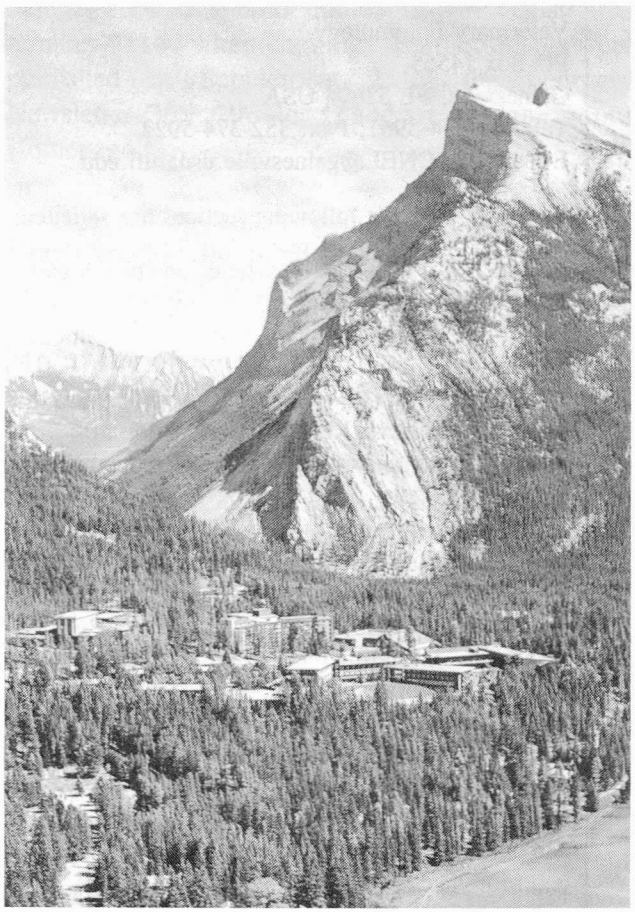
sip

NEWSLETTER

society for invertebrate pathology

VOLUME 29, NUMBER 2
June 1997

30TH ANNUAL MEETING, BANFF CENTRE, BANFF, ALBERTA, CANADA AUGUST 24 - 29, 1997



The Banff Centre situated at the base of Mount Rundle

Over 250 participants and nearly 50 companions have registered by the end of May and close to 300 abstracts have been received. Of these, 29 oral presentations and 20 posters have been entered in the student competition. The Program and Abstracts book is enclosed with this Newsletter. **Please bring this Program and Abstracts booklet with you to Banff, as extra copies will only be available to non-members who have registered.** Please note that the registration and accommodation rates published in the Newsletter are in Canadian dollars (Cdn $ 1.00 = approximately US $ 0.72).

Accommodation. As of printing, only 20 rooms were still available at the Banff Centre. We are working closely with the Banff Centre to arrange for outside accommodation if this becomes necessary. As Banff is an extremely popular tourist resort area, alternate accommodation will be difficult to find.

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Deadline for the next Newsletter is October 15, 1997.

Help us by submitting your accommodation reservations as soon as possible. Sharing your room with another delegate would also be helpful. Once our allotment of rooms at the Centre is gone we cannot guarantee that alternate accommodation will be found. Invariably, the alternate accommodation will be more expensive than at the Centre. We will advise you of the situation once we have received your registration. **Delegates are advised not to come to Banff unless they have confirmed accommodation reservations at the Banff Centre or elsewhere**. Hotels are usually completely booked in Banff and nearby Canmore during the busy tourist season. The only alternative would be to stay in Calgary, which is a one hour drive away.

If you must stay in Calgary overnight on your way to or from Banff, the following are hotels in the proximity of the airport.

At the airport itself:

Canadian Pacific Chateau Airport
2001 Airport Rd. N.E.
T2E 6Z8
Tel: 403-291-2600
Fax: 403-250-8722 Rate: $ 144

Hotels close to the airport providing free shuttle bus service to and from the airport are:

Best Western Airport
1947 - 18th Ave. N.E.
T2E 7T8
Tel. 403-250-5015
Fax. 403-250-5019 Rate: $ 95

Best Western Port of Call Inn
1935 McKnight Blvd. N.E.
T2E 6V4
Tel: 403-291-4600
Fax: 403-250-6827 Rate: $ 127

Holiday Inn Calgary Airport
1250 McKinnon Dr. N.E.
T2E 7T7
Tel 403-230 1999
Fax: 403-277-2623 Rate: $ 125

SIP NEWSLETTER
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Submissions to the following sections are solicited:

Forum: More substantial articles on current issues of concern, limited to approximately five pages.
Letters to the Editor: Issues of concern can be brought to light here.
Microbial Control News: Information on new discoveries, "News Releases", formation of companies etc. pertaining to microbial control.

We also depend on our members to supply us with information for the following sections: **Obituaries, Member News** (Retirements, Awards, Promotions), **Members on the Move** (New addresses), **Positions Available/Wanted, Meeting and Workshop Announcements**, and other **News Items.**

Send all submissions directly to the Editor. Submissions via E-mail or on computer disk (WP, MSWORD or ASCII) make our lives much easier and save on costs. Please include a hard copy of any text sent via computer disk.

Deadline for next Newsletter is October 15, 1997.

Travelodge Hotel
Calgary International Airport
2750 Sunridge Blvd. N.E.
T1Y 3C2
Tel: 403-291-1260
Fax: 403-291-9170 Rate: $ 54.85.

Travel Information:

By air: Delegates arriving by air should book flights to Calgary. Canadian Airlines International and their regional partners have been selected as our "Official Carrier." Special discount fares are available to delegates, who should quote our file registration number **01140** when booking. Further details were published in Supplement 2 of the February Newsletter (Vol. 29, No. 1) and are available at our Homepage.

Upon arrival in Calgary, international delegates will clear Canadian Immigration, pick up their luggage and then clear Canadian Customs (note: delegates transferring through Toronto, Vancouver or other port of entry will have already cleared Immigration and Customs before arrival in Calgary). Delegates should then proceed with their baggage to the Laidlaw and Brewster bus counter, situated at the arrivals level, and purchase their bus transfer to Banff. Advance reservations are not necessary. Fares are $ 32 or $ 34 one way. There is no monetary advantage in purchasing a return fare.

Daily Bus Schedule to Banff

Leave Calgary Airport	Arrive Banff
1200	1400
1230	1430
1530	1730
1800	2000

Ask the bus driver to let you off at the Banff Centre for Conferences.

Return bus schedules are as follows:

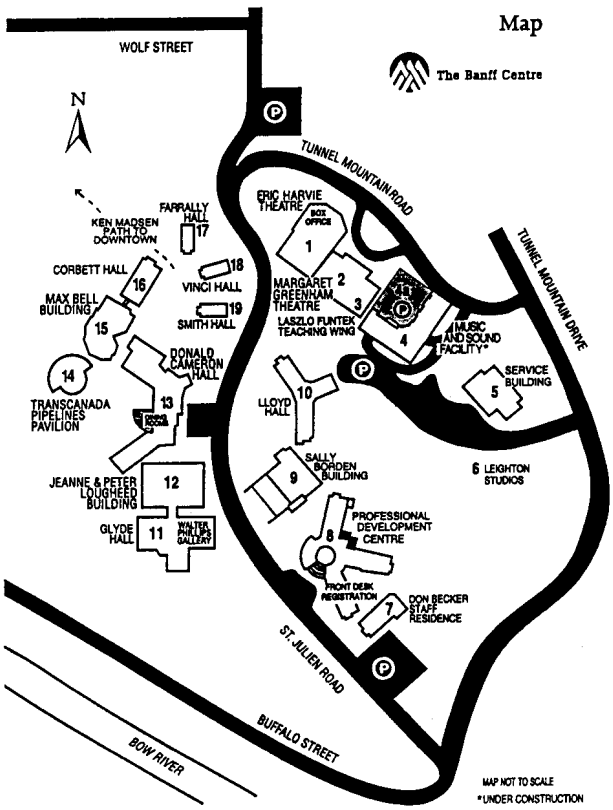
Leave Banff	Arrive Calgary Airport
0830	1030
1010	1215
1230	1430
1600	1830
1930	2130

Rental Cars: Major car rental companies are also located at the arrivals level of the Calgary International Airport. If you plan to rent a car, you are strongly advised to pre-book well before arrival. Ask your travel agent regarding drivers license requirements in Canada. Telephone numbers of major rental companies with offices at the airport were published in Supplement 2 of the February Newsletter (Vol. 29, No. 1). Follow the signs from the airport to the Trans Canada Highway West (No. 1), and proceed west on No. 1 until Banff.

Share a Ride Program. In order to facilitate transfer to and from Banff, especially for delegates arriving after the last bus leaves to Banff and for those requiring better connections for flights on their return, we are providing a ride matching service. If you will be renting a car at the Calgary airport and are willing to provide someone a ride to/from Banff, if you are a delegate wishing a ride to/from Banff, or if you would like to share costs of renting a car, please e-mail or fax your name, flight arrival/departure information and other particulars to Troy Danyk at danyk@em.agr.ca, fax: 403-382-3156.

By car: Banff is accessible from either the west, from British Columbia, or the east via the Trans Canada Highway (No. 1). Upon arrival at the Banff National Park Gates, proceed through the right-hand pass through lane marked "for pass holders." If you are stopped, explain that you are attending a Conference at the Banff Centre for Conferences, and produce the letter you received from the Banff Centre Reservations Office. There are 2 exits to Banff town site. Take either one and follow the signs to the Banff Centre.Upon arrival at the Banff Centre, park at the Professional Development Centre on St. Julien Road (No. 8 on the map).

Upon Arrival at the Banff Centre: Proceed to the Professional Development Centre on St. Julien Road (No. 8) (buses will drop you off here). Check in at the front desk. If you have a car, and you plan to drive around the Park, make sure you purchase a Park Visitors Pass. A park pass must be displayed in your car within park boundaries whenever you leave the Banff Center premises. Most delegates will be staying at either Lloyd Hall (No. 10 on the map) or the Professional Development Centre. Meals before breakfast on Monday can be purchased "á la carte" in the cafeteria located in the Donald Cameron Hall (No. 13 on the map). We encourage you to also explore the many fine restaurants located in the Town Centre, about 15 minutes walk away. A travel agency and small convenience store are located in Donald Cameron Hall. **A licenced bar** and recreational facilities, including an indoor pool, are located in the Sally Borden Building (No. 9).



Registration: The registration desk will be located in the Max Bell Foyer (No. 15) on Sunday between 1600 - 2000, and Monday and Tuesday, 0800 - 1000. For later arrivals, contact a member of the Local Organizing Committee at the SIP Office, located in room 155 (adjacent to the slide preview room 154) in the Max Bell Building.

Late Posters: Providing poster space is still available, late poster submissions will be accepted up to the time of registration. Please bring a copy of your abstract with you. The poster boards will be approximately 1.2 m high and 1.5 m wide.

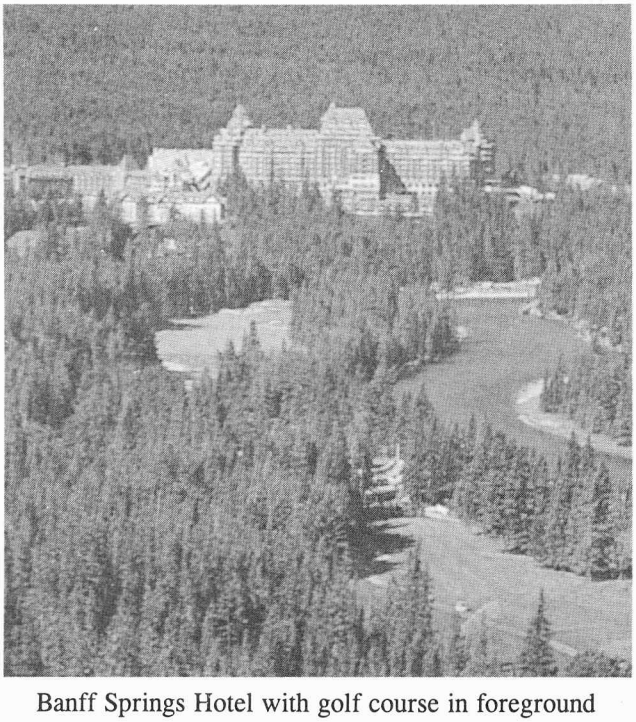
Employment Opportunities Bulletin Board: There will be a bulletin board dedicated to employment opportunities. If you are seeking candidates for employment, post-doctoral positions or graduate studies or if you are available for any such positions, simply prepare a 1 - 2 page advertisement suitable for posting on a board and either mail, fax or e-mail your announcement to Grant Duke at: Lethbridge Research Centre, P.O. Box 3000, Lethbridge, AB, Canada, T1J 4B1, Fax: 403-382-3156; e-mail Dukeg@em.agr.ca. You need not attend the Banff meetings to take advantage of this service. **Deadline for submissions will be 18 August**. However, if you are attending the meetings, you can just bring your advertisement with you to Banff.

Social Program: The Social Program will commence on Sunday evening with a Mixer in the Banff Centre Dining Room (No. 13) commencing at 1930. Finger foods and refreshments will be provided. Meals for delegates staying at the Centre will be provided daily (except during excursions) in the Banff Centre Dining Room. Delegates not staying at the Centre can purchase a meal plan and join us in the Dining Room, or they can eat "a la carte" in the cafeteria.

The social program will continue on Wednesday morning. Buses will leave the Banff Centre at 1115 - 1130 for the Kananaskis Nordic Centre, located north of Canmore. This was the site of the cross country skiing events of the 1988 Calgary Winter Olympic Games and will be the site of the 1997 SIP 5-K race! **We invite you to wear your oldest or favorite SIP T-shirt or other T-shirt depicting an Invertebrate**

or Microbiology theme. Prizes will be awarded to the oldest or best T-shirt! A light BBQ lunch will be provided for all delegates. Buses will then depart at approximately 1400 for Lake Louise, where we will have the opportunity to stroll around the famous lake, or visit the Chateau. Don't forget your cameras! After a brief return to the Banff Centre, buses will once again start departing for the Brewster Donut tent for an evening of eating, drinking, dancing and entertainment. This will be a Western Style BBQ, so blue jeans and casual attire are appropriate. Cost of the BBQ is included in your registration fee.

The Banquet will take place on Thursday at the Banff Centre Dining Hall commencing at 1930. Because the banquet is part of the meal plan for delegates staying at the Centre, it will be necessary for delegates not staying at the Centre to purchase a banquet ticket at a cost of $50. We note that several delegates staying at the Centre have erroneously purchased banquet tickets. We will ensure that these will be refunded.



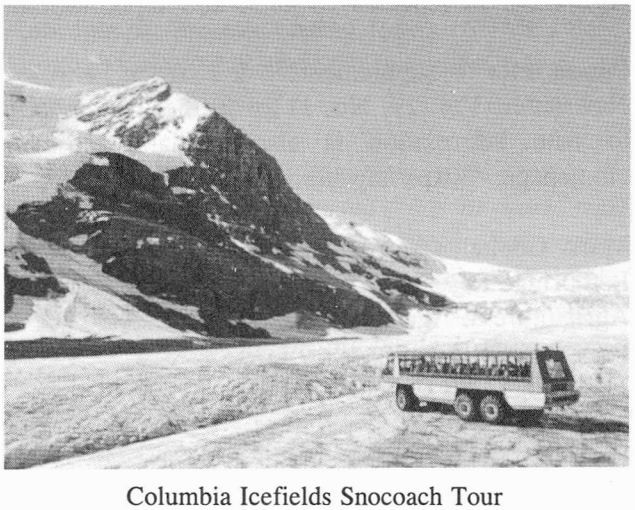
Banff Springs Hotel with golf course in foreground

Attention SIP golfers! The Banff area has a number of spectacular and challenging golf courses. A limited number of tee times have been reserved for an informal, fun outing. Depending on how many SIP golfers are interested and how much you are willing to pay, we can play on Sunday, 24 August (expensive) or Friday, 29 August (less expensive).

To reserve your tee time please contact:

Ross Halliday
Ricerca Inc.
7528 Auburn Road
Painesville, Ohio 44077, USA
Tel.: 216-357-3352
Fax.: 216-354-4662
E-mail: halliday_r@ricerca.com

Optional Companion Tours: We are pleased to announce that we have enough companions signed up to be able to offer the Monday trip to the Columbia Icefields and the Tuesday evening tour of the Banff Springs Hotel. Further details will be provided in your registration package. Space is limited, so if your companion is interested, yet has not registered for these events, please ensure they do as soon as possible.



Columbia Icefields Snocoach Tour

Weather and Dress: Banff has a cool dry climate. Day temperatures in late August average 20 to 25 ° C, but nights are significantly cooler, with possible frosts. The area is at an altitude of 1476 m (4500 ft) and is subject to sudden, dramatic changes in temperature and conditions. **The bottom line weatherwise: Come prepared for anything.** As a

minimum, make sure to include a warm sweater and a good rainproof windbreaker. This is especially important for those planning the trip to the Columbia Icefields. Remember to bring comfortable walking shoes, preferably hiking boots, and ensure you have an extra pair to change into in case of wet weather. Life at the Banff Centre is informal; casual clothing is the norm. Remember to bring your favorite T-shirt for the Wednesday afternoon outing, and your cowboy boots, hat and blue jeans for the Wednesday evening night Western style BBQ. As usual, the Banquet will be casual to semi-formal.

Refund Policy: Refunds for registration fees (minus $40 handling fee) will be available with delivery of a cancellation notice **prior to July 15**. Full refund of room deposit will be made if your room reservation is cancelled 48 hours prior to arrival. However, due to the critical shortage of rooms, please cancel your room reservation as soon you know that you will not be able to attend.

Wildlife: Remember, the wildlife at the Centre and in the park are not tame. Do not approach them! It is unlawful to feed wild animals. Male elk will be in rut and will be especially irritable and unpredictable!

Please refer to Supplements 1 & 2 of the February Newsletter (Vol. 29, No. 1) for further details. Up to date information is also available on our Homepage: **"http://sip.home.ml.org"**

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Tel: 306- 956-7276
Fax: 306- 956-7247
E-mail: erlandsonm@em.agr.ca

For matters concerning **Registration and Accommodation:**

The Banff Centre for Conferences
Box 1020, Station 15
Banff, AB, Canada T0L 0C0
Tel: 1-800-884-7574 (Canada) or 403-762-6308
Fax: 403-762-7502
http://www.banffcentre.ab.ca

Workshop: Partnerships to meet new challenges: public and industrial R&D on *Bt*. 30th Annual Meeting of the Society for Invertebrate Pathology, Banff, Alberta, Canada.

Participants at our 30th Annual meeting are invited to attend a workshop organized by the Division of Bacteria and the Biotechnology Research Institute (BRI), National Research Council of Canada. Due to diminishing public funds and the need for immediate commercial returns, it is uncertain whether *Bt* research will continue to be sufficiently supported to address, in addition to as yet unidentified priority areas, the ever-present problem of insect resistance and the need to discover new and highly active *Bt* strains. The purpose of the workshop is to establish a framework for strategies to develop creative partnerships between industry and academia, in order to promote growth of the knowledge base required to address needs for the 21st century. Two well-known speakers, Thomas Currier from Novartis, Research Triangle Park, North Carolina, and Michael Adang from the University of Georgia, Athens, Georgia, will present their views on the subject. A round-table discussion between invited panellists will follow, and the audience will be encouraged to take part. The workshop will be chaired by Susan MacIntosh, AgrEvo, Des Moines, Iowa, and Roland Brousseau, BRI, Montreal, Quebec.

The workshop is scheduled for Tuesday evening from 1930 to 2130, August 26. Refreshments will be served. For additional information contact:

Eileen Raymond
Tel: 514-496-6349
E-mail: eileen.raymond@nrc.ca

Jean-Louis Schwartz
Tel: 514-496-6355
E-mail: jean-louis.schwartz@bri.nrc.ca

New Slide Atlas Available at Banff

A new set of slides covering basic insect pathology is nearing completion and copies will be available at the meetings in Banff. The set consists of 200 slides with 40 slides each of entomopathogenic bacteria, viruses, fungi, protozoa, and nematodes. Images of the microbes themselves are included (compound microscope, SEM and TEM), as well as images of diseased insects and drawings of some life cycles. The cost of the slide set is $60 (U.S. dollars or Canadian equivalent). At the meetings, you can either pay with cash or by writing a check to the Society for Invertebrate Pathology. After September, sildes can also be ordered by sending a cheque, money order or international bank draft (**drawable on an American bank**) for U.S. $ 60.00 payable to "The Society for Invertebrate Pathology" to Dr. Ann E. Hajek, Department of Entomology, Cornell University, Ithaca, NY 14853-0901, USA.

Thanks are extended to the many society members who helped to make this slide atlas possible!

Ann Hajek

MICROBIAL CONTROL DIVISION CALL FOR NOMINATIONS

The Microbial Control Division is accepting nominations for the positions of Chair-Elect, Secretary/Treasurer, and two Members-at-Large. The candidates voted into these positions at the Banff meeting will begin service at the end of the meeting (attendance at the meeting is not a requirement for running for these offices). Please send nominations by August 1 to:

Dr. Ann E. Hajek
Department of Entomology
Cornell University
Ithaca, NY 14853-0901
Fax: 607-255-0939
E-mail: aeh4@cornell.edu)

LETTERS TO THE EDITOR

E-mail and mollusca

I have been a member of this organization for many years. I am alarmed at two situations occurring in this society. One is the substitution of e-mail address for correspondence frequently omitting a telephone or FAX (editors not included). The second matter is that there seems to be a complete omission of newsletter or meeting reports on the mollusca.

I hope you can clarify these situations for me.

John A. Arcadi, M.D.
Coordinator, Prostate Cancer Research
Huntington Medical Research Institutes
Pasadena, CA 01101

Editor's note: Many of the articles published in the Newsletter are either extracted from the world wide web, or submitted via e-mail. These often contain only the e-mail as the sender's address. The editor will attempt to include telephone and fax numbers as much as possible. Regarding the lack of reports on the mollusca, submissions are welcomed! The editor depends on the membership for submissions to the Newsletter.

FROM THE PRESIDENT

One of the most important functions of the SIP is our annual meeting, and we have had the good fortune, due largely to the skills of the organizers, of having had a series of recent meetings which were very well attended, interesting scientifically and socially, and well organized and run. The meetings at Montpellier

(1994), and Cordoba (1996) all exceeded our attendance expectations, and our meeting at Banff this year promises to continue this tradition. There will be somewhere in the range of 300 presentations, including papers and posters, and the number of registrants is already over 300. Having been there, I can assure you that Banff is a beautiful and relaxing location. But accommodations are limited, so if you intend to attend, this is not the year to register at the last minute.

The scientific program for the meeting this year was put together largely by a Scientific Program Committee co-chaired by Andrew Keddie and Martin Erlandson. Andrew and Martin are both Canadians and members of this year's organizing committee. A review of the scientific program for the Banff meeting included with this newsletter will show that they have done an excellent job. They consulted with members of our various divisions and have developed a program which well represents the interests of most members of SIP. While this somewhat informal way of organizing the scientific program, that is, by letting the local organizing committee organize the scientific program, has generally worked well, several members of our society think that it would be better to have a more formal scientific program committee, one that would be permanent, but with rotating membership. Suggestions for membership on the committee have included the chairs of our various divisions, the President and Vice President, one or two members-at-large to represent members without divisional affiliation, and one or two members of the local organizing committee. I plan to raise this issue with the SIP Council at Banff, so if you have an opinion you would like to offer on this matter, it will be welcome.

One of the SIP members that raised the issue of establishing an official Scientific Program Committee thought that this might be necessary to avoid disenfranchising members without a divisional affiliation. In this regard, I will mention that there are movements underway to form a Division of Nematology, and possibly one dealing with diseases and disease prevention in non-insect invertebrates. Not too long ago, SIP had a substantial number of members interested in the diseases of non-insect invertebrates. This area will grow in importance with the worldwide growth of aquaculture and marine biotechnology. Thus, I think it would be beneficial for the Society to foster our relationship with members and potential members with interests in these areas by providing them with the opportunity to play an active role in our divisional organizations as well as in the development of the scientific program for our annual meetings.

Speaking of future meetings, next year we will meet in Sapporo, Japan. This will be a combination of our regular annual meeting with the International Colloquium on Invertebrate Pathology and Microbial Control, and the International Conference on *Bacillus thuringiensis*. Sapporo is another beautiful location, and the well-known hospitality and organizational talents of our Japanese hosts will make this another meeting not to miss. The value of the Yen with respect to most other currencies is very favourable at present, and barring any substantial change, the costs for attending the meeting will be reasonable. In 1999, we will probably meet in California at La Jolla (University of California, San Diego) or Irvine (University of California, Irvine), which is close to Laguna Beach and Newport Beach. We are currently negotiating rates with both campuses. Meeting at Irvine would be of historical interest because Edward Steinhaus, a founder of our Society and its first president, set up the College of Biological Sciences when UC Irvine was founded.

I will close this letter by offering, both personally and on behalf of the Society, my congratulations to Lois K. Miller on her election to membership in the U.S. National Academy of Sciences (*Eds note: see article on page 12*). Lois has been a member of the SIP for many years, and she was our Founders' Lecturer at our International Colloquium held in Montpellier, France in 1994. Lois was elected for her outstanding research on baculoviruses, and those familiar with her work, know it is an honor well deserved.

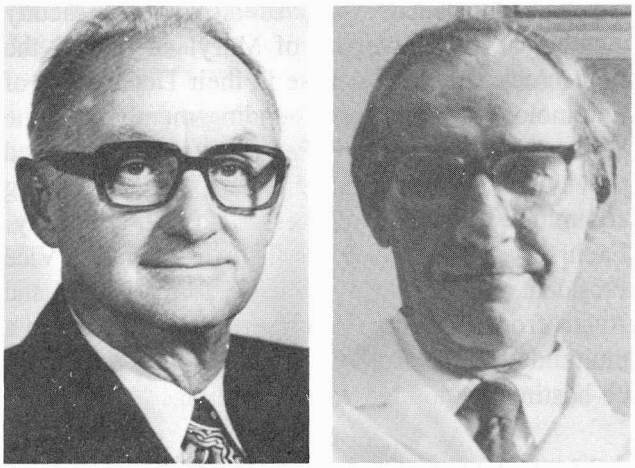
For those of you who will be at Banff, I look forward to seeing you. For the others, perhaps we will meet in Sapporo.

Brian Federici

1997 FOUNDER'S LECTURE

In 1982, the Society initiated an annual recognition of individuals, who, in the opinion of the Society, have contributed to the genesis and development of scientific effort and accomplishments identified as invertebrate pathology. In celebration of the recognition of an Honoree, the Society sponsors a Founder's Lecture. For 1997, the Founders Lecture Committee has decided to honor two individuals, Dr. Tomas A. Angus and Dr. Arthur M. Heimpel as the Honorees, and Dr. Kees van Frankenhuyzen as the Lecturer.

1997 Founder's Lecture Honorees--Thomas A. Angus and Arthur M. Heimpel



Thomas A. Angus and Arthur M. Heimpel

Each of these two individuals has helped shape the discipline of insect pathology in very significant ways, working together as a team in their early professional careers in insect pathology, and then individually in the latter years of their respective careers. Each was involved in the founding of the Society for Invertebrate Pathology, both being part of the original seven member committee that was selected through Ed Steinhaus' initiative to initiate the Society in 1967.

The personal and professional lives of these two men paralleled each other in many interesting and important ways. Both were born Canadian citizens, Tom on September 19, 1915 in Toronto, Ontario, and Art on June 27, 1923 in Baie d'Urfe, Quebec. Tom completed his secondary education during the Great Depression years and worked in a variety of sales and technical jobs from 1933 until 1941, when he enlisted in the Royal Canadian Air Force. He trained as a navigator/air bomber and was stationed in England until 1945. Art also served overseas in the Canadian Army from 1943-45.

Following the end of their respective military careers, both began undergraduate studies in separate universities. Tom studied bacteriology at the Ontario Agricultural College, now the University of Guelph, and Art studied at Queen's University in Kingston, Ontario. In 1948, both accepted summer positions as student assistants with the newly formed insect pathology group at the Canadian Forestry Service's laboratories in Sault Ste. Marie, Ontario. Art received his B.S. degree in 1948 and Tom, his B.S.A. in 1949. Both continued in graduate studies at their respective universities, Art graduating with an M.S. in 1949 and Tom with an M.S.A. in 1950. Their work was in the field of bacteriology and entomology. Art continued working toward his Ph.D. degree at Queen's, graduating in 1954, and Tom began work on his Ph.D. at the University of McGill in Montreal, graduating in 1955. Art also spent time in the labs of Ed Steinhaus in 1949 and 1950 while on leave to the University of California.

Both men became Technical Officers at the Sault laboratory while graduate students and then Research Officers following their graduations. During the years 1948 to 1961, Tom and Art worked closely together, making many critical discoveries and advancing the young field of insect pathology in many important ways. Art brought his training from a medical bacteriology oriented education while Tom brought a more agriculturally oriented microbiological background to focus jointly on topics of mutual interest within the Laboratory's mission. Significantly, their work resulted in many firsts including the recognition of the basic mode of action of *Bacillus thuringiensis* in Lepidoptera. They elucidated the role of the parasporal crystal toxin in midgut binding and disruption, the relationship

between gut pH and toxin activity, and the presence of multiple toxic factors in the bacterium. They worked extensively on the classification of the crystalliferous bacteria. These studies have provided the foundation for ever more sophisticated studies on the molecular and genetic bases for B.t. mode of action, leading to the very detailed knowledge that we have today on this subject. This elegant work was complemented by work at the population level, where they collaborated with other researchers at the Sault labs to test B.t. in the first field trials against the spruce budworm and other important forest defoliators. This body of research, in conjunction with much other work done together and later, separately, was critical to the commercial development of B.t. as a microbial insecticide.

In 1961, the Angus-Heimpel team separated when Art accepted a position with the United States Department of Agriculture as Principle Insect Pathologist in the newly formed Insect Pathology Pioneering Research Laboratory in Beltsville, Maryland. In 1970, he became Laboratory Chief when this lab was renamed the USDA Insect Pathology Laboratory. Art remained in this position until his untimely death on November 10, 1979. In the Beltsville position, Art had the opportunity and responsibility to determine the direction of a basic research program in his own lab, but also influenced basic and applied research direction in insect pathology throughout the United States. In his lab, he assembled a group of scientists that was particularly committed to research on viruses and bacteria, although not exclusively so, as he felt these were particularly suited to development as microbial insecticides. His lab focused on isolation of new pathogens or strains, pathogen identification and classification, propagation, mode of action, host range, specificity, dissemination, and protocols for registration of pathogens as insecticides. The science of insect pathology was advanced significantly through the activities of this lab and the lab has continued to be active following Art's death.

Following the 1961 separation, Tom continued through the ranks of Research Officer within the Canadian Forestry Service and in 1970 became Associate Director of the Sault's Insect Pathology Research Institute. In 1975 he was appointed Director of the Institute when Dr. J. M. Cameron, the previous Director, died. In 1976, the Institute merged with the Chemical Control Research Institute to form the Forest Pest Management Institute, and Tom was named Deputy Director. He retired from this position in 1980 after 30 years of service. During the period from 1961 on, Tom's research interests and guidance of the Institute's research centered on both basic and applied aspects of fungi, protozoa, viruses, and bacteria. Research output from the Institute resulted in several critical registrations of B.t. and viruses for use against numerous forest defoliators.

We come back again to parallels in the careers of Art Heimpel and Tom Angus. Both worked with students in their respective institutions, encouraging lab members to seek advanced degrees and mentoring numerous students. Art, as a part-time faculty member at the University of Maryland, taught the first insect pathology course in their Department of Entomology. Both were founding members of the Society for Invertebrate Pathology and, as stated previously, were members of the organizing committee that originally established the Society. Each served the Society as Council member, Vice President, and President (Heimpel from 1974-76 and Angus from 1976-78). Each served the Society in a multitude of other roles as well including hosting or co-hosting memorable annual meetings.

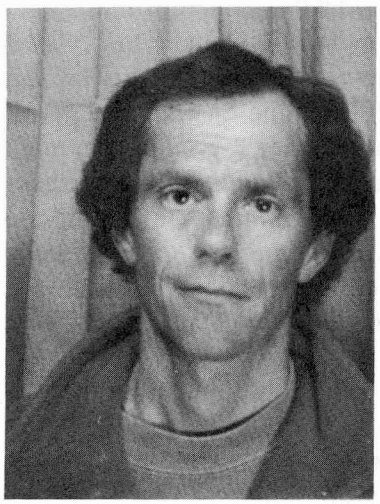
Art's untimely death undoubtedly prevented him from receiving many additional honors within the Society and from other organizations. Tom has been recognized with several honors from the Society. He was, himself, the Founder's Lecturer in 1985 when the meetings were held in Sault Ste. Marie, honoring Dr. G. H. Bergold. He was asked to deliver the Jubilee Speech at the Society's 25th Annual meeting in Heidelberg in 1992 and provided an enjoyable and memorable presentation. In 1996, he was elected as an Honorary Member of the Society. He continues to reside in Sault St. Marie and is active as always.

As a final note, those who have been priviledged to know Art Heimpel and Tom Angus know that these two men were more than just exceptional scientists,

they were warm, outgoing, humorous, caring and giving individuals. They encouraged many young pathologists with advice, support, and concern about their work and personal problems. As seriously as they took their work, they were always quick with their wit and humor. Tom remains so today. Just call him and find out!

More information on Art Heimpel can be found in R. M. Faust, 1984, "Arthur M. Heimpel: His service and contributions to the pathobiology of *Bacillus thuringiensis* and other entomopathogens", in "Pathogens of Invertebrates", Comparative Pathobiology,Vol. 7, pages 1-34, T. C. Cheng, ed. See also SIP Newsletter Vol 12, no. 1, 1980 for an obituary written by Dr. John Briggs. Tom Angus is featured in SIP Newsletters Vol. 13, no. 2, 1981 and Vol. 28, no. 1, 1996.

Dr. Kees van Frankenhuyzen, 1997 Founder's Lecturer



Kees van Frankenhuyzen

Our 1997 Founder's Lecturer, Dr. Kees van Frankenhuyzen, is a highly active and distinguished research insect pathologist at the world renown Forest Pest Management Institute in Sault Ste. Marie, Ontario. Dr. van Frankenhuyzen has made significant contributions in more than 40 refereed publications in both basic and applied invertebrate pathology. Since coming to the Forest Pest Management Institute some 12 years ago, Kees' research has focused primarily on the development of *Bacillus thuringiensis* (Bt) as a microbial insecticide against Canadian forest insect pests, including mode of action and efficacy evaluations in the laboratory and a wide range of studies in the field. He has made especially important contributions into the understanding of spray application technology of Bt and its effect on forest insect control and ecological interactions between Bt, the spruce budworm and larval parasitoids.

Dr. van Frankenhuyzen will be honoring two highly distinguished scientists, Drs. Thomas A. Angus and Arthur M. Heimpel., both of whom made significant contributions to the understanding of the mode of action of *Bacillus thuringiensis* in insects before much was known about this subject. Dr. Angus went on to become the leader of the same laboratory in which Dr. van Frankenhuyzen presently works. This laboratory serves as the principal governmental national insect pathology center in Canada today as was the case while Dr. Angus was leader.

Dr. van Frankenhuyzen was born in 1955 in the Netherlands. Immediately after his birth, his family moved to Wageningen, the center of agricultural research in the Netherlands. As Kees' father was an entomologist with the Department of Agriculture in Wageningen, he was introduced at an early age to the amazing world of insects. Kees' dad was involved in the introduction of integrated pest control to Dutch growers and, therefore, Kees learned at an early age that there was a need to reduce the use of chemical pesticides in favour of more environmentally friendly methods of pest control. Kees was an avid collector of insects from a very early age.

Kees' completed his B.Sc. Degree in crop protection at the Agricultural University in Wageningen in 1977. He later went on at the Agricultural University to complete his M. Sc. Degree in 1980. As part of the latter degree, Kees spent one year studying insect pests with the Canadian Forest Service in Sault Ste. Marie, Canada and with Agriculture Canada in the fruit-producing Okanagan Valley. Almost immediately upon his return from Canada, he moved to West Africa for six months to study ecological

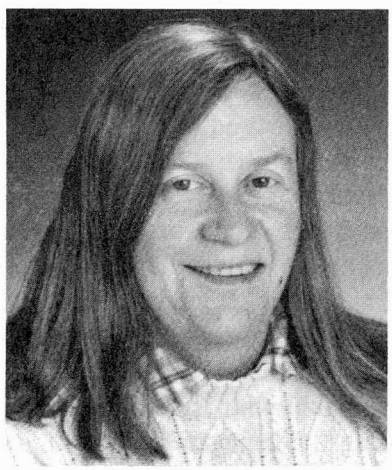
impacts of tse-tse fly control programs under the auspices of the World Health Organization. As a final part of his M.Sc. Degree, Kees returned to Wageningen to work on a research project on the characterization of a new NPV from *Spodoptera exigua,* his first real introduction to the field of invertebrate pathology.

After the completion of the M.Sc. Degree, Kees returned to Canada to do a PhD. in aquatic entomology at Simon Fraser University in 1980. The focus of much of his doctoral work was on the effects of acid rain on fish and insect populations, using the shredding caddisfly, *Clistoronia magnifica* as a model for this studies. Following his Ph.D. degree, in 1985 Kees accepted the position of Research Scientist joining Paul Fast in the bacteria Pathogen's Project of the Canadian Forest Service in Sault Ste. Marie. After Paul's retirement in 1988, Dr. van Frankenhuyzen became Project Leader of the Bacterial Pathogen's Project. In 1997, he accepted the position of Project Leader of Microbial Control at the Forest Pest Management Institute where he remains today.

The Founder's Lecture Committee
James D. Harper, Chair
R. Daoust, D. Ellar, A.W. Sweeney

MEMBER NEWS

Lois Miller Elected to U.S. National Academy of Sciences



Lois K. Miller

Lois K. Miller, a member of the Society for Invertebrate Pathology and Professor of Entomology and Genetics at the University of Georgia has been elected to membership in the prestigious National Academy of Sciences. Results of the election were announced April 29 at the annual meeting of the National Academy in Washington, D.C.

Election to the National Academy represents the summit of career achievements for scientists in the United States. Only a small fraction of working scientists are elected to the group. Although anyone can suggest a name for membership, formal proposals for nomination must come from members of the Academy. Dr. Miller was elected by the membership 'at large', a special honor.

"I am thrilled and honored to have been elected as a member of the National Academy of Sciences," says Miller. She continues: "I have strived to do the very best research on baculoviruses possible and this has been a consuming passion for the past twenty years. The fact that so many of the most outstanding scientists in the U.S.A. have appreciated the quality and significance of this research is an added bonus to a wonderful lifetime of scientific pursuit. But the accomplishments of my laboratory could not have been achieved without the skill, commitment and creativity of my students and post-docs over the years. My election to the Academy really reflects on their quality and work. It has been a joy to know them and I wish them the best in the future."

A native of Lebanon, Pa., Miller received her bachelor's degree in chemistry from Upsala College in East Orange, N.J. in 1967 and her doctoral degree in biochemistry from the University of Wisconsin-Madison in 1972. After serving postdoctoral fellowships with the American Cancer Society at the California Institute of Technology and the National Institutes of Health at the Imperial Cancer Research Fund, she took a position at the University of Idaho where she initiated her research program on baculoviruses in 1976. Miller came to the University of Georgia in 1986 as Professor of Entomology and Genetics. She was named a Research Professor at UGA in 1992. In 1994, she was selected by the Society of Invertebrate Pathology to present the

Founders' lecture at their annual meeting held in Montpellier, France. In 1996, she was selected by the American Society of Microbiology to receive the prestigious Chiron Biotechnology Research Award and presented a special lecture at the ASM's annual meeting. She has also been elected a fellow of the American Academy of Microbiology and a fellow of the American Association for the Advancement of Science.

Miller pioneered the development of genetically engineered baculoviruses for use as biopesticides. Genetic engineering technologies developed in Dr. Miller's laboratory have improved the properties of baculoviruses as biopesticides by speeding up the rate at which they stop their hosts from feeding and decreasing the amount of crop damage. One of these technologies affects the hormonal control of insect development while the other employs genes encoding paralytic proteins to stop insect feeding. She also discovered two types of baculovirus genes responsible for inhibiting programmed cell death (or 'apoptosis') induced during baculovirus infection. These genes, P35 and the IAPs, act at central points in apoptotic pathways of vertebrate as well as invertebrate cells. These genes are now widely used to explore the process of cell death in eukaryotes. Her work in understanding the nature and function of baculovirus genes has had significant impact in diverse areas of basic and applied biology.

MICROBIAL CONTROL NEWS

From NBIAP/ISB News Reports

Potential Allergenicity of Transgenic Foods

The development of transgenic food crops to enhance production or desirable traits presents some exciting new possibilities but also a potential health concern related to the inadvertent expression of a protein that causes an allergic reaction in a sensitive individual. The testing of transgenic plants with suspected allergens can be straightforward using an IgE test with serum from sensitive individuals. However, in some cases genes cloned from sources that are not known to be allergenic are being introduced into plants. Thus a valid method to test proteins for potential allergenicity is needed.

Allergenic proteins often share similar properties such as resistance to enzymatic and acid degradation or heat stability. Astwood and coworkers at the Monsanto Company (St. Louis, MO) reported in the October 1996 issue of Nature Biotechnology the development of an assay to evaluate the allergenicity of proteins. This assay is based on the assumption that stability to digestion is a general property of allergenic proteins. The researchers tested the digestive stability of 16 major peanut, soybean, mustard, egg and milk allergens to a simulated gastric fluid (SGF) containing the protease pepsin. Purified allergens such as egg ovalbumin or milk beta-lactoglobulin were stable for 60 minutes in SGF, whereas common plant proteins such as spinach ribulose bis phosphate carboxylase or phosphofructokinase were digested within 15 seconds. The stability of the test proteins to SGF was unchanged when also assayed in the presence of a typical food matrix, such as crude soybean extract. However, not all allergen proteins tested remained intact in SGF. Some allergens such as egg conalbumin were rapidly cleaved into fragments, which were subsequently stable to further digestion. These results demonstrate that stability of the whole protein or protein fragments to SGF digestion can be used as a valid method for assessing the potential allergenicity of a protein.

Reference:
Astwood *et al.* 1996. Nature Biotechnology 14:1269-1273.

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Litigating Bt Patents for Market Share

A recent (1/23/97) press release headline states, Mycogen Corporation has filed suit in Federal Court here [San Diego], claiming that a new bioinsecticide developed by Ecogen Inc. infringes Mycogen patents covering *Bacillus thuringiensis* (Bt) gene technology.

(see SIP Newsletter Vol. 29 No.1, p. 13) There have been so many lawsuits in recent years over claimed infringements relating to Bt that even industry insiders who keep a close watch on these activities have a hard time keeping track of who is suing whom. It s not just the Bt genes themselves, but every aspect of the technology relating to Bt genes, including the promoters, selectable markers, full-length versus truncated and synthetic versions, transformation methods, etc. The following table which lists recent suits is incomplete, but it provides a sense of the intensity of the battle over the patent claims relating to Bt. The fact that litigation is extremely expensive and time consuming suggests that the stakes are high for the participants.

These disputes are to be settled in court. Why can't the companies sit down at a table and find an amicable solution? Depending on who you ask, the following answers are given:

* These disputes reflect the novelty of this technology to the seed industry. The situation is reminiscent of the learning process which the chemical and pharmaceutical industries went through in past years.

* There is much at stake financially because the new technology generates a lot of added value and all the players believe they are entitled to a big piece.

* Extended litigation saps the financial resources of weaker companies, assisting in further consolidation of agbiotech companies, to the advantage of the financially stronger companies even though their patent claims might be weaker.

* There is a lot of pressure on companies to maintain their stock value which is partially based on claimed property rights.

* Some of the players have big egos. Monsanto's CEO Robert Shapiro will kick butt in the marketplace in order to get environmentally better products that people want to market faster at lower costs (Fortune 4/16/96, p. 116).

The good news is that, in spite of the litigation, corn, cotton, and potato modified with the Bt gene technology are being aggressively commercialized. Several companies have already brought products into the market place. There are many examples of research collaborations and licensing agreements which allow other interested parties access to the patented materials. DeKalb, for example, recently announced that Monsanto's acquisition of Holden's Foundation Seeds will have no impact on the long-term research collaboration or the cross-licensing agreements that DeKalb and Monsanto entered into a year ago.

Companies Involved in Bt Litigation

Date/Plaintiff Defendants - Area of Patent Coverage	
Jan.'97/Novartis	
-Monsanto -DeKalb -Pioneer	Method of protecting corn against insects, including Bt protein ingestion by corn borers
Oct.'96/ Mycogen	
-Monsanto, -DeKalb	1) Modification of Bt genes for plant expression 2) Introduction of genes into plant 3) Plants and seeds from cells transformed with Bt genes
Aug.'96/PGS	
-Mycogen -Ciba	Bt expressed in plants
Jul.'96/ DeKalb	
-Beck's -Hybrids -Countrymark	Intent to sell Bt corn hybrids
June & Apr.'96/ DeKalb	
-Northrup King -Pioneer -Ciba -Mycogen	Bt insect resistance and glufosinate tolerance using ballistic transformation methods
Mar.'96/Monsanto	
-Mycogen -Ciba	Modified Bt DNA sequence to make plants more insect resistant
Oct.'95/PGS	
-Mycogen -Ciba truncated	Protection of plants containing Bt genes
May '95 /Mycogen	
-Monsanto	Process to synthesize Bt genes

On the negative side, farmers, who will benefit from the new technology through reduced pesticide use and increased yield, will likely pay the price of the lawsuits in the cost of the value-added seed. Another negative impact, according to Brent McCown (University of Wisconsin), is that commercialization of genetically modified minor crops has been prevented or delayed due to conflicts over proprietary rights. For example, commercialization of Bt-cranberry has been put on hold until some of the Bt patent issues are settled. The small cranberry industry is not willing to commit the necessary resources - time and money for lawyers - to pursue the necessary agreements in the uncertain environment created by the numerous lawsuits.

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Summaries of Risk Assessment Research Now Online

Summaries of all past and current USDA Biotechnology Risk Assessment Research Grant awards are now available on the ISB Website under U.S. Government Documents. The summaries of 1992-1995 awards were extracted from USDA's Current Research Information System (the so-called CRIS Reports). Proposal summaries for 1996 awards are taken from the BRARG Website (http://www.reeusda.gov/crgam/biotechrisk/biotech.htm). The database allows keyword and concept searching as well as listing by year.

The 1997 Request For Proposals is expected to be published in the Federal Register the first week of April; a May 16 submissions deadline is expected. Previous RFP's have included descriptions of priority research areas in addition to logistical details. The official announcement will be distributed to News Report subscribers and posted on the ISB and BRARG Websites. Summaries of proposals funded in 1997 will be added to the database when the new awards are made.

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Response to Reports of Early Damage in 1996 Commercial Bt Transgenic Cotton (Bollgard™) Plantings

In early July, 1996, reports surfaced of Bollgard™ cotton fields in Texas (Brazos river valley) that various factors were triggering supplemental treatments for cotton bollworm. Similar reports existed in areas of Texas and other locations within the Cotton Belt. It is estimated that between 25-50% of Bollgard™ acres received supplemental treatment for cotton bollworm. No treatments for tobacco budworm or pink bollworm were reported.

Several avenues of investigation were initiated in response to the first reported bollworm outbreak in Texas in early July. The data collected and summarized below answer several major questions concerning Bollgard™ efficacy in the field. Was the situation experienced in Texas due to:

1) resistant bollworms (*Helicoverpa zea*)?

2) mixed seed in Bollgard™ fields?

3) reduced expression of CryIA© in certain Bollgard™ fields?

To explore the possible role of resistant bollworms, surviving larvae from Bollgard™ fields in the Brazos river valley were sent to our laboratory for testing. Because *H. zea* and *Heliothis virescens* are virtually indistinguishable, the larvae were reared to adulthood for positive identification; all were bollworm (*H. zea*). Progeny from these adults were evaluated in diagnostic dose bioassays to test for a significant difference in susceptibility to CryIA© protein when compared to a known sensitive laboratory strain. A lab population from Ecogen was secured for this purpose. The assay involved challenging neonate larvae from each population with a concentration of CryIA© in synthetic diet known to produce 98-99% stunting (EC_{98-99}) in a 7-day assay; for comparison, control larvae from each population were fed untreated diet. A sublethal diagnostic dose was used because of its sensitivity in finding small differences in susceptibility among populations. Responses of the laboratory and field populations are compared in Table 1. The data show that the populations are identical in their susceptibility to CryIA(c). In addition, crude concentration mortality curves for both populations were generated against CryIA© and these too revealed identical susceptibilities.

Table 1 - Diagnostic dose evaluation of Brazos-collected bollworm population vs. laboratory bollworm population. Larvae were challenged with CryIA© @ EC_{98-99} (10 g/ml diet). For each test weights of 24 treated larvae were compared with weights of 24 untreated larvae from the same population.

Population	No. of Tests	Avg. % stunting
Laboratory	8	99.4±0.10
Brazos Valley	5	99.3±0.14

To see if non-expressing (or non- Bollgard™) plants in significant numbers contributed to the damage seen, terminal leaf samples (500 per field) were collected from 7 separate Bollgard™ fields (5 damaged and 2 undamaged by bollworms) in the Brazos valley and evaluated via qualitative ELISA for the presence of CryIA(c). For each field, samples were tested in batches of 50, subsequent batches of 50 were tested if there were any non-expressers. The results appear in Table 2.

Table 2 - Qualitative ELISA results for terminal leaf samples from 7 Bollgard™ fields in the Brazos river valley. Five fields sustained significant bollworm damage (they were treated with insecticides.); two fields did not reach damage thresholds (CK).

Field Site	n	% Positive
damaged	50	100
damaged	50	100
CK	50	100
CK	50	100
damaged	200	97
damaged	50	100
damaged	500	94

Expression levels of the CryIA© protein in the Brazos fields was also explored. Various plant parts were collected from a damaged field when bollworm damage was initially seen. The same field was sampled a week later along with an undamaged field in the vicinity. These plant samples were evaluated in a sensitive quantitative bioassay which measures developmental effects of CryIA© on *Heliothis virescens*. This bioassay, which utilizes powdered lyophilized plant tissue, has been used for several years to quantify *in planta* CryIA© levels in both greenhouse and field studies. The results (Figure 1) show that there was no significant difference between damaged and undamaged fields in their expression of CryIA© and that the 1 week sampling interval did not effect the results. The values for CryIA© in these tissues also agree well with historical data for CryIA© levels in the field from Bollgard™ plants sampled, as these Brazos plants were, at about 100 days after planting.

In response to numerous observations from the field that bollworm larvae were found surviving in blooms and bloom tags (senescent petals attached to a developing boll), two additional studies were conducted to evaluate expression in component parts

of fruiting structures. A greenhouse study was undertaken to look at expression in component parts of white blooms of Bollgard™ plants. White blooms were collected and dissected into petals, pollen, pistil/anthers, and carpel/ovules. These component samples were processed and assayed in the quantitative bioassay described above. The results (Figure 2) show that the lowest levels of CryIA© are found in the pollen, suggesting a possible avenue for larval survival.

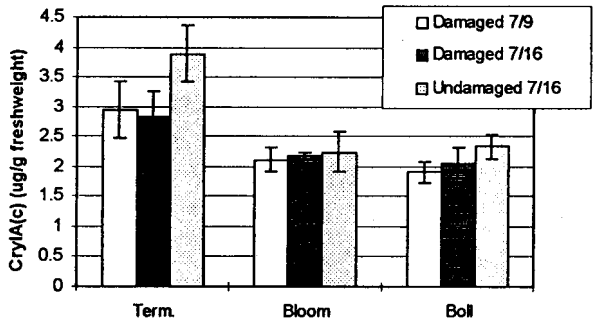

Figure 1 - Levels of CryIA© activity in plant parts collected from Brazos valley Bollgard™ fields. The same damaged field was sampled first when worms were actively feeding, and then a week later after the field had been treated. The undamaged field was close by (3-5 miles away) and had not sustained significant bollworm damage. Each value represents the mean ± SEM for ten replicates. Each replicate consisted of a single structure (either terminal or fruiting structure).

To further look at levels of CryIA© in senescent blooms, samples of white blooms, red blooms (senescent), and young bolls (4-5 days after flowering) were collected from a damaged Bollgard™ field in Monroe, LA. These tissue samples were also dissected and component parts assayed for levels of CryIA(c). The results in Figure 3 show that, except for slightly higher levels in fresh petals, there were no significant differences among these plant parts. These levels of CryIA© also agree quite well with the data collected from damaged and undamaged Bollgard™ fields (Figure 1) and from the greenhouse (Figure 2).

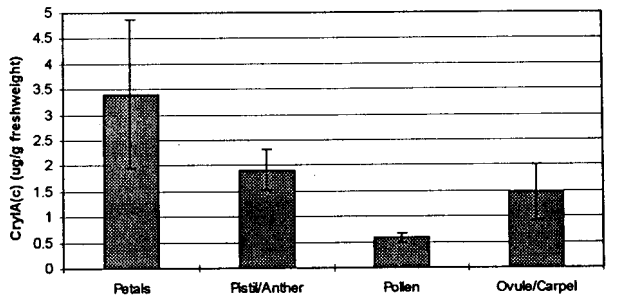

Figure 2 - Levels of CryIA© in component parts of Bollgard™ white cotton blooms grown in the greenhouse. Each value represents the mean ± SEM for three replicates. For each replicate, the component part from four individual blooms was used.

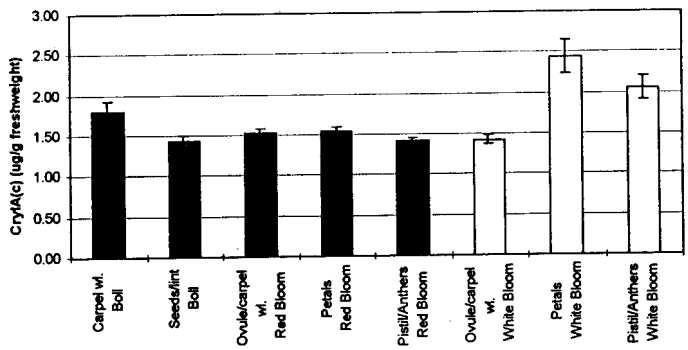

Figure 3 - Levels of CryIA© in component parts of white blooms (white bars), red senescent blooms (vertical-striped bars), and 4-5 day-old bolls (horizontal-striped bars) from Bollgard™ plants in Monroe, LA in August, 1996. Each value represents the mean ± SEM for eight replicates. For each replicate, the component part from two individual blooms or bolls was used.

In summary, the bollworm damage observed in the TX Bollgard™ fields in July, 96 did not appear to be attributable to bollworm resistance, since the surviving worm population was just as sensitive to CryIA© as was a known susceptible laboratory population in both diagnostic dose and dose-mortality tests (Table 1). Neither could significant numbers of non-expressing plants account for the levels of bollworm damage observed; among the damaged fields tested via ELISA, an average purity of 98.2 % Bollgard™ plants was observed (Table 2).

Compromised CryIA© expression in the field could not be considered a contributing factor to this year's bollworm damage. CryIA© levels appeared to be consistent with historical data and no differences were seen either between damaged and undamaged fields or among fruiting structures as they aged (Figures 1 & 3). The single factor evaluated in this series of studies which may have contributed to bollworm survival is the level of CryIA© found in the pollen (Figure 2). As is known, *Helicoverpa zea* is less sensitive to CryIA© than is *Heliothis virescens* by about 40 fold in diet assays. The past six years of field studies prior to commercial launch of Bollgard™ indicated that under almost all conditions, *H. zea* was adequately controlled (estimates of 90% control) without supplemental sprays, although damage by *H. zea* could be induced by artificial infestations at high levels. The most compelling explanation for the bollworm damage observed in 1996 involves this year's increase in *H. zea* populations throughout the South (These were, in many areas, the highest that have been measured in 10 years.), and the lower levels of CryIA© observed in the pollen. It is possible that a proportion of the population can survive on pollen and grow large enough to escape higher levels of CryIA© in bolls. It is known that as larvae grow they become more tolerant to CryIA(c). Indeed these conclusions are tentative and research is planned for '97 to clarify the relationship between pollen expression of CryIA© and the ability of *H. zea* to survive.

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Amended Regulations for Genetically Engineered Plants

Washington, May 1, 1997 The U.S. Department of Agriculture is amending its regulations pertaining to genetically engineered plants introduced under USDA's notification and petition regulatory processes.

"The amendment will simplify procedures for the introduction of certain genetically engineered organisms, expedite review for certain determinations of non-regulated status, and adjust procedures for the reporting of field tests conducted under notification to the biology of the test organisms," said John Payne, director for biotechnology and scientific services with the Animal and Plant Health Inspection Service, a part of USDA's marketing and regulatory programs mission area.

Developing and commercializing new genetically engineered plant varieties most often involves field testing under APHIS oversight, followed by submission of a petition for determination of non-regulated status by the agency. APHIS grants non-regulated status to a new plant variety when it determines that the new variety has no potential to pose a plant pest risk and is as safe to grow as any other variety of the same plant.

The amended regulations will allow a broader application of existing simplified procedures for requests for movement or field testing of genetically engineered plants. They will also streamline the determination of non-regulated status for plant varieties that closely resemble other varieties that have already been through the determination process. This will enable APHIS, when appropriate, to extend the existing determination of non-regulated status for new products that do not raise new risk issues.

For plants that are being evaluated in field tests, reporting requirements have been made more consistent. For example, for trees and other long lived plants field data reports will only need to be provided upon the conclusion of the trial. However, applicants must apply to APHIS for yearly renewal to ensure appropriate measures are taken when plants become reproductively mature.

APHIS will also use appropriate guidelines to provide additional information to developers of regulated articles and other interested persons regarding procedures, methods, scientific principles, and other factors that could be considered for various aspects of its regulations. The first guidelines will provide

information to help applicants on requests for extension of a determination of non-regulated status.

Payne added that USDA has the responsibility to ensure that, in releasing any bioengineered plant, no plant pest risk is presented. APHIS reviewers focus on the biology, propagation, and cultivation of the plant. The reviewers also consider the source of the engineered genes, the vector used to transfer them, and the stability of the insertion.

For further information on the regulatory changes, contact:
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NOTE: USDA news releases, program announcements, and media advisories are available on the Internet. Access the APHIS Home Page by pointing your Web browser to http://www.aphis.usda.gov and clicking on "APHIS Press Releases." Also, anyone with an E-mail address can sign up to receive APHIS press releases automatically. Send an E-mail message to majordomo@ info.aphis.usda.gov and leave the subject blank. In the message field, type: subscribe press_releases.

Mycotech Receives EPA Registration of Improved *Beauveria bassiana* Products

Mycotech Corporation, Butte, MT has received registration from the US Environmental Protection Agency for two new biopesticide products. Both are based on *Beauveria bassiana*. Mycotrol® ES is an emulsifiable conidia suspension for control of pest Homoptera, Hemiptera, thrips and various beetles on agricultural crops. BotaniGard™ ES is an emulsifiable suspension for insect pests of greenhouse vegetables, ornamentals, and turf. The new formulations have better handling and mixing characteristics than the Mycotrol® WP formulation and cause less rabbit eye irritation, allowing a Warning rather than a Danger signal word on the label.

Emulsifiable and WP formulations have also been developed for use on organically grown crops and are in the final stages of toxicity testing. The organic EC has been given approval by California Certified Organic Farmers for use on certified organic crops. Mycotech also has previously labelled ES and oil flowable *B. bassiana* formulations for grasshoppers, locusts, and Mormon crickets in rangeland, improved pasture, and several field crops.

The first module of Mycotech's new production facility has recently come on line. It has a current capacity of 6,000 lbs. of spores/month or 500,000 treatment acres/yr. The plant's modular in design will allow production to grow with increasing product demand.

Since the beginning of 1997, Mycotech has filled four new sales and technical support positions and two new

SIP Home Page on the WWW

In addition to providing information regarding our Society, the page is intended to promote new membership and inform those who cruise (surf, browse) the web (internet) about invertebrate pathology. Our web sites provides information regarding the table of contents of the latest Newsletter, deadlines for submission of articles to the next Newsletter, dates when to expect receipt of the next Newsletter, schedule of meetings and the possibility to download membership application and meeting registration forms. Address:

"http://sip.home.ml.org"

Check it out!

microbiologist positions. The company now has 37 full time employees. Several selective marketing and distribution agreements have been set up and more are currently being negotiated.

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MEMBERS ON THE MOVE

The Central Science Laboratory including **Ian Smith**, has relocated recently from Slough to a new site in northern England. Its status (an Executive Agency of the Ministry of Agriculture, Fisheries and Food) and work remain otherwise unchanged.

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E-mail: i.smith@csl.gov.uk

After a 27 year stint as entomologist with the Australian Army Malaria Research Unit at Ingleburn, (near Sydney) **Tony Sweeney** has retired from the army to take up a post with the South Pacific Commission, based in Noumea, New Caledonia. His position is Medical Entomologist for a new project on vector borne diseases in the Pacific Islands. It will focus on community based control of malaria, filariasis and dengue in the Solomon Islands, Vanuatu and Fiji.

This is an advisory job so Tony will not have the resources to actively continue work on pathogens and parasities of mosquitoes but he will maintain his links with SIP and would be pleased to receive any messages from friends and colleagues. Just send him a note in a cork sealed bottle and he will wait for it to wash up on the beach. Alternatively, he can be contacted at the following address:

Dr A.W. Sweeney
c/- South Pacific Commission
B.P. D5, 98848 Noumea Cedex
New Caledonia
Tel: (687) 262000, Fax : (687) 263818
E-mail: sweeney@spc.org.nc

Moving?

To ensure proper address in future Membership Directory and for receipt of SIP Mailings including the Newsletter:

1) Contact FASEB and provide both **New** and **Old** addresses at:

Society for Invertebrate Pathology
FASEB Membership Department
9650 Rockville Pike
Bethesda, MD 20814, USA
Tel. 301-530-7026
Fax. 301-530-7001
EMail staff@dues.faseb.org

2) Prepare a paragraph including information about past and present postings, new address, telephone, fax and Email address and send to your Newsletter Editor for inclusion in the Members on the Move section in the next issue of the Newsletter. Editor's address can be found on page 2.

Stephen Wraight of the USDA, Agricultural Research Service, has moved to the Plant Protection Research Unit of the U. S. Plant, Soil, and Nutrition Laboratory in Ithaca, New York. As an Insect Pathologist with Mycotech Corporation of Butte, Montana, from 1993 to 1995, Steve was stationed at the USDA-ARS Subtropical Agricultural Research Laboratory in Weslaco, Texas, where he worked on development of fungal pathogens for microbial control of Bemisia whiteflies under a Cooperative Research and Development Agreement (CRADA). Steve joined the USDA-ARS Biological Control of Pests Research Unit in Weslaco in May 1995 and continued the CRADA research until his recent transfer to Ithaca. Steve's research in Ithaca will focus on field development of hyphomycete pathogens for microbial control of Colorado potato beetle and diamondback moth.

Stephen Wraight
USDA-ARS, U. S. Plant, Soil, and Nutrition Lab
Tower Road, Ithaca, NY 14853
Tel: (607) 255-2458; Fax: (607) 255-1132
E-mail: spw4@cornell.edu

Fernando E. Vega has moved from the Bioactive Agents Research Unit (USDA) in Peoria, Illinois, where he was conducting research dealing with formulations of the fungal entomopathogen *Paecilomyces fumosoroseus*, to the European Biological Control Laboratory (EBCL) in Montpellier, France. Fernando's main mission as EBCL's insect pathologist, is to conduct foreign explorations for pathogens of codling moth, diamondback moth, and gypsy moth, among other insect pests that have been introduced to the United States. Fernando will also be conducting field and laboratory research to better understand the dissemination and effectiveness of fungal entomopathogens.

Fernando's new address is:

European Biological Control Laboratory
USDA, ARS
Parc Scientifique Agropolis
34397 Montpellier Cedex 5
France
Tel: 33 4 67 52 68 44
Fax: 33 4 67 61 99 93
E-mail: fvega@cirad.fr

Donald W. Roberts, whose name has been happily linked for many years with that of the Boyce Thompson Institute for Plant Research in Ithaca, New York, is on the move. He took early "retirement" from BTI, and has moved to Utah State University in Logan, Utah. This is a lovely college town in the north of the state with a university of about 20,000 students. Don will continue his research emphasis on entomopathogenic fungi, and will maintain the previous international flavor of his program.

Since he is now affiliated full time with an academic organization, he will increase his educational activities -- especially in training M.S. and Ph.D. candidates. He also will work with postdoctoral and sabbatic scientists. He invites potential collaborators and students to contact him.

Don tells us his wife is from the Logan area and graduated from USU. Don and Mae have relatives, including grandchildren, nearby; which combined with the very attractive setting and strong, education-oriented university makes this a most inviting move for the two of them. They will miss several aspects of the Ithaca scene, including the white-hot local interest in swing dancing; but they are enjoying the mountains, seeing the sun every day, and building new scientific alliances -- plus they hope to add positively to Logan's dance community.

Don's new address:

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Logan, Utah 84322
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E-mail: dwroberts@biology.usu.edu

NEWS ITEMS

Conducting Bibliographic Searches on the Internet

Most scientists perform a periodic pilgrimage to the library or subscribe to literature alert services to keep up with recently published papers in their area of interest. In a rapidly advancing and information intensive field like biotechnology, it can be a continuous and demanding activity to keep track of papers appearing in scientific journals. Now, thanks to the Internet, you can retrieve titles and even abstracts of scientific papers from your desktop. The most comprehensive and integrated database of molecular biology information is the Entrez search system (http://www.ncbi.nlm.nih.gov/). Although Entrez is from the National Center for Biotechnology Information of the National Library of Medicine (NIH), the literature related to agricultural biotechnology is well covered. For instance, a search for *Arabidopsis* generated 1695 citations while *Bacillus thuringiensis* produced 863 hits.

Entrez is more than just a database of 1.3 million citations. It is a comprehensive information retrieval system that integrates the MEDLINE molecular biology subset and databases of nucleotide and protein sequences, genomes and 3D structures. Thus with a few clicks, users can not only find titles of papers with blazing speed, but also receive the abstract and download protein and nucleotide sequences of genes mentioned in the papers. Entrez also links you to related

papers for every citation and provides a "glossary" type explanation of key words.

To navigate to the MEDLINE subset of Entrez, click on "Entrez" under the "NCBI Services" and then choose the "Search Molecular Biology Subset of MEDLINE". You will be provided with a simple and user-friendly interface where you can search with key words, author names or gene symbols; more advanced searches including Boolean search (AND, NOT, or OR) are permitted.

Uncover is a document delivery service run by a private company whose database indexes thousands of titles daily in the science, technology, and medical fields. Uncover can be found on the Web (http://www.Carl.Org/uncover) while a text-based interface is available through telnet (database.Carl.Org). Uncover maintains 8 million citations from nearly 17,000 journals; 5,000 citations are added daily. The user interface is simple and you can search using key words, journal titles or author names. Uncover returns your query with complete citations but does not provide abstracts except for occasional summaries. For many journals, you can browse through each issue's Table of Contents. The search for citations is free, and you can receive full-text documents by fax for about $10 to $15, often within one hour. For a $25 annual fee, Uncover also provides an electronic alert service that regularly emails the Table of Contents from up to 50 journals of your choice.

For searching titles in agricultural subjects (including biotechnology), the Integrated System for Information Services (ISIS) from the USDA's National Agricultural Library (NAL) is your best bet. The ISIS cannot be accessed through the Web yet, although the NAL is hoping to have a Web interface soon. ISIS can be reached by telnet (opac.nal.usda.gov); enter "isis" at the login prompt. In the menu, choose "4" for "Accessing Journal Article Citation Database" and then enter the command "/IND". Boolean searches are permitted and abstracts are available for many recent citations. ISIS includes the popular AGRICOLA database, a vast repository of practically everything published in agricultural research. Unlike the friendly interface of the Web, navigating through the text-based ISIS with its arcane interface can be frustrating as it is necessary to remember the search commands. ISIS can thus be rather unforgiving to the novice, but the NAL provides search tips and a list of commands for ISIS on its Web site (http://www.nal.usda.gov/isis/).

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Plant Gene Transfer Comes of Age: Large DNA Molecules Transferred to Plants

Introduction of foreign DNA molecules into plant cells is a pivotal but routine technique in crop biotechnology. The present technology, however, does not permit the introduction of more than three or four genes at a time. A technique that enables scientists to produce transgenic plants with large inserts of DNA can thus have an exciting impact on both basic and applied biotechnology. Scientists at Cornell University report in the Proceedings of the National Academy of Sciences USA the development of exactly such a technique (1). Using a newly constructed plasmid vector they transferred a 150 kilobase human DNA fragment into plant cells - about ten times the normal DNA size that could be transferred with conventional approaches.

The key to the success of the Cornell team, consisting of Carol Hamilton, Steven Tanksley and colleagues, was the methodical development of a unique vector called BIBAC (Binary Bacterial Artificial Chromosome) (2). Libraries with large chromosomal inserts are now increasingly made in the bacterial artificial chromosome (BAC) vectors in *E. coli*, while the workhorse for transfer of genes into plants is Agrobacterium, which transfers a piece of its DNA into plant cells during infection. The BIBAC vector can multiply in both *E. coli* and Agrobacterium, and also has additional copies of the virG and virE genes whose products help in the efficient transfer of DNA from Agrobacterium to plant cells. Most of the transgenic tobacco plants developed with the BIBAC vector showed that the introduced human DNA fragment (150 kb) was present in an intact form and the fragment was passed on to subsequent progeny without any changes.

Now that the size barrier for plant DNA transfer is broken, scientists can seek to alter quality and yield traits that are controlled by multiple genes. Many agronomically important traits such as seed weight in soybean or tuber dormancy in potato are controlled by such quantitative trait loci. Additionally, many disease resistance genes are known to occur in clusters spanning a large chromosomal segment. The BIBAC vector may, for the first time, facilitate engineering of such complex traits in plants. Tanksley's group has recently isolated a chromosomal segment from tomato containing a major fruit weight quantitative trait locus (3). Richard Michelmore of the University of California, Davis, predicts that BIBAC's most significant applications will be in the map-based cloning of plant genes and a better understanding of how plant genomes are organized (4). According to Hamilton, BIBAC vectors may also be used in the future to reconstitute secondary product pathways, create new pathways for the production of novel compounds and reduce position-dependent expression of transgenes.

References

1. Hamilton, C. M., A. Frary, C. Lewis & S. D. Tanksley. 1996. Stable transfer of intact high molecular weight DNA into plant chromosomes. Proc. Natl. Acad. Sci. USA 93:9975-9979.

2. Hamilton, C. M. 1997. Binary-BAC system for plant transformation with high molecular weight DNA. Nuc. Acid Res. (Submitted)

3. Alpert, K. B. & S. D. Tanksley. 1996. High-resolution mapping and isolation of a yeast artificial chromosome contig containing tw2: A major fruit weight quantitative trait locus in tomato. Proc. Natl. Acad. Sci. USA 93: 15503-15508.

4. Michelmore, R. 1996. Big news for plant transformation. Nature Biotechnology 14: 16553-1654.

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Searching Patent Information on the Internet

Ever since the U. S. Supreme Court upheld an award of a patent to Ananda Chakrabarty for a genetically engineered organism in 1980, patents have become an integral fuel driving the commercial biotechnology boom. Biotechnology researchers are actively patenting many new products and processes arising from their inventions. Patent application documents contain a wealth of descriptive information and are very useful to researchers and students wishing to keep up with the cutting-edge advances in biotechnology. While patent searches yield valuable information on technological breakthroughs, they are also necessary if you want to file a new patent application, avoid patent infringement and lawsuits, and explore licensing opportunities. Thanks to the Internet, now you can obtain patent information right at your desktop. You can conduct patent searches at no cost and retrieve full patent texts as E-mail or down loadable documents. You can also have them faxed or mailed to you for a small fee. There are many patent-related Web sites with varying complexities and pricing and we list here few such sites.

- The National Agricultural Library of USDA has a Web page (http://www.nal.usda.gov/bic/Biotech_Patents/) on U.S. agricultural biotechnology patent issues with some excellent links to patent resources. Full text of patents issued in agricultural biotechnology during 1995 and 1996 is available.

- The Yahoo site (http://www.yahoo.com/Law/Intellectual_Property/) provides links to many resources such as companies, institutions, magazines and news groups related to patenting.

- The U. S. Patent and Trademark Office's Web site (http://www.uspto.gov/) lets you conduct no-cost searches using key words, assignee, inventor, subject or patent number. The database covers patents issued since 1976 and includes information in the patent abstract, related patents and references. Complete documents can be ordered for a small price ($3 by mail).

- The IBM Patent Server (http://patent.womplex.ibm.com/) holds two million patents dating from 1971 and allows a free search. The resulting displays contain abstracts, names of inventors, related patent numbers, claims and references. You can

also view at no cost the actual image of the first and last pages of patent documents issued since 1980. Printed full text copies can be obtained through mail for $2.50 or through fax ($9 and up).

- Possibly the most useful site for patent searches is Micro patent's Patent Web site (http://www.micropat.com/) which has many freebies such as the ability to search and retrieve full text documents of any U.S. patent issued during the past two weeks. Another useful feature is being able to obtain instantly, by E-mail, any complete patent document for $1.50. You can also download (for $3) original patent documents with images which could be viewed immediately using free software. Such documents may include figures such as drawings of plasmid or equipment, and thus often provide additional detailed information. Micro patent site also delivers International (EP and PCT) patent documents.

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PUBLICATIONS

Microbial Insecticides: Novelty or Necessity?

Conclusions and discussion points from the BCPC Symposium held at the University of Warwick, 16-18 April 1997

Copies of the Symposium Proceedings can be obtained for £35 in the EU, or £37/$60 elsewhere, from:

BCPC Publications Sales
Bear Farm, Binfield
Bracknell, Berks RG42 5QE,
United Kingdom
Tel: +44 (0) 118934 2727
Fax: +44 (0) 118 934 1998
E-mail: publications@BCPC.org.

A synopsis of the meeting can be found on page 26.

Manual of Techniques in Insect Pathology
L. A. Lacey (ed.)

409 pp. ISBN 0-12-432555-6

Academic Press is offering a 20% discount for the Manual to members of SIP. To receive the discount, orders from all countries must be placed with:

Polly Jones
Academic Press Marketing Department
24-28 Oval Road
London, NW1 7DX
UK
Tel +44 (0)171 482 2893
Fax +44 (0)171 267 0362
Email: wildlife@apuk.co.uk

POSITIONS AVAILABLE

Insect Pathologist

DuPont Agricultural Products in Newark, Delaware, is seeking a highly motivated and creative individual to join our multidisciplinary Insecticide Discovery Team. The main responsibilities of this person will be leadership of an insectary which includes the capability of producing large numbers of consistent, high quality and disease-free insects, support of a significant biological screening program, and research focused on the mass production of baculoviruses in vivo. This person should be able to work and communicate effectively in a diverse group of biologists, entomologists, chemists, biochemists, and molecular biologists.

The successful candidate must have a Ph.D. or equivalent experience in insect pathology and a proven track record of achievement in this discipline. Experience in the mass rearing of of insects is highly desireable.

DuPont offers a highly competitive salary, excellent benefits, a challenging work environment, and opportunities for advancement. Du Pont is an equal opportunity employer. Qualified candidates should send their resumes and a list of references to:

Stine-haskell Research Center
Attention Human Resources, SIP-23
P. O. Box 30
Newark, DE 19714

Visiting Scientist

The Great Lakes Forestry Centre in Sault Ste. Marie is offering a special opportunity for visiting scientists in the field of entomopathogenic fungi. In addition to a fully equipped laboratory and office space, we can provide technical support (manpower) and access to growth chambers, insect production facility, and greenhouse facilities. Multidisciplinary expertise in protein chemistry, cell physiology, insect physiology, immunochemistry, field ecology, and pathology is available through collaboration with other scientists in the Microbial Control project. Although we cannot provide funds for salary of visiting scientist, we might be able to help out with some expenses. We would like to hear from anyone who is interested in joining our project for a sabbatical or career development (or any other form of paid leave) for six months to one year to conduct studies on entomopathogenic fungi of forest insects. For further information, please contact:

Kees van Frankenhuyzen
Microbial Control Project leader
Great Lakes Forestry Centre
Canadian Forest Service
P.O. Box 490
Sault Ste. Marie ONT P6A 5M7
Tel: 705-759-5740 ext. 2502
Fax: 705-759-5700
E-mail: KVANFRANK@FORESTRY.CA

POSITIONS WANTED

Insect Pathologist

Ph.D., 36 years old, close to 8 years experience in microbial/biological control. Feb. '92 - Dec. 97 Insect Pathologist (isolation, bioassay baculovirus Oryctes, fungi, nematodes, bacteria, protozoa; surveys, field-tests 4 South Pacific countries), 2 ½ yrs post-doc IRRI (isolation, bioassay Bt, rice pests), Ph.D. 1989 'reproduction related peptides in insects' additional subject 'RFLP of Bt strains'. Computer literate. Working knowledge of Dutch, English, French, German. Broad interest in microbial/biological control - pathogens - insect physiology - biotechnology - agricultural, medical, research, implementation, training. Tropical location and travel no objection. Available December 1.

Theunis Wilfried
Insect Pathologist, EU/SPC Taro Beetle Project
P.O. Box 912 Honiara, Solomon Islands
Tel: 677 31014 ; Fax: 677 31007
E-mail: PRAP5@ffa.int or
SPCTARO@welkam.solomon.com.sb

MEETINGS AND WORKSHOPS

More detailed information on these meetings can be found on our homepage: "http://sip.home.ml.org"

International Workshop on Vectors of Plant Pathogens: Methods and Problems of Laboratory Rearing, Tucson, AZ, USA, 31 July - 3 August, 1997.

This workshop will be held in conjunction with the 1997 **Insects in Captivity Conference**. For more information contact:

Randy C. Morgan
Cincinnati Zoo Insectarium
3400 Vine St.
Cincinnati OH 45220
Fax: (513) 559-7791

or workshop chairs:

Karl Maramorosch and Farida Mahmood
Rutgers University
Tel: (908) 932-9459; Fax: (908) 932-7229

Microbial Control of Pests in Sustainable Agriculture, Royal Veterinary and Agricultural University, Copenhagen, Denmark, August 10-15, 1997

Jørgen Eilenberg
Royal Veterinary and Agricultural University
Department of Ecology and Molecular Biology

Thorvaldsensvej 40
DK - 1871 Frederiksberg
Tel: +45 35 28 26 60 or 35 28 26 92
Fax: +45 35 28 26 70

The British Mycological Society International Symposium on the "The Future of Fungi in the Control of Pests, Weeds and Diseases", Southampton University, United Kingdom, 5-9th April, 1998

This meeting provides an excellent opportunity for mycologists of all persuasions to join with others in a vigorous discussion of an important issue concerning the relevance of fungi in a practical and environmental context. Fundamental aspects of the biology of fungi that impinge on the problems and opportunities surrounding the actual and potential use of these organisms as biocontrol agents will be of prime concern. The discussion will provide a platform from which to initiate future research themes and outline strategies for the successful development of fungi as sustainable, environmentally benign agents for crop protection.

The meeting will last four days. The first two days will be conducted in general session and be devoted to fundamental issues and debate. The second two days will concern more specific issues related to practical application, and will be conducted concurrently with other special interest sessions of the Society.

Registered Charity No. 276503

For more information contact:

Chris Jackson
School of Biological Sciences,
University of Southampton
Bassett Crescent East,
Southampton
SO16 7PX
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Tel: (+44) 01703 59 32 05
Fax: (+44) 01703 59 42 69
E-mail: cwj@soton.ac.uk

PAST MEETINGS

Microbial Insecticides: Novelty or Necessity?

Conclusions and discussion points from the BCPC Symposium held at the University of Warwick, 16-18 April 1997

This Symposium, chaired by Dr Hugh Evans of the Forestry Commission Research Agency, addressed the issues that determine both the opportunities and constraints for microbial insecticides in modern pest management. The two days of the meeting provided an opportunity to hear from leading experts in the field who, through a combination of succinct written papers, published at the Symposium in BCPC Symposium Proceedings 68, and challenging verbal presentations, provided a platform for wide ranging and lively discussion of current and future issues. Indeed, the speakers, without exception, took on the challenge of placing their chosen subject firmly within the core question; Novelty or Necessity? (Information on ordering copies of the Symposium Proceedings can be found on page 24.)

A common theme that was apparent in analysis of the position of microbial insecticides was the widespread tendency to classify them as basic substitutes for chemical pesticides, aptly termed by Wendy Gelernter as the chemical paradigm. This may be true but the argument was firmly advanced that the chemical paradigm is inappropriate and that more attention should be paid to the biological and ecological characteristics of bioinsecticides. Within this framework some of the key points were:

- The analogy to chemical insecticides (the chemical paradigm) requires rapid action, low specificity and rapid and irreversible decay in the environment once the agent has been applied. *Bacillus thuringiensis*, as the lead microbial insecticide, which acts mainly through the effect of a toxin, approaches this paradigm but is not the most appropriate model by which to judge the other microbial insecticides.

- High specificity, relatively slow action and the ability to multiply and persist in the environment are characteristics of most microbial insecticides and these

need to be exploited, not necessarily changed, for future development.

- Large commercial companies have relatively little interest in wild-type microbial agents because these have more limited markets than chemical insecticides and, even where markets have been established, they may not be able to protect their intellectual property rights sufficiently to make the initial investment.

- These conclusions point to opportunities for exploitation in markets where there are problems of resistance to conventional (including B.t.) insecticides or in niche markets where there are no viable conventional alternatives.

- There is increasing flexibility in the registration process for microbials, but the costs are likely to remain out of proportion to market potential, as exemplified by the fact that registration costs are 1% of the potential market for conventional insecticides compared with 25% for microbials. Clearly, this must be redressed before significant progress can be made.

- Scale-up and quality control are important constraints to increasing availability and reducing prices of microbial insecticides. Microbials must be manufactured to rigorous specifications with ease of storage and adequate shelf life. There are still clear deficiencies in this area, not least of which is scale-up of fermentation technology for baculoviruses and, to a lesser extent, fungi.

- The widening opportunities offered by genetic modification have influenced research and development quite dramatically during the past decade. Large companies are more likely to support this area because of the IPR protection afforded by producing "unique" products.

- Widespread use of transgenic plants was also seen as an opportunity and a potentially major constraint, through engineering for both herbicide tolerance and for inclusion of insecticidal activity. Both have potential, either indirectly by removal of non- crop plants through widespread herbicide usage or, by continuous expression of insecticidal genes, to induce resistance in target organisms. There may also be potential effects by reducing the effectiveness of more conventionally applied microbial agents . It is important that the science of risk assessment in relation to these new agents is improved, supported by ecological research to assess both the beneficial and potentially non-beneficial effects of the new technology.

The tone of the discussion was refreshingly candid and did not disguise the problems faced in placing microbial insecticides in the marketplace at their appropriate levels. Overall, it was felt by many present that progress will be made, but only when two core elements are satisfied:

1. The microbial products are improved sufficiently to make them acceptable within current grower practices and they are shown to be effective, both biologically and financially.

2. The chemical paradigm must be replaced by a biological paradigm, constructed on the innate characteristics of the microbial agents and not trying to circumvent them by making them chemical analogues. In essence, more account should be taken of the strengths of microbial agents, rather than forcing them into a standard of assessment that, within the chemical paradigm, emphasises some particular weaknesses relative to chemical insecticides.

The above are some of the key points that arose from the presentations and discussions. They are re-iterated here to provide information both for those who did not attend and, equally important, to attempt to broaden the discussion to the wider scientific, industrial and user communities.

Hugh Evans would be pleased to hear from anyone who has further thoughts on the subject. In particular, would SIP members be interested in a similar session within either the annual meeting or the International Colloquium.

Dr Hugh Evans
Forest Research, Alice Holt Lodge
Wrecclesham, Farnham, Surrey, GU10 4LH, UK
E-mail: H.Evans@fcrd.gov.uk **or** @forestry.gov.uk

EDITOR'S NOTES

Membership Directory

Included with this issue is the 1997-1998 SIP Membership Directory. Please report errors or changes to me and I shall publish a supplement in future issues of the Newsletter if this becomes necessary.

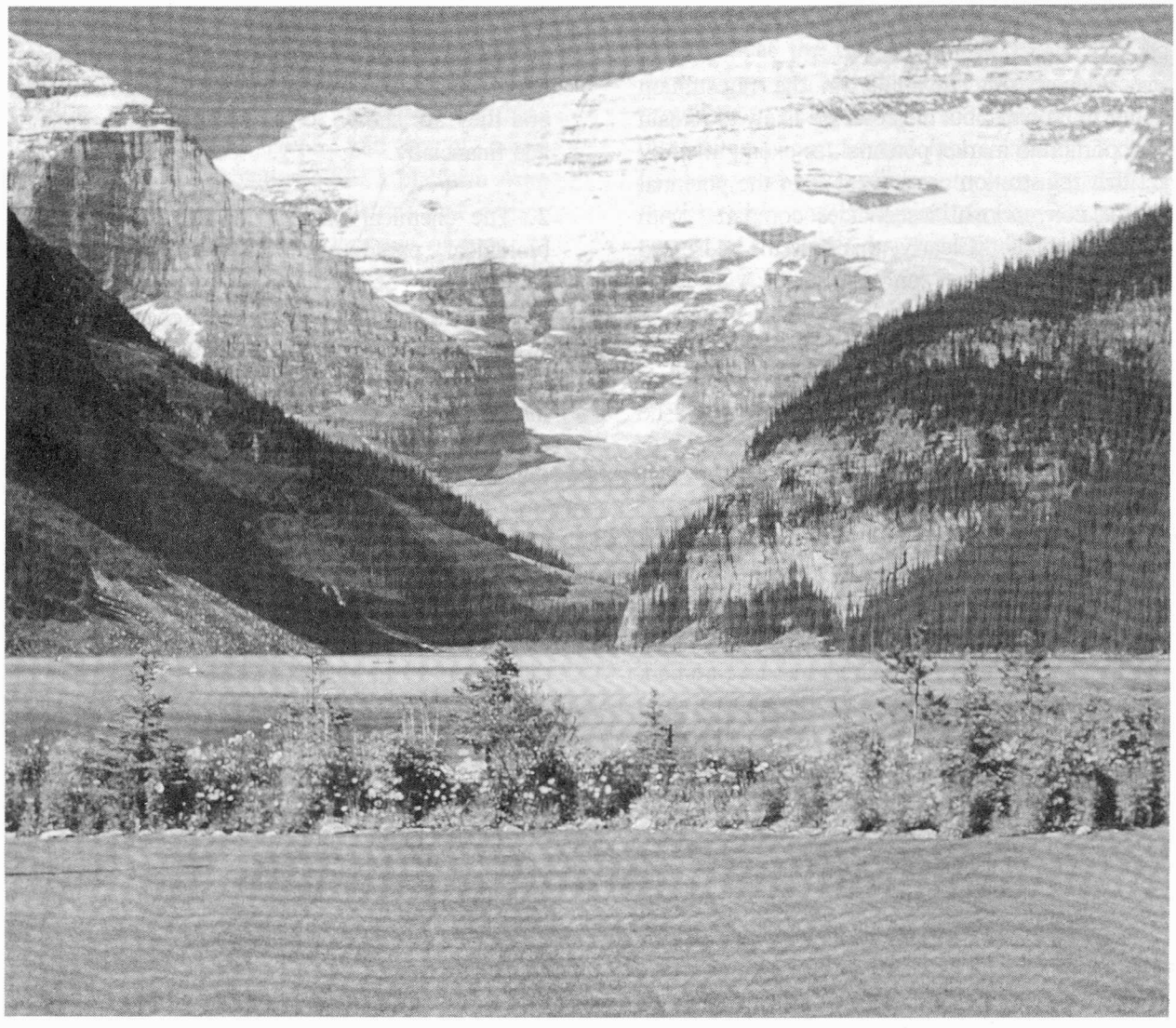
Deadline for next issue. Please submit all material by **October 15, 1997** for publication in the November, 1997 issue.

WHEN DID YOU RECEIVE YOUR NEWSLETTER?

We are still attempting to identify trouble areas in delivery times of the Newsletter. We'd like to improve our delivery time, but at reasonable cost.

Please send me a short E-mail message or postcard if you received this Newsletter after July 15. Please include the postmark date and place which was on the Newsletter Envelope.

The Editor



Lake Louise, Banff National Park

Directory of Industries Involved in the Development of Microbial Control Products (2nd Edition)

Questionnaire

PREFACE

In December 1991, the Division on Microbial Control published the Directory of Industries Involved in the Development of Microbial Control Products. The Directory contained 35 pages of information with indexes of pathogens, area of research, target hosts, crops and habitats, companies and addresses, and trade names. Over 40 companies and 60 products were listed. Updates were published as Supplement No. 1 in January 1993 and Supplement No. 2 in February 1994. Because the Directory is out of print and because there have been numerous changes since its first publication, the Division has elected to publish a second edition. **In order to be included in this new Directory, please fill out a form for each of your products or area of research and return by 30 October, 1997**. Please note that only companies returning newly completed forms will be included in the new Directory. You need not be a member of the Society to contribute. We would like to make this Directory as comprehensive as possible and include information on microbial control products or services related to invertebrates. This includes transgenic organisms using pathogen genes for pest control. For more information, please contact either Paresh Shah (address next page) or Mark Goettel, P.O. Box 3000, Lethbridge AB, Canada, T1J 4B1, Tel: 403-317-2264; Fax: 403-382-3156; E-mail: goettel@em.agr.ca. Thank you.

Paresh A. Shah
Mark S. Goettel
June, 1997

SOCIETY FOR INVERTEBRATE PATHOLOGY, MICROBIAL CONTROL DIVISION

Questionnaire for Directory of Industries Involved in the Development of Microbial Control Products, Second Edition

This directory will be made available to the Society membership and any other interested parties. In order for this venture to be a success, we need feedback from all industry involved in the area of invertebrate microbial control or use of pathogen genes in transgenic organisms intended for invertebrate pest control. If you are not involved in industry, please forward this questionnaire to someone in industry who may not otherwise receive it. If replying by e-mail, simply include your response following the questionnaire question number.

1) Pathogen developed or being developed or area of research, i.e., delivery systems, formulation, safety testing etc. (if more than one pathogen or area of research, please complete separate form for each):

_____

_____

2) Target host(s) (can be broad): _____

_____

3) Crop or Habitat: _____

_____

4) Company name: _____

Company address: _____

Telephone no.: _____ Facsimile no.: _____

E-mail: _____

Contact person: _____

5) Registration status: _____

Which countries? _____

6) Trade name: _____

7) Availability of experimental formulations (are formulations available for researchers to test?):

_____

Please return completed form(s) to:

Paresh Shah
Institute of Microbiology
Swiss Federal Institute of Technology
ETH Zentrum, CH-8092, Zurich, Switzerland
Tel. +41 1 632 4437; Fax. +41 1 632 1148
E-mail: shah@micro.biol.ethz.ch

SOCIETY FOR INVERTEBRATE PATHOLOGY, MICROBIAL CONTROL DIVISION

Questionnaire for Directory of Industries Involved in the Development of Microbial Control Products, Second Edition

This directory will be made available to the Society membership and any other interested parties. In order for this venture to be a success, we need feedback from all industry involved in the area of invertebrate microbial control or use of pathogen genes in transgenic organisms intended for invertebrate pest control. If you are not involved in industry, please forward this questionnaire to someone in industry who may not otherwise receive it. If replying by e-mail, simply include your response following the questionnaire question number.

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_____

_____

2) Target host(s) (can be broad): _____

_____

3) Crop or Habitat: _____

_____

4) Company name: _____

Company address: _____

Telephone no.: _____ Facsimile no.: _____

E-mail: _____

Contact person: _____

5) Registration status: _____

Which countries? _____

6) Trade name: _____

7) Availability of experimental formulations (are formulations available for researchers to test?):

_____

Please return completed form(s) to:

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E-mail: shah@micro.biol.ethz.ch

1997 Membership Form SOCIETY FOR INVERTEBRATE PATHOLOGY

BACKGROUND INFORMATION			
NAME			
First:	Middle Initial:	Last:	
Organization:			
Street Address or PO BOX:			
City:	State:	Country:	Zip Code:
Phone:	FAX:	E-mail:	
Please check appropriate box:	☐ above is new address	☐ new member	☐ renewal

ANNUAL DUES (Please check appropriate box):		
Membership (founding, charter and regular member)	☐	$30.00
Student membership *(Complete Certification Below)*	☐	$15.00
Division of Microsporidia	☐	$2.00
Division of Microbial Control	☐	$2.00
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