

The logo for the Society for Invertebrate Pathology (SIP) features the lowercase letters 'sip' in a bold, white, sans-serif font. The letters are set against a solid black rectangular background.

# newsletter

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## society for invertebrate pathology

VOLUME 24, NUMBER 1  
February 1991

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**1991 ANNUAL MEETING  
NORTHERN ARIZONA UNIVERSITY  
FLAGSTAFF, ARIZONA  
AUGUST 4-8, 1991**

The 1991 Annual Meeting of the Society for Invertebrate Pathology will be held on the campus of Northern Arizona University in Flagstaff, Arizona. For those of you who remember the hottest SIP meeting on record, 1974 in Tempe, Arizona (117°F; ca. 47°C), we hasten to inform you that it will NOT be this hot in Flagstaff! NAU is Arizona's "Mountain Campus", located in a community of 44,000 people in a beautiful Ponderosa pine forest at 7,000 feet (11,200 meters) above sea level (5K runners, please note!). Flagstaff enjoys an average of 300 days of sunshine, with only 3 of those days over 90°F. In the winter, the village receives nearly 90 inches of snow, and is the site of a successful ski resort.

Flagstaff is the closest town to the famous Grand Canyon, and we hope that many of you will combine the meeting with family vacations in the Southwest. If you plan to visit the Canyon, we recommend making hotel and car rental reservations immediately, as August is the busiest time of the year. Flagstaff is served by America West and Southwest Airlines, with flights out of Phoenix, Las Vegas and Albuquerque. We recommend you book your airline reservations into Flagstaff early as well. You can also fly to Phoenix and rent a car or use the bus to travel to Flagstaff, or drive there on Route 40 or Interstate 17.

A highlight of the meeting will be our Wednesday trip from Williams, Arizona to the Canyon aboard the Grand Canyon Railway, a restored steam train. We will have an opportunity to gaze over the South Rim near the old El Tovar Lodge (featured in Zane Grey novels), and then will board busses for a guided tour of other points and return to campus.

Tentative symposium topics for the scientific program include invertebrate immunity, effects of microbials on nontarget invertebrates, synergism and antagonism among microorganisms, resistance, symbionts and normal microbial flora, introduction of microbials (including foreign explorations and dealing with the public), insect viruses, epizootiology, hymenopteran pathogens and parasites, and a symposium on *B. thuringiensis*. We welcome other suggestions and would be delighted to have volunteers willing to organise a session.

By meeting on a campus, we hope to keep the housing and

registration fees for this meeting low enough for students and those on limited budgets to attend. Watch for further details in future Newsletters!

**Local Arrangements:**

Elizabeth W. Davidson  
Department of Zoology  
Arizona State University  
Tempe, AZ 85287  
602-965-7560

**Program:**

Martha Gilliam  
Carl Hayden Bee Laboratory  
2000 E. Allen Rd.  
Tucson, AZ 85719  
602-670-6481

**SOCIETY FOR INVERTEBRATE PATHOLOGY  
PRESIDENTIAL ADDRESS  
Adelaide, South Australia  
August 20, 1990**

As President of the Society for Invertebrate Pathology, and as a representative of all the officers of our Society, I extend our welcome to all of you to the Fifth International Colloquium on Invertebrate Pathology and Microbial Control.

This meeting has had the longest preparatory period of any international colloquium sponsored by SIP. Much thought has gone into arranging the scientific program and seeking out accommodations for this meeting; and we owe a great vote of thanks to those persons who have expended so much time and energy on our behalf. The 1986 Fourth Colloquium in Veldhoven, Netherlands, maintained the high standard of the 1982 Brighton, England, meeting. It is my expectation that, with the excellent venue and the new methodologies and concepts which will be presented here at this 1990 meeting in Adelaide, we will move to a new, higher level of excellence.

I am pleased to report to you that our Society for Invertebrate Pathology is currently in very good health. Our membership increased by approximately 60 persons this past year and now stands at about 1,060 members. Although our membership dues are currently too low in relation to expenses incurred for services rendered to the members, through hard work and good organization, a surplus of funds has been gained over the years from our meeting activities; and we now have a modest but, for current needs, adequate reserve of funds in the bank. (I should warn you that because of our almost doubling in size in the last five years, we can expect in the near future to have to commit

funds for professional administrative help; and, at that time, or possibly even before, our dues will have to be increased.) We have the reputation of being an active and friendly group of scientists that readily welcomes newcomers into its midst. Our profession of invertebrate pathology is currently enjoying a great surge of interest, in large measure because of the potential to alleviate chemical pesticide pollution and to protect beneficial invertebrates through our studies of invertebrate diseases. In addition, it is possible that, with the strong anti-vivisectionist sentiment in many nations, some invertebrate diseases may be exploited as models for human disease. All-in-all, we're riding a new wave of acceptance of our profession which is being carried over into growth of the Society. It has been a great time to be President since we are in a growth phase and, although we have problems which need attention, we have none which are insurmountable.

I belong to the Entomological Society of America, the Entomological Society of Brazil, the Malaysian Plant Protection Society, and others; for a total of ten professional scientific societies. Seven of these include the name of a country in their title. One of those that does not is unabashedly American and the other two have to deal with biological control organisms. These are the International

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### SIP Newsletter

The SIP Newsletter is produced four times a year by the Society for Invertebrate Pathology. Annual dues (U.S. Funds) for the Society are: regular members, \$15.00; and students, \$6.00. Members receive the SIP Newsletter and a copy of the Abstracts of all SIP General Meetings free, whether or not they attend. Application forms for membership in the Society may be obtained from the acting Treasurer, Dr. Donald W. Roberts, Boyce Thompson Institute, Cornell University, Tower Road, Ithaca, New York 14853, U.S.A.

#### Council Officers of the Society are:

President	Elizabeth W. Davidson, USA
Vice President	Christopher C. Payne, UK
Past President	Donald W. Roberts, USA
Secretary	Larry A. Lacey, USA
Treasurer(acting)	Donald W. Roberts, USA
Trustees	Peter Faulkner, Canada
	Toshihiko Iizuka, Japan
	Dudley E. Pinnock, Australia
	George G. Soares, Jr., USA

#### Send News items and other contributions to:

David Tyrrell, Editor  
SIP Newsletter  
Forestry Canada  
Forest Pest Management Institute  
P.O. Box 490  
Sault Ste Marie, Ontario P6A 5M7  
Canada

Deadline for Next Issue: April 1

Organization for Biological Control and the Society for Invertebrate Pathology. I know, from personal discussions with several of the founders of the Society for Invertebrate Pathology, that they always intended for it to be an international organization.

As I mentioned earlier, the membership is now approaching 1,100. These members live in 60 nations. A little over 40% are from the United States. The second largest contingent--10%--is made up of those from the United Kingdom. Canadians constitute 8% of the Society, while Japanese represent 7%, and 5% are French. The Australian contingent is 3.5%. One-fourth of our members are Western Europeans, one-half North American, and one-fourth from the rest of the world. It is obvious that the SIP Founders' hope that the Society would attain a truly international flavor has been realized. This should soon become even more pronounced.

There is a large body of scientists who have wished to participate in our Society's activities for many years, but could not do so because of foreign currency exchange problems. A large percentage of these people live in Eastern Europe and hopefully, with the very significant changes in governmental policies now taking place in those nations, our membership numbers from this part of the world will increase significantly in the next few years. As previously mentioned, Western Europeans constitute 25% of our current membership. Eastern Europeans, on the other hand, constitute only 1.5%. Indeed, we have as many members in the Netherlands as we have in all of Eastern Europe. The same could be said of Israel or Brazil. In the spirit of taking advantage of new opportunities for interaction with Eastern Europeans, we invite the invertebrate pathologists of these nations to join us. Perhaps some of us as individuals can contact and help specific colleagues we know personally join the Society. If you have ideas as to how the Society can find and attract such potential new members, please contact our Membership Committee which is chaired by Wendy Gelernter. We also have a number of pathologists in other parts of the world who are having financial difficulty joining with us. We need help there as well. The Endowment Committee helped approximately 12 people in the past year. Please contribute to this fund, and provide suggestions as to recipients. One approach we have taken to facilitate international communication is to hold meetings in several nations. Please note that after this Australian meeting, we will meet in Heidelberg, Germany, in 1992 and the next International Colloquium will be in Montpellier, France in 1994. The interim meetings--1991 and 1993--will be in Flagstaff, Arizona, and Ithaca, New York.

Why is it that our discipline so inspires international participation? The answer probably lies in the nature of disease research, particularly research aimed at biological control of pests and of disease control in beneficial invertebrates. The pathogens of beneficial invertebrates, such as shrimp, have been transported worldwide in aquaculture activities and therefore attract worldwide approaches to investigating their sources and natures. Classical biological control has been based on the concept that pests are frequently migrants from other parts of the world and introduction of natural enemies from their geographic sources is an effective approach to bringing the pest under control in its new location. This type of work involves interaction between peoples of many cultures. In other words, in our type of work we need to have scientific contacts in many locations. Probably the most important function of a scientific society is to facilitate communication among professionals interested in the

same topic. To be fully functional for its members our Society will, of necessity, attract international participation.

There has been a very interesting discovery within the past year in the Northeastern United States which I think illustrates the importance of international interactions. The gypsy moth is a forest-defoliating lepidopterous insect which exists in virtually all temperate regions of the northern hemisphere. It apparently originated in Asia. This is based on the observation of much greater genetic diversity in populations of that area. In fact, some authorities have proposed subspecies for various populations in Asia. Genetic diversity in Europe is considerably less and the insect was not present in the United States until 1868 or 1869. At that time it was accidentally released in the Boston, Massachusetts area by an entomologist who was interested in the insect for its possible silk production. Unlike some Asian populations, the female in the United States is incapable of flight and the insect spread slowly from its point of origin. However, by the turn of the century, it was recognized as a serious pest in Massachusetts. Another lepidopterous insect, the brown-tail moth, was damaging Massachusetts forests at the same time. This insect has urticating hairs and was considered such a pest in Massachusetts that they appointed an official Moth Commission for developing control methods for it. This was before the time of our modern low-dosage pesticides and our highly efficient application technology for these pesticides. They turned to a native fungus, *Entomophaga aulicae*, which apparently provided excellent control. The fungus was mass-produced in insects and infected insects were released into the field. This afforded plant-protecting reductions in pest populations. Encouraged by success with one hairy caterpillar, the scientists turned to another, the gypsy moth. *Entomophaga aulicae* was not effective against gypsy moth larvae but, in 1908, the Commission received gypsy moth larvae from Japan which had been killed by a similar fungus--but the fungus in the specimens was dead. Fortunately, for our international story, an unnamed person (who is referred to only as "a friend of Harvard University") provided funds for a Dr. G. Clinton of Connecticut to travel in 1909 to Japan to collect infected insects. He arrived in the northeast United States from his long trip to the Orient with a few living larvae, two of which developed disease. He put these two together with healthy caterpillars, one of which became infected. He picked spores off of this animal and placed them directly on healthy larvae. A few of these animals became sick and developed resting spores. From these small beginnings, the scientists gathered enough material for six releases, which they referred to as "plantings," from mid-June to early July, 1910. There was no sign of infection that summer, nor in the spring of the following year. Nevertheless, placing healthy larvae in the outdoor chambers used for infecting larvae in 1909 and 1910 did yield infected larvae in 1911. Further releases were made in 1911 but the nuclear polyhedrosis virus, which they referred to as wilt disease, was so prevalent as to make it impossible to maintain caterpillars for production of the fungus disease. The scientists concluded that the fungus had not obtained a foothold in the field. They did state that the fungus could survive the New England winters and a very slight increase in virulence might bring about quite different results from what they had observed.

In June of 1989, two scientists from Connecticut, Ted Andreadis and Mike McManus, contacted Ann Hajek of the USDA and Boyce Thompson Institute to report that a fungus disease was

decimating populations of gypsy moth larvae in Connecticut. Population surveys in 1989 detected this fungus in 7 states and revealed that the fungus was killing up to 88% of the larvae in plots in Massachusetts. Ann Hajek succeeded in culturing the fungus and, in collaboration with isozyme and restriction fragment length polymorphism (RFLP) specialists, established that this fungus is *Entomophaga maimaiga*. Richard Soper had travelled to Japan in 1984 and, in collaboration with Mitsuaki Shimazu of the Forestry and Forest Products Research Institute, obtained cultures from fungus-diseased gypsy moth larvae. The fungus was designated a new species and named *Entomophaga maimaiga*. These 1984 isolates proved to have virtually zero virulence for American gypsy moth in the field. The most plausible explanation as to the source of the fungus which caused the 1989 epizootics in the northeastern United States is that this is the same fungus released by Drs. Speare, Colley and Clinton in 1910 and 1911 in the Boston area. The fungus may not have been detected before now because the symptoms of this fungus disease are very similar to those of the commonly occurring nuclear polyhedrosis virus which infects gypsy moth. In addition, 1989 was an exceptionally moist spring and summer in the northeastern United States and this probably encouraged the fungus. In retrospect, other moist years, for example 1922, seem to have had high levels of what was termed virus disease. It is likely that the true etiologic agent was *E. maimaiga*.

The gypsy moth population is spreading. The fungus disease occurs only where the insect has been 10 years or longer, but this time lag can be reduced. Introduction of forest litter from areas of high 1989 infection levels in southeastern New York and Massachusetts into central New York, where the fungus was not present in 1989, has caused high levels of infection in 1990. If our suppositions are correct, the international exploration activities of 80 years ago bore considerably more fruit than the scientists involved realized. With the rediscovery of the fungus, we will hopefully be able to exploit its potential for gypsy moth control in the United States, and perhaps internationally. It is exciting to realize that, with modern transportation and communications plus the break-down in political barriers, more and more effective international interactions will be taking place in the near future. It is my expectation that the Society for Invertebrate Pathology will be an important catalyst in this activity.

I was in Australia five years ago when nominated for Vice President/President of SIP. At that point, I was in the final month of a Fulbright Senior Research Scholarship; and I knew, liked, and respected both Australia and a number of Australian molecular biologists, entomologists, and insect pathologists. Accordingly, it is particularly rewarding personally to preside at our first SIP Australian Colloquium.

This is my final meeting as your President. I am honored to have had the opportunity to serve you, and I have done so with pleasure. Your other officers have served you willingly, and I must thank them for their support. With these comments, we end the preliminaries of our Colloquium. Let us now commence the scientific program!

Donald W. Roberts

## VTH ICIP STUDENT PAPER AWARD



E. Moorhouse (right), winner of the Best Student Paper, with his supervisor A. Gillespie. (Co-supervisor K. Charnley was not available for the photo session).

The prize for the best student paper presented at the recent ICIP was awarded to E.R. Moorhouse for the paper entitled:

"The Progress and Prospects for Control of the Black Vine Weevil, *Otioryhncus sulcatus*, by Entomogenous fungi".

The Student Prize Committee wishes to thank all student paper presenters and commends them for the high calibre of their contributions.

A.P.J. Trinci  
R.J. Akhurst  
K.D.Z. Samuels

## MINUTES OF THE XXIII ANNUAL SIP BUSINESS MEETING (V<sup>th</sup> International Colloquium on Invertebrate Pathology and Microbial Control)

Adelaide, Australia - August 23, 1990

The 23<sup>rd</sup> Annual SIP Business Meeting was called to order by Don Roberts (President) on August 23, 1990 at 5:35 PM. A motion to accept the minutes of the last meeting at the University of Maryland, College Park, as published in the SIP Newsletter was made, seconded and passed.

All committee reports were approved and will be published in the SIP Newsletter; therefore, these proceedings will be reported here in condensed form. Please also see the following Annual Reports for reports from the Treasurer, Publications Board, etc.

Dudley Pinnock, Chair of the Organizing Committee for the V<sup>th</sup> International Colloquium on Invertebrate Pathology presented a preliminary report on this year's meeting. At the time of the report, 226 delegates and 23 students had registered, representing 27 nations.

It was estimated that about 300 registrants were required to "break even." Delegates were encouraged to promote sales of Proceedings and Abstracts volume (about 550 pp, cost \$50) to interested individuals and libraries in order to defray some of the meeting costs. All aspects of the meeting were proceeding smoothly; the staff of the Adelaide Convention Center and Ellisservice Convention Management were congratulated for their contributions to the success of the meeting. A full scientific program was planned around numerous symposia, workshops, contributed paper sessions and posters. An active social program included a welcome reception, banquet, daily tours, 5 km fun run, post-conference tours, etc.

Betty Davidson, Chair of the 24<sup>th</sup> Annual Meeting of SIP, described some of the plans for the next meeting to be held at Northern Arizona University, Flagstaff, Arizona, 4-8 August, 1991. Due to the elevation at Flagstaff, temperatures will be comfortable, not to be confused with the 100°F temperatures experienced by SIP members a few years ago at the Tempe, Arizona meeting. Delegates will be housed in adult dormitories or at local motels. In addition to the usual scientific and social activities, a scenic ride on the Grand Canyon Cog Railway and a bus tour of the Canyon are planned. The scientific program coordinator will be Martha Gilliam, USDA, Tucson, Arizona.

Brian Federici (Chair, SIP Meeting Site Selection Committee) reported the venues of the upcoming Annual Meetings:

1991: Northern Arizona University, Flagstaff, Arizona  
1992: University of Heidelberg, Heidelberg, Germany  
1993: Cornell University, Ithaca, New York  
1994: University of Montpellier, Montpellier, France  
1995: University of North Carolina, Asheville, N.C.

This schedule was previously approved by SIP Council.

Max Bergoin presented beautiful slides of Montpellier to preview the site of the 1994 meeting. A new convention center has been opened; accommodation will be available at hotels and/or dormitories, as well as at local camping sites.

Fred Kern, Treasurer, presented the budget and fully-audited financial report for the period. The report is published elsewhere in this newsletter. The time and effort requirements for this office continue to be demanding; the issue of a home office possibly housing the functions of the treasurer and Newsletter editor is still under consideration. Due to the tragic accident involving Treasurer-elect Charles Reichelderfer, it was decided that Fred Kern would continue on as acting treasurer until January 1, 1991, at which time the duties will be transferred to the Boyce Thompson Institute under Don Roberts. The entire situation will be reviewed at the next council meeting. A motion to allow payment of SIP dues by Mastercard and/or Visa card was carried.

Bob Anderson (Secretary) reported the results of recent election:

President:	E.W. Davidson
Vice-President:	C.C. Payne
Treasurer:	C.F. Reichelderfer
Secretary:	L. Lacey
Trustees:	T. Iizuka and G. Soares
Honary Member:	A.K. Sparks

The 317 total votes received were counted by Tellers Jean Adams and Kevin Hackett. About 90% of the ballots were prepared according to the published guidelines, but some members still continue not to sign the outer mailing envelope.

The report of the Division of Microsporida was presented by A. Sweeney. The Division decided to commit \$1,100 to fund the translation by Dr. Issi's monograph or taxonomy of the Microsporidia. Division officers as of September 1990 are A. Sweeney, President; A. Cali, Vice-President; and A. Undeen, Secretary. T. Andreadis was appointed to represent the Division on the Committee for a new SIP logo.

Verbal reports at the Business Meeting were not presented by the Division of Microbial Control and several of the committees; however, their formal written reports will follow these minutes.

Wayne Brooks, Archivist, called for material to be submitted by out-going SIP officers. It was suggested that this material be screened for relevancy prior to submission in order to avoid storing useless information.

Bob Granados spoke on behalf of the Founders Lecture Committee, which is starting to consider candidates to be honored at future meetings. The Committee wishes to have input from the SIP membership with regard to future candidates.

The Chair of the Endowment Committee, Betty Davidson, reported that twelve SIP memberships were presented to colleagues residing in countries with difficulties paying dues in U.S. currency. Members were encouraged to contribute to the Fund when paying their annual dues and to recommend candidates for Endowment membership to the chair. A new chair for this committee will be needed because B. Davidson is taking up her position as SIP President.

Jim Harper, Chair pro-temp of the Publications Committee, reported that the Newsletter and Meeting Abstracts have been published on schedule. Reduced rates for the Journal of Invertebrate Pathology are still available for individual members of SIP. It was decided that the Glossary of Terms for Invertebrate Pathology, assembled by Dr. Martignoni, would be put on computer disc, copies of which could be distributed to interested individuals.

David Tyrrell, Editor of the SIP Newsletter, submitted the accompanying report. The appearance of the newsletter has been improved resulting from the use of a new word processing system. After many years of service, Dr. Tyrrell must step down as Editor (as of August 1991) because of increased job responsibilities. Efforts to identify a replacement are currently under way.

Don Roberts announced that Dr. Phyllis T. Johnson's nomination for Honorary Membership in the Society had been approved by Council; her name will appear on the next biennial ballot.

Betty Davidson discussed the need for a home office for SIP in some central location, as well as an executive officer to take some of the work load off the elected Society officers. Our options in this matter will be thoroughly explored in the near future.

In other actions: Council approved the establishment of a SIP Constitution and By-Laws Revision Committee to make recommendations at next year's meeting; Council also approved \$500 to support a mixer planned in conjunction with a joint SIP-ESA symposium on molecular interactions between pathogens and hosts, organized by Brian Federici for the December ESA meeting.

The Presidential gavel was passed from Don Roberts to Betty

Davidson and the meeting was adjourned at 6:35 PM.

Robert S. Anderson, Secretary

## SOCIETY FOR INVERTEBRATE PATHOLOGY 1990 ANNUAL REPORTS

### Treasurers Report

The Society for Invertebrate Pathology had an income of \$17,382.26 for the year beginning 1 August 1989 and ending 31 July 1990. Dues and Division membership fees totaled \$8712.26, with deposits of \$7485.00 for regular membership; \$174.00 for Student membership; and two \$250.00 sustaining memberships from Crop Genetics International and Rohn and Hass Inc.

The Microsporida Division collected \$51.00 bringing its total to \$1229.00, and the Microbial Control Division collected \$201.00 increasing their total holdings to \$1831.00.

The regular SIP account earned \$1542.0 in interest and the endowment fund interest was \$240.38. Other contributions included \$100.50 for the Endowment Fund and \$116.50 in donations to the "Regular" SIP account.

The Society received a check from generous contributors to offset the cost of the College Park Meeting to a tune of \$6668.27. This offset most of the deficit incurred by the newsletter in mailing the Abstracts for the meeting.

A total of \$12941.49 in expenses were incurred by the Society. This includes \$1073.25 in costs associated with the presentation of the Founders lecture and Student awards at the College Park meeting. The SIP Newsletter was issued checks to cover \$11000.00 in operating costs. As mentioned above, \$6000.00 was used to offset the deficit incurred in 1989, and \$5000.00 was used to cover the 1990 newsletter publication.

Treasurer's office expenses including printing and mailing dues notices, office supplies and help, as well as Banking fees, totaled \$868.24.

The balance on hand as of 31 July 1990 is \$39732.65, this includes \$35569.63 in the General Society Account, \$4157.70 in the Endowment Fund, and \$5.32 in Petty Cash.

**FINANCIAL STATEMENT  
OF SIP FOR THE PERIOD  
1 August 1989 - 31 July 1990**

<b>BALANCE ON HAND 16 JULY 1989</b>		\$ 35291.88
<b>INCOME</b>		\$ 17382.26
<b>Membership Dues</b>		\$ 8712.26
Regular	\$ 7485.00	
Student	\$ 174.00	
Sustaining	\$ 500.00	
Unrecorded	\$ 301.52	
Div. Microsporida	\$ 51.00	
Div. Microbial Control	\$ 201.00	
<b>Interest</b>		\$ 1784.47
Regular	\$ 1544.09	
Endowment Fund	\$ 240.38	
<b>Contributions</b>		\$ 6885.27
Endowment Fund	\$ 100.50	
Regular	\$ 116.50	
College Park Mtg.	\$ 6668.27	
<b>TOTAL</b>		\$ 52674.14
<b>Disbursements</b>		( \$ 12941.49)
Founders Lecture	\$ 500.00	
Print Fee	\$ 232.25	
Student Paper Awards	\$ 250.00	
SIP Newsletter	\$ 11000.00	
<b>Treasurer Office Expenses</b>		
Printing	\$ 110.25	
Office Supplies	\$ 44.89	
Office Help	\$ 270.00	
Postage	\$ 348.60	
Bank Fees/	\$ 94.50	
Returned Checks		
<b>BALANCE ON HAND 15 AUGUST 1990</b>		\$ 39732.65

Second National Federal Savings Bank

Savings/Checking Account	\$ 35569.63
Endowment Fund Savings Account	\$ 4157.70
Petty Cash	\$ 5.32

**SOCIETY FOR INVERTEBRATE PATHOLOGY  
PROPOSED BUDGET**

August, 1990

	PROPOSED 1989-90	ACTUAL 1989-90	PROPOSED 1990-91
<b>INCOME</b>			
<b>Dues</b>			
Regular	8500.00	7786.52	9000.00
Student	250.00	174.00	250.00
Sustaining	1000.00	500.00	1000.00
Microsporida	85.00	51.00	85.00
Microbial Control	260.00	201.00	260.00
Interest	2000.00	2784.47	2000.00
Contributions	300.00	217.00	300.00
Miscellaneous	100.00	6668.27	100.00*
<b>TOTAL INCOME</b>	\$ 12495.00	\$ 17382.26	\$ 12995.00
<b>EXPENDITURES</b>			
Newsletter	8400.00	11000.00	9000.00
<b>Office Expenses</b>			
Postage	1000.00	348.60	1000.00
Office Supplies	175.00	44.89	200.00
Bank Fees	75.00	94.50	75.00
Student Help	2000.00	270.00	2000.00
Miscellaneous	100.00	110.25	100.00
Int. Colloq. Advance	5025.00	5025.00	0.00
Founders Lecture Award	1000.00	823.25	1000.00
Student Paper Award	250.00	250.00	500.00
<b>TOTAL EXPENDITURES</b>	\$ 18025.00	\$ 17966.49	\$ 13875.00

\*Seed money from Int. Coll. Reimbursement?

Frederick Kern, Treasurer

## MICROBIAL CONTROL DIVISION

### Annual Report

A new executive was appointed to the Division at the XXII SIP meetings, College Park, MD; Mark Goettel (chairperson), Mikey McGuire (vice chairperson), Ann Hajek (secretary/treasurer) and Richard Daoust, Larry Lacey, and Kevin Samuels (members at large). We have 198 members in the division of which 149 paid dues this year. We urge all SIP members with an interest in microbial control who are not already members of the Division to join us when they renew their SIP membership.

Our budget presently stands at \$1,779. Although very little to no money has been spent in the past, we anticipate that this money will become useful as the division becomes more active.

The Division is organizing a symposium entitled "Commercialization of Pathogens for Pest Control" for the 1990 International Colloquium in Adelaide. Kevin Samuels is the convener.

A section entitled "Microbial Control News" was initiated for the Society's newsletter. To date, 8 articles and several news items/announcements have been published. It is hoped that this will become a regular feature in the Newsletter. Members are encouraged to submit articles and news items.

An appeal was sent out to the membership for submission of material for a "Color Slide Atlas of Microbial Control: Bioassay, Production and Application Methods." Once completed, the atlas will be offered to all Society members at cost price. To date the response has been luke warm and the executive will attempt one last push to solicit material. Details for those interested in submitting slides were published in the SIP Newsletter, 21 (3) and 22 (2). A tentative deadline for receipt of submissions has been set as 30 October, 1990.

A "Directory of Industries Involved in the Development of Microbial Control Products" is planned. Questionnaires will be mailed out to industries in December. The Directory will be made available to all members.

A workshop/panel discussion for the next SIP annual meetings is being planned. A tentative title is "Registration Procedures for Microbial Control Products."

Mark Goettel, Chairperson

## DIVISION ON MICROSPORIDA

### Annual Report

#### Committee Activities August, 1989 - August 1990.

The Division on Microsporida held its annual business meeting on August 22, 1989 at the XXII Annual Meeting of the Society for Invertebrate Pathology in College Park, Maryland. The following items were discussed.

### Old Business

The translation of Dr. Issi's 1986 monograph on the taxonomy of the Microsporidia was the main topic of discussion. Dr. Andreadis had approached Dr. Lipa and Dr. Weiser about translating the monograph during his tenure as chairman. He received a response from Dr. Weiser stating that he would not be able to undertake the task. Dr. Lipa had not yet replied. Dr. Cali reported that she had sent a partial translation by one of her students to Dr. Issi for her approval; she had not received a reply. Dr. Brooks suggested Duke University translations an option. Consensus of the group was that someone with a background in microsporidia perform the translation. Dr. Canning suggested that Drs. Lom or Vavra be contacted, suggesting that they could be compensated by payment of meeting expenses, outside Czechoslovakia. The Chairman will contact them concerning this matter.

An additional item was an invitation to division members (through Dr. Andreadis) by Dr. Malone of New Zealand to visit her lab either before or after the meeting in Adelaide. Dr. Sweeney will follow-up and get more details.

### New Business

Organization of symposia for the meeting in Adelaide was discussed. Dr. Sweeney reported that there will be three symposia on protozoa, including one on the Microsporidia. The specific topics had not yet been finalized.

There were several suggestions for the topic of the Workshop on Microsporidia to be held at Adelaide. Dr. Sweeney suggested a topic of transmission, life cycles and host specificity while Dr. Sprague suggested host-parasite interactions. Both suggestions were well received with the final decision to be made by the Vice-Chair. Dr. Andreadis suggested that there be a bit of time set aside at each workshop for new material or new findings. Suggestion appeared to be well taken by participants.

Dr. Andreadis brought forth the suggestion that the workshop key speakers submit abstracts as for other sessions and provide this, by letter to the program chairman, so that it can be included in Program and Abstract.

Dr. Sweeney reported that the post conference workshop will deal with screening for pathogens, especially in hosts that are vectors of medically important diseases. The workshop will be held in Cairns near the Great Barrier Reef.

Additional information the symposia and the workshops will be announced in the Newsletter.

Dr. Andreadis expressed concern about representation of the Division on the committee for a new society logo. Dr. Andreadis will approach the committee to represent the Division on Microsporidia.

### Recent Division Activities

Soon after the meeting in Maryland, the Chair received word from Dr. Lipa that he was interested in translating Dr. Issi's monograph. Several correspondences were exchanged and Dr. Lipa agreed to a figure of \$1,100 for translating the complete work. Since this was such a large commitment of the Division's funds, the chair decided that the

will tender her resignation as she "will be only very erratically attending SIP meetings in the future." The Committee would like to thank her for many good suggestions with respect to possible Founders Lecturers and Honorees.

The Founders Lecture at the 1989 SIP Meetings in San Diego was given by Dr. Victor Sprague, who honored one of the greatest pioneers in protozoology, Dr. R. Kudo. The title of his fine lecture was: Richard Roksabro Kudo, the Man and his Hobby.

The Committee did not meet as a whole in San Diego, as only Pinnock and Granados attended the 1989 SIP Meetings, but by correspondence it was unanimously decided to invite Dr. Karl Maramorosch to present the 1990 Founders Lecture in Adelaide, Australia. Dr. Maramorosch will devote his lecture to Dr. Tom D. C. Grace, a pioneer in insect tissue culture.

The Committee wishes to express their thanks to Dr. John Briggs for the preparation of the certificates which are handed to the Lecturer and the Honoree.

L.P.S. van der Geest, Chair

### MEMBERSHIP COMMITTEE REPORT

Current membership stands at an all time high of 1,000. The newly formed membership committee, consisting of Esther Peters, Lawrence Lacey and Wendy Gelernter, hopes to contribute towards further increases in our membership over the next year. Additional committee members are being sought, especially from outside the United States.

An updated SIP brochure and streamlined membership form is currently in preparation, and will be distributed to Council members at the Adelaide meetings for review. Our goal is to have approved brochures and forms printed by October, 1990, in time for distribution at professional society meetings (American Society of Zoologists, Entomological Society of America) this winter. A table-top display is also in preparation for use at membership tables at the upcoming SIP meetings in Adelaide, as well as for other scientific society meetings. To further increase membership, recent contributors to the Journal of Invertebrate Pathology who are not currently on our membership list will be contacted with a letter and attached membership form, urging them to join the SIP. The streamlined membership form will also be printed on the back of upcoming newsletter issues.

Although no suggestions for a new SIP logo have yet been received, an artist has agreed to come up with some designs (free of charge) which will be presented (along with any late entries from SIP members) to the membership for their votes in an upcoming issue of the newsletter. This will hopefully translate into new SIP stationary and perhaps even SIP tee-shirts.

Wendy Gelernter, Chair

### REPORT OF THE ENDOWMENT COMMITTEE, 1989-90

Twelve memberships were presented to scientists residing in countries regarded as "soft currency," i.e. those with difficulty paying membership in US dollars. This year, these members are from Czechoslovakia, Iraq, Hungary, Liberia, People's Republic of China, Mexico, Yugoslavia, Brazil, and Romania. The memberships permit these scientists to keep informed about the Society and invertebrate pathology in general through the Newsletter. Letters from recipients make it clear that the memberships are very much appreciated. We encourage you to contribute to the Endowment; only the interest is used to fund memberships. If you have a colleague in a soft currency country who would be a candidate for an Endowment membership, please inform the Chair.

E.W. Davidson, Chair

Robert Granados

L.A. Lacey

### SIP NEWSLETTER 1989-1990

Four issues of the Newsletter have been prepared and mailed to members during the period September 1989 to July 1990 (Volume 21 nos. 3 and 4 and Volume 22 nos. 1 and 2) (Volume 22(2) is being printed as this note is prepared and costs for printing and mailing are not yet available). These four issues together comprise 38 pages, an increase of 18 pages over the same period last year. In addition, the ballot for Society Officers and Registration Form, Abstract and Information Leaflets for the forthcoming International Colloquium were printed and mailed. Printing and mailing costs are shown in Table 1.

During the past year, all issues have been prepared at FPMI using the Interleaf Word Processing System, which has resulted in much higher quality of print copy for the Newsletter. Since all submitted material must be entered into the computer at FPMI, I am grateful to all those correspondents who were able to submit items in machine readable form. We have facilities at the Institute to handle both 3 1/2 and 5 1/4 inch discs, and can accept most of the popular word processing programmes.

Proposed deadlines and major contents of 1990-91 issues of the Newsletter are given in Table 2.

I thank all of the correspondents for their contributions over the past year, and am most grateful to Vicky Mervyn and Karen Jamieson of our Editorial Unit for their assistance with Interleaf, and my technicians Mary Welton and Kathy Humphries for preparing the copy and mailing the envelopes.

TABLE 1

	# Printed	Printing	Mailing	Total
Newsletter 21(3)	1100	735.00	968.96	1703.96
21(4)	1100	1003.00	1414.24	2417.24



22(1)	1150	938.00	1101.83	2039.83
22(2)	1100	Not available for this report		
\$ 6161.03				
ICIP information		450.12	450.12	
Ballot form		67.42	67.42	
\$ 517.54				
Envelopes (Newsletter)		241.49		
(Ballot)		256.19		
Miscellaneous		3.00		
\$ 500.68				
\$ 7179.25				

Note: All dollar figures are in Canadian \$.

TABLE 2

Proposed Newsletter Contents and Deadlines, 1990-91

1990	Vol 22(3)	Sept 30	Presidential address from Annual Meeting Report for ICIP V, including selection of pictures
	Vol 22(4)	Nov 23	Minutes and Reports from Annual Meeting Advance information on 1991 Meeting in Arizona
	Vol 23(1)	Jan 25	Details of Annual Meeting Call for abstracts
	Vol 23(2)	May 10	Final details of Annual Meeting Mailing of Abstracts for Meeting

David Tyrrell, Editor

**REPORT OF THE AD-HOC COMMITTEE ON THE SIP HOME OFFICE**

The increasing burden of the office of the Treasurer has led us to investigate the possibility of establishing a permanent home office for SIP. As we are not financially capable of maintaining our own office and staff at this time, we have considered contracting for office services with another, small or mid-sized scientific society. We have chosen to contact societies with a number of members in common with us, as these societies are well known to at least some of our members, and would be expected to share common goals and problems.

Discussions with two societies have led to estimates of costs for services currently performed by volunteers, paid part-time student labor, and elected officers of SIP. These services may include maintenance of the membership roster, distribution of dues notices and ballots, collection and deposit of dues, publication of the Newsletter and Abstracts, and routine correspondence. The Treasurer would continue to hold sole withdrawal power on all Society funds.

The cost required by one society for these services were judged excessive. However the prices provided by the second society appear to be reasonable and close to the costs currently incurred by the Treasurer and Newsletter Editor. Don Roberts and Betty Davidson will discuss this matter further with the second society, and we hope to be able to arrange for a home office to SIP within the year.

E.W. Davidson, Chair

**CHARLES REICHELDERFER MEMORIAL SCHOLARSHIP**

The University of Maryland Department of Entomology and Espro, Inc., Columbia, MD are joining forces to establish a scholarship in memory of Charles Reichelderfer, Ph.D.

As many of you know, Dr. Reichelderfer died August 24, during a trip to Adelaide, Australia. He suffered massive brain trauma and internal injuries when struck by a car near his hotel while attending the International Colloquium on Invertebrate Pathology and Microbial Control. He was treasurer-elect of the Society for Invertebrate Pathology and co-chair of last year's Annual Meeting at Maryland.

Dr. Reichelderfer's contributions to the study of entomology gained him international recognition. Most recently, he was working as an Associate Professor of Entomology at the University of Maryland, College Park. He had been an entomology faculty member since 1968, collaborating with the U.S. Forest Service in 1973-75 to develop virulent virus strains for gypsy moth control, and spending the 1975-76 academic year on a Fulbright-Hayes senior research fellowship at Oxford University in England.

He is noted for his work involving microbial diseases of insects. His research with the U.S. Department of Agriculture at the Beltsville Agriculture Research Centre involved isolation and identification of new strains of *Bacillus thuringiensis* (Bt). Those discoveries contributed to the explosion of new organic products to control a broad spectrum of insect pests.

As a longtime member of a USDA biohazard safety committee, he helped maintain National Institutes of Health guidelines for research in genetic engineering. He also served as a member of an international working group on safety considerations for the use of insect pathogens.

Born in Wadena, Minnesota, Reichelderfer held a B.S. degree in biology from St. Cloud University, and M.S. in microbial genetics from the University of Washington and a Ph.D. in entomology from the University of California at Riverside, with minors in ecology and microbiology.

His name appears as author or co-author on 32 articles in scientific journals, three book chapters, three book reviews, 28 papers presented at national and international meetings and a patent application

for a process of preparing human hepatitis B antigen from an insect virus.

The Charles Reichelderfer Scholarship fund has been established to assist deserving entomology students to carry on with studies in his field of expertise. Contributions have already been received from friends and faculty at the University of Maryland, and Espro has made a company contribution. A goal amount of \$25,000 has been set for the fund and we are asking for your help in reaching that goal.

If you need more information on the scholarship, you may contact John Connolly of the University of Maryland (301) 405-3706. We ask that you make checks out to the University of Maryland Foundation, designated for the Charles Reichelderfer Scholarship Fund. Please send contributions to the Department of Entomology, 1300 Symons Hall, College Park, MD 20742.

Robert S. Anderson

## MICROBIAL CONTROL NEWS

The SIP Microbial Control Division is sponsoring this section which features short news items on microbial control. If you have any information which you would like to contribute under this heading, please submit one or two paragraphs to the Newsletter Editor or Mark Goettel, Chairman, Microbial Control Division, P.O. Box 3000 Main, Lethbridge AB, Canada, T1J 4B1, (FAX 403-382-3156). Articles do not constitute formal publication and therefore should not be cited without permission of the author(s).

### Color Slide Atlas of Microbial Control: Bioassay, Production and Application Methods

#### LAST CALL FOR SUBMISSIONS.

There's still time to include your slides in the atlas. All submitters will be acknowledged in the atlas. Please send all submissions to: Mark Goettel, Chairman, SIP Microbial Control Division, Research Station, P.O. Box 3000 Main, Lethbridge, AB, CANADA T1J 4B1. If you have any questions, please call me at 403-327-4561 or send a Fax at 403-382-3156. Selected slides will be duplicated and all submissions will be returned; however, to reduce duplicating and postage costs, if at all possible, please send duplicate slides rather than originals.

Please include the following information 1) a short description of slide including scientific names of pathogen, host and crop (as the case may be), 2) place and year, 3) reference citation if slide is associated with a publication (authors, year, journal, volume #, pages) 4) Name, address and telephone number of submitter. Once completed, the atlas will be offered to those interested at cost price.

### Workshop on Genetically Modified Microbial Fertilizers and Pest Control Agents

A forum to discuss issues relative to the drafting of guidelines for testing and registration of genetically modified microorganisms to be used as fertilizers or pest control agents in Canada was held in Ottawa on 20 - 21 March, 1990. The workshop was organized by the CORE biotechnology group and was sponsored by the Pesticides and Plant Health Directorates, Food Production and Inspection Branch, Agriculture Canada. Limited numbers of the Proceedings are available from Joyce Byrne, Biotech Officer, Pesticides Directorate, Agriculture Canada, 2323 Riverside Dr., Ottawa, ON, Canada, K1A 0C6.

### Recent developments in the commercialization of steinernematid and heterorhabditid entomopathogenic nematodes.

Steinernematid and heterorhabditid nematode-based products (e.g., Biosafe®, Biosafe®-N, and BioVector®) have emerged as effective biological soil insecticides against insects attacking citrus, cranberries, strawberries, ornamentals, vegetables, and turf. Other current research is focusing on new technologies for controlling cockroaches and corn rootworms. Recent developments in mass rearing through liquid fermentation (15,000 and 60,000 liters) have enabled these products to become economically competitive with chemical insecticides in various market segments. Substantial improvement in formulation stability and shelf life has been achieved by immobilizing large numbers of nematodes on specific carriers such as polyacrylamide and alginate gels. Large-scale application of nematode products is now feasible due to the ease of mixing and applying these formulations.

Current efforts aimed at inducing infective stage nematodes into anhydrobiosis may ultimately be a solution to developing a stable, lightweight formulation which is easier to handle and store than present formulations. Ongoing research concerning the identification and incorporation of certain desirable traits (e.g., host-seeking ability, UV tolerance, desiccation tolerance) into these nematodes through genetic manipulation may lead to more virulent and pathogenic nematodes. Research efforts toward adopting a quality control procedure, selecting a suitable target environment and target insect for nematodes, identifying an effective strain and dosage, timing applications properly, and choosing a means of application and delivery that increases the probability of successful contact between insect and nematode have been instrumental in reducing the "efficacy gap" between entomopathogenic nematodes and chemical pesticides.

Ramon Georgis,  
Biosys, Palo Alto, CA

### Ecological research and field trials with *Aschersonia aleyrodis* against *Dialeurodes citri* in China

Eleven species of *Aschersonia* were discovered in seven southern provinces in China, in which *A. aleyrodis* were widely used to control the citrus whitefly, *D. citri*. The fungi appeared throughout the year but were more prevalent between April and December. Two epidemic peaks occurred during April-May and October. Of several meteorological factors, temperature and precipitation appeared the most important.

issue should be discussed and voted upon at the business meeting in Adelaide.

Dr. Andreadis was appointed to represent the Division on the committee for a new society logo by Dr. Roberts.

The chair appointed a nominating committee of Drs. Brooks and Maddox to choose a new Vice-Chair to replace Dr. Sweeney who will take over as the Division Chair in August, 1990. Dr. Ann Cali was nominated and has accepted the position. Dr. Al Undeed has graciously accepted the secretary position for another 2 years.

James J. Becnel, Chair, Division on Microsporidia

## REPORT OF THE COMMISSION ON INVERTEBRATE PATHOLOGY IN THE INTERNATIONAL UNION OF BIOLOGICAL SCIENCES

The Society for Invertebrate Pathology serves as the Commission on Invertebrate Pathology in the International Union of Biological Sciences (IUBS). The IUBS is a Non-Governmental Organization (NGO), consequently the Society for Invertebrate Pathology (SIP) serves effectively as an NGO through the IUBS. NGO counsel is important particularly to the United Nations specialized agencies, for example the World Health Organization (WHO), the Food and Agricultural Organization (FAO). NGOs are participants in the various associations of scientific disciplines, for example, the International Council of Scientific Unions (ICSU). The latter includes organizations such as the International Commission on Culture Collections (ICCC). The array of bureaucracy as suggested above can be found in the Yearbook published by the International Council of Scientific Unions, ICSU Press, P.O. Box 015129 Miami, FL, 33101, USA. The Yearbook is distributed by ICSU, 51 Bd de Montmorency, 75016 Paris, France.

A 1989 organizational chart for ICSU is attached. Note that the Commission on Invertebrate pathology is associated with one of the International Scientific Union members, the International Union of Biological Sciences (IUBS).

The ICSU Yearbooks are particularly useful for the names and addresses of the interim representatives for each affiliated scientific organization. Further, the Yearbooks provide a calendar of future scheduled meetings of organizations for a period of 4 or 5 years. When I receive the Yearbook, it is forwarded to the President or President-Elect of the SIP. The 1990 ICSU yearbook has been sent to President-Elect Davidson.

Annually, as the interim representative for the Commission, I advise the IUBS concerning the activities of the SIP which serves as the Commission. One of the material elements which is useful to ICSU, IUBS and organizations with interests in common with the SIP is the availability of a Directory of Invertebrate pathologists. The current Directory for Invertebrate was published in 1986. It carries a 1985 Copyright by the SIP and is assigned an ISS Number (ISSN 0885-1646). A copy of the current Directory is enclosed with this report.

It is appropriate for the council to consider taking action on the publication of the Directory? A sample of Directory additions and deletions is attached. An alternative is to discontinue publication of

the Directory in its present form. Generally, the Directory has been free to members of the Society. The retail price to others is \$15.00 (US). Those who are members of the Society are identified with an asterisk. The Directory, either in mimeograph or multilith has, for the years 1965 through 1980, been supported partially by The Ohio State University. Two editions, 1980-86 have been supported partially by the Society.

If a Directory is to be issued, with what frequency? Should we consider a hard copy edition or issue it on diskette? One of the thorniest issues is the categories for individuals in the Directory. For example, should all persons with any interest in invertebrate pathology, Society members or not, be listed in the Directory and receive a free copy of the Directory? Should students be encouraged to be in the Directory? Student listings are the first to be out-of-date. We need to have individuals listed when they are in a professional position. The listing of interests of individuals should be according to a formula which the Council can devise to enable cross indexing to be accurate. Should telephone numbers be included? The small informal telephone Directory which was assembled in 1983, as the "SIP Telephone Numbers" is still useful. FAX numbers and electronic mail addresses are two items which encourage low cost international communications.

The Directory fund remaining from the printing and postage of the 1986 edition, and held in the operating budget of the Department of Entomology, The Ohio State University shows a credit balance of \$534.00. The original \$5341.00 was appropriated for the publication of the current 1986 edition. Of the 1100 copies of the 1986 edition, 384 main on hand to fill occasional orders. Checks sent to me for Directory purchases are forwarded to the Society Treasurer.

John D. Briggs, Interim SIP Representative

## REPORT OF THE FOUNDERS LECTURE COMMITTEE

The Founders Lecture Committee still comprises Roberts Granados, Phyllis Johnson, Dudley Pinnock and Leo van der Geest (Chairman), but Phyllis Johnson has informed the Committee that she



Dudley Pinnock, Tom Grace and Karl Maramorosch after the Founders Lecture at ICIP

The spacial distribution patterns of both *D. citri* and *A. aleyrodis* were in the aggregated pattern. In canopy distribution, they were no differences in horizontal distribution; however, significant differences were found in vertical distribution patterns, i.e. there were greater numbers in the lower and middle canopy. In spite of this, the infection incidence remained the same in all directions and canopy levels. The theoretical sampling numbers of field surveys were tabulated.

The niche theory was applied to probe into the ecosystem of citrus orchards. Undercropping green manure and legume crops could improve the microclimate in the orchards by providing fertilizer to the plants and promoting the fungus to increase. In Fujian Province more than 600,000 yuan of net profit was realized. Dollar return was 146:1. In Fujian and Sichuan Provinces, more than 1000 ha of citrus were successfully protected by using the fungi's branch-tied method against *D. citri*. Now this effective approach is being adopted and used in more and more citrus-growing areas.

Guan Xiong  
Dept. Plant Protection, Fujian Agricultural College  
Fuzhou, P.R. China

#### SYMPOSIUM ON BIOCONTROL HELD IN BRAZIL

The second Symposium on Biological Control (Siconbiol) was held at the Israel Pinheiro Institute, Brasilia, on October 14-18, 1990. Topics of discussion included Ecology of Biocontrol, Bacterial, Fungal, and Viral Control of Insects, Classical Biocontrol by Parasites and Predators, Biocontrol of Weeds, Resistance to Biocontrol, and Integrated Pest Management. The conference offered a unique opportunity for discussions among North American, European and Brazilian scientists on many aspects of biocontrol.



SIP members at the Second Symposium on Biocontrol, Brasilia, 14-18 October, 1990.

L to R., Front Row: R. Coveneiro, J. Maruniak, M. Tigano, B. Vinson, E. Davidson, E. Quintela, L. Nicolas, F. Moscardi, B. Magalhaes, P. Neves, M. Pinheiro, S. Bilimoria, J. Deloach. Back Row: E. Vilela, R. Soper, C. McCoy, J. Stemmak, D. Roberts, I. Smith, J. Fuxa, S. Alves.

#### BACTERIAL INSECTICIDES TO BE FEATURED IN NATIONAL GEOGRAPHIC MAGAZINE ARTICLE

Several SIP members discussed their work with bacterial insecticides with a National Geographic Magazine reporter at the 1989 meeting in College Park, Maryland. The magazine was interested in this information as a part of a larger article on modern uses of bacteria. This proposal was accepted by the magazine editorial board, and in late August, 1990, E. Davidson was contacted by a National Geographic photographer for further suggestions of photographic opportunities. Several SIP members will probably be contacted by this photographer, and your work may appear in this internationally acclaimed magazine. The article is scheduled to appear in late 1991.

#### ANNOUNCEMENTS

##### Committee for the National Institutes for the Environment

The Committee for the National Institutes for the Environment has opened a Washington office to spearhead efforts to establish a National Institutes for the Environment (BioScience 40(8):567). The NIE proposal is an effort to greatly expand environmental research and education to drive environmental policy through a new funding agency. Of the \$9 billion in federal extramural support for science, 11% goes to environmental sciences (broadly defined). This amount could be increased and the results of this research made more applicable to solving environmental problems through an interdisciplinary agency, analogous to the National Institutes of Health. The present proposal is to set up a series of problem-oriented institutes that would support competitively-awarded mission-oriented environmental research. Legislation to have the National Academy of Sciences study the NIE concept is presently moving through Congress. The plan for the NIE is still in an early conceptual stage. Environmental scientists who are interested in having input in the process should contact Dr. David E. Blockstein, Director of the Washington office of the NIE Committee. The office is housed at the American Institutes for Biological Sciences building, 730 11th St. NW, Washington, DC 20001-4521; home (202)-628-4303; fax (202)-628-4311.

##### International Symposium on Applications of Biotechnology to Tree Culture, Protection and Utilization

Worthington, Ohio, USA. August 5-8, 1991. Carol Cowles, Northeastern Forest Experiment Station, 359 Main Road, Delaware, Ohio 43015, (614) 369-4476, fax (614) 363-1437.

##### International Symposium on Applications of Biotechnology to Tree Culture, Protection and Utilization

Will be held on August 5-8, 1991, at the Holiday Inn Conference Center in Worthington, Ohio, USA. The USDA Office of Biotechnology and the USDA Forest Service are sponsoring this symposium to highlight recent contributions of biotechnology to the field of forestry and to facilitate future applications of molecular biology within the forestry discipline. The platform sessions for the symposium include: Genetics/Physiology, Biological Control of Diseases and Insect Pests, Bioprocessing, Techniques of Tree Culture and Protection, Techniques in Tree Utilization, Public Policy Issues, and Commercial Applications. In addition, the format will offer poster presentations. A second announcement will appear early in 1991 with a call for abstracts for poster presentation. For additional information please contact Carol Cowles, USDA Forest Service, Northeastern Forest Experiment Station, 359 Main Road, Delaware, Ohio, 43015, (614) 369-4476, fax (614) 363-1437.

### Special Workshop - Marine Invertebrate Cell Culture

The Invertebrate Division of the Tissue Culture Association and the Society for Invertebrate Pathology will co-sponsor a workshop on Marine Invertebrate Cell and Tissue Culture as part of the World Congress on Cell and Tissue Culture in Anaheim, California, June 16-20, 1991. The workshop will explore the possible reasons for the lack of success, despite vigorous attempts over a period of more than 40 years, to continuously grow lines of cells derived from tissues of marine invertebrate species. Long-term *in vitro* maintenance of tissues and primary cell cultures of some marine invertebrate species has been achieved--and used to good advantage! Nevertheless, the need to develop cell culture systems for continuous *in vitro* propagation of marine invertebrate cell lines is still compelling. Development of such systems will allow for the cells to be cloned, characterized, stored, retrieved, transported, and shared with cooperating laboratories. Their use will help ensure uniformity and reproducibility of results. Furthermore, the systems will provide for consistent production of an enormous variety of unique cells from many phyla. These marine invertebrate cells contain an extraordinary diversity of genetic information and possess other properties that can be used to good advantage for a many basic and applied purposes.

In addition to invertebrate pathologists, a number of tissue culture experts will be invited to the workshop who have been successful in the propagation of cells originating from a wide array of homeothermic and poikilothermic taxa, including: mammals, birds, reptiles, fish, insects, and arachnids. These experts will critique past yellers. They will discuss and advise those interested and involved with marine invertebrate cell culture on how to improve their changes for success in continuously cultivating cells over several generations.

From this meeting, it is expected that innovative ideas will be generated and may lead to some approaches for producing cell lines from marine invertebrates. It is also anticipated that the workshop will produce agreements for cooperative actions calling for a worldwide multi-laboratory assault aimed toward the development of cell lines

from several candidate species of marine invertebrates, for example from: crustaceans, mollusks, echinoderms, annelids, coelenterates and even, perhaps, primitive chordates.

Your ideas and suggestions on these important topics are needed. Please share them if at all possible with those of us attending the workshop. If you are unable to attend the workshop and would like to provide information on how you think breakthroughs can be made to continuously propagate marine invertebrate cells *in vitro*, please contact:

Aaron Rosenfield  
National Oceanic and Atmospheric Administration  
National Marine Fisheries Service  
Northeast Fisheries Center  
Oxford Laboratory  
Oxford, Maryland 21654

Submitted ideas will be brought to the attention of the workshop participants for their consideration.

### Call For Proposals

The Bt Management Group is a consortium of 12 companies involved in the development and commercialization of insecticidal products based on *Bacillus thuringiensis*. During 1989-1991, the Group has provided a total of \$120,000 to 5 university and/or government research projects on resistance to B.t. in economically-important insect species. Proposals are now being solicited for the next 2-year funding cycle (Sept. 1991-Aug. 1993). Successful proposals will be funded for one year, with the second year's funding contingent upon submission of an acceptable progress report in September 1992. Investigators currently funded by the Group are also invited to submit new proposals or requests for continuation of funding for existing projects, which will receive the same consideration as competing proposals. Successful proposals will address one or more of the following topics (in order of priority):

- 1) What is the potential for insects to develop resistance to B.t.?
  - a) What is the likelihood of cross-resistance developing to different B.t. endotoxins?
  - b) Will selection with two or more endotoxins delay resistance development?
- 2) What is the cellular mechanism of resistance to B.t. (as related to the mechanism of action of B.t.)?
- 3) Development of a field monitoring program for detection of B.t. resistance.
  - a) Baseline data on susceptibility to B.t. in field populations.
  - b) Standardized lab/field assays for assessment of susceptibility and detection of resistance in insect populations.
  - c) Development and validation of predictive population dynamics and genetic models.

4) Development of strategies for optimizing efficacy of B.t. products, such as:

- a) Multiple genes (B.t. or non-B.t.)
- b) Tissue- or temporal- specific expression
- c) Multilines
- d) Altering expression level
- e) Product rotation

Pests of primary interest are *Heliothis*, Colorado potato beetle, European corn borer, diamondback moth, armyworms, and mosquitoes. Proposals involving other species will also be considered if they address at least one of the topics described above.

Deadline for submission of proposals is April 1, 1991. Proposals should not be longer than 10 pages and must include a clear statement of objectives as pertaining to the topics listed above, a brief review of the subject with justification for the project, proposed methods, description of existing facilities and capabilities, summary of current funding, and a proposed budget. Abbreviated curricula vitae of principle investigators should be included as appendices or separate attachments. Any number of unique proposals may be submitted by the same investigator(s).

Send proposals to: Dr. Michael B. Dimock  
Crop Genetics International  
7249 National Drive  
Hanover, MD 21076

## ANNOUNCEMENT AND CALL FOR PAPERS

An **International Symposium on Applications of Biotechnology to Tree Culture, Protection and utilization** will be held on August 5-8, 1991, at the Radison Hotel Columbus North, Columbus, Ohio, USA. The USDA Office of Agricultural Biotechnology and the USDA Forest Service are sponsoring this symposium to highlight recent contributions of biotechnology to the field of forestry and to facilitate future applications of molecular biology within the forestry discipline. The platform sessions for the symposium include: Genetics/Physiology, Biological Control of Diseases and Insect Pests, Bioprocessing, Techniques of Tree Culture and Protection, Techniques in Tree Utilization, Public Policy Issues, and Commercial Applications. In addition, the format will offer poster presentations. **Deadline for submission of poster abstracts is May 01, 1991.** Delta Airlines will be offering special discounted fares to many participants (Delta - 1-800-221-1212, Ext. 7705; Reference No. D 49300).

For additional information please contact Rhonda Cobourn, USDA Forest Service, Northeastern Forest Experiment Station, Forestry Sciences Laboratory, 359 Main Road, Delaware, Ohio, USA 43015, (614) 369-4476, Fax (614) 363-1437.

## New Book

### **Bacterial Control of Agriculturally and Medically Important Insects: A Global Perspective.**

E.W. Davidson, R.M. Faust, J. Margalit and A.S Tahori, Eds.

The bacterial insecticides *Bacillus thuringiensis* and *B. sphaericus* are currently the most successful microbial agents for controlling both agricultural and public health pests. This book provides a multifaceted view of these bacteria, highlighting both basic and applied aspects, agricultural as well as public health uses, and research in developing and developed nations.

Publication of the Entomological Society of Israel and the Ben Gurion University of the Negev, Israel.

260 pp Softbound \$36.00US.

Available from Ben Gurion University  
Attn: Professor Joel Margalit  
Department of Life Sciences  
Beer Sheva, 84105, ISRAEL.

## New Journal

### **BIOLOGICAL CONTROL: Theory and Application in Pest Management**

Editors Raghavan Charudattam, Harry K. Kaya, W. Joe Lewis, Charlie E. Rogers

The aim of the journal is to promote the science and technology of biological control through publication of original research articles and reviews of research and theory. The focus will include new and emerging trends in biological control. Biological control is defined as the reduction or mitigation of pests and pest effects through the use of natural enemies. The journal will devote a section to reporting on biotechnologies dealing with the elucidation and use of genes or gene products for the enhancement of biological control agents.

The journal will encompass biological control of viral, microbial, nematode, insect, mite, weed, and vertebrate pests in agricultural, aquatic, forest, natural resource, stored products, and urban environments. Biological control of arthropod pests of human and domestic animals will also be included. Ecological, molecular, and biotechnological approaches to the understanding of biological control are welcome.

This multidisciplinary journal covers:

**Entomology**- parasitoids, predators, and pathogens and their use through importation, augmentation, and/or habitat management strategies

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### IN MEMORIUM

#### INTERNATIONALLY KNOWN MARYLAND ENTOMOLOGIST DEAD IN AUSTRALIA

Charles F. Reichelderfer of University Park, Associate Professor of Entomology at the University of Maryland College Park, died Aug. 24 at the Royal Adelaide Hospital in Adelaide, Australia. Dr. Reichelderfer was 53.

Death resulted from massive brain trauma and internal injuries suffered when he was struck by an automobile about dusk on Aug. 20 as he was crossing the street near the hotel where he was staying.

Reichelderfer was in Adelaide attending the international



Charles Reichelderfer

meeting of the Society for Invertebrate Pathology. He was recently elected treasurer of the society, and he served as annual meeting chairman last year when the society met at the Center of Adult Education on the University of Maryland campus at College Park.

His wife, Katherine H. Reichelderfer, and three fellow entomology department faculty members from the University of Maryland accompanied him to Australia. None of them were with him at the time of the accident.

Reichelderfer had gained international stature for his research involving microbial diseases of insects. He worked closely in recent years with a team of U.S. Department of Agriculture scientists at the Beltsville Agricultural Research Center in isolating and identifying new strains of *Bacillus thuringiensis* (Bt.). This research has resulted in a virtual explosion of new organic products for controlling a wide array of insect pests.

Reichelderfer was a longtime member of a USDA biohazard safety committee that was responsible for maintaining National Institutes of Health guidelines for research in genetic engineering. He also served on a science advisory panel for the U.S. Environmental Protection Agency review committee on biological and microbial pesticides.

In addition, he had served since 1970 as a member of an international working group on safety considerations for the use of insect pathogens.

Born in Wadena, Minn., Reichelderfer attended high school at nearby Staples in east central Minnesota. He held a B.S. degree in biology from St. Cloud State University, and M.S. in microbial genetics from the University of Washington, and a Ph.D. in entomology from the University of California at Riverside, with minors in ecology and microbiology.

He had been an entomology faculty member at the University of Maryland since 1968, spending the 1975-76 academic year on a Fulbright-Hayes senior research fellowship at Oxford University in England.

Reichelderfer's name appears as an author or co-author on 32 articles in scientific journals, three book chapters, three book reviews,

and 28 papers presented at national and international meetings of fellow professionals.

His name appears on the patent application for a process of preparing human hepatitis virus B antigen from an insect virus.

He collaborated with the U.S. Forest Service in 1973-75 on developing a more virulent strain of virus to help control the gypsy moth invasion in the Northeast.

In addition to his teaching and research activities at the University of Maryland, Reichelderfer was the principal advisor for five successful Ph.D. candidates and six M.S. degree candidates. Most of these are now employed in the USDA.

He was graduate director for the entomology department at the University of Maryland, and he served at various times as temporary acting department chairperson.

Dr. Reichelderfer was a member of Sigma Xi and five other scientific or professional organizations, including the Entomological Society of America, Society for Invertebrate Pathology, and the Fulbright Alumni Association.

An avid hunter and outdoorsman, he was an active member of the Agricultural Research Center Gun Club at Beltsville and the Berwyn Rod and Gun Club of Berwyn Heights.

He is survived by his wife Dr. Katherine H. Reichelderfer, a senior fellow in the National Center for Food and Agricultural Policy at Resources for the Future, a Washington, D.C.-based research organization. Until six months ago, Mrs. Reichelderfer had spent 13 years as an economist for the U.S. Department of Agriculture.

The deceased formerly was married to Patricia D. Sinclair, now living in Las Vegas, Nev.

He also is survived by two sisters--Cynthia Reichelderfer of Rockville, microbiology department head at Suburban Hospital in Bethesda, and Elaine Robinson of Grand Prairie, Tex., a retired special education teacher--and an aunt, Viola Mahaney of Birchwood, Wis., a retired Registered Nurse.

The body was cremated in Australia. A memorial service for Dr. Reichelderfer is scheduled Thursday (Sept. 6) at 3 p.m. in University Methodist Church on the west edge of the College Park campus.

The family requests that memorial contributions be made to a scholarship fund established in his name. Send contributions to the Department of Entomology, 1300 Symons Hall, College Park, Md. 20742. Make checks payable to the University of Maryland Foundation.

For further information contact:

Dr. Allan L. Steinhauer, (301) 405-3912  
T. Milton Nelson, " 405-4596

T. Milton Nelson  
Agricultural Editor

## IN REMEMBRANCE OF PROFESSOR GAO SHAGYIN

Dr. Gao Shangyin, professor of Wuhan University passed away on April 24, 1989, at Wuhan Pear Orchard Hospital, due to a heart attack. My colleagues and I, as his students, herewith express our deepest regret over his passing.

Professor Gao was born March 3, 1909, in Jiashan county, Zhejiang province, China. Professor Gao received Ph.D. from Yale University in 1935, returned to his motherland and was accredited professor of Department of Biology, Department of Virology, the dean of Science School, the vice-president of Wuhan University, and the director of Wuhan Institute of Virology, Academia Sinica. He was the member of Academia Sinica, the member of Sigma Xi, the member of Society of Invertebrate Pathology.

Professor Gao showed the great leadership to promote Chinese education and research in the field of Microbiology. He worked tirelessly for the education in more than half a century. As an educator, he has been totally devoted to the quality training of the younger generation and has always been a very demanding teacher of very high standard. Many of his students play leading roles in Microbiology in China, and he now has many students all around the globe who respect and admire him more dearly as if he were their own father.

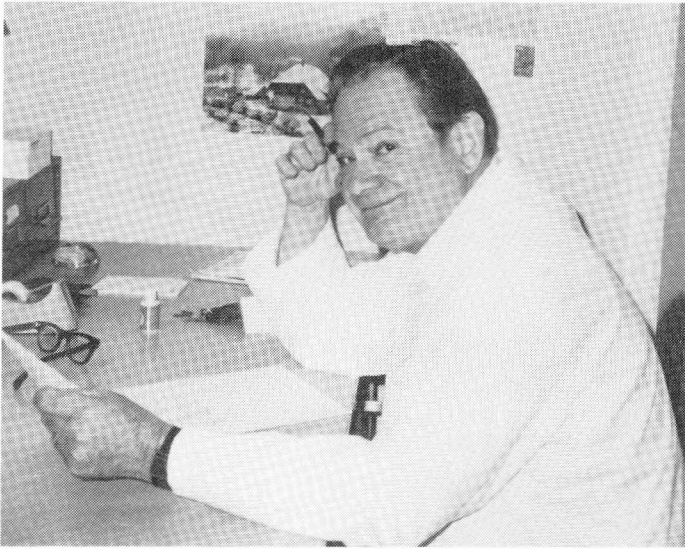
During the end of second world war, he researched structure of TMV in Wendell M. Stanley Laboratory. His pioneering achievement used tissue culture to study *Bombyx mori* nuclear polyhedrosis virus, and research Influenza virus on duck embryo in 1950s. Later he focused on the screen of some Chinese medicaine against Influenza virus and reconstructed the vaccine of newcastle disease virus. In recent years he researched characterization of insect viruses and development of the viral pesticide. The areas of his expertise and contributions include Biology, Microbiology, Virology, Invertebrate Pathology, Immunology and Molecular Biology. Professor Gao was an important brick for both of Department of Virology, Wuhan University and Wuhan Institute of Virology, Academia Sinica. As one of results, he was awarded an honorary degree from Rollins College and the honorary member of Sigma Xi from Seton Hall University.

Professor Gao made significant contributions to development of education and research in Microbiology and Virology, and he will be remembered as one of the frontiers of Virology in China. His ideals and grand visions shared for a very long time to come.

Tan Yeping  
Department of Virology  
Wuhan University  
Wuhan, China



WILLIAM R. KELLEN



William Kellen 1926 - 1990

Dr. William R. Kellen died after a prolonged illness on September 14, 1990 in Fresno, California. Dr. Kellen was born in Chicago, Illinois on January 5, 1926. During World War II Dr. Kellen served in the U.S. Army in France on anti-tank missions. He attended Wright Junior College in Chicago from 1947 until 1949. He received his Bachelor of Science and Masters degrees in Zoology from the University of Michigan and his Ph.D. from the University of California, Berkeley in 1955. Dr. Kellen specialized in entomology and insect pathology. He was a Research Entomologist with the University of California, Berkeley from 1952-1956 and for the government of American Samoa 1956-1958.

Upon his return, Dr. Kellen conducted research for the state of California on biological control of mosquitoes as a Senior Vector Control Specialist. While in this position, Dr. Kellen described and conducted research on many insect pathogens of mosquitoes including protozoa, viruses, fungi and bacteria. Of particular interest was his early work with Bacillus sphaericus as a pathogen of mosquitoes. He also conducted research on iridescent viruses and transstadial transmission of mosquito pathogens. This earlier research on various pathogens of mosquitoes is considered by many to be pioneering in the field.

In 1966, Dr. Kellen was hired by the USDA-ARS Stored-Product Insects Research Laboratory, Fresno, California to conduct research on pathogens and microbial control of stored product insects. He became deeply involved in Special Foreign Currency Programs in eastern block countries during the 1960s and 1970s.

I have known Bill since about 1966 and was privileged to work side-by-side with him in Fresno from 1978 until his retirement in 1986. While at the Fresno lab, his wide interests can be appreciated by his publications on a variety of pathogens including Rickettsiella, fungi,

protozoa, bacteria and viruses infectious to postharvest insects. Bill always dove into his research programs with a lot of enthusiasm and would pursue them to their logical conclusions. His last work, an in-depth study on two previously unknown non-occluded viruses of the navel orangeworm, led to the first known occurrence of a calicivirus in an invertebrate host. He provide evidence of the occurrence of two forms o the virus. This research also led to the development of two cell lines from the navel orangeworm, both of which were found to support replication of this virus.

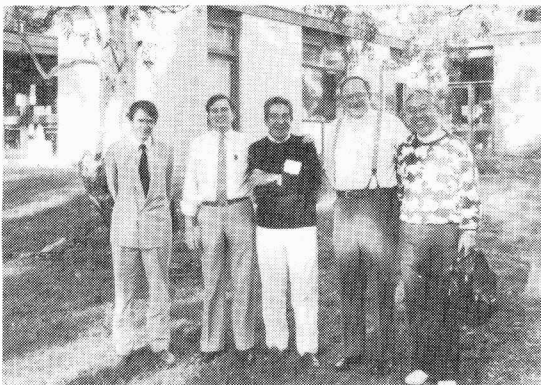
Dr. Kellen was the author of over 60 publications in refereed journals, mostly in the field of insect pathology. In addition to being respected worldwide for his work on entomogenous pathogens, Dr. Kellen had many side interests which he pursued with equal enthusiasm, such as rifles and cannons, tropical fish, and coin collecting. He was an excellent artist, particularly of wildlife. He was also an excellent craftsman as can be evidenced by his museum quality model ships. Additionally, he was very interested in music, photography and old aircraft.

Bill was a true personal friend and will be remembered by all of us who were fortunate enough to have made his acquaintance.

Dr. Kellen is survived by his wife, Hanna, and a son, both of whom live in Fresno. The family requests that any donations be forwarded to the Nancy Hinds Hospice, 1416 West Twain Avenue, Fresno, California 93711.

Patrick V. Vail  
Fresno, California

## ICIP Adelaide, Australia 1990



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# *Biocontrol Science and Technology*

Volume 1 Number 1 1991



**Biocontrol Science and Technology** is a new quarterly international bioscience journal to be published from March 1991. The journal will present original research and reviews in the fields of biological pest, disease and weed control from a diversity of perspectives, encompassing basic scientific research, the application of new techniques such as genetic manipulation, and the technological development and application of biocontrol measures.

The journal will cover:

- animal pest control by natural enemies (parasites, predators and pathogens)
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- weed biocontrol
- 'classical' biocontrol
- augmentative releases of natural enemies
- quality control of beneficial organisms
- microbial pesticides
- properties of biocontrol agents; modes of action; methods of application
- physiology and behaviour of biocontrol agents and their interaction with hosts
- pest and natural enemy dynamics; simulation modelling
- genetic improvement of natural enemies including genetic manipulation
- natural enemy production, formulation, distribution and release methods
- environmental impact studies; releases of selected and/or genetically-manipulated organisms; safety testing
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**Biocontrol Science and Technology** will be published four times a year. These four issues will constitute one volume. An annual index and title-page will be bound in the December issue.

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