flight muscles in particular have a rich tracheal supply, with terminal tracheoles penetrating individual fibres in all except the Odonata and the lower Orthoptera.

Elder briefly describes the three main types of flight muscle, namely the tubular, close-packed and fibrillar forms, and lists Orders in which each is to be found. Certain differences between the close-packed or non-fibrillar (= synchronous) and fibrillar (= asynchronous) are dealt with by Tregear in Chapter 7, and by Crabtree & Newsholme in Chapter 8, but nowhere in the book is there a consideration of the evolutionary and phylogenetic significance of these differences.

It is also noted that the other muscles in insects are variable, the details depending on the precise functional requirements, especially with respect to speed, frequency and duration of contraction. Miller in Chapter 10 takes up insect visceral muscle, including cardiac muscle, and describes the distribution, development, structure and basic physiology, but does not discuss the functional aspects of the variability hinted at by Elder.

One recent finding also mentioned in Chapter 1 is the varying ratio of thick and thin filaments in insect muscle. Functionally, Elder relates the high ratio to a slow work rhythm, but this is not discussed in detail, elsewhere. Neither is there any consideration of the systematic and evolutionary importance of this variation.

Finlayson in Chapter 2 considers development and degeneration of insect muscle. The various factors controlling these processes are discussed, although the peculiarities of the insect system are not stressed. Some comparison with development and degeneration in other taxa, such as the vertebrates would have been of interest, especially to developmental biologists with a general interest in muscle. There is little consideration of the environmental factors involved in muscle development and degeneration, and the importance of these events in various life history strategies. This gap will be disappointing to a number of entomologists.

The ultrastructure of nerve and muscle synapses is considered by Osborne in Chapter 3. It is pointed out that to date no one has described good ultra-structural features to distinguish excitatory and inhibitory neuro-muscular synapses in insect skeletal muscle, although some differences have been noted in Crustacea. Osborne deals in detail with synaptic vesicles, the presynaptic membrane, synaptic cleft and the post synaptic membrane. The idea that the synthesis of synaptic vesicles, synthesis of L-glutamate or its uptake for subsequent incorporation into synaptic vesicles could take place in the motor nerve endings, is not accepted. Further, the idea that the vesicles could come from microtubules is not supported.

The insect nerve-muscle synapse is compared with that in the vertebrates, and it is noted that it may not be the same. It is pointed out that the vertebrate neuro-muscular junction is a structural oddity. It is also a crude all or nothing system that lacks the more sophisticated action found elsewhere.

Chapter 4 considers the pharmacology of somatic nerve muscle synapses. Usherwood and Cull-Candy note at the beginning that insecticides which act on general skeletal muscle membranes and motor axon membranes in vertebrates, also act at these sites in insects. This suggests some important basic similarities in the properties of these sites in the two groups of animals. However, the receptors on the postsynaptic membrane of insect excitatory nerve-muscle synapses are sensitive only to amino acids which closely resemble L-glutamate. In fact, this chapter outlines why it is now generally agreed that L-glutamate is the transmitter at excitatory synapses — a fact that has taken a long time to become accepted as the authors point out. More readily accepted was the fact that gamma-aminobutyrate (GABA) is the putative transmitter at inhibitory synapses.

Piek in Chapter 5 considers the data that show that the electrophysiological phenomena observed in the insect muscle fibre cannot be described accurately and completely in terms of theoretical equations which can describe these phenomena in squid nerve fibres. The problem as noted by Piek, could mean either that the theories do not apply to these insect muscles or that the experimentally determined ion concentrations differ markedly from those actually present in the fluid adjacent to both sides of the membrane. In fact, it is shown that the available data seem to indicate that resting membrane potentials as well as postsynaptic potentials of insect skeletal muscle fibres may be determined mainly by the ionic gradient across the walls of the transverse tubular system, i.e. by gradients not usually accurately determined by most studies on ionic and electrical properties of insect muscle. The importance of the complexity of the membrane phenomena in skeletal muscle in a number of insects is stressed by Piek.

Chapter 6 by Aidley on excitation-contraction coupling and mechanical properties is concerned with comparing the insect system with that thought to occur in vertebrate skeletal muscle. It includes a consideration of depolarization of surface membranes, spread of depolarization down the transverse tubules of the transverse tubular system, release of calcium ions from the sarcoplasmic reticulum the combination of calcium ions with troponin, and the interaction of actin, myosin and ATP to produce contraction. Such work as has been done on insect muscles has shown that their excitation-contraction coupling systems are on the whole similar to those of other striated muscles, and so this chapter contains little for the entomologists.

Tregear in Chapter 7 considers the biophysics of fibrillar flight muscle and concentrates on the experiments that have been performed on glycerol-extracted *Lethocerus* flight muscle fibres. This preparation, which has now been worked on in

almost as many ways as the frog sartorius muscle, has been used to confirm and extend the interpretation of the molecular events during contraction. Since the actomyosin interaction seems to be much the same in frog and *Lethocerus* muscle, Tregear suggests that the insect preparation is a logical choice for continued use in investigations of the molecular events during contraction.

Since numerous entomologists have at one time or another attempted to measure the fuel and fuel consumption in insect movement such as flight, Chapter 8 by Crabtree & Newsholme is of special interest. They consider the comparative aspects of fuel utilization and metabolism by muscle, give a historical review of the study of fuel utilization and present a detailed account of the metabolic characteristics of insect flight muscles.

The authors note that the basic mechanism for contraction (i.e. the sliding filament mechanism) appears to be the same for most, if not all, muscles. Thus it might be expected that the metabolic pathway for the regeneration of ATP for contraction would be the same in all muscles, i.e. a common fuel would be utilized by muscle tissue. The only difference would then be in the rates of utilization, which would reflect the differences in power output. However, it is well established that different muscles use different fuels for ATP formation. Thus glucose has been reported as the fuel for flight muscles in honeybees, trehalose the fuel in other insects, diglycerides in locusts and the amino acid proline for initial flight period in the tsetse fly (*Glossina*). Crabtree & Newsholme compare in particular, the flight muscles of insects with the red and white skeletal muscles of vertebrates, point out the similarities and differences with respect to the utilization of both endogenous and exogenous fuels, and in discussions of the various metabolic pathways, note certain differences, for example whether the oxidation of isocitrate is reversible or irreversible.

In Chapter 9 Hoyle considers the neural control of skeletal muscles, that is the programming of the output of the motoneurons. After a short discussion of "fast" and "slow" axon responses, and certain motor output patterns in intact insects, he outlines the very interesting research on the organization of motoneurons in the insect ganglia as demonstrated using the new intracellular injection techniques using the fluorescent dye, Procion yellow and more recently cobalt chloride. The resulting anatomical maps obtained, have opened up new avenues for an understanding of neural control in insects, and this chapter indicates certain situations where the integrative activity in motoneurons, is being unravelled.

Finally in the last Chapter, as pointed out above, Miller considers insect visceral muscle. It is noted that the subject of neurosecretion has become of integral importance to the physiology of visceral muscle and so the neurosecretory system is discussed briefly.

"Insect Muscle" is profusely illustrated, has few type setting errors and conforms to the usual high standard of Academic Press. It is an invaluable reference work and should be in the library of everyone interested in insect muscle, funds permitting.

G.G.E. Scudder

The Tachydromiinae (Dipt., Empididae) of Fennoscandia and Denmark. M. Chvála. Fauna Entomologica Scandinavica, Vol. 3, 336 pp., 790 illustrations. Scandinavian Science Press Ltd., Gadstrup, Denmark. 1975. Agent, E.W. Classey Ltd., Faringdon, Berks. (Price unknown)

The present volume continues this fine series of faunal works edited by the Societas Entomologica Scandinavica. Altogether 128 species of Tachydromiinae are treated under 9 genera. The species are all distinguished on the basis of the external male terminalia (especially the structure of the asymmetrical periandrium and cerci), in addition to more conventional characters. For many species the figures of the terminalia contained in this work are the first to be published. The work is thus not merely a regional fauna but also an important original source of information. All workers on boreal Empididae will need access to a copy.

No new taxa are described in this work (since the author published his descriptions in prior journal articles), but a few of the synonymies are new. Since these are nowhere listed, I provide the following list for the benefit of recording journals:

Symbollophthalmus pollinosus Collin, 1961 = *S. pictipes* (Becker, 1889)
Coryneta Miki var. *tristriolata* Engel, 1939 = *Platypalpus mikii* (Becker, 1890)

Platypalpus doormani Theowald, 1962 = *P. niger* (Meigen, 1804)

Tachydromia diversipes Strobl, 1910 = *Platypalpus rapidus* (Meigen, 1822)

Tachydromia major var. *minor* Strobl, 1899 = *Platypalpus major* (Zetterstedt, 1842)

Tachydromia anderssoni Chvála, 1970 = *T. incompleta* (Becker, 1900)

My only criticism of this otherwise excellent work concerns the discussion of "classification and phylogeny" (pp 30-35). The concept presented in this discussion is of an evolutionary series ("ascendant phylogenetic row"), with the greatest number of primitive (plesiomorphous) characters shown by *Symbollophthalmus* (Tachydromiini) at the beginning of a series culminating in *Stilpon* (Drapetini), which shows the greatest number of derived (apomorphous) characters. However, to justify the diagram of phylogenetic relationships it is necessary to show that each of the groupings indicated by the branching of the diagram can be characterized by autapomorphous characters (in accordance with the Hennigian argumentation scheme of phylogenetic systematics). The discussion presented does not justify all the branches on the diagram, and in the absence of characterization on the diagram itself the reader is left to search the text for information on which groupings are justified in terms of autapomorphous characterization and which are more speculative.

Chvála indicates that the male hypopygia in Tachydromiinae are not only asymmetrical but rotated through 90-180°. Like other workers on Empididae, he has accepted the revised interpretation of the homologies of the male genitalia (and consequent terminological changes) proposed in my 1972 book. I trust that those Dipterists at the Biosystematics Research Institute (Ottawa) who still consider my terminology "unacceptable" are taking note how widely accepted it is becoming in Europe.

Graham C.D. Griffiths
University of Alberta, Edmonton

Classification of the Acridomorphoid Insects. V.M. Dirsh. 170 pp., E.W. Classey Ltd., Park Road, Faringdon, Oxon. England. 1975

The contributions of Dr Dirsh to acridology are well known; this book presents a further revision of the classification of these insects, incorporating new information. Dr Dirsh adopts Bey-Bienko's concept of the superorder Orthopteroidea, divided into 10 orders, two of which, the Eumastacoidea and Acridomorphaidea, are dealt with. The title thus does not fully describe the contents. The order Eumastacoidea is divided into the superfamilies Eumastaciidea, Proscopioidea and Trigonopteroidea, the order Acridomorphaidea into the superfamilies Pneumoroidea, Pamphagoidea and Acridoidea. Keys and diagnoses are given to the families, of which the Pamphagidae, Pyrgomorphidae, Hemiacrididae, Catantopidae and Acrididae are divided into subfamilies, which are also keyed. The Oedipodinae is restored as a subfamily of the Acrididae, the diagnostic character being the usual one of the presence of a serrated intercalary vein.

The first part of the book includes a description of the main characters used in classification, including the genitalia, especially the phallic complex. The lack of illustrations detracts from the value of this part of the book and anyone unfamiliar with these structures would be well advised first to consult the same author's "African Genera of Acridoidea" where such illustrations may be found. A glossary is of some assistance, but it also suffers from the lack of illustrations.

Almost every taxon is illustrated by a drawing of a species of the type genus accompanied by drawings of the phallic complex. Here too, other characters are not illustrated, for example, the external apical spine of the hind tibia is frequently used but nowhere figured. There are at least two places where position in the book is the only indication as to which taxon a figure illustrates; the figures of *Parageloiomimus spinosus* (illustrating the Echinotropinae) on p. 50 and those of *Dnopherula dorsata* (illustrating the Gomphocerinae) on p. 149.

It is a little difficult to see for whom the book is intended. There is probably insufficient discussion of taxonomic principles and problems to satisfy the specialist and insufficient explanation of terms to make the keys really useful to the non-specialist. Nevertheless, if something like this had been available when I started work on African grasshoppers more than 25 years ago it would have been enormously useful and would have saved me a great deal of time.

There are few misprints, though the English is sometimes odd. On p. 6 *Phrynotettix* is misspelt and on p. 9 'spermatophore'. The distribution of the Pyrgomorphidae is described as "Tropical, Subtropical and Southern part of the temperate zones of all World." Since the family occurs in the southern hemisphere, this needs some care in interpretation.

John Phipps

BOOK NOTES

The following two well known works have been reprinted by Entomological Reprint Specialist, P.O. Box 77224, Dockweiler Station, Los Angeles, California 90007.

Burks, B.D. 1953. The Mayflies, or Ephemeroptera of Illinois. Bull. Nat. Hist. Survey Div. 26: 1-216. Reprinted 1975. \$15.00 (U.S.)

Frison, T.H. 1935. The Stoneflies, or Plecoptera of Illinois. Bull. Nat. Hist. Survey Div. 20: 281-471. Reprinted 1975. \$15.00 (U.S.)

Busvine, J.R. 1975. Arthropod Vectors of Disease. The Institute of Biology's Studies in Biology No. 55. Edward Arnold (Britain) and MacMillan of Canada. 67pp. \$3.50.

In this short book the author does an excellent job of presenting the basics of arthropod-borne diseases. A chapter each is devoted to the nature of the pathogens and the vectors. For each disease the history, importance and distribution is summarized, as well as the nature of the disease, knowledge of the pathogen and vectors, and the treatment, control and prevention. Photographs show the major pathological features of some of the diseases and diagrams illustrate the basic structure of the vectors. The concluding chapter deals with achievements and setbacks in vector control.

Wigglesworth, V.B. 1974. Insect physiology. Chapman and Hall, London. 2nd paperback edition, 166pp.

This compact volume is an abbreviated edition of Wigglesworth's well known and widely used full length textbook. The organization follows that of the full length edition, namely, chapters on The Integument, Respiration, The Circulatory System and Associated Tissues, etc. The paperback edition can be recommended to anyone wanting a simple and short introduction to insect physiology or for use in classes where insect physiology is briefly discussed.

Sollers-Riedel, H. 1972. The 1971 Global mosquito and mosquito-borne disease situation. Proc. 59th Ann. Meet. N.J. Mosq. Exterm. Assoc., suppl. 51pp.

Sollers-Riedel, H. 1974. Mosquitoes and disease problems — Worldwide in 1973. Proc. 61st Ann. Meet. N.J. Mosq. Exterm. Assoc., suppl. 55pp.

Both of these booklets are extremely valuable to anyone interested in mosquitoes and/or the diseases they carry. The presentation is informal and chatty which makes for pleasant as well as informative reading. Sections covered include taxonomy and distribution, techniques, genetics and genetic control, behavior and ecology, morphology and physiology, arboviruses, filariasis, malaria, adulticides and larvicides, parasites and predators, resistance and susceptibility, and attractants and repellants.

S. McIver

BOOKS RECEIVED

1. Daly, H.V. 1973. Bees of the Genus *Ceratina* in America North of Mexico (Hymenoptero: Apoidea). University of California Press, Berkeley. 120 pp. \$6.25.
2. Krieg, A. 1973. Arthropodenviren. Georg Thieme Verlag, Stuttgart. 328 pp. Paperback. In German.
3. Mani, M.S. 1974. Modern classification of Insects. Satish Book Enterprise. Agra, India. 331 pp.

4. Middlebrooks, E.J., D.H. Falkenborg, and T.E. Maloney. 1976. Biostimulation and Nutrient Assessment. Ann Arbor Science. 390 pp. \$22.50
5. Final Report for the Anti-Locust Research Centre. Jan. 1970 — May 1971. Centre for Overseas Pest Research. Overseas Development Administration. College House, Wrights Lane, London. 71 pp.
6. Report. June 1971 — December 1972. Centre for Overseas Pest Research. College House, Wrights' Lane, London. 148 pp.

NOTICE OF NEW JOURNAL

Journal of Thermal Biology. Published quarterly, commencing Summer 1975.

U.S. \$35.00/year (institutional)

U.S. \$25.00/year (individual)

Pergamon Press, Maxwell House, Fairview Park, Elmsford, N.Y. 10523, U.S.A.

The journal will publish results of work in which the central theme is the mechanisms by which temperature affects living organisms. It will be wide in scope and include studies at the biochemical and physiological level and also at the level of the organism. The following are examples of the subject areas to be covered:

- Studies on the mechanisms involved in acclimation and acclimatization to temperature in plants and animals, including the phenomena of hibernation, dormancy, aestivation and diapause.
- The mechanisms of cellular heat and cold injury, and of the resistance of organisms to extremes of temperature
- Effects of temperature on growth and development, ageing and life-span.
- Effects of temperature on micro-organisms.
- Behavioural and physiological regulation of body temperature.
- Medical applications of hypo- and hyperthermy, excluding descriptive clinical studies and case-histories.
- Review articles.

INTERNATIONAL COMMISSION ON ZOOLOGICAL NOMENCLATURE ANNOUNCEMENT

A.N. (S) 99

Required six months' notice is given of the possible use of plenary powers by the International Commission on Zoological Nomenclature in connection with the following names listed by case number: (see Bull. Zool. Nom. 33 part 1, 26th June, 1976).

896. *Tipula oleracea* (Diptera: TIPULIDAE): revived proposals for stabilizing names in species-group.
1117. *Beyrichia* M'Coy, 1846 (Crustacea: Ostracoda): proposed designation of type-species and neotype designation for that species.
2093. *Baboon and Mandrill* (Mammalia: Primates, CERCOPITHECIDAE). proposed determination of generic names.

Comments should be sent in duplicate, citing case number, to the Secretary, International Commission on Zoological Nomenclature, c/o British Museum (Natural History), Cromwell Road, London, S.W.7 5BD, England, if possible within 6 months of the date of publication of this notice. Those received early enough will be published in the Bulletin of Zoological Nomenclature.

The following Opinions have been published recently by the International Commission on Zoological Nomenclature

Opinion No. 1055 (Bull. zool. Nom. 33 (1) page 11) *Gryllus hieroglyphicus* Johannes Mueller (Physiologist) 1826 (Insecta: Orthoptera): suppressed under plenary powers in favour of *Decticus hieroglyphicus* Klug, 1832.

Opinion No. 1058 (Bull. zool. Nom. 33 (1) page 22) *Papilio actaeon* Fabricius, 1775 (Lepidoptera) suppressed under plenary powers in favour of *Papilio acteon* von Rottemburg, 1775.

Opinion No. 1062 (Bull. zool. Nom. 33 (1) page 31) *Anobium* Fabricius, 1775: *Grynobius* Thomson, 1859: *Priobium* Motschulsky, 1845 (Coleoptera) designation as type-species of *Ptinus punctatus* de Geer, 1774, *Anobium excavatum* Kugelann, 1791, and *Anobium carpini* Herbst, 1793, respectively.

Opinion No. 1064 (Bull. zool. Nom. 33 (1) page 36) *Ptenura* Templeton, 1844: *crystallina*, *Podura*, Müller, 1776 (Collembola) suppressed under plenary powers in favour of *Heteromurus margaritarius* Wankel, 1860.

The Commission cannot supply separates of Opinions.

R. V. MELVILLE
Secretary to the International Commission
on Zoological Nomenclature.

FORTHCOMING MEETINGS

Entomological Society of Canada. Annual Meeting. Toronto, October 24-27, 1976.

Société Entomologique du Québec. Institut de Technologie Agricole, La Pocatière, 21-22 octobre 1976.

Entomological Society of America. Sheraton Waikiki Hotel, Honolulu, Hawaii, Nov. 28 — Dec. 2, 1976.

MEETING WITH STUDENTS

During the March Meetings of the Governing Board of the E.S.C., the Entomology Department, University of Manitoba invited Entomology Students from the Universities of Winnipeg and Manitoba, Members of the Governing Board, and Members of the Entomological Society of Manitoba to participate in a social and discussion program, on the evening of March 30. Part of the program consisted of short talks presented by Dr. Jack Heron on "May's Tropical Exhibition in Colorado Springs, Colorado"; by Dr. C. Jay on "Queen Bee Production and Overwintering of Bees in Manitoba"; by Dr. G.S. Cooper on "The Duties of Junior Technical Representatives and Fieldmen in the Pesticide and Herbicide Industries"; and by Dr. Brust on "The Operation of a Proposed Canadian Centre for Biting Fly Research (i.e. if it is funded by the Canadian Government)". In the second part of the program, Mr. T.D. Galloway was the chairman for a forum where the Students directed questions to the Members of the Governing Board. The questions covered such topics as membership in the E.S.C., the operation of the E.S.C., employment opportunities, and the future of the entomological profession. The evening ended with informal discussions and refreshments. Everyone present found the evening to be very enlightening and enjoyable.

George H. Gerber

EMPLOYMENT: POSITION AVAILABLE

Position: Assistant Professor

Qualifications: PhD and experience in the fields of Economic Entomology-Pest Management-Insect Control.

Responsibilities: Teaching and Research in Economic Entomology, especially those areas related to Agriculture in Western Canada.

Salary: Commensurate with qualifications and experience.

Apply to: Dr. A.G. Robinson, Acting Head, Department of Entomology, University of Manitoba, Winnipeg, Manitoba R3T 2N2.

PERSONALIA

Philip S. Corbet, Director, Joint Centre for Environmental Sciences, University of Canterbury and Lincoln College, New Zealand has been awarded the Sc.D Degree of the University of Cambridge on the basis of his zoological research, mainly in the fields of insect ecology and behaviour, conducted in England, Uganda and Canada. He has been appointed by the Minister for the Environment to the New Zealand Environmental Council, and is a foundation member of the New Zealand Branch of the Club of Rome. He is Vice-President of the Entomological Society of New Zealand.

Ron Forbes has been appointed Head of the Entomology Section at the Agriculture Canada Vancouver Research Station. He succeeds H.R. 'Mac' MacCarthy who retired in June (see page 10).

Ron has achieved International recognition for his research on insect vectors of plant diseases, especially aphids. He is probably best known for his work on the mouthparts and feeding mechanism of aphids, leafhoppers, and other vector insects. He has been an invited symposium participant and speaker at national and international meetings. The University of British Columbia appointed him an Honorary Lecturer in Plant Science in 1972.

**BELTSVILLE SYMPOSIUM II: BIOSYSTEMATICS IN
AGRICULTURE**

BELTSVILLE AGRICULTURAL RESEARCH CENTER

BELTSVILLE, MARYLAND

MAY 9-11, 1977

In 5 symposium sessions leading investigators will lecture or engage in panel discussions on the role that biosystematics has in agriculture. Main topics will include new techniques, taxonomic theories, uses of taxonomic and biosystematic data, especially predictive applications, and the planning and direction of biosystematic research. In addition, a poster session and mixer is scheduled for the evening of May 9. Manned displays at the mixer should generate valuable discussion.

For further information, send lower portion of this notice to:

*Dr. James A. Duke
Publicity Committee, BARC Symposium II
Plant Taxonomy Laboratory
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CONTRIBUTIONS

Contributions and correspondence should be sent to: B.J.R. Philogène, Bulletin of the Entomological Society of Canada, Department of Biology, University of Ottawa, Ottawa, Ontario K1N 6N5.

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The deadline for the next issue, Vol. 8, No. 3 for September 1976 is 15 August. The approximate date of mailing will be 15 September.

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