sip newsletter

society for invertebrate pathology

Volume 19, Number 3
December 1987.

Presidential Address

Good Morning Ladies and Gentlemen.

Welcome to the 20th annual meeting of the Society for Invertebrate Pathology. This is the second time we have had the good fortune to meet at the University of Florida. On your behalf, I thank Dr. Drion Boucias, his committee and staff for inviting us and making the arrangements. I urge you to participate fully in the sessions, the discussions and the comraderie.

On this 20th anniversary I wish to share a few of my perceptions regarding the Society and the field of Invertebrate Pathology.

The founding of the Society on May 9, 1967 is the milestone indicating that invertebrate pathology had reached its gestalt. It had become a field with its own identity. Everyone here knows that a major impetus for this achievement was provided by Edward A. Steinhaus who helped consolidate the worldwide advances in insect pathology with his books and papers while promoting the field with his own tireless research, teaching, administration and international coordination.

However, everyone here may not know some of the other contributing factors. During the 1950s and early 1960s a number of significant discoveries and events stimulated invertebrate pathology in particular and comparative pathology in general:

First: Insect cell culture. When T. D. C. Grace developed effective procedures around 1960 for the establishment of insect cell lines, insect virology advanced rapidly and the potential for biological control of insect pests was greatly expanded.

Second: Biomedicine. One of the leaders in this area was the late Frederik Bang, an MD pathologist at Johns Hopkins University. Fred, who was a charter member of the SIP, was a descendent of Bernhard L. F. Bang who described Brucellosis in cattle. He abhored the concept that the only problems worth studying were those directly related to human diseases. His approach was to study invertebrate pathology as a matter of scientific curiosity and then to relate applicable findings to human diseases. He was especially interested in invertebrate immunity and invertebrate models for human diseases. For example, while study ing clotting in horseshoe crabs he and Jack Levin discovered a highly sensitive test for gram-negative bacterial endotoxin. He also discovered that a macromolecule in human body fluids stimulated mucus production in the free-floating urn cells in the blood of sipunculid worms and suggested that the sipunculid could be a useful animal model to study cystic fibrosis.

Bang was looking for a unique name to describe his type of comparative pathology and one of his parasitology students who was trying to be flippant suggested "Pathobiologists", meaning sick biologists. However, Bang liked the term and adopted it as his department's name. Later Ed Steinhaus started the Pathobiology project at UC Irvine that I served on with Phyllis T. Johnson and Ronald L. Taylor. This project evolved into the Center for Pathobiology. Thomas Cheng followed with an Institute for Pathobiology at Lehigh University. The term is established, thanks to Frederik Bang.

THIRD: Molluscan Pathology. Molluscan pathologists became loosely organized in 1958 or 1959 to study and hold annual conferences about a devastating haplosporidian disease of oysters called MSX (Multinucleate Sphere Unknown). MSX first hit Delaware Bay in 1957 and in three years oyster production dropped from 7.5 million to less than 100,000. The disease spread to the Chesapeake Bay in 1959. The disease organism was identified and named by Hal Haskin, Leslie Stauber and John Mackin in 1966. The spore stage was identified and described by John Couch, Austin Farley and Aaron Rosenfield in 1966. The fine structure was first described by Frank Perkins in 1968. The life cycle and disease syndrome were described by Austin Farley in 1967 and 1969. By 1965 the Annual Shellfish Mortality Conference had been renamed the Annual Shellfish Pathology Conference at the urging of Victor Sprague.

FOURTH: Silent Spring, published in 1962. The author, Rachael L. Carson, had a Doctor of Science degree from Johns Hopkins University and had spent most of her career with the Fish and Wildlife Service in the US Department of the Interior. Silent Spring was a landmark work that aroused public concern about pollution of the environment with industrial toxins, carcinogens and mutagens. Extrapolations of laboratory data, then and since, have suggested that most human cancers are due to environmental exposures. This book provided incentive for Arthur Heimpel, Carlo Ignoffo and others to accelerate studies of biological control as a means to reduce the need for chemical insecticides.

FIFTH Cancer. In 1916, Calvin Bridges identified a lethal gene in Drosophila melanogaster which Mary Stark reported a few years later caused imaginal disk tissues to become neoplastic. This was the first report of a gene-driven cancer. This was followed in 1928 by the report of Georg Haussler that melanomas developed in certain platyfish X swordtail backcross hybrids. The selective hybridization eliminated regulator genes and allowed a tumor gene to exert its full effect on the melanophores. So the first tumor gene was observed in an insect followed by one in a fish. Mammalian oncologists, R. J. Huebner and G. J. Todaro, did not postulate oncogenes until 1969. It is now considered that the enhanced or augmented activity of these host-derived genes is the cause of most cancers.

In 1962, Wilhelm Heuper of the National Cancer Institute reported the finding of two Chesapeake Bay soft clams with mantle papillomas at a New York Academy of Sciences Symposium on Epizootiology of Cancer in Animals. Heuper, recalling that Jaquemain, et al. had chemically induced mesenchymal neoplasms in cephalopods, introduced the possibility that environmental chemicals could cause cancer in mollusks.

In the 1950s, studies of epizootic renal adenocarcinoma of leopard frogs from Maine to North Dakota provided the first evidence that a herpesvirus could cause cancer. In

the early 1960s panzootic liver cancer in hatchery rainbow trout coincided with the worldwide introduction of pelleted trout chow. Studies showed that aflatoxin, a fluorescent lactone metabolite produced by the mold Aspergillus flavus growing on the peanuts used in the chow, was causing the cancer.

These reports of gene-driven insect and fish cancers, the suggestion of environmental carcinogenesis in mollusks, the back to back discoveries of a new family of oncogenic viruses in a frog and a new class of chemical carcinogens in a fish stimulated Clyde Dawe and others at the National Cancer Institute to wonder what other break-throughs for cancer research could be found in lower animals.

At that time the National Academy of Science National Research Council had a section on Pathology. This section established a Subcommittee on Comparative Pathology chaired by Donald King of the University of Colorado Medical Center. Among those on the subcommittee were Clyde Dawe, Frederik Bang and Edward A. Steinhaus. This subcommittee met twice in 1963 and made six recommendations:

1) Encourage symposia on comparative pathology. Quite a few symposia followed.
2) Conduct courses on Comparative Pathology. Drs. Guido Majno and Morris Karnovsky at Harvard Medical School designed and taught a course in human pathology for biologists from 1965-1967. I took their course in 1966 and several other SIP members took it during the period it was offered.
3) Reprint Elie Metchnikoff's book, Lectures on the Comparative Pathology of Infection. This was done by Dover Press.
4) Support registries of Comparative Pathology. The Registry of Tumors in Lower Animals was established by Clyde Dawe in 1965.
5) Start a journal for comparative pathology. In 1965 Steinhaus broadened the Journal of Insect Pathology to include all invertebrates.
6) Start a society for comparative pathology. On May 9, 1967 the Society for Invertebrate Pathology was founded at the University of Washington. Albert K. Sparks who was active in the Shellfish Pathology and Mortality Conferences hosted the meeting and joined with Steinhaus in a team effort to include all invertebrates in the Society. Eighty founding members initially paid $25.00. In two years the society had grown to 200 members and after five years to 400 members. Currently the society has 900 members.

I have tried to point out, in an over-simplified way, that twenty years ago a multidisciplinary combination of factors emphasized the potential benefits that could accrue from the study of invertebrate pathology. Steinhaus, with international cooperation from insect pathologists, other invertebrate pathologists and even chordate pathologists, was instrumental in the consolidation of these diverse interests into a definitive field of Invertebrate Pathology. Today, we individually share the responsibility for insuring that invertebrate pathology retains its legacy as a comparative field. We all need to pursue our specialties but we will be more productive if we simultaneously maintain a broad outlook. I suggest we think of the science of invertebrate pathology as a web that grows by interactions that reach out in time and space.* These interactions cross species boundaries, nationality boundaries, discipline boundaries and the basic versus applied research boundaries. We all need each other. Let us work together to maintain the collaborative spirit of our Society's founding twenty years ago.

* Paraphrased from George D. Snell (Science 213:177, 1981).

John C. Harshbarger

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Minutes of the XX Annual SIP Business Meeting

University of Florida, Gainesville, Florida

July 22, 1987

The XXth Annual SIP Business Meeting was called to order by President John Harshbarger on July 22, 1987 at 13:30 hours.

A motion to accept the minutes of the Veldhoven General Membership Meeting as published in the SIP NEWSLETTER was seconded and passed.

Since all reports will be published in the Newsletter, only the highlights were presented. All were approved.

Dr. Robert Granados presented the treasurer's report which included an explanation of a computorized system for the financial business of the Society. Dr. Granados has implemented a system called "Reflex" which should make the activities of the treasurer much more reasonable to deal with. He requested finances for a consultant to do a system debug and an assistant to enter the data (this was approved). This new system should generate the first set of Mailing Labels in October 1987.

In regard to the Society finances, Drs. Milner and Soper audited the books and found them in good order. Dr. Granados reported an $8000 increase due to the Brighton, England meeting funds. The finances from the Veldhoven meeting have not yet been finalized; there seems to be some question as to whether or not a tax has to be paid; if we are tax exempt there should be at least a $3500 income to the Society.

SIP Newsletter

The SIP Newsletter is produced four times a year by the Society for Invertebrate Pathology. Annual dues (U.S. funds) in the Society are: regular members, $11.00; and students, $4.00. Members receive the SIP Newsletter and a copy of the abstracts of all SIP Annual General meetings free, whether or not they attend. Application forms for membership in the Society may be obtained from the Treasurer, Dr. Robert R. Granados, Boyce Thompson Institute, Cornell University, Tower Road, Ithaca, New York 14853, U.S.A.

Send news items and other contributions to:
David Tyrrell, Editor
SIP Newsletter
Forest Pest Management Institute
Canadian Forestry Service
P.O. Box 490
Sault Ste. Marie, Ontario, Canada P6A 5M7

DEADLINE NEXT ISSUE: January 25, 1988

Secretary, Dr. A. Cali reported that Dr. J. Tanada has been nominated for honorary membership by Dr. H. Kaya. The necessary materials were submitted and the council approved the nomination. Both Dr. Tanada and Dr. Vago will be submitted to the Society at large for honorary membership on our next election ballot.

Future meetings of the Society were announced.

In 1988 we will meet in LaJolla, California. Local arrangements committee chairperson, Dr. Brian Federici, gave us some highlights of plans already made for the meeting, Aug. 14-18. These included the newly instituted student presentation competition with a $250.00 award for the winner. Living accommodations encourage family attendance.

In 1989 we will meet in College Park, Maryland. The Adult Education Center on the University of Maryland Campus has been reserved for the meeting August 21-24. Drs. C. Reichelderfer and J. Vaughn are the local meeting committee chairpersons.

In 1990 we will meet in Australia. This meeting is also our International Colloquium meeting. Dr. D. Pinnock is in charge of local arrangements. He did not submit a written report but he told us the conference hall is under construction and we have reservations for our meeting on the 20-24 of August. He is trying to organize a trip to the research station at the Great Barrier Reef with a seminar there on Aquaculture. He is putting a package together for reduced costs. Additionally, he has reserved hotel rooms at about $31.00 per night and apartments at $46.00 per night, and is putting together a package deal for meals and banquet at the center.

Highlights from the Division of Microsporida report from Dr. T. Andreadis included the establishment of an atlas of Microsporida ultrastructure. This atlas would be edited and compiled by Dr. A. Cali and include contributions from members of the Division. This years' workshop will be coordinated by J. Becnel and will deal with molecular biology techniques as applied to microsporida. Dr. D. Roberts commented on the Microbial Control Division. This years meeting will be on Glasshouse Microbial Control.

Dr. James Harper spoke as Chairperson of the Publications Committee. Two major subjects have occupied the Publication Board since the Veldhoven meeting, the first being the Journal of Invertebrate Pathology, the second the issue of the glossary of terms in Invertebrate Pathology.

Regarding the Journal, a plea was made by Pres. Harshbarger by mail to the membership of the Society to subscribe as individuals and/or to encourage their institutions to subscribe. This was done shortly following the Veldhoven meeting and produced two results. The plea apparently resulted in significant numbers of new subscriptions of both types. At the same time, a number of replies were sent to President Harshbarger expressing concerns over various issues dealing with the journal. This in turn prompted Dr. Harshbarger and myself as chair of the Publications Board to consider an offer from Richard Humber, to chair an ad hoc Journal Advisory Committee to prepare a questionnaire to be sent to the membership to survey opinions and attitudes toward the Journal of Invertebrate Pathology. This was done and mailed with the first issue of the 1987 newsletter.

That survey was completed and has been delivered to the Publications Board. A concise summary of pertinent points will be made available to the membership as soon as possible. Publications Board members are currently working with the Journal editor and Academic Press officials to strengthen the Journal, via consideration of positive suggestions that came out of the survey. This work is already in progress and will continue through the coming year.

Relative to the Glossary, the survey which was also included in the ad hoc Committee's questionnaire produced rather ambiguous results. The council considered the issue and decided to explore several alternatives to direct publication by the Society. These would include approaching authors or editors of several books which are currently in preparation and suggesting or requesting inclusion of the Glossary as a chapter or appendix.

Dr. T. Cheng, Editor of the J.I.P. read his report which is included below. The highlights of which include acknowledgements to Dr. R. S. Anderson who served as the Acting Editor-in-Chief while Dr. Cheng was on sabbatical in France. Dr. Cheng commented that his office has received compliments that the quality of the Journal has continued to improve. Relative to a drop in numbers of manuscripts received, he commented: other similar Journals are experiencing a parallel situation. In regard to the subscriptions, he said we now have 759, this is an increase of 98 over the previous year, thus reflecting a healthy state of the Journal.

Dr. D. Tyrrell was not present so his report on the Newsletter was read by the secretary. Three issues of the newsletter, two questionnaires, the call for abstracts, and the program and abstracts were prepared and air-mailed out. The total costs are $8,700.00. A detailed explaination of costs and activities is included in the report.

The endowment committee chaired by Dr. Davidson has provided free memberships for 17 persons. These memberships were paid by the proceeds of an endowment made to the Society by an anonymous donor.

The Founders lecture committee chaired by Dr. Van der Geest prepared a list of scientists to which future founders lectures may be devoted. The Founders lecture for the Gainesville meeting was prepared by Professor Vago and honored the work of Louis Pasteur. The Founders lecture certificate was prepared by Dr. Briggs, it is a work of art.

Dr. D. Burges, Chairperson of the Culture collection committee, commented that the Dulmage collection of Bacillus thuringiensis strains has been taken over by the USDA/ARS station in Peoria, Il.

President Harshbarger announced that the nominating committee was developing a slate of candidates for the next election. The archivist is maintaining the archives with no major changes over the past year. The membership committee plans to examine the updated list of active

members in order to identify geographic areas that need to be targeted for 1987-88 and the safety committee chairmanship has recently changed to Dr. J. Siegel.

A motion to adjourn was seconded and carried. The business meeting was closed at 1430.

Respectfully submitted
Ann Cali, Secretary

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REPORTS OF SIP OFFICERS, BOARDS AND COMMITTEES.

Treasurer's Report

During the period 2 June, 1986 to 30 June, 1987 the Treasury increased by $8,102.40. This increase was due to a large extent to transfer of funds from the 1982 Brighton Colloquium ($4,310.76) to the SIP Treasury. Interest income was similar to 1985-86. The "high-interest" savings account dropped from 5.7% on 30 September, 1986 to 5.3% in early 1987, and is currently at 5.5%. A Newsletter account has been established in Canada to facilitate the financial operation of that office. Funds are transferred from the SIP Treasury to the Canadian account once or twice a year and a separate financial statement is submitted by the Newsletter editor. The Microsporida Division has assets of $1,041.00 and the Microbial Control Division has $1,172.00. Neither division has spent any money since they started collecting dues in 1971 and 1981, respectively.

A separate endowment account was established on 24 December, 1986 and the money plus interest is to be used to pay dues or SIP subscriptions for certain members with currency exchange problems. An endowment committee chaired by Dr. Betty Davidson selected 15 persons for whom dues were paid for 1986-87. Two of these individuals will be paid for life as requested by one of the benefactors. The endowment fund as of 30 June, 1987 totals $3,646.24.

Dr. Dick Peters has informed me that a preliminary accounting of the Veldhoven meeting (1986) indicates a balance of approximately $30,000 Dutch Guilders (=$15,000.00 U.S. dollars). Since the currency exchange rate is favorable at this time, I would recommend a transfer of these funds to the SIP Treasury as soon as possible.

A major charge for the Treasurer's Office during 1986-87 was the computerization of the SIP membership. A Membership Database program has been created and is operational. The database utilizes Reflex, a user-friendly, IBM-compatible, software package which provides many powerful tools for sorting and analyzing data. Of the $2,500.00 budgeted for this project, $2,025.35 was utilized. An additional $500.00 for computer services is requested for 1987-88 for the purpose of fine-tuning the database.

The SIP membership increased by 119 during 1986-1987. This included 88 regular members and 31 student members. The Treasurer's Office has had increasing demands in recent years for numerous SIP functions and our increasing membership suggests further demands on this office. I am requesting $1,700.00 to be allocated for a part-time student (10 hrs/week) to assist this office during 1987-88. The Boyce Thompson Institute will continue providing additional funds for a second part-time student and all the necessary secretarial support.

Respectfully submitted,

Robert R. Granados
Treasurer
20 July, 1987

Financial Statement of SIP for the period 2 June, 1986 - 30 June, 1987

Balance on Hand 2 June 1986		$ 32,318.17
Income		
Membership Dues		$ 8,535.96
Regular	$ 7,979.96	
Student	356.00	
Sustaining	200.00	
Division of Microsporida		100.00
Division of Microbial Control		237.00
Journal of Invertebrate Pathology Subscript		12,124.00
U.S.	6,060.00	
Foreign	6,064.00	
Interest		2,110.35
Regular Savings	2,012.95	
Endowment Fund	97.40	
Contributions		166.00
Endowment Fund	100.00	
Regular	66.00	
Directory for I.P.		75.22
Brighton Funds		4,310.76
NSF Travel Grant		2,000.00
Miscellaneous		64.56
Exchange rate refunds	10.14	
	$ 29,669.43	$29,669.43
Disbursements		
Academic Press (J.I.P.)		$ 11,748.00
Treasurer Office Expenses		1,362.55
Bank Fees	$ 76.31	
Postage	850.86	
Printing and Photocopies	275.72	
SIP Checkbook	47.75	
Student Help	105.00	
General Office Supplies	25.49	
Awards		2,291.55
Veldhoven Travel Awards	2,000.00	
Founders Lecture Award	291.00	
Newsletter-Funds for Canadian Acct.		4,001.00
Miscellaneous		153.00
Pacific Science Assoc.	25.00	
Checks Returned	90.00	
Computerization SIP Membership		2,025.35
Reflex Software Installation	112.35	
Database Design & Consult.	950.00	
Data Entry Keyboarding	963.00	
		(21,567.03)
		$40,420.57
Balance on hand 30 June, 1987		
Tompkins County Trust Company		$40,420.57
Savings Account		$ 35,462.10
Endowment Savings Acct.		3,646.24
Checking Account		1,312.33

1988 Annual Meeting
Society for Invertebrate Pathology
Society of Vector Ecologists
August 14 - 18, 1988 at La Jolla
University of California, San Diego

Some projected costs:

Registration:		
Regular members	-	$30
Late registration	-	$50
Student	-	$20
Non-member	-	$40
Companion	-	$20

Registration fee includes mixer (Sunday night) and Beach Barbeque (Tuesday night).

Banquet (Wed.): $20, including entertainment

Living accommodations: Third College Townhouses. 80 units. Accommodations for 200+ persons.

Each unit: living room, kitchen, patio, bath, and 2 bedrooms (one with 1 single bed at $37 night; other with 2 single beds at $29 per bed per night.)

Family rate: $50/day per unit/night.

Board: University Cafeterias

Breakfast and lunch=$10. All meeting participants living on campus must pay for breakfast and lunch except for those renting units with their families. Dinner = $7.50 (optional and no advance booking necessary).

Tentative Symposia (5 or 6 to be selected)

1. Molecular Basis of Pathogen Specificity
2. Comparative Pathology: Clams & Crabs
3. Immunosupression by Polydnaviruses
4. Microbial Control of Vectors (SOVE)
5. Genetic Engineering for Improved Pathogen Efficacy
6. Microbial Control in IPM: Current Status
7. Symbionts of Arthropods
8. Comparative Mycology/Invertebrate Diseases

Contributed Paper Sessions
As appropriate.

Submitted by B. Federici

Report of the 1989 SIP Annual Meeting Committee

The 1989 Annual Meeting of the Society will be held at the University of Maryland, College Park, Maryland. The Adult Education Center on the University campus has been reserved for the meeting from August 21 to August 24, 1989. The Center will provide all the needed rooms for the scientific program and lodging as needed for most of the participants.

We have identified about 20 scientists in the College Park - Beltsville Area who can be called upon to serve in various capacities to plan the meeting. We have tentatively planned for committees on : Program, Facilities, Publicity, Transportation, Entertainment, 5K race and Hospitality.

In accordance with the Society's Constitution we are submitting the names of the following for the position as Program Committee Chairperson: Edward M. Dougherty, Jean R. Adams, and Dwight E. Lynn. After this person has been selected we will proceed to fill other committee chairs.

Respectfully submitted,

Charles F. Reichelderfer and James L. Vaughn
Co-Chairs, 1989 Local Meeting Committee

DIVISION OF MICROSPORIDA

COMMITTEE ACTIVITIES AUGUST, 1986 - JULY, 1987

The Division of Microsporida held its annual business meeting at Veldhoven, The Netherlands in conjunction with the Fourth International Colloquium of Invertebrate pathology. New officers were elected. They include: Chairman - Theodore Andreadis, Vice Chairman - James Becnel, and Secretary-Treasurer - Al Undeen.

The major subject discussed was the establishment of an atlas of Microsporida ultrastructure. This atlas would be edited and compiled by Dr. A. Cali and include contributions from members of the Division. It would basically contain electron micrographs and descriptions of General type species and hopefully serve as an ultrastructural guide to the Microsporida. There was lengthy discussion on whether or not this atlas would include published and/or unpublished micrographs, which generally would be included, and whether the atlas would be available to members of the Division or be developed as a formal publication. It was agreed that more details were necessary before the Division could formally act on this matter. It was suggested that Dr. Cali, who was not able to attend the meeting, provide additional details and a "typical" format for the proposed atlas at the 1987 business meeting in Gainesville.

The Treasurer's report indicated that as of June 1986, the Division had $941.00 in assests and had not spent any money since collecting dues in 1971.

A Workshop was held in Veldhoven. It dealt with the current status of intermediate hosts for polymorphic Microsporida (Amblyospora) of mosquitoes. Formal presentations were given by T. G. Andreadis, J.J. Becnel, and A. W. Sweeney. The talks were very informative and stimulated much discussion.

The 1987 Workshop to be held in Gainesville is being coordinated by James Becnel and will deal with the applications of molecular biology to the study of Microsporida. Participants will include T. Kurti, A.H. Undeen, and C. R. Vossbrinck.

Respectfully Submitted
Ted Andreadis

Publication Board Report--1986-87

During 1986-87 the publication board initially focused attention on problems associated with low numbers of individual subscriptions to the Journal of Invertebrate Pathology. Following a written plan to SIP members from President Harshbarger for considering personal and institutional subscriptions, a number of responses were received from individuals and groups of individuals expressing opinions on problems they perceived in the JIP and its editorial policy. This prompted the board to consider an offer from Richard Humber to prepare a survey document regarding attitudes of the membership toward the JIP. Humber was asked to select and chair an ad hoc Journal Advisory Committee for this purpose. This document was prepared, reviewed by the Board, and submitted to the entire membership of the Society in the Newsletter (see attached report by Humber). The questionnaire was completed and returned by 125 members. The returns were summarized by members of the committee and a report was delivered to the Publications Board by June 11, 1987.

Between the mailing of the questionnaire and its receipt by the Journal Advisory Committee, Publications Board chair Harper and John Henry (as an observer) met with members of Academic Press in San Diego on February 17, 1987. Discussions centered on the relationship between Academic Press, SIP, JIP, editorship of the journal, and areas in which improvements in the journal and interrelationships between these components might be made. This meeting was very positive. A major point made by Academic Press chairman Janes Barsky, Senior Vice President Roselle Coviello, and Vice President David Swanson was that the editorial policies of the journal have always been presumed to be under the regulation of the Society. The Society is thus responsible for the science and quality of the Journal, and Academic Press is responsible for the publication of the information supplied. This relationship was apparently never formalized contractually but was by mutual consent between the SIP governing board, Dr. Ed Steinhaus, and Academic Press when the SIP was founded in 1967 (the JIP was published for nine years before the SIP was founded).

The previously mentioned responses to President Harshbarger's pleas for journal support underscored previous Board and Council efforts to seek improvements in publishing and editorial policy and the need for such improvements. The report of the Journal Advisory Committee suggests numerous changes that could be made to improve the Journal. Most of the problems fall into two areas--concerns overeditorial mechanisms and policies and concerns over subscription costs relative to product value. These issues will be addressed by the Publications Board during the Gainesville, SIP meeting and specific recommendations will be presented to Council for their consideration and action.

The question of publication of an enlarged Glossary of Terms used in Invertebrate Pathology, as approved by Council at the Veldhoven meeting, but suspended pending further input by the Publications Board, was also addressed. A questionnaire on the Glossary was included with the Journal questionnaire. The majority of respondents did not have a copy of the present Glossary, despite its free distribution. Most (2/3) indicated willingness to buy it (a new Glossary) at some price. The Board will discuss this issue in Gainesville and make recommendations to Council.

The Newsletter, under editorship of Dr. David Tyrrell, has published three issues since the Veldhoven meeting. Issues 3 and 4 of the 1986 volume were published in combined form as a single mailing and issues 1 and 2 for 1987 have been published and mailed (see Newsletter Editor's report for additional details).

The Journal of Invertebrate Pathology has been published on schedule during the past year. Dr. Robert Anderson filled in during much of the year as acting editor while Dr. Thomas Cheng was on sabbatical leave in France.

Respectfully submitted,

James D. Harper, Chair

Journal Advisory Committee

This ad hoc committee was formed by President Harshbarger in December 1986 in response to comments and suggestions received following his appeal for SIP members to become individual subscribers to the JIP. The committee consists of Richard Humber (Chair), Wayne Brooks, Elizabeth Davidson, Brian Federici, Stefan Jaronski, Phyllis Johnson, and Christopher Payne. The committee's responsibilities are (1) to evaluate the strengths and weaknesses of the JIP, and (2) to make recommendations to the Publications Board regarding editorial policy, publisher policy, subscription costs, and mounting levels of dissatisfaction with the JIP, and any other journal-related matters that might reasonably be changed to increase membership's levels of confidence in and subscription to the Journal. The work of this committee should be completed before a special meeting of the Publications Board to be held prior to the Council's meeting in July 1987.

A survey soliciting the membership attitudes and suggestions for changes in the JIP was distributed in the February/March SIP Newsletter. By late April, 123 responses had been received and tabulated. The tabulated results of this survey were distributed to the members of the committee, together with information gathered during a 1982 examination of the JIP by the Publications Board, and information about services and price estimates from several publishing houses. The committees' recommendations will be collated by the end of May 1987 and distributed to the members of the Publications Board in time for their special meeting during early June.

It has become clear that the Journal of Invertebrate Pathology is more financially solvent and its future with the Academic Press more secure than many SIP members have believed. The survey confirmed that there is a very broad concern among the membership that the subscription price is too high; this perception seems to have accounted for the continuing loss of subscriptions. Several alternatives for reducing at least the individual subscription price are being explored.

A welcome outcome of this current examination of the JIP has been to open new lines of communication between the Society for Invertebrate Pathology and the Academic Press. It is now clear that the Academic Press regards the Journal of Invertebrate Pathology to be the Society's journal to manage as it sees fit, and that any societal dissatisfaction with the Journal must be remedied from within the SIP. The Academic Press is anxious to cooperate with the SIP and to discuss suggestions for improvements in the JIP brought forward from the Society.

A more extensive verbal report should be possible by the time of the SIP Annual Meeting in Gainesville.

Richard A. Humber
Chairperson

REPORT OF THE JOURNAL OF INVERTEBRATE PATHOLOGY
1986-87

The Journal of Invertebrate Pathology remains healthy. Although this report is being written by the undersigned, your editor was on sabbatical leave in France from March 1, 1986, through February 28, 1987. During his absence Dr. Robert S. Anderson served as the Acting Editor-in-Chief. The Society owes him a strong "thanks" since he carried out the editorship during a trying period of changing jobs.

During the period of May 1, 1986, through April 30, 1987, a total of 179 manuscripts were received and processed. Of these 95 were accepted while 45 were rejected. The remaining 39 are still in the process of being reviewed or revised by the authors. In comparison with last year, the number of manuscripts received dropped by 94. The rejection rate rose from 15.75% to 25.14%. This reflects the tougher reviewing on the part of members of the Editorial Board and other special reviewers. As a result, this office has received complements that the quality of Journal has continued to improve.

Relative to the drop in number of manuscripts received, it is noted that other major journals in allied speciality areas, i.e., microbiology, parasitology, and comparative immunology are experiencing a parallel situation. A recent article that appeared in a review journal has indicated that increasing number of biologists are now working in the general area of molecular biology and also in cell biology. In part, this has been dictated by the various NIH study sections which are giving lower scores to non-molecular proposals. Since JIP is a multi-disciplinary journal, we have seen a rise in the number of biochemically oriented manuscripts, especially those pertaining to viruses and invertebrate immunology. Although we are still receiving descriptive pathology manuscripts, the number is falling, especially from younger authors.

Recently received subscription data from Academic Press have revealed the following:

	DOMESTIC	FOREIGN	SUBTOTALS
Institutional	361	288	649
Individual	60	50	110
TOTAL			759

When compared to last year's figures, the total number of subscription has increased by 98. This reflects an increase of 77 institutional subscriptions (from 572 to 649) and 21 individual subscriptions (from 89 to 110). The increase in the number of subscriptions is welcomed news to both Academic Press and the Society. It reflects the healthy state of the journal.

Finally, as all of you are aware, Dr. John Harshbarger, the President of SIP, has initiated a survey of the Society's membership relative to the journal. Although the final results are still not available, preliminary results unofficially relayed by Dr. Harshbarger indicate the membership is relatively happy with the journal. It is noted that some errors were made with the acceptance dates of manuscripts by the secretary (not Dr. Anderson) while your editor was on leave. Our apologies for these.

Respectfully submitted,

Thomas C. Cheng
Editor-in-Chief

SIP Newsletter

Three issues of the Newsletter were prepared and mailed direct to individual members during the period August 1986 to July 1987 (Vol. 18, No.3, Vol. 19, Nos. 1 and 2). Extra copies were sent to the Archivist and Treasurer. Because of late submission of material for Vol. 18(3), it was not practical to issue 2 Newsletters in late 1986 and consequently Nos. 3 and 4 were combined with a single issue. With the ocmpletion of that issue Gary Wilson retired as Newsletter Editor and I want to thank Gary for his assistance and guidance as I have assumed the role of Editor. Coincident with Gary's departure, the company which had printed the Newsletter for the past 6 years went out of business. Advance Printing of Sault Ste. Marie has now taken over the printing of the Newsletter and I am likewise grateful for their assistance as I learn the ropes.

The three Newsletters issued during this period comprised a total of 22 pages. In addition, 2 questionnaires, concerning the Journal of Invertebrate Pathology and Invertebrate Pathology courses, the call for Abstracts and the Programme and Abstracts for the 1987 Annual Meeting of the Society were also produced and mailed. All issues were sent airmail from Sault Ste. Marie, Ontario, with the exception of Vol. 19(2) to U.S. members, which, because of the early date of the Annual Meeting and the possiblity of mail disruption in Canada, was mailed 1st class from Sault Ste. Marie, Michigan.

Total printing and mailing costs are shown in Table 1. Total costs incurred by the Newsletter Editors in 1986-87 rose by $1,068.05 over 1985-86. This increase is directly attributable to printing and mailing costs associated with the Programme Abstracts. These costs I consider to have been rather high, but mainly because of time constraints imposed by the early date of the Annual Meeting I was not able to reduce this figure. Although the Abstracts are printed and mailed with the Newsletter, the direct costs of the operation can readily be determined (Table 1), and I recommend that in the future they be carried on the Society's Accounts

as a charge against the Annual Meeting Account rather than the Newsletter Account. This will better reflect the true cost of running the Annual Meeting of the Society.

NOTE: All amounts are in Canadian dollars.

David Tyrrell
Newsletter Editor

	Printing	Mailing	Total
Newsletter 18(3,4)	$ 906.62 a)	$ 778.51	$1,685.13
" 19(1)	450.00	815.90	1,265.90
" 19(2)	425.00	586.83	1,011.83
	$1,781.62	$2,181.24	$3,962.86
Programme Abstracts	3,288.00	1,450.34 b)	4,738.09
		23.75 c)	
	$3.288.00	$1,450/75	$4,738.09
	$5,069.62	$3,631.33	$8,700.95

a) includes 2,000 envelopes
b) mailing to individual members
c) mailing to Local Arrangements Committee
d) all amounts are in Canadian dollars

REPORT OF THE ENDOWMENT COMMITTEE, 1987

The Endowment Committee was appointed by President Harshbarger to select persons from countries where it is difficult to obtain dollars as recipients of memberships in the Society. These memberships are to be paid by the proceeds of an Endowment made to the Society by an anonymous member. The committee consisted of John Briggs, John Henry, Ralph Eliston, Robert Granados (Treasurer) and Elizabeth Davidson (Chair). Two members stipulated by the donor and fifteen others were offered free memberships in the Society. These persons are residents of Yugoslavia, Poland, Hungary, Czechoslovakia, Thailand, Mexico, The Gambia, Kenya, Iraq, Turkey, Argentina, and the People's Republic of China. No Journal subscriptions were presented this year, as the proceeds are not sufficient to fund such a donation.

Elizabeth W. Davidson

Founders Lecture Committee

The present Founders Lecture Committee comprises Granados, Johnson, Pinnock and van der Geest (Chairman). The committee met as a whole at the 1986 JCIP congress at Veldhoven. The Netherlands and discussed pioneers in invertebrate pathology which may be honored at forthcoming meetings. The committee has prepared a list of scientists to which future founders lectures may be devoted. This list includes Pasteur, Paillot, Morgan, Sotto, Metlanikov, Bang, , Cantacuzene and others. The Founders Lecture at the 1987 SIP Annual Meeting at Gainesville, Florida will be prepared by Prof. C. Vago who will honor the work on insect pathology by Louis Pasteur.

John Briggs has always prepared the certificates that were handed out to the Founders Lectures at the SIP Meetings. The Committee is very pleased that John is still willing to do this difficult and artistic job.

L.P.S. van der Geest

CULTURE COLLECTION COMMITTEE

No cultures at risk have been noted by committee members. The Dalmage collection of Bacillus thuringiensis strains has been taken over by the Northern Regional Research Laboratory, ARS/USDA Station, 200 W Pioneer Parkway, Peoria, IL 61615, USA. All requests for samples of strains should be sent to Peoria.

H. Denis Burges

Report of the Nominations Committee

The Nominations Committee has begun its process of formulating a list of candidates for officers of the Society for 1988-1990 but will not have a slate of nominees before late fall of this year. With appropriate progress in selecting nominees, we do not anticipate any difficulties in developing a slate of nominees to meet constitutionally mandated deadlines for the election of officers in early 1988.

Respectively submitted,

W.M. Brooks, Chairman
H.D. Burges
S.E. Ford
P. Gotz
A. Rosenfield

Report of the Membership Committee

Invitations to prospective Membership Committee members were sent out 8 Dec. 1986; an attempt was made to involve persons of varied interests from diverse geographic locations. The following have agreed to serve on this committee: Drs. Ralph Elston, Susan E. Ford, Peter Gotz, Toshihiko Iizuka, Lawrence A. Lacey, Esther C. Peters, and Dudley E. Pinnock. All have received S.I.P. fliers and blank memberships forms and are actively recruiting new members and generally boosting the Society. Recent activities include revising and reissuing the S.I.P. descriptive flier and processing several applications for Emeritus Members. As soon as possible, we plan to examine the updated list of active members in order to identify geographic areas and research specialties that need to be targeted for 1987-1988.

Workshop in Sri Lanka highlights **Bacillus thuringiensis** as a safe mosquito larvicide in Self-Help Programme.

The Sarvodaya Movement, a Buddhist movement in Sri Lanka, have had considerable experience of encouraging community participation amongst the rural communities. Their latest venture into mosquito control, for malaria abatement, is one of the most active self-help programmes in under-developed countries. **Bacillus thuringiensis** var. **israelensis**, (**Bti**), has been chosen as one of the safe methods of control suitable for community use.

Their efforts in this integrated control research programme have attracted attention which culminated in a workshop last November. This workshop was organized by the South Asia Cooperative Environment Programme and the Wolfson Mosquito Control Project of Southampton University. It was funded by the EEC and was attended by representatives of six South Asian Countries.

Included in the Workshop programme was a visit to the field to examine the methods they are using in this research programme which covers 58 villages. The system they adopt is to train the most able of the young people from the villages in their developmental educational centres in mosquito monitoring and control. They then return to work in their own villages where they are known and are aware of the local situation.

The pools in each village are mapped and those selected for larviciding are treated by children under the guidance of their school teacher and mosquito worker. The children are chosen for two reasons, firstly because it is important for them to learn, while they are young, the importance of controlling mosquitoes and secondly because they are good at searching out and finding pools of water that may have been missed. They have proved to be very helpful and interested. Other methods of control being practiced are the removal of breeding sites where possible, larvivorous fish and the use of cattle to divert the vector. Some of these methods are being tested separately in different villages to give a guide to the efficiency of each method. However, the ultimate aim, since no method is perfect, is to combine all methods safe for the community to use. This was tried out successfully in a refugee village where Sinhalese refugees were moving south from the Tamil-dominated north as a result of continuing ethnic violence. An epidemic of malaria broke out in December 1985 due to the lack of immunity of the refugees. The epidemic initiated an all-out attack by the Sarvodaya workers on all mosquito breeding sites and they were successful in bringing the epidemic under control.

Although **Bti** has been used successfully in many parts of the world, unfortunately its rapid disappearance once it reaches the water means that frequent spraying is necessary, adding to the cost burden in underdeveloped countries. This is especially so when **Bti** is applied against anophelines which feed near the surface. Consequently, several floating formulations, for example Bactimos briquets, were tried. The most successful and economic method was the combination of the **Bti** primary powder with a monomolecular surface active film. The surface film spreads the **Bti** to give a good surface cover, thus disposing of the need for sophisticated spraying equipment. Simple plastic dropping bottles were adequate. The monolayer holds the **Bti** in the feeding zones for longer periods, and there is evidence that even when the surface pressure has gone due to biodegradation of the monolayer, the **Bti** is still held in suspension.

In addition, by spraying an overdose of the mixture, the surplus is held in a reservoir until the monolayer biodegrades. This acts as a slow release mechanism that allows more of the mixture to replenish the monolayer, releasing the **Bti** as it moves over the water surface. The monolayer itself is an efficient pupicide and is active against the last, non-feeding larval instar, thus killing mosquito stages unharmed by **Bti** and further increasing the interval between applications. The monolayer acts by wetting the breathing trumpets and larval syphons, allowing water into the tracheal respiratory system, so that they drown.

The monolayer was supplied by the Wolfson Mosquito Control Project at Southampton and by OXFAM. The **Bti** was given by Biochem, the high potency Bactimos primary powder being selected. There was considerable evidence that control with these safe larvicides, which did not interfere with the natural predators of the mosquito, was greatly supplemented by natural biological control.

The group attending the Workshop was impressed by Sarvodaya's activities and they contributed to the Workshop themselves by suggesting improvements gained from experience in mosquito control projects in their own countries. Among the recommendations was further entomological training to continue to improve the work and also to improve and also to extend suitable methods of integrated control to cover the breeding habitats of other vector mosquitoes. Urban areas in several countries are a cause for concern and interest was expressed in work study to examine the possibility of extending community participation to these areas.

Gillian M. Roberts
GCRI, Littlehampton.

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RESEARCH ON ENTOMOGENOUS FUNGI IN CHINA

Workers in the research on entomogenous fungi are distributed in many universities and institutes in many provinces of the People's Republic of China. Their academic actions used to be sponsored by societies of entomology, plant protection, microbiology, as well as forestry at different level. The First National Symposium on Insecticidal Microbes was held in Changzhou, Jiangsu Province in September, 1986, which resulted in the proceedings, INSECTICIDAL MICROBES. Several insect mycologists attended it. Then in August, 1987, 50 workers, who represent a large part of workers in this field, attended the First National Symposium on Entomogenous Fungi held in Gongzhuling, Jilin Province, and sponsored by the Mycological Society of China. During the symposium, Division of Entomogenous Fungi of the Mycological Society was established. The proceedings, STUDY AND APPLICATION OF ENTOMOGENOUS FUNGI IN CHINA, will be published in 1988.

Beauveria bassiana: Plant Protection Institute of Jilin Province (Qinfeng Xu) has been working on it against Ostrinia furcanalis for over 30 years. Many workers in Forestry Institutes of Guangdong (Fengmin Yin), Guangxi (Zhongmei Hi), Fujian (Yunwei Li), Hunan (Fengzhi Long) and other provinces, and many workers in Forestry Departments of some provinces are involved in pine caterpillar control by using it alone or integrating it with other agents.

Entomophthorales: quite few institutions are involved. Departments of Forestry of Agricultural College of Anhui (Zengzhi Li), Forestry University of Beijing (Jinwen Wu) focus on the resource investigation to the fungal group, while Plant Protection Institute of Shaanxi Province (Xiao lineage Zhang) has been working on cotton aphid control by in vitro production and application of Neozygites fresenii.

Miscellaneous fungi: Departments of Plant Protection of Agricultural College of Guizhou (Zongqi Liang), Agricultural College of Fujian (Rixia Gao) and Subtropic Crops Institute of Zhejiang Province (Zhu-an Chen) have been putting their emphasis on the exploitation of the fungi, especially Hyphomycetes and sometimes Cordyceps, many spp. of which are of important pharmaceutical value. Department of Biology of Normal University of Hunan (Zhiguang Zhang) and Biocontrol Unit of Chinese Academy of Agriculture (Zhengkai Wu) study genetical strain improvement and the latter is also interested in

developmental biology. Plant Protection Institute of Hunan Province (Hongke Li) and Citrus Institute of Zhejiang Province (Daimao Chen) have done much on pathogenicity of Fusarium spp. and commercial production of Hirsutella thompsonii, respectively.

Zengzhi Li
Department of Forestry
Agricultural College of Anhui
Hefei, Anhui
People's Republic of China

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A NEW BOOK IN PRESS

FUNGI IN BIOLOGICAL CONTROL SYSTEMS

Edited by M.N. Burge

CONTENTS

1. The scope of fungi in biological control. M.N. Burge
2. The use of fungi to control insects in glasshouses. R. Quinlan
3. The use of fungi to control insects of agricultural importance. A. Gillespie
4. Mass production of fungi as agents of insect control. M.C. Bartlett & S.J. Jaronski
5. Inundative control of weeds with indigenous fungal pathogens. R. Charudattan
6. Production and formulation of mycoherbicides. C.D. Boyette
7. Classical weed control with fungal pathogens. E.B. Adams
8. Competitive antagonism of soil-borne plant pathogens. J.L. Faull
9. Competitive antagonism of air-borne fungal pathogens. J.P. Blakeman
10. Mycoparasitism and plant disease control. J.M. Whipps, K. Lewis & R.C. Cooke
11. Prospects for the use of fungi in nematode control. G.R. Stirling.
12. The potential impact of fungal genetics and molecular biology on biological control. J. Heale
13. The use of fungi in the integrated control of plant diseases. G.C. Papavizas & J.A. Lewis

This book takes a valuable look at the use of fungi in biological control from all aspects. As well as arthropod pests of plants, the nematode pests are considered, in addition to organisms causing diseases in plants. In different vein, the use of fungi to control weeds is described. Prominence is given to consideration of important general aspects, such as competitive antagonism between lower organisms and the potential involvement of fungal genetics and molecular biology. Arthropod pathogens are considered in chapters 1, 2, 3, 4 and 12. However, perhaps the greatest value of this book - to members of our Society - is to have a treatise in which our subject area within the fungi is seen in perspective with other rapidly developing areas of biological control. At the time of writing proofs are expected shortly.

DENIS BURGES
13 May, 1987

Postdoctoral position.

One postdoctoral associate position is available immediately to study foreign gene expression in insect cells with insect virus vectors. Research will be conducted in South of France at the Comparative Pathology Institute INRA-CNRS. SAINT-CHRISTOL-LES-ALES (near Montpellier). The position is funded for two years with salary of 8000 FF per month (about US$ 15,000). Send resume and 3 references to Gerard DEVAUCHELLE. Station de Recherches de Pathologie Comparee. 30380 Saint-Christol-Les-Ales. France. Telephone : 66.52.20.17.

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NEW BIOCONTROL NEWSLETTER

A new Canadian Newsletter dealing with all aspects of biocontrol, both classical and microbial, is to start publication soon. Deadline for the first issue, scheduled for February or March, is December 15. It is anticipated that the newsletter will includes items dealing with recent research and publications, updates of available technologies, exchange projects and useful foreign contacts, workshops, conferences, personalia and letters to the editor.

The editor of the Newsletter is:

Michael Sarazin
Biocontrol Unit,
Biosystematics Research Centre,
Room 3123, K.W. Neatby Bldg.,
Central Experimental Farm,
Ottawa, Ontario K1A 0C6,
CANADA.

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PERSONALIA

EMERITUS MEMBERS

The following persons have been elected to Emeritus Membership in the Society following retirement from their professional careers:

Dr. H.D. Burges
Dr. W.A. Dimmitt
Dr. R.R. Cowden

Dr. Burges served as President of the Society for the years 1984-1986.

USDA PROMOTION

Dr. Richard S. Soper has been appointed National Programme Leader for Biocontrol, USDA, Agricultural Research Service. In his new position, Dr. Soper will be responsible for development and coordination of the agency's biocontrol programme in entomology, nematology, plant pathology and weed science.

RELEASE OF RECOMBINANT ORGANISMS INTO THE ENVIRONMENT.

This contentious issue, which is, or will be, of direct concern to many of us involved in biological control, is the subject of a report recently issued by the Council of the National Academy of Sciences in the United States. The report was prepared by a committee of biologists, who between them represent a broad range of experience and disciplines, with input from ecologists, molecular biologists, geneticists and applied biologists.

The report outlines briefly the key issues involved in the introduction of genetically engineered organisms into the environment, and incidentally pointing out the often overlooked fact that genetic engineering has been practiced by mankind for thousands of years: the advent of recombinant DNA technology only permitted a new and more precise kind of genetic manipulation. Potential hazards of genetic engineering and the classification of risks associated with introduction of recombinant organisms into the environment are addressed.

The principle conclusion of the committee is that 'there is no evidence that unique hazards exist, either in the use of recombinant DNA techniques or in the movement of genes between unrelated organisms'. This is not to say that hazards do not exist: they do, but they are essentially no different from those associated with the introduction of unmodified organisms, or organisms modified by other methods. Thus, an assessment of the risk should focus on the nature of the organism and the environment to which it is to be introduced, not the method by which it was produced. There is an urgent need for the provision of guidelines both to research workers and regulators to evaluate planned releases of modified organisms from an ecological perspective.

A limited number of copies of this report, entitled 'Introduction of recombinant DNA-engineered organisms into the environment: Key issues.
are available from:

The Board on Basic Biology,
National Research Council,
2101 Constitution Avenue NW,
Washington, DC 20418, USA.

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EDITOR'S NOTE.

The Editor apologizes for the delay in producing this issue of the Newsletter. Unavoidable delays in preparation and submission of some of the material made it impossible to meet the September deadline, and it was decided to once more combine numbers three and four into a single issue.

NOTE TO CONTRIBUTORS.

The SIP Newsletter is produced by offset printing from camera-ready copy provided by your Editor. To make my job easier, contributors are asked to submit their material in a form suitable for direct paste-up and reproduction wherever possible. Copy should be typed in 5 inch (125 mm) columns, preferably in 12 pitch type and right-justified if possible. Type single space and provide a clean clear original. Facilities are available for retyping material at the Institute if necessary. For general format, follow a recent issue of the Newsletter.

Thankyou.

David Tyrrell, Editor.

OBITUARY

Professor Isaac Harpaz

Isaac Harpaz, Professor and Head, Department of Entomology, at the Faculty of Agriculture of the Hebrew University of Jerusalem, at Rehovot, died suddenly on May 7, 1987, of heart disease, at the age of 62. Professor Harpaz, born in Tel Aviv, belonged to the second graduating class of the School of Agriculture at Rehovot, which later became the only agricultural college in Israel, and where he later served as Dean (1974-77). He was among the very first plant virologists in this country, and his book "Maize Rough Dwarf, a Planthopper Virus Disease Affecting Maize, Rice, Small Grains and Grasses" (1972) is the definitive work on this puzzling and destructive plant disease (MRDV), which he showed to be primarily a disease of the vector itself, leading to its own (cyclic) demise. He later referred to certain other "plant viruses that are propagative in their insect vectors" as "insect viruses that obligately propagate in their plant vectors", a new approach. Along with over 130 learned papers published, and other popular articles, Prof. Harpaz was co-author of the book, with Prof. Zvi Avidov "Plant Pests of Israel" (Israel Universities Press, 1969), still considered the last word on this subject.

Professor Harpaz's interests were very wide, and his knowledge of many agricultural and biological subjects, including the history of entomology in the middle East, was truly phenomenal. It was always a pleasure for colleagues and students to put questions to him, as answers were usually forthcoming, and in good spirit. No wonder that in 1974 he was appointed Chairman, Curricula Committee in Agriculture, Israel Ministry of Education and Culture. In insect pathology, he made important advances in the knowledge about nuclear polyhedrosis viruses of Lepidoptera, and was furthermore a recognized authority on Integrated Pest Management, having been appointed a member of the FAO/UNEP Panel of Experts on IPM in 1966, and was consultant to the Inter-American Institute of Agricultural Sciences / Organization of American States on maize virology in Argentina in 1983. He was founder and Chairman of the IPM Research Centre of the Hebrew University, current President of the Israel Entomological Society and member of the Council of the Wolf Foundation. Last year he was awarded the prestigious Rothschild Prize in Jerusalem for his work on IPM. His latest work, the chapter "Prospects of improving the effectiveness of insect pathogens for pest control", in the book edited by K. Maramorosch, Biotechnology Advances in Invertebrate Pathology and Cell Culture, Academic Press, should appear this year.

Not only by his charming wife Joan (Yocheved) and his son Dr. Sheenan Harpaz, daughter-in-law and grandchildren is the tragic loss of this modest but exceptional person felt, but by his many colleagues and friends in Israel and abroad. I count myself as one of them.

R. Kenneth.