sip newsletter

society for invertebrate pathology

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KEYNOTE ADDRESS

Third International Colloquium on Invertebrate Pathology
University of Sussex, Brighton, United Kingdom
September 6, 1982

"FROM THERE TO HERE TO WHERE"

When Dr. Burges and Dr. Payne invited me to present the Keynote Address I felt honored, yet had some trepidations. My alarm did not decrease when they further requested a balanced presentation that would start our colloquium in *a good frame of mind* and to *bring out areas of mutual benefit, interest, and future cooperation.* They did nothing to alleviate this growing apprehension when they further charged *to do this so as to create a dynamic, forward-looking environment.* I now feel like *Don Quixote* trying to fulfill *The Impossible Dream.*

The title "FROM THERE TO HERE TO WHERE" is an attempt to illustrate the continuum between our society's past, present, and future. I believe H. G. Wells (*Nature 65: 326-331, 1902*) aptly expressed this continuum when referring to all mankind, he said:

"...All the past is but the beginning of a beginning . . . all that is and has been is but the twilight of the dawn. . . all the human mind has ever accomplished is but the dream before the awakening. . . all this world is heavy with the promise of greater things, and a day will come, one day in the unending succession of days, when beings. . . shall stand upon this earth as one stands upon a footstool, and shall laugh and reach out their hands amidst the stars."

H. G. Wells' thoughts are indeed both optimistic and challenging. I also am optimistic in believing that the past is but the initial beginning of a fruitful and meaningful future for our society, and we, as scientists, will accept individual challenges and obligations as well as our society's obligations and challenges to:

Promote scientific knowledge of pathology of invertebrate animals and of related subjects. . . Stimulate scientific investigations and their applications . . . Plan, organize, and administer projects for the advancement of scientific knowledge in invertebrate pathology. . . Improve its educations and professional qualifications. . . Promote international cooperation . . .

Thus, we as members of our society have a challenge not only to acquire and disseminate knowledge but also a responsibility to implement this acquired knowledge internationally to the betterment of all humanity.

. . . THE THERE

In order to better understand our uniqueness and, thus, plan for the future let us look at our beginnings. I believe Invertebrate Pathology became a unified science after World War II. The crystallizing agent for this beginning was the publication of Dr. Edward A. Steinhaus' *Principles of Insect Pathology* (Edward A. Steinhaus, *Principles of Insect Pathology*, McGraw Hill Book Co., Inc., New York, 1949). This publication brought together what was known of diseases of invertebrates, especially insects, and served as a focal point for what was to come. The publication, of itself, might not have resulted in what we recognize today. Something more was needed, and that something was Dr. Steinhaus. Dr. Steinhaus not only fostered the development of invertebrate pathology but was the milk that nourished it and the cement that kept us together during its infancy and during two critical decades before his death. He left several living memorials as his legacy. To acknowledge Dr. Steinhaus' contributions does not imply that others did not have similar thoughts or publish many excellent, comprehensive studies on diseases of invertebrates. Dr. Steinhaus fully recognized the significant contributions and impact of others and always acknowledged these in his writings from the *Principles of Insect Pathology* (Edward A. Steinhaus, *ibid*, 1949) to the publication of his unfinished manuscripts *Diseases in a Minor Chord* (Edward A. Steinhaus, *Diseases in a Minor Chord*, Ohio State Univ. Press, Columbus, 1975).

We are still a young organization. It has been only 23 years since the initial publication of the Journal of Insect Pathology and less than 20 years since we changed our journal's name. Our society is only 15 years old. We are now in our adolescent years and, as adolescents, are struggling through phases of growth coupled with the discouragements and frustrations of adolescence. Adolescence, however, is only a transitional period; a period of both hope and expectations.

. . . THE HERE

THE HERE is but a fleeting moment of time between THE THERE of the past and THE WHERE of the future. What was THE WHERE is now THE HERE; what was THE HERE is now THE THERE. In this "HERE" period I would like to comment on some of our accomplishments that I feel we can be proud of and, as importantly, to dedicate this keynote address to all our living and dead colleagues who have devoted their professional careers to achieving these accomplishments, namely:

The growth of our society to an organization representing many countries and scientific disciplines. . .
The establishment of a vehicle for reporting of our research, namely the Journal of Invertebrate Pathology. . .
The establishment of curriculua for training scientists in

the concepts, principles, and practices of invertebrate pathology . . .

The development and existence of an encouraging environment for funding fundamental and applied research in invertebrate pathology throughout the world . . .

The recognition of other societies of our existence and, yes, even of the important role we have and can continue to play . . .

The development and use of microbial pesticides, representing all major types of pathogen-induced diseases, to control pests of man.

I believe we are members of a unique society. We are small, young, and growing. We represent many different countries of the world. We represent many different scientific disciplines. We use animal models that represent a majority of the described animal species. We conduct the complete spectrum of research from fundamental to applied; but, above all, we are unique because we are who we are! Based on our accomplishemnts, it is safe to say that our foundation is firmly established and we show good signs of growth. Our past, our accomplishments, and our uniqueness fuel the flame of our future!

THE WHERE . . .

THE WHERE, our future, is yet to be fulfilled; it is left to all of us to fulfill as individuals and societal members. The concluding paragraph of the preface of *Diseases in a Minor Chord,* relates:

"This book will be written with the conviction that what is to be historical in invertebrate pathology lies in the future. The best is yet to come." (Edward A. Steinhaus, *ibid,* 1975)

To try to predict the future is risky. Those with the gift of prophecy will prophesize . . . I can only extrapolate from our present base of knowledge to what I hope may be our future. My attempted voyage into the future should be considered as a challenge to us as individual scientists as well as scientific members of a society. It is not important whether you agree or disagree with these challenges and obligations or the manner in which they should be implemented. However, I think it is important that we as individuals and as a Society address ourselves to the needs of our world; that we seek an understanding of our unique role whatever it may be, and then plan and take future actions based on these deliberations.

SIP NEWSLETTER

The SIP Newsletter is produced four times a year by the Society for Invertebrate Pathology. Annual dues (U.S. funds) in the Society are: regular members, $11.00; and students, $4.00. Members receive the SIP. Newsletter free. Application forms for Membership in the Society may be obtained from the Treasurer, Dr. Aaron Rosenfield, Oxford Lab., NOAA, Nat'l. Marine Fisheries Service, Oxford, Maryland 21654, U.S.A.

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PHILOSOPHICAL CHALLENGES AND OBLIGATIONS AS SCIENTISTS

We, as individual scientists, have to address ourselves to both ethical and philosophical challenges. The fruits of our labor is knowledge . . .

We must always freely give and exchange our fundamental knowledge and unique technology.

We must do more as individuals to synthesize our fundamental knowledge . . . to establish general working principles and promote technological advances.

We should acknowledge the accomplishment of others . . . give credit where credit is due . . . provide positive feedback and encourage others in the pursuit of their scientific endeavors.

We must create a favorable environment in which unpopular as well as popular ideas can be fully explored . . . encourage competition but also promote cooperation.

We must accept the challenge to undertake high risk/high potential research to more rapidly advance fundamental knowledge. We must first risk failure in order to succeed.

It is like the boy seeking a juicy apple. If you want to partake of the fruit of the apple tree, *you must go out on the limb.*

TECHNICAL CHALLENGES AND OBLIGATIONS AS SCIENTISTS

". . . a Man's reach should exceed his grasp, or what's a heaven for?" . . .(Robert Browning). As individual scientists, we also have technical challenges and obligations.

Research on Pest Models: Because of our small number and to have the greatest impact, I believe that more fundamental research in invertebrate pathology should be conducted on invertebrate pest models, i.e., mission-oriented fundamental research. Fundamental knowledge then could be immediately applied and have a greater impact on solving problems of mankind. If a particular concept is to be demonstrated and a major pest model system is not available, then the concept should be established with whatever model system is best.

Prevent and Control Diseases: Anyone trying to rear invertebrates knows the impact of disease in cultures. Food from the sea is touted as one of man's hopes for alleviating malnutrition. Food from the sea implies the need to mass cultivate invertebrates, and mass cultivation demands the acquisition and application of fundamental knowledge on how to prevent and control diseases of invertebrates. We are therefore challenged to acquire fundamental knowledge that can be applied to future technologies that optimize the mass production and use of aquatic marine and freshwater invertebrates.

Discover New Pesticides: We, as Invertebrate pathologists, should specifically look for known or potential pathogens (or their by-products) that attack invertebrate pests other than insects. We should evaluate whether the technology used to develop microbial insecticides, could be used to develop biocontrol agents for other invertebrate pests. As examples: for pest molluscs, and for invertebrate pests of man and animals. The fact that we are a combination of many different disciplines is a uniqueness that can aid us in the rapid development of microbial pesticides.

Employ New Technologies: As individual scientists, we must further broaden our base of knowledge and do more to develop or adopt new technologies to advance our fundamental knowledge in invertebrate pathology. If these technologies are not in our field, then we should escape from the *jail of provincialism* and look to other fields.

Based on what we see and hear today, the cutting edge of science is in molecular genetics utilizing the new technologies of genetic engineering, hybridomas, and protoplast-fusion. Thus, there is a challenge to apply these new technologies to the advancement of our knowledge of invertebrate pathology. Several applications come to mind with microbial insecticides. Many genes are probably involved in

the process of increasing infectivity, or virulence. Although complex it will be possible if not now, then, in the future to identify, isolate and insert, at the appropriate site, an array of genes from different chromosomes, make these transplanted genes properly function, and tailor-make microbes to control a specific pest in a particular ecosystem. Although the above is theoretically possible, today it is more technically feasible to transfer one gene that confers a specific, desired trait than several genes from different chromosomes. It might be feasible to transfer a gene coding for a specific insecticidal toxin or protoxin to a microbe that naturally inhabits the mid-gut of a pest insect. A gene of one strain possessing sunlight-stability but low yield might be spliced into another strain that has high yield but lacks sunlight-stability. The effectiveness of a promising fungal pesticide might be increased by use of recombinant or protoplast-fusion techniques. The use of baculoviruses as vectors for transferring genes might also be developed.

It is clear that many breakthroughs and rapid advances in knowledge result from the application of new technologies. It would be difficult today to define microbiological problems without the technological development of the microscope; and what of the dependence of cellular and molecular biology on the electron microscope? More recently, the use of enzyme-recombinant technology has stimulated a massive effort to produce commercial products in mass-produced, non-homologous hosts. What do these examples demonstrate? To me, they demonstrate a close union, yes, even a marriage if you will, between fundamental and applied knowledge. Both areas of expertise are represented in our society. *Science is science!* The only real difference between fundamental and applied knowledge is the immediacy of its application. We should be as aggressive in applying our fundamental knowledge as we are in pursuing it. The acquisition of fundamental knowledge and its application are not only necessary for the rapid growth and advancement of our society, it also gives future promise for a better quality of life for all. But what of the cutting edge of the future? Fundamental and applied knowledge will surely be cyclically generated as we progress in invertebrate pathology and seek new technologies that can be applied to our specific efforts. The cutting edge of the future, like teeth of a circular saw, changes with time, with each edge of the blade providing a new cut into the timber of fundamental and applied knowledge.

OBLIGATIONS AND CHALLENGES AS A SCIENTIFIC SOCIETY

We as individual scientists are called to the acquisition of new knowledge by observation, description, and experimentation. We also are members of The Society of Invertebrate Pathology. What then will be our future challenges and obligations as members of this society?

Implementation of Knowledge: I believe an important societal challenge of the future is to implement our acquired knowledge for the benefit of mankind. We justly commit ourselves to the cause of endangered species. In many countries of the world, "*children are the endangered species.*" About a million children under 14 die each year in Africa because of malaria, and the United Nation reports that about 1 billion members of the human species (1/4 of our world's population), go to bed hungry every day and that 2/3 of these are children and mothers. Malnutrition kills or debilitates more children than the combination of all natural or man-made disasters (UNICEF News in Pat Orvis, *Chicago Sun Times,* March, 1982).

The question has always been "What can I, an individual, do"? Although limited in what we can do as individuals, we as members of a unique, international society often can do what individuals find difficult to do. Thus, I summon our society to give consideration to *the appointment of a commission to explore how our society could be more involved in world-wide research and educational programs.* Scientists and residents of developing countries need self-help, not charity. Given fundamental knowledge, technologies, and opportunities, they have the ability and imagination to help themselves. In fact, developing countries are more rapidly adapting and using the newer microbial pesticides than are the developed countries. We, as a society, might:

Assist in establishing curricula and educational programs for invertebrate pathology throughout the world. . .
Develop programs or workshops for training in fundamental and applied aspects of invertebrate pathology and in dispensing fundamental knowledge of invertebrate pathology to those individuals, organizations or nations, requesting our aid . . .
Explore possibilities of developing cadre of expertise to directly assist developing countries to implement and apply the technology of invertebrate pathology.

Our Society of Invertebrate Pathology should identify with the needs of others and ensure that knowledge we generate meets these needs. We should be the central driving force to achieving our own constitutional objectives. . .

"The planning, organization, and administration of projects for the advancement of scientific knowledge in invertebrate pathology" and . . . *"The promotion of international cooperation."*

Dissemination of Knowledge: Another future challenge we as a society must deal with is the publication of our knowledge. We have a constitutional mandate to . . . *promote the scientific knowledge . . . through reports and publications.* The vehicle for this is a Journal. The continuing existence of a journal is of utmost importance to the growth of invertebrate pathology. It provides a vehicle for reporting all phases of research in invertebrate pathology.

We must strive for accuracy and precision in our publications yet be fully aware of tendencies toward censorship. Competition between ideas should be encouraged not discouraged. Editors and reviewers have a technical and professional responsibility to specify why a manuscript is rejected and an obligation to specifically communicate this to the author. I personally feel that it is best to err in publishing controversial manuscripts than to exclude from publication manuscripts that are of value. I know of no Journal that has failed because of the occasional publication of a questionable manuscript. There are probably more examples of the other extreme, i.e., failure to publish a manuscript containing controversial but useful information. Again, in the final analysis, the worthiness of any publication must stand the test of continuing judgment by peers through time. I also feel that the society should more vigorously encourage and solicit manuscripts reporting results of applied knowledge. There is a need and a desire that authors and members be assured that both their fundamental and applied research be published in their own society's journal. Thus, I recommend *that a study group, representing different disciplines and types of research, be commissioned to determine what can be done to keep our Journal secure.*

Promote Research Alliances: Another future challenge we as a society must eventually face is how to promote and plan research that will maximize our limited resources and personnel. I feel our society should encourage, develop, and plan closer alliances between academia, government, and industry in order to expedite research developments in invertebrate pathology. Examples of alliances already exist in other fields of microbiology. Recent developments in molecular genetics have stimulated cooperative research between academia, government, and industry in an effort to expedite and maximize their common research objectives. Research and development are not independent functions. They are part of an integrated continuum from innovation to implementation. Industry is the only organization involved in the total process of *a product from concept to research to development to manufacturer and ultimately to the consumer.* Our society should appoint a commission with representatives from academia, industry, and government to . . . *encourage and explore ways in which this troika could be harnessed to support our common research goals* . . . a sharing not only of ideas but of people.

Recognition of Achievements: Last, but not least, we as a society should formally recognize the success *of individuals, of agencies, of organizations and of industry,* and the contributions they have made to *stimulating scientific investigations and their applications* and *improving education and professional qualifications in invertebrate pathology,* all stated constitutional objectives of our society.

To formally recognize these achievements, we might give consideration to striking some kind of medallion that is given for a major research . . . *or professional . . . or educational contribution* to the field of invertebrate pathology. This award could be presented each time we meet in International Colloquium. Thus, I recommend that a working group be commissioned to . . . *explore how our society might recognize notable achievements in invertebrate pathology.*

SUMMARY AND CONCLUSIONS

We are still in the first generation of our society; a generation that has seen our science and society grow from the idea of a few men to a world-wide group of scientists. The excitement and promise of the future are before us. Although we are small in number, we are a unique grouping of diversified disciplines, utilizing many different experimental animal models, and we are involved in all phases of research extending from fundamental to applied. We must use our uniqueness to address these challenges and to fulfill our obligations. We must also realize, however, that, because of our low critical mass of scientists, it will be difficult to provide sufficient focus on specific problems or fast-moving areas of research to obtain the technology required to be at the forefront of science. Thus, we must make the most of our limited number of scientists and resources and, as individuals and society members, be more involved in: *specifically defining and prioritizing research problems . . . planning and coordinating our limited research resources to resolve these problems. . . and advising and assisting others to implement solutions.*

As I stated earlier, it is not important whether you agree or disagree with these challenges and obligations or the manner in which they should be implemented. However, I think it is important that we, both as individuals and a society, address ourselves to our specific role. To meet individual and societal challenges and obligations, we must look within . . . to define and understand our uniqueness and use these to plan and shape our future. We must continually strive to synthesize and fuse our fundamental research to that of applied research and implement this research to the betterment of all mankind.

The future is bright! I am optimistic and confident that our society will do what has to be done to achieve both our individual and societal objectives in invertebrate pathology. Our uniqueness and our talents will create our future. I started this presentation referring to *Don Quixote* and, as *Don Quixote* would say to his trusted friend *Sancho,* I say to you and to our society, *"Adelante"* and *thank you!*

ACKNOWLEDGEMENT: The following contributions are acknowledged for ideas as well as stimulating and solidifying thoughts expressed herein, namely: D. Allan Bromely, *Science* 215: 1036-1044, 1982; Edward E. David Jr., *Science* 217, 1982; Edward E. David Jr., Presentation New York City Bar Association, New York, April, 1982; Anna J. Harrison, *Science* 215: 1061-1063, 1982; George A. Keyworth II, *Science* 217: 606-609, 1982; Terry B. Kinney Jr., *Agriculture Research,* 30: 2, 1981; Lois K. Miller *in* Genetic Engineering in the Plant Sciences, N. J. Panopoulos, *Ed.* Praeger Public. New York, 1982; J. Thomas Ratchford, *Science* 216, 1982; Ian M. Ross, *Science* 217: 130-133, 1982.

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High above Cayuga's waters - Cornell's sprawling 740 acre campus offers a panoranic view of glacially carved Cayuga Lake.

Boyce Thompson Institute, a Cornell affiliate, moved to Ithaca from Yonkers when this building on the Cornell Campus was completed in 1979.

16th Annual Meeting
Society for Invertebrate Pathology
Cornell University, Ithaca, New York
August 7-11, 1983

Ithaca and Cornell University

Ithaca and the campuses of Cornell University and Ithaca College are located at the south end of Lake Cayuga in the Finger Lakes region of upstate New York. The natural beauties of the region have long attracted visitors from around the world, so that Ithaca was already a frequent stop on the itinerary of travelers in the early part of the last century. The Finger Lakes themselves, and the fertile farmlands between them make the region an attractive one, but Ithaca has been particularly blessed by the results of the glacial interaction with the deep beds of layered limestone and shale that formed the Lakes.

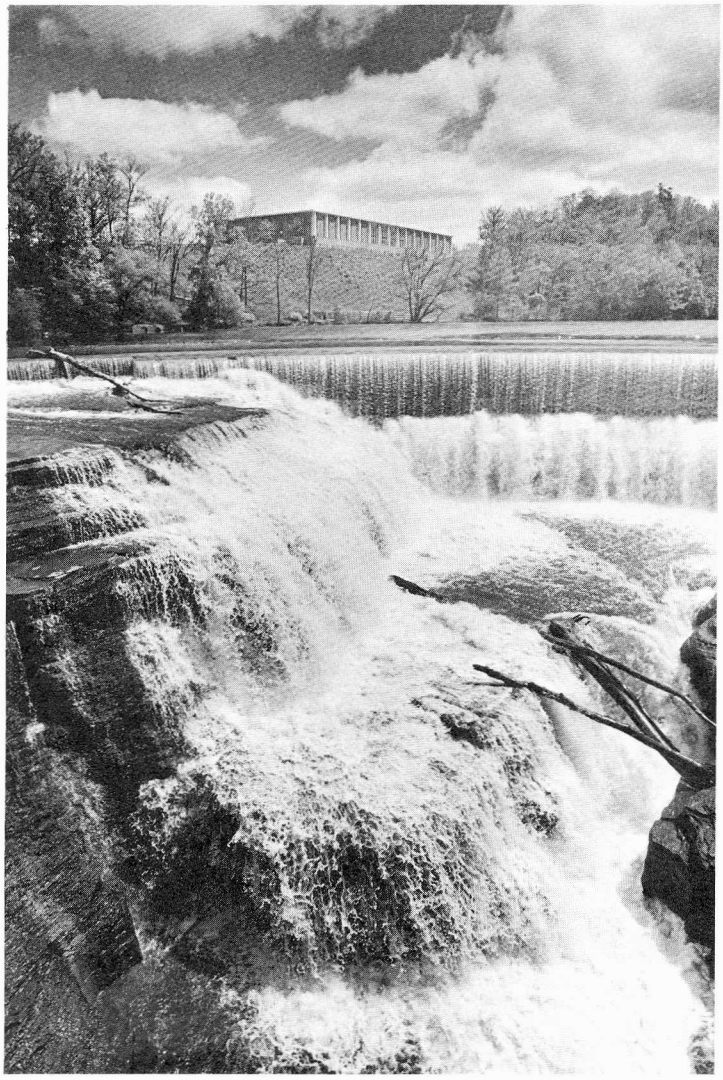
The city of Ithaca, which was settled in 1811 and chartered in 1888, has grown around several handsome creeks, gorges, large waterfalls, and other water features. It is not surprising that one of the most commonly seen slogans on local teeshirts and bumperstickers is the self-congratulatory (and true) slogan, "Ithaca is Gorges." The city is not only proud of its physical setting, but has placed much effort on its cultural and historical assets. One need not walk very long in the downtown area or on some of the precipitous hills leading up to the Cornell campus to see a number of very well preserved or restored residences. Relatively few people are aware that Ithaca and its richly endowed natural setting were exploited by the fledgling movie industry during the early part of the century before Hollywood became the center for the industry. Even afterward, it was the home for the production of the "Our Gang" and "little Rascals" comedies.

In addition to the creeks, gorges, and falls located in the city, there are several state parks (Buttermilk Fall, Robt. H. Treman, and Taughannock Falls) within a radius of less than 10 miles which are equally captivating for their gorges, waterfalls and other facilities.

A bit more distant from Ithaca, but no less spectacular, one can visit the internationally renowned Watkins Glen State Park, one or more of New York's wineries (whose products are gaining rapidly in both quality and international stature), Corning Glass Museum (with vast exhibitions on historic glass, glassmaking, Steuben Crystal, etc.) or Remington Museum (the world's largest collection of the works of this famous western artist) in Corning, or the Mark Twain home and gravesite in Elmira.

The SIP barbeque will be held at Taughannock, Falls State Park, some 7 miles north of Ithaca on the west side of Lake Cayuga. This site offers not only a full range of lakeside activities, but a brief, pleasant, and shaded walk from the lakeside pavillion places the visitor at the base of Taughannock Falls, the highest waterfall in the eastern United States, which plunges more than 100 feet directly into a natural rock bowl.

Cornell University occupies a 740 acre campus on the bluffs overlooking Ithaca and Lake Cayuga. This internationally respected university, the largest employer in Ithaca and Tompkins County, employs nearly 1700 full-time faculty members, and serves more than 11,000 undergraduate and some 5,000 graduate students. Cornell is a complex of colleges and schools which are either privately endowed or part of the State University system as New York's land-grant college. Cornell also maintains the New York State Agricultural Experiment Station at Geneva, at the northern end of Lake Seneca some 50 miles from Ithaca.



Cornell University's Helen Newman Hall, which houses the Women's Athletic Program, overlooks scenic Beebe Lake.

The Boyce Thompson Institute for Plant Research, a privately endowed research facility, is a relative newcomer to the Cornell campus. BTI moved from their original site in Yonkers, New York, to newly constructed facilities adjacent to the Veterinary College in 1978. The wide range of research programs at BTI include biocontrol, environmental biology, nitrogen and crop yields, plant stress, and bioregulant chemicals; the Institute also houses the USDA-ARA Insect Pathology Research Unit.

Any visitor to Cornell might be well advised to try to find time to see some of the more special attractions of the campus: The Johnson Museum of Art, an unusual building designed with computer assistance to minimize disruption of sightlines from adjacent buildings, contains a fine and diverse collection of art, and provides spectacular views of Ithaca, Lake Cayuga, and the campus. Within a few minutes walk of the Boyce Thompson Institute are the Cornell Plantations with several attractive gardens (herbs, peonies, native plants, etc.) and an extensive arboretum. One of the most popular local swimming, wading, and sunbathing spots is located on a shelf-like area of Fall Creek immediately adjacent to the arboretum.

Call For Papers and Abstracts

Because of the delay in issuing the February, 1983 newsletter (Vol. 15, No. 1), the Program Committee will accept abstracts received after April 30, 1983, but not later than May 20, 1983.

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SAFETY WORKING GROUP
Call for discussion at the annual meeting

The Safety Working Group will meet as usual during the 1983 SIP Annual Meeting at Cornell University. In keeping with our informal format, members are invited to bring up for discussion any topics pertinent to safety of microorganisms for nontarget organisms. However, our time can be best spent if the chairman is notified in advance of any major topics of discussion. Therefore, please notify the chairman if you wish to discuss any particular topic in some detail.

The U.S. Environmental Protection Agency has published data requirements for microbial pesticides (Federal Register, Nov. 24, 1982, pp. 53192-53221). The full guidelines are available from the National Technical Information Service, Attn: Order Desk, 5285 Port Royal Road, Springfield, VA 22161. Those interested should request Subdivision M, Biorational pesticides, Doc. No. PB 83-153965. The hard copy costs $25 and the microfiche $4.50. If you would like to read a copy of just the proposed nontarget insect guidelines, please contact the undersigned. Members are encouraged to discuss in detail the requirements for nontarget insect testing, including appropriate species, testing methods, materials, etc., and to propose research to be undertaken by EPA leading to a better set of nontarget insect guidelines. This is your opportunity to have an impact on regulation of microbials!

Elizabeth W. Davidson, Chairman
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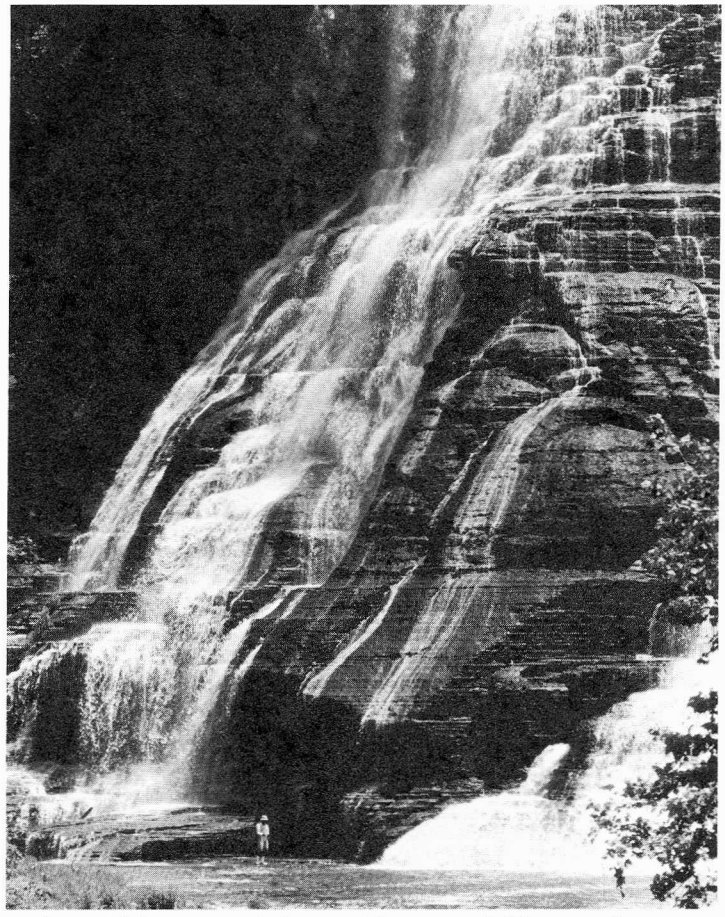

Beautiful gorges with cascading waterfalls are characteristic of Ithaca and the whole Finger Lakes Region.

MEMBERS APPROVE REVISED CONSTITUTION

The revised constitution and by-laws of the Society for Invertebrate Pathology have been approved by an overwhelming majority of the members. According to the tally prepared by our scrutineers Dwight Lynn, George Tompkins and Jean Adams 227 votes were in favour of and 2 against the revision.

New Members and members who were delinquent and have paid their dues may request a copy of the revised constitution and by-laws from the Secretary, Dr. Jean R. Adams, US Dept. of Agriculture, Insect Pathology Laboratory, Bldg. 011A, Rm. 214, BARC-W, Beltsville, Md. 20705.

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INVERTEBRATE PATHOLOGY IN AUSTRALIA

Workers in Invertebrate Pathology are distributed in the capital cities of all six states and the national capital, Canberra. Regular communication between workers in Australia and New Zealand was established by the formation of an Invertebrate Pathology Working Group in 1979.

SOUTH AUSTRALIA: Dr. Dudley Pinnock (late U. of California, Berkeley) has established the Insect Pathology Laboratory at the Waite Institute, University of Adelaide. His main personal involvement is with European foulbrood and viral diseases of honeybees, pollination in almond and alfalfa (lucerne) crops and integrated pest management on seed alfalfa. In the latter large-scale collaborative study, pathogens under investigation include *Bacillus thuringiensis* (Bt), *Heliothis* NPV and *Zoophthora radicans*.

Others are: Dr. David Cooper - microbial control of sheep blowfly, *Lucilia cuprina*. The most promising pathogen to date is the microsporidian *Octosporea muscaedomesticae* obtained from Dr. Joe Maddox.

Mr. Robin Coles: microbial control of the pasture cockchafer, *Aphodius tasmaniae* using *Metarhizium anisopliae*. This involves selection of highly infective strains, large-scale spore production, and field trials, which have yielded promising results.

Mr. David Dall: biochemical characterization of 2 honeybee viruses, Kashmir bee virus (KBV) and Sacbrood virus (SBV).

Ms. Karen Gibb: the synchronization of the nematode, *Contortylenchus grandicolli* with its host, the bark beetle, *Ips grandicollis*.

VICTORIA: Dr. Ian Griffith heads the work at the College of Pharmacy, Parkville Melbourne 3052, which is concerned with a GV of the potato tuber moth, *Phthorimaea operculella*, its production, assay and formulation. The formulation of a GV of *Heliothis punctiger* is also being studied. Another group at the college is investigating transovarial transmission of GV in the potato moth (no success) and *Pieris rapae* (apparent success). Further work concerns the effect of microorganisms on the development of the sheep blowfly, *L. cuprina*.

At the Department of Agriculture, Burnley Gardens, Melbourne (address Box 4044, G.P.O., Melbourne 3001) workers comprise:

Dr. Steven Gagen: control of the field cricket *Teleogryllus commodus* using *Metarhizium anisopliae*.

Dr. Carl Reinganum: The use of NPVs for the suppression of armyworm species in cereals and characterization of cricket paralysis virus and Boolarra virus, a member of the *Nodavirus* group. Multicapsid NPVs (MNPV) have been isolated from three species which are additionally susceptible to the *Autographa californica* MNPV.

Gordon Berg and Peter Williams: control of red-headed cockchafer *Adoryphorus couloni* and white fringe weevil *Graphognathus leucoloma* using the nematodes *Neoaplectana glaseri*, *N. bibionis* and *Heterorhabditis* sp.

TASMANIA: Dr. Robin Bedding is working with 2 professional and 4 support staff at the C.S.I.R.O. Tasmanian Regional Laboratory, Stowell Avenue, Hobart, 7000, on studies of the biology, taxonomy and use of steinernematid and heterorhabditid nematodes and their symbiotic bacteria. Methods for the easy production, washing, storage and transportation of billions of nematodes have been developed. Field-testing has been done in most Australian states and New Zealand. Insects investigated as potential candidates for control are sugar cane scarabs, rice borer, blowfly, white fringe weevil, *Heliothis*, pasture scarabs and Sitona weevil. In cooperation with the Tasmanian Dept. of Agriculture, techniques for disinfesting from currant borer moth all of Australia's annual requirement of black currant cuttings have been developed (nearly ½ million treated to date).

NEW SOUTH WALES: Dr. A.W. Sweeney of the Army Malaria Research Unit, Ingleburn N.S.W. 2174, west of Sydney, heads a team evaluating the fungus, *Culicinomyces*, as a candidate for the biological control of mosquito larvae. The fungus has proved highly lethal to *Anopheles*, *Culex* and *Aedes* larvae in the laboratory, and field control of *Culex* larvae breeding in non-polluted situations has been achieved.

AUSTRALIAN CAPITAL TERRITORY: Workers within the C.S.I.R.O. Division of Entomology, Canberra 2601, include Dr. T.D.C. Grace, who is resuming work into viruses and tissue culture after a posting in Tokyo.

Dr. Richard Milner: Fungal pathogens of three aphid species which are pests of alfalfa (lucerne), have been his main research interest since the spotted aphid, *Therioaphis trifolii* f. *maculata* and the blue green aphid, *Acyrthosiphon kondoi* were accidentally introduced into Australia in 1977 and the pea aphid *A. pisum* in 1980. The three species of fungi studied are *Erynia neoaphidis*, *Zoophthora radicans* and *Z. phalloides*. A new programme on the use of *Verticillium* for aphid control in glasshouses has just started, while research continues on microsporidia infecting insects and copepods.

WESTERN AUSTRALIA: Philip Michael, John Moulden and Mary Mutch of the Department of Agriculture, Jarrah Road, South Perth 6151, have been involved in the study of *Beauveria bassiana* for the control of webworm in pastures and cereals, and *Nosema locustae* against the wingless grasshopper, *Phaulacridium vittatum*, and commercial NPV against *Heliothis* species.

QUEENSLAND: David Holdom, a student at the University of Queensland, St. Lucia, Brisbane 4067, is completing studies of *Entomophthora planchoniana*, the predominant fungal pathogen of aphids on alfalfa in this state. Prof. D. Kettle and Mr. Chris Freebairn also study pathogens (including nematodes) in mosquitoes.

Other workers at the U. of Queensland collaborate with workers from C.S.I.R.O., Queensland Department of Primary Industries, and New South Wales Department of Agriculture in the evaluation of *Bt* and *Heliothis* NPV in SIRATAC, a pest management programme for cotton. R.E. Teakle is evaluating commercial *Heliothis* NPV, 'Elcar', for use against *Heliothis armiger* (mainly on sorghum) and *H. punctiger*.

R.E. Teakle,
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KARL MARAMOROSCH WINS 1983 AIBS DISTINGUISHED SERVICE AWARD

Microbiologist Karl Maramorosch is the recipient of the 1983 Distinguished Service Award, which will be presented to him at the plenary session of the AIBS annual meeting in Grand Forks. Maramorosch is now Professor of Microbiology at the Waksman Institute of Microbiology at Rutgers, The State University of New Jersey. Not only has he broken new ground in biology, but he also has applied biological knowledge to the problems of human health and welfare and public policy and planning.

Karl Maramorosch

Maramorosch's interdisciplinary research has embraced botany, zoology, and medicine. He has published on diverse subjects, including entomology, plant virology, insect vector transmission, viruses and spiroplasmas, and invertebrate cells. His applied studies include biological control of plant and insect diseases and the potential application of invertebrate cell culture in food production and health care in developing nations. Maramorosch pioneered wide-ranging studies on the interactions between plants, insects, and disease agents, especially mycoplasmas and spiroplasmas (once erroneously thought to be viruses), which he showed to be the causative agents of numerous plant diseases.

Maramorosch's numerous other awards and honors include the Wolf Prize in Agriculture and the Jurzykowski Prize in Biology. He is a fellow of the AAAs, the American Phytopathological Society, the Indian National Science Academy, and the New York Academy of Sciences. The interdisciplinary nature of his work is reflected in his membership in numerous other scientific societies, including the Electron Microscopy Society of America, the American Society of Microbiology, Society for Invertebrate Pathology, and the Tissue Culture Association. He has served as an officer for several of these.

Maramorosch was born in Vienna and educated in Poland and the United States. He was a member of the faculty of the Rockefeller Institute for Medical Research, Rockefeller University, in the 1950's. He moved to the Boyce Thompson Institute, Yonkers, New York, in the 1960's and joined the staff of the Waksman Institute of Microbiology in 1974. Besides his research on the interrelationships of plant diseases, their causative agents and insect vectors, Karl has worked on yellow fever and invertebrate viruses, the latter with the idea of developing microbial control of insects.

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NEW BOOKS

MICROBIAL AND VIRAL PESTICIDES

edited by Edouard Kurstak, (University of Montreal, Canada) Marcel Dekker, Inc., New York and Basel. June, 1982 712 pages, illustrated $99.50 (Price is 20% higher outside the U.S. and Canada.)

This work offers an up-to-date review, stressing the latest concepts in the use of various pathogens and microbial toxins for pest control in agriculture, medicine, and forestry. The contents are listed below:

INTRODUCTORY REMARKS

Microbial Pesticides:Mode of Action, Safety and Future Prospects. *E. Kurstak* and *P. Tijssen*

BACTERIAL PESTICIDES

Bacillus thuringiensis as Bacterial Insecticide: Basic Considerations and Application. *P. Lüthy*, *J.L. Cordier*, and *H. Fisher*

Bacteria and their Toxins as Insecticides. *R.M. Faust* and *L.A. Bulla*

Distribution of *Bacillus thuringiensis* in Nature. *H.T. Dulmage* and *K. Aizawa*

Bacteria as Pesticides: Forest Trials. *O.N. Morris*

Bacteria for the Control of Arthropod Vectors of Human and Animal Diseases. *E. West Davidson*

Use of Bacteria and Other Pathogens to Control Insect Pests in China. *Te Ming Su*

VIRAL PESTICIDES

Field Trials with Baculoviruses: Control of Forest Insect Pests. *J. Cunningham*

Control of Insect Pests of Agricultural Importance. *W. Yearian* and *S.T. Young*

An Ecological Approach to the Use of Viral Insect Pathogens for Pest Control. *J.P. Longworth* and *J. Kalmakoff*

Enzootic Virus of *Wiseana* spp. in the Pasture Environment. *J. Kalmakoff* and *A.M. Crawford*

Epizootiology of the Nuclear Polyhedrosis Virus of European Spruce Sawfly with Emphasis on Persistence of Virus Outside the Host. *H.P. Evans* and *P.F. Entwistle*

In Vivo Mass Production of Insect Viruses for Use as Pesticides. *M. Shapiro*

Production of *Autographa californica* Nuclear Polyhedrosis Virus (AcNPV) in Cells from Large Scale Suspension Cultures. *F. Hink*

A New Approach to the Problem of Identifying Baculoviruses. *I.P. Griffith*

FUNGUS PATHOGENS AS PESTICIDES

Persistence of Fungal Insecticides: Influence of Environmental Factors. Present and Future Application. *J. Weiser*

Possible Use of Mycotoxins as Insecticides. *A. Ciegler* and *R. Vesonder*

BIOCONTROL BY PROTOZOA PATHOGENS

Protozoa for Insect Control. *G.G. Wilson*

Prospects of Biological Control of Mosquito Vectors of Filariasis. *J.S. Pillai* and *B. Engber*

MICROBIAL HERBICIDES

Microbial Herbicides: Development and Application. *P.C. Scheepens* and *J.C.J. van Zon*

REGISTRATION OF MICROBIAL PESTICIDES

Regulatory Safety Data Requirements for Registration of Microbial Pesticides. *M.H. Rogoff*

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