

INTERNATIONAL COLLOQUIUM ON INVERTEBRATE PATHOLOGY AND  
X<sup>th</sup> ANNUAL MEETING, SOCIETY OF INVERTEBRATE PATHOLOGY,  
Prague, Czechoslovakia, September 11-17, 1978

## ADDITIONAL DETAILS - PRAGUE MEETING

Since the information concerning the meeting was published in the last issue of Newsletter IX, Number 4, little new information relating to program arrangements and other details have been forthcoming to an extent suitable for the publication of additional details in this issue. A second program announcement was sent out to most members by Dr. J. Weiser containing essentially the same information previously published. However, as the deadline for submission of titles and abstracts was changed, your Newsletter editor sent out a special notice to all members of the extended deadline date of March 15, 1978. The permanent program chairman, Dr. A. Rosenfield, is cooperating with Dr. Weiser to select convenors and chairpersons for the various symposia and submitted paper sessions. The list of symposia titles and convenors as known to date are as follows:

1. Safety evaluation of microbial control agents.  
Convenor: R. Engler
2. Microbial control agents - requirements for environmental protection.  
Convenor: to be named
3. Standardization of biopreparations.  
Convenor: to be named
4. Current world status of microbial control preparations.  
Convenor: to be named
5. Mode of action of biological control agents - pathophysiology.  
Convenor: E.W. Davidson
6. Biological control of vector invertebrates.  
Convenor: M. Laird
7. Immunity in invertebrates.  
Convenor: to be named
8. Neoplasms in invertebrates.  
Convenors: J.C. Harshbarger, J.A. Couch
9. Release of pathogens; introductions and colonization.  
Convenor: A. Rosenfield
10. Ultrastructure of vegetative stages of Microsporidians.  
Convenor: E.I. Hazard

A more detailed report of the program will be published in the next issue of the Newsletter in May. Dr. J. Briggs has submitted a proposal for consideration for travel funds to Prague, but no decision has yet been made.

## AN EDITOR'S OUTLOOK

Anytime I get a chance to go abroad, I rush to the local library and obtain a copy of the region I propose to visit. Now I have travelled to Austria, but I have never visited Czechoslovakia, so I immediately procured some books and perused them, and here are some of the many fascinating things that originated in the historic region where (if I can get the travel money), we will have our XI Annual Meeting.

In Praha, we may obtain a good frothy Pilsner, the word came from the kind of beer made at Plzen - some 90 kms from Praha. And the name Ceské Budejovice - or Budweis probably evokes images for most Americans of a span of rather large horses pulling a beer wagon. But best of all, if you have ever drunk it - a Pilsner Urquell with dumplings and wurst, a favorite dinner of the Czechoslovaks.

But not only things gastronomic originated from this country. As an incurable romantic, along with a predilection for Gothic cathedrals, I am avidly looking forward to seeing the old town with its medieval walls and churches, and there are several pictures in the Newsletter to illustrate this.

Most of us musicophiles have heard the flowing music of Smetana - Die Moldau (VLTAVA) from his cycle MA VLAST (my country). We also owe to Antonin Dvorak, the New World Symphony; that is, the one with the "going home" theme - and he wrote some perfectly delectable Slavonic dances.

But to go back further in time, in our Christmas caroling, good old King Wenceslaus (Saint Vaclav) is Bohemia's spiritual patron saint, and there is a statue of him in Saint Wenceslas Square. And, how many of us are aware of Huss who died as a "heretic" in 1415 but who Martin Luther called his "great predecessor"?

Many are the contributions from this nation of over 14,000,000 people of which over 8,000,000 are Czech-speaking, 4,000,000 speak Slovak and there are a few minorities. They tell me that if you speak German you can get along, so I'll brush up on some elementary German, such as "Wo ist der Weinstube" and hope for the best. Speaking of things cultural, the "good soldier Schweik" was written by Hasek and don't forget Kafka who made his home in Prague. Finally, a last note on cultural things - most of the laboratory people would be lost without Czapek's medium, a standard mycological growth culture.

#### Regional SIP Workshop

A Regional Invertebrate Pathology Workshop will be held at the University of Georgia, Athens, Georgia, August 20-24, 1978, in conjunction with the 29th Annual A.I.B.S. Meeting. The Workshop is intended for members and students who are unable to attend the International Colloquium on Invertebrate Pathology and the XIth Annual Meeting of the Society for Invertebrate Pathology in Prague, Czechoslovakia, September 10-17, 1978.

A tentative schedule of four discussion sessions and two to four contributed paper sessions has been arranged for the Workshop. Professor Ching H. Tsao, University of Georgia Department of Entomology, has kindly consented to serve as the Society's local representative and will be responsible for local arrangements. Those planning to present 15-minute papers for the contributed paper sessions are expected to send paper titles only of their reports to Dr. John Harshbarger, Registry of Tumors in Lower Animals, Museum of Natural History, Smithsonian Institute, Washington, D.C. 02560, no later than April 15, 1978. Titles of papers to be presented and authors' affiliation are needed for scheduling purposes. They will be printed in the ALBS catalog. The Society will not publish abstracts this year. However, those contributing papers are requested to reproduce 100 copies of a 100-200 word, single page abstract so they can be distributed at the time papers are presented.

Further information on housing, registration, travel directions, etc., are now being prepared by the A.I.B.S. and will be available for distribution within the next several weeks. As soon as this material is available, it will be sent to North American members. For further information, contact Dr. John Harshbarger.



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#### ELECTION OF OFFICERS

The SIP Constitution and By-Laws state:

On or before the first day of January of the year in which officers are to be elected, the Nominating Committee shall certify . . . nominations to the Secretary, who shall announce them along with brief biographical sketches to the members of the Society on or before the next succeeding first day of February. Additional nominations for office may be made, but such nominations shall be valid only if presented in a petition form over the signature of at least ten members in good standing, and if received by the Secretary on or before the fifteenth day of March. (The Secretary apologizes for not being able to announce the nominations for office prior to February 1 but publication schedules of the Newsletter make it impossible to meet this deadline. Despite this delay, the date of 15 March for the receipt of additional nominations must be adhered to if the balloting process is to proceed in the manner prescribed in our Constitution and Bylaws.)

A nominating committee composed of Drs. J.D. Briggs, E.W. Davidson, J.M. Franz and A.K. Sparks (Chairman) has submitted the following nominations for Council:

PRESIDENT:	Jaroslav Weiser
VICE PRESIDENT:	Phyllis T. Johnson James E. Stewart
SECRETARY:	Robert S. Anderson John E. Henry
TREASURER:	Joseph V. Maddox Marenes R. Tripp
TRUSTEES:	H. Denis Burges Michael C. Mix Torgny Unestam

The Secretary, Wayne M. Brooks, will send a final ballot to all members of the Society by April 1. This ballot must be returned in a separate sealed envelope within another envelope addressed to the secretary and complete with name and address of the sender.

#### Biographies

##### President

Jaroslav G. Weiser

R.N.Dr., D.Sc., 1946 (Charles University, Czechoslovakia)

Born: Prague, Czechoslovakia, 1920

Experience: Organizer, Inst. Int. Conf. Insect Pathology, Prague 1958, Head, Dept. Parasitology 1951-54, Dept. Insect Pathology 1954-present. Research on protozoa, fungi, viruses and nematodes infecting insects and mites. Assoc. Director Inst. of Entomology, Acad. Sci., Prague from 1970. Corresponding Member, Acad. Sci., 1968.

Membership: SIP from 1967, Trustee, Nominating Committee, Editorial Board JIP 1959-63, 1976-present. Vice President SIP 1977.

Interests: Protozoa affecting insects, esp. Microsporidia; viruses; MIV, pox; fungi: chytrids, Entomophthora; nematodes: Neoalectana; Biological control of vectors.

Objectives: Culture collections, evidence of types, cooperation and exchange of ideas East-West. Organization of the Int. Conf. Invertebr. Pathology in Prague, 1978. Organization of a Division on practical application of bio-preparations and evidence of results.

### Vice President

Phyllis T. Johnson

A.B., Ph.D., University of California at Berkeley

Born: 1926

Experience: Invertebrate Pathologist, National Marine Fisheries Service, Oxford, Maryland, USA, 1972-present. Research Associate, California Institute of Technology, Corona del Mar, California, 1970-71. Associate Research Pathobiologist, University of California, Irvine, 1964-69. Medical Entomologist, Gorgas Memorial Laboratory, Panama, R. de Panama, 1959-63. Entomologist, U.S. Dept. of Agriculture, Washington, D.C., 1955-58. Parasitologist, Walter Reed Army Medical Center, Washington, D.C. 1950-55.

Membership: Society for Invertebrate Pathology: Divisions Committee, 1969-present; Glossary Committee, 1974-present; Editorial Board, JIP, 1970-73; Am. Soc. Trop. Med. Hyg.; Am. Soc. Parasitol.; Ent. Soc. Wash.; AAAS: Wash. Acad. Sci. Committee on Animal Models and Genetic Stocks, ILAR, Natl. Res. Council, 1973-75. Consultant: U.S. Naval Medical Unit No. 3, Cairo, Egypt, 1957-present; Smithsonian Institution, Washington, D.C., 1971-72; U.S. Dept. of Agriculture, 1959-63.

Interests: Pathobiology of crustaceans, especially defense mechanisms and general studies on viral diseases. Comparative pathology of invertebrates.

Objectives: Promote interest in comparative pathology of invertebrates through society participation in and cosponsoring symposia or workshops with other societies that have some common interests to emphasize and enlarge recognition of the place of invertebrate pathology in such general fields as parasitology, tropical medicine, microbiology, virology, immunology, etc. Continue and expand support of our excellent journal.

James E. Stewart

B.S., 1952; M.S.A., 1954; Ph.D., 1958 (Iowa State Univ.)

Born: 1928

Experience: Scientist Associate and Senior Scientist, Halifax Laboratory, 1958-68; Assistant Director, Acting Director, 1968-71, Halifax Laboratory; Program Manager Aquaculture Group, Halifax Laboratory, Canada Department of the Environment, Halifax, Nova Scotia, Canada, 1971-present.

Membership: Canadian Society of Microbiologists, Chapter President; Nova Scotian Institute of Science, Treasurer and Council Member; Editorial Board, JIP; International Council for the Exploration of the Sea; American Society for Microbiology; Society for Invertebrate Pathology; AAAS; Assoc. Editor Can. J. Microbiology; Editorial Boards of Aquaculture, and Developmental and Comparative Immunology.

Interests: Diseases of aquatic species; defense mechanisms of marine invertebrates, specifically marine crustaceans, notably the lobster; microbial degradation of hydrocarbons.

Objectives: Emphasis on greater interaction between people studying insects and those working on invertebrates other than insects through more sessions focused on topics which cross discipline and species lines.

### Secretary

Robert S. Anderson

B.S.; M.S.; Ph.D., 1971 (University of Delaware)

Born: 1939

Experience: Postdoctoral Fellow (U.S. Public Health Service), University of Minnesota, 1970-73. Sloan-Kettering Institute for Cancer Research, New York, 1973-present; Head of Laboratory for the Study of Phylogenetic Aspects of Cancer and Immunity. Cornell University, Graduate School of Medical Sciences, 1974-present, Assistant Professor.

Membership: American Association of Immunologists, American Entomological Association, American Society of Zoologists, New York Academy of Science, Philadelphia Physiological Society, Society for Invertebrate Pathology, Society of Sigma Xi, Committee on Animal Models and Genetic Stocks of the National Academy of Sciences. Editorial Board Membership: Journal of Invertebrate Pathology, Journal of Developmental and Comparative Immunology.

Interests: Comparative immunology; cellular and humoral defense mechanisms of invertebrates.

Neoplasia in lower animals, with particular emphasis on chemical carcinogenesis.

Objectives: To help the Society maintain a position of leadership in the rapidly expanding field of invertebrate pathology. To promote better communication between the members of the Society and to make the general scientific community more aware of the activities and interests of the Society.

John E. Henry

Ph.D. (Montana State University)

Born: 1932

Experience: Research Assistant, University of Idaho 1959-61; Research Entomologist, USDA/ARS, Bozeman, Montana 1961-present.

Membership: Entomological Society America; Association d'Acridologie; Pan American Acridological Society; Sigma Xi; Trustee, Division of Microsporidia, 1971; Vice Chairman, Division of Microsporidia, 1975-76; Chairman, Division of Microsporidia, 1977-78.

Interests: Protozoan and viral infections in invertebrates, particularly Orthoptera; microbial control of Orthoptera.

Objectives: To promote more international exchange of microbials for studies in applied invertebrate pathology.

### Treasurer

Joseph V. Maddox

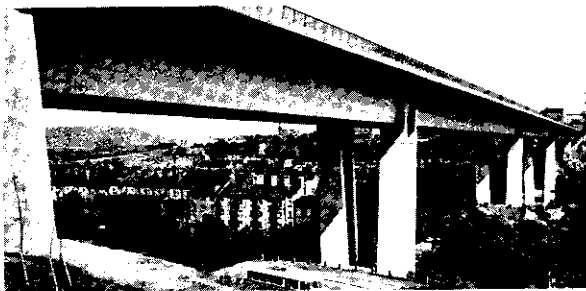
B.S., M.S. (Auburn University); Ph.D. 1966 (University of Illinois, U.S.A.)

Born: 1938

Experience: Associate Entomologist and Associate Professor, Illinois Natural History Survey and Illinois Agricultural Experiment Station, 1966-present.

Membership: SIP Organizational Committee for Division on Microsporidia; Executive Committee, Division on Microsporidia, 1972-74; Entomological Society of America; AAAS; IOBC.

Interests: Microsporidian infections of insects; general invertebrate pathology; use of pathogens to control invertebrate pests.



Marenes R. Tripp

A.B., M.S. (University of Rochester); Ph.D. 1958 (University of Illinois)

Born: 1931

Experience: Postdoctoral Research Fellow, Harvard School of Public Health, 1958-60; Assistant, Associate and Professor, Biological Science, University of Delaware, 1960-present.

Membership: American Society of Parasitology; Society of Invertebrate Pathology; American Society of Zoology; Reticuloendothelial Society; Program Chairman, Amherst regional meeting SIP, 1973; Editorial Board, JIP, 1969-75; Nominating Committee, 1974; Chairman, Kingston SIP meeting, 1976.

Interests: Invertebrate (particularly molluscan) immunity and how it is affected by environmental stress.

#### Trustee

H. Denis Burges

B.Sc., Ph.D. 1956 (London University, England)

Born: 1927

Experience: Scientific Officer and Principal Scientific Officer, Pest Infestation Control Laboratory, Slough England, 1957-69; Visiting Scientist, Dept. of Insect Pathology, University of California, Berkeley, 1963; Principal Scientific Officer, Glasshouse Crops Research Institute, Littlehampton, England, 1970-present.

Membership: Association of Applied Biologists and Royal Entomological Society of London, England; Chairman, SIP Nominating Committee, 1974; Editor of the book Microbial Control of Insects and Mites, Academic Press, 1971, and a sequel Microbial Control of Insects, Mites and Plant Diseases, Vol. 2, currently being produced.

Interests: Pathogens of glasshouse, cereal and stored products invertebrates, particularly Bacillus thuringiensis and protozoa; use of pathogens to control invertebrate pests; bioassay and standardization of products containing pathogens; general invertebrate pathology.

Objectives: To encourage and extend the various activities of the Society, with emphasis on its international basis and leadership in the development of invertebrate pathology. To ensure a correct balance between the interests of members working with insects and those working with other invertebrates. To extend membership.

Michael C. Mix

B.S., Ph.D. 1970 (University of Washington)

Born: 1941

Experience: Assistant, Associate Professor of Biology, Oregon State University, Corvallis, Oregon, U.S.A., 1970-present.

Membership: Founding Member SIP; committee to revise and expand the Glossary of Terms Used in Invertebrate Pathology; Program Co-Chairman, SIP meeting at Corvallis, Oregon, 1975; Trustee, SIP, 1977-78; AAAS; American Fisheries Society; National Shellfisheries Assn.; New York Academy of Sciences; Oregon Academy of Science; Pacific Fisheries Biologists; Sigma Xi.

Interests: Invertebrate oncology, the utilization of mollusks for environmental monitoring systems, diseases of marine invertebrates, molluscan cell renewal systems, radiation effects on invertebrates.

Objectives: To increase the participation and responsibilities of non-insect invertebrate pathologists in SIP.

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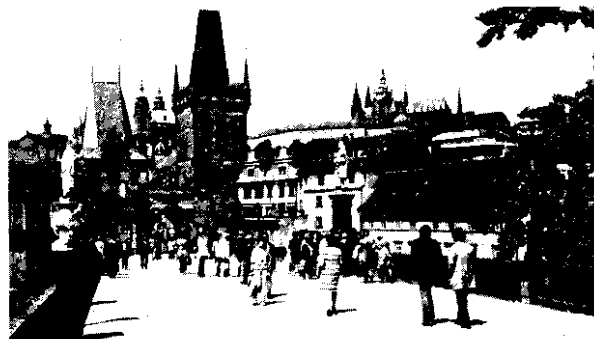
Ph.D. 1964, Docent 1969 (University of Uppsala, Sweden)

Born: 1931

Experience: Research biologists, Swedish Natural Science Research Council 1964-66; Postdoctoral fellow (Mycology + Pathology), Departments of Botany and Microbiology, University of California, Berkeley, 1966-67; Lecturer and Associate Professor, Institute of Physiological Botany, University of Uppsala, Sweden 1969-present; on leave for NSRC research in Invertebrate Pathology, 1974-present.

Membership: SIP; Referee Committee, Scandinavian Society of Plant Physiology; Transplantation Committee, International Association of Astacology.

Interests: Interaction between fungal parasites and their hosts, specifically crustaceans, on the biochemical level; defense mechanisms and fungal, parasitic specialization; ecological approaches.  
Objectives: Encourage interaction between invertebrate pathologists and people working in neighboring disciplines, e.g., Biochemistry, Mycology, Microbiology, and Plant Pathology. They need us and we need them if we wish to do more than "screening" work and to contribute to the deep and causal understanding of nature that will be required in the future. Emphasis on international contacts in invertebrate pathology saves resources and widens our perspectives.



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#### Open House - Darmstadt, Federal Republic of Germany

An unofficial open house visit will be arranged for Friday, September 8, 1978 in the following two laboratories for those on the way to Prague colloquium:

Biological Control Laboratory, Federal Biological Research Centre, Heinrichstr. 243, D-6100 Darmstadt, Fed. Rep. of Germany (work on all insect pathogens, fundamental research, diagnosis and development of microbial control of pest insects in agriculture - 6 insect pathologists; J. M. Franz in charge).

Institute of Zoology, Cell Biology Laboratory, Technical University, Schnittspahnstr. 3, D-6100 Darmstadt (work on insect cell cultures and virus replication in vitro - 4 research workers; H. G. Miltenburger in charge).

Your visit will be appreciated on September 8, particularly after informal announcement. The distance from Frankfurt to Darmstadt is 25 km to the south. There are many trains also from the airport via Frankfurt main station. Direct flights from Frankfurt to Prague are available every day.

Both Laboratories are 200 m apart from each other.

J. M. Franz  
H. G. Miltenburger

Lament at Lansing - Environmental Safety Aspects of Bacillus thuringiensis

On the evening of August 22, 1977 during the annual meeting at Lansing of the Society for Invertebrate Pathology, the Working Group on the Safety of Microbial Control Agents arranged a panel discussion on the environmental safety aspects of using microbial insecticides based on Bacillus thuringiensis. Members of the Group will later receive from its Chairman, Dr. M. Laird, a more detailed report.

The session was arranged because many members had requested an open discussion of a recent report\* on B.t. use authored by Dr. C.W. Forsberg. They felt that it contained statements which if taken out of context, could mislead those not having easy access either to the complete document other than through press summaries or excerpts, or to the extensive B.t. literature. In fairness to Dr. Forsberg, anyone wishing to enter the lists, should closely read his report for it does contain a number of caveats arising from the terms of reference set by the agency funding the report.

In an attempt to bring together a representative panel, the Society (through Dr. M. Laird) approached a number of scientists having direct experience with various aspects of B.t. research. These included: Dr. R. Cibulsky (Abbott Laboratories, North Chicago, Ill.); Dr. J. Harper (Auburn University, Auburn, Ala.); Dr. C. Beegle, (USDA, ARS, Brownsville, Tex.); Dr. O. Morris (Forest Pest Management Institute, Canadian Forestry Service, Ottawa, Canada); Dr. D. Pinnock (University of California, Berkeley, Calif.) submitted a letter read in his absence. The author of the report Dr. C. Forsberg (University of Guelph, Guelph, Ontario, Canada) was extended an invitation to join the panel, but was unable to attend.

T.A. Angus chaired the session and began by referring to several key questions identified by Forsberg in the summary of his report. As given, these are:

- 1) What are the toxic components in commercial formulations of this pesticide?
- 2) What quantities of formulations enter the environment and how persistent are the toxic components?
- 3) Are commercial preparations of B.t. toxic to non-target animals and humans?
- 4) What effects do large-scale field applications of B.t. have on the ecosystem?
- 5) Is B.t. liable to mutate or be modified by genetic transfer to a form capable of producing different toxic components or ones with modified toxicity or host specificity?

The report also included a number of recommendations for additional research. Briefly (and shorn of preamble statements) these include:

- a) the growth cycle of B.t. in affected larvae should be ascertained;
- b) formulation adjuvants should be further studied to evaluate potentiation effects;

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\*Bacillus thuringiensis: its effects on environmental quality. Publication No. N.R.R.C. 15385 National Research Council of Canada, 1976.

- c) genetic studies under conditions employing typical environmental stresses should be initiated to determine if the B.t. spectrum of pathogenicity will shift;
- d) the production of B.t. alpha-exotoxin and its toxicology should be carefully delineated;
- e) longer term studies at elevated doses should be carried out to detect secondary population or delayed effects.

The first panelist (Harper) indicated that, in his opinion, not comparing B.t. with chemicals (which was identified as being outside the scope of the report) was a serious omission by Dr. Forsberg because without these comparisons the uninformed reader could remain in ignorance of the many positive aspects attending uses of B.t. He also thought there were perhaps undue emphasis in the report on possible harmful environmental impacts, especially in view of the fact that none have been reported following widespread use of B.t. for many years in the U.S.A. and elsewhere. If one removes a pest from an environment, changes in parasite and predator levels as well as for other interrelated species are to be expected. This is an indirect effect, and is not nearly as disruptive as the direct effects caused by most chemical insecticides. Also, it is not nearly as serious as the disruption caused in the same populations when a forest is clear-cut, or an agricultural crop is harvested. In these cases, removal of a primary component of an ecosystem disrupts all involved organisms severely.

In Harper's opinion (also shared by other panelists and attendees) B.t. does not reproduce vigorously, if at all, in soil. On this point, S. Singer (from the floor) concurred indicating B.t. is uncommon in nature because it does not reproduce well. Singer also indicated that high levels of toxin production were largely a laboratory phenomenon and required special media and culturing conditions. The point was also made that the kurstaki serotype is not thought to be a potent  $\beta$ -exotoxin producer.

The second panelist (Morris) presented evidence to indicate that in actual spray trials with B.t. products, no direct effects on non-target species could be detected. His studies included surveillance of bees (flight activity, honey production, hive health), hymenopterous parasites, other arthropods and birds. Later in the general discussion, Morris indicated that the report had been cited as a reason for not using B.t. products in some projected spray operations. In the same vein Cibulsky also confirmed that the report had a negative effect in municipalities in Canada that were planning B.t. spray programs during 1977; several commercial applications were cancelled.

The third panelist (Beegle) objected that there was some confusion of fact and hypothesis in the report. He was of the opinion that it would be an almost impossible task (certainly herculean) to study all non-target organisms in an environment where B.t. is proposed for use. There was agreement that laboratory safety appraisals of effects on non-target organisms were certainly highly desirable and should be supported. In touching on effects on non-target species, Beegle indicated that non-lepidopterous predators are not affected by B.t., and took exception to the suggestion that nesting birds may be more affected by B.t. than non-nesting birds; he says no evidence is presented on this point. Ignoffo (from the floor) suggested that it would be possible to estimate possible ecological effects by a careful study of a few well-chosen indicator species.

The final panelist (Cibulsky) touched on the question whether B.t. could mutate to more "dangerous" forms (i.e. anthrax-like, or result in enhanced toxin production). He referred to the difficulty of proving a negative proposition and indicated that one must balance possibility against probability. According to industrial microbial geneticists, the event was highly unlikely, and this is based on long-term application of the rigid safety testing protocols attending B.t. manufacture, formulation and assay. The safety of B.t. for non-target organisms has been reported in the literature and many unpublished records are easily available from manufactures according to Cibulsky. He presented evidence to indicate that a very wide range of parasitic insects had been studied by his group; none were affected by B.t. These reports had been submitted to the United States Environmental Protection Agency and the Canada Department of Agriculture during 1977.

As the final formal presentation, Pinnock's letter was read. In his opinion the report contained several simplistic extrapolations of laboratory data to the field situation and should be modified. Referring to the supposed environmental risk posed by growth of B.t. in infected larvae, he pointed out that post-mortem invasion of the hemocoel by various gut bacteria often follows application of chemical insecticides and in many cases these bacteria are closely related to vertebrate enteropathogens. With one exception (a hospital infection in a burn patient, involving Pseudomonas from a salad crop) he did not know of any implication of insect cadavers as a source of environmentally harmful bacteria. Agreeing that more work is needed, he felt B.t. killed larvae did not pose any greater risk than insect cadavers infected by gut bacteria. Pinnock also cited some experimental work (as yet unpublished) which indicates that B.t. is not per se pathogenic to Eisenia foetida or Enchytraeus fragmentosis (earthworms) unless some other factor allows a means of entry to the tissues or coelom.

The meeting was then opened to questions, floor discussion and voluntary contributions.

It should be reported that in general the panel was strongly critical of the Forsberg report, and this was true of many of the floor speakers. There was a feeling that the report could be counter-productive and hinder use of a control procedure felt by many to be intrinsically safer than most conventional chemical insecticides.

At a late hour (after a 14 hour day) the Chairman was dragged moaning to the pleasures of a nearby inn and the soothing comfort of some of Dr. Spark's picaresque anecdotes.

Stepping out of my role as Chairman and Newsletter rapporteur, may I speak as your President (as an aside, I too always vote aye when someone else is instructed to prepare a report).

It was suggested at Lansing (and in later correspondence) that the Society of Invertebrate Pathology should prepare a statement of dissent and place it in the literature, hopefully to counteract possible negative effects of the National Research Council report. I have some misgivings about this, and my reluctance does not stem from any serious dissent with the views expressed by the panel members, but from my feeling that unless it polls its membership the Society should avoid 'position' statements. Accordingly, I have attempted to capture what was said in general terms only and to convey a general impression of the mood of the meeting. I am grateful to Dr. M. Laird and Dr. R. Engler for access to their notes taken during the meeting.

#### Short Course on Scanning Electron Microscopy

On June 12-16, 1978, a short course on scanning electron microscopy and x-ray microanalysis will be held at Lehigh University, Bethlehem, Pennsylvania. The course, which costs \$450, will cover: fundamentals of SEM and electron microprobe, solid state x-ray detector, quantitative x-ray analysis of biological materials, preparation of biological specimens, and scanning transmission electron microscopy. The lecture material will be complemented by seven laboratory sessions. Five SEM instruments, one automated electron microprobe, and one STEM instrument will be available in the laboratories. The course is open to engineers, scientists, technical managers, and advanced technicians.

Information and registration forms are available from Professor J. I. Goldstein, Lehigh University, Whitaker Laboratory #5, Bethlehem, Pennsylvania 18015.

#### Workshop on Microbial Control of Insect Pests

A workshop entitled "Microbial Control of Insect Pests: Future Strategies in Pest Management Systems" was held January 10 to 12 in Gainesville, Florida. Approximately 60 participants and guests from the United States and Canada attended the workshop, which was jointly sponsored by the National Science Foundation, U.S. Department of Agriculture, Forest Service, Cooperative State Research Service, and the University of Florida.

The workshop focused on the present and potential uses of microbials in integrated pest management systems. Specifically, the objectives were:

- 1) To document the current state of the art;
- 2) To identify future needs and potential uses for microbials within integrated pest management systems.

The workshop consisted of four sections. Section I, Concepts to Increase Effectiveness, included presentations on introduction and colonization, induced epizootics, autodissemination, manipulation of the environment, and application technology. In Section II, The Role of Entomopathogens in Pest Management Systems, a panel discussed the role of microbials as viewed by non-microbial control programmers. Speakers in Section III, The Use of Entomopathogens in Pest Management Systems, discussed use of microbials in specific ecosystems. Topics included cotton, soybean, and vegetable crops; rangeland and aquatic systems; stored products; fruit and ornamentals; and forest systems. In Section IV, Analysis and Recommendations, small work groups formulated a critique and recommendations for each topic in Sections I and III. In addition to prepared papers, all sections included ample time for general discussion.

The workshop was coordinated by George Allen of the University of Florida, Carlo Ignoffo of USDA-ARS in Columbia, Missouri, and Robert Jaques of Agriculture Canada. Key administrators representing the Environmental Protection Agency, U.S. Department of Agriculture, Forest Service, and Agriculture Canada, as well as top scientists, attended the meetings. The proceedings will be published in the Spring.

## NEW BOOKS

### Book Preparation

#### Microbial Control of Insects, Mites and Plant Diseases: Volume 2. H.D. Burges, Editor.

Progress in the preparation of this sequel to the original book on microbial control has been good, and I wish to thank the many colleagues who have corresponded with me. I am trying to make the new book as up-to-date and forward-looking as possible by not including any material that is in the original book and by inviting members who have relevant "in press" articles or unpublished reports and data to contact appropriate authors. Inclusion of such material, suitably acknowledged, can be to our mutual benefit. The complete list of authors is given below, and I have requested their manuscripts by March, 1978. However, additions can still be made to chapters after March, during the editorial period, in response to articles received by authors after March.

Introduction. H.D. Burges, Glasshouse Crops Research Institute, Littlehampton, England.

Identification: bacteria found in insects and mites. G.E. Bucher, Research Station, 25 Dafoe Road, Winnipeg, Manitoba, Canada.

Identification: H-serotypes of Bacillus thuringiensis. H. de Barjac, 23 Rue du Dr Roux, Pasteur Institute, Paris, France.

Identification: Bacillus popilliae group. R.J. Milner, CSIRO, Pastoral Research Laboratory, Private Bag, Armidale, Australia.

Identification: insect viruses. C.C. Payne, Glasshouse Crops Research Institute, Littlehampton, England; D.C. Kelly, Oxford, England.

Identification: Entomophthora group. D.S. King, American Type Culture Collection, 12301 Parklawn Drive, Rockville, Maryland; R. Humber, Sault Ste. Marie, Ontario, Canada.

Identification: Coelomomyces, Saprolegniales and Lagenidiales. J.N. Couch, Department of Botany, University of North Carolina, Coker Hall 010-A, Chapel Hill, North Carolina; C. Bland, Greenville, N.C., U.S.A.

Identification: entomopathogenic Deuteromycetes. R.A. Samson, Centralbureau voor Schimmelcultures, Baarn, The Netherlands.

Identification: Microsporida. E.I. Hazard, Insects Affecting Man Research Laboratory, 1600 SW 23rd Drive, P.O. Box 14565, Gainesville, Florida, U.S.A.

Bacteria: potential of different strains of Bacillus thuringiensis for insect control. H. Dulmage, USDA, ARS, Cotton Insects Research, P.O. Box 1033, Brownsville, Texas, U.S.A.

Bacteria: properties of the delta endotoxin crystal of Bacillus thuringiensis. P.F. Fast, Insect Pathology Research Institute, Sault Ste Marie, Ontario, Canada.

Bacteria: exotoxins of Bacillus thuringiensis. K. Sebesta, J. Vankova, K. Horska, J. Farkas, Academy of Sciences, Flemingovo namesti 2, Prague, Czechoslovakia.

Bacteria: advances in the use of Bacillus popilliae for insect control. M.G. Klein, Japanese Beetle Investigation Laboratory, USDA, Wooster, Ohio, U.S.A.

Bacteria: potential of spore formers without crystals for pest control. S. Singer, Western Illinois University, College of Arts and Sciences, Macomb, Illinois, U.S.A.

Bacteria: genetics and genetical manipulation. H.D. Burges, Glasshouse Crops Research Institute, Littlehampton, England.

Viruses: production in tissue culture. H. Stockdale, R. Priston, Shell Biosciences Laboratory, Sittingbourne, Kent, England.

Viruses: advances in the use of baculovirus for Heliothis control. T.L. Couch, Abbott Laboratories, North Chicago, Illinois, U.S.A.; C.M. Ignoffo, Columbia, Missouri, U.S.A.

Viruses: control of the gypsy moth by baculovirus. F.B. Lewis, USDA Forest Service, Northeastern Forest Experiment Station, 151 Sanford Street, Hamden, Connecticut, U.S.A.

Viruses: control of the rhinoceros beetle by baculovirus. G.O. Bedford, School of Biological Sciences, Sydney Technical College, Broadway, New South Wales, Australia.

Viruses: control of mites by non-occluded viruses. D.K. Reed, Fruit and Vegetable Insects Research Unit, 1118 Chestnut Street, P.O. Box 944, Vincennes, Indiana, U.S.A.

Viruses: pest control by cytoplasmic polyhedrosis viruses. K. Katagiri, Forest Experiment Station, Ministry of Agriculture and Forestry, Nagafusacho 1833, Hachioji, Tokyo, Japan.

Viruses: strategy of use in field and forest. W.G. Yendol, Department of Entomology, Pennsylvania State University, University Park, Pennsylvania, U.S.A.; O.N. Morris, Sault Ste Marie, Ontario, Canada; A.M. Heimpel, Beltsville, Maryland, U.S.A.

Fungi: pest control by Verticillium lecanii. R.A. Hall, Glasshouse Crops Research Institute, Littlehampton, England.

Fungi: pest control by Beauveria and Metarrhizium. P. Ferron, Station de Recherches de Lutte Biologique et de Biocoenotique, 78 La Minière par Versailles, France.

Fungi: pest control by Nomuraea. C.M. Ignoffo, USDA, ARS, Biological Control of Insects Research Unit, P.O. Box A, Columbia, Missouri, U.S.A.

Fungi: pest control by Hirsutella. C.W. McCoy, University of Florida, Agricultural Research and Education Centre, P.O. Box 1088, Lake Alfred, Florida, U.S.A.

Fungi: pest control by the Entomophthora group. N. Wilding, Rothamsted Experimental Station, Harpenden, Herts., England.

Fungi: toxins. D.W. Roberts, Boyce Thompson Institute for Plant Research, 1086 North Broadway, Yonkers, New York, U.S.A.

Protozoa: Nosema fumiferanae, a natural parasite of a forest pest and its potential for use in forest management. G.C. Wilson, Insect Pathology Research Institute, P.O. Box 490, Sault Ste. Marie, Ontario, Canada.

Protozoa: pest control by Nosema necatrix a pathogen of agricultural pests. J.W. Maddox, Section of Economic Entomology, Illinois Natural History Survey, Urbana, Illinois, U.S.A.

Protozoa: pest control by Nosema locustae, a pathogen of grasshoppers and crickets. J.E. Henry; E.A. Oma, USDA, ARS, Entomology Research Division, Montana State University, Bozeman, Montana, U.S.A.

Nematodes: potential for pest control. J. Finney, Research Unit on Vector Pathology, Memorial University of Newfoundland, St. John's, Newfoundland, Canada.

Technology: machinery and factors that affect the application of pathogens. D.B. Smith, Bioengineering Research Center, Building T-12, University of Missouri, Columbia, Missouri, U.S.A.; L.F. Bouse, College Station, Texas, U.S.A.

Technology: formulation of insect pathogens. C.M. Ignoffo, USDA, ARS, Biological Control of Insects Research Unit. P.O. Box A, Columbia, Missouri, U.S.A.; T. Couch, Chicago, Illinois, U.S.A.

Technology: application of statistics in insect pathology. R.J. Brand, Earl Warren Hall, University of California, Berkeley, California, U.S.A.; D.E. Pinnock, Berkeley, California, U.S.A.

Integration: a quantitative approach to the ecology of the use of pathogens. D.E. Pinnock, College of Natural Resources, 333 Hilgard Hall, University of California, Berkeley, California, U.S.A.

Integration: compatibility of pathogens with other methods of pest control and with different crops. R.P. Jaques, Research Station, Canada Department of Agriculture, Harrow, Ontario, Canada; O.N. Morrie, Sault Ste. Marie, Ontario, Canada.

Integration: use of micro-organisms to control plant diseases. A.T.K. Corke, Long Ashton Research Station, Long Ashton, Bristol, England.

Safety of the use of insect pathogens. H.D. Burges, Glasshouse Crops Research Institute, Littlehampton, England.

Defense mechanisms of insects against pathogens. H.G. Boman, Department of Microbiology, University of Umea, Umea, Sweden.

Impressions of insect pathology in the People's Republic of China. N.W. Hussey, Glasshouse Crops Research Institute, Littlehampton, England.

Conclusions. H.D. Burges, Glasshouse Crops Research Institute, Littlehampton, England.

Appendix 1. Susceptibility of arthropod species to Bacillus thuringiensis. A. Kreig and Langenbruch, Institut für Biologische Schädlingsbekämpfung, Heinrichstrasse 243, Darmstadt, Germany.

Appendix 2. A list of insects and mites attacked by viruses. M.E. Martignoni, USDA Forest Service, Forest Sciences Laboratory, 3200 Jefferson Way, Corvallis, Oregon, U.S.A.

Appendix 3. Repository for data on the safety of insect pathogens. M. Laird, Memorial University of Newfoundland, St. John's, Newfoundland, Canada.

H.D. Burges  
Editor

#### Announcement - Annual Meeting

August 13-18, 1978, 29th Annual Meeting, Society for Industrial Microbiology at Rice University, Houston, Texas. Information - Ms. Ann Kulback, Society for Industrial Microbiology, 1401 Wilson Boulevard, Arlington, Virginia 22209, U.S.A.

#### New Titles

Virus-Insect Relationships. Kenneth M. Smith. 1977. 291 pp. Longman Inc., New York, N.Y. Cloth. ISBN: 0-582-46612-1.

An account of the various kinds of virus diseases affecting insects together with the causative viruses; discussion of matters of general application in insect virology. First describes characteristics of virus diseases or group of diseases in general terms. Then offers a more detailed description of one or more specific viruses, and the diseases caused, chosen as representative of the group.

Description of specific virus infections follow a common pattern throughout the book: inclusion body, if present, is described, detailed account of causative virus particle and its properties so far as they have been ascertained, shape, ultrastructure, etc., mode of replication, disease caused, purification methods, serology, transmission, host range (if any), geographical distribution. Other features such as serology and virus replication dealt with in later chapters.

(Available from: Longman Inc., Publishers, 19 West 44th Street, New York, N.Y. 10036, U.S.A. \$23.50.)

Comparative Pathology Volume 2, Systematics of the Microsporidia. 1972. Bulla, L.A., and Cheng, T.C., Editors. (V. Sprague, Contributing Editor). Plenum Press, New York, N.Y. 510 pp. Cloth. ISBN: 0-306-38122-2.

Complementing Volume 1 of this series, which dealt with the biology of the microsporidia, this second volume is a comprehensive review of the current state of knowledge of microsporidian taxonomy. It constitutes the most complete annotated list of microsporidian species currently available. This unparalleled volume outlines microsporidian classification and phylogeny and provides a zoological distribution for each species.

(Available from: Plenum Press, 227 West 17th Street, New York, N.Y. 10011, U.S.A. \$39.00.)

Aquatic Pollutants and Biologic Effects with Emphasis on Neoplasia. 1977. Kraybill, H.F., Dawe, C.J., Harshbarger, J.C., and Tardiff, R.G. Editors. Paper. Annals of The New York Academy of Sciences. Vol. 298, New York, N.Y. 604 pp. ISBN: 0-89072-044-4.

Aquatic pollutants have been a matter of concern for sometime to biomedical scientists, public health authorities, and regulatory and legislative groups. Recently, concern has been demonstrated nationally and internationally on the effect of pollutants in waterways relevant to fish kills, reduction in fish and shellfish populations with the associated socioeconomic impact and the observation that cancer is occurring in finfish and shellfish.

In order to provide an orientation for future research and to identify the needs and requirements for wider recognition of this important area of environmental health, The New York Academy of Sciences organized its conference on Aquatic Pollutants and Biologic Effects with Emphasis on Neoplasia, which was held September 27-29, 1976.



The objectives of the 41 papers and discussion was to put into perspective the various concentrations of pollutants in the water supply of countries that are influenced by industrial and geographical patterns. Furthermore, the effect of such contaminants was evaluated in various biological systems, with particular emphasis on neoplastic disease. The potential public health hazard was evaluated within the framework of current methodology and information resources, with a broad spectrum of inorganic, organic and radiological contaminants considered.

(Available from: The New York Academy of Sciences, P.O. Box 5075, F.D.R. Station, New York, N.Y. 10022, U.S.A. \$52.00 plus \$1.00 for mailing and handling.)

Pathogens of Medically Important Insects. Roberts, D.W., and Strand, M.A., Editors. 1977. Approx. 420 pp. Bulletin of the World Health Organization, Supplement No. 1, Volume 55, Geneva, Switzerland.

(Available from: WHO Publication Center USA, 49 Sheridan Avenue, Albany, New York 12210, U.S.A. \$10.00 plus \$1.00 for mailing and handling charge.)



St. Vitus' Cathedral



SIP Newsletter

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