

# sip

# newsletter

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## society for invertebrate pathology

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Volume VI, Number 3  
August 1974

### THE OXFORD LABORATORY

A CENTER FOR MARINE AND ESTUARINE INVERTEBRATE PATHOLOGY

During the middle 1950's, "Delaware Bay" or "MSX" disease moved in an unrelenting progression from the decimated oyster bars of Delaware Bay into the highly-productive, highly-vulnerable Chesapeake Bay. The U.S. Fish and Wildlife Service became convinced that federal initiative and close cooperation with state agencies were essential to solve the enigma of this costly epizootic. Accordingly, in 1958, a small U.S. Bureau of Commercial Fisheries laboratory in Annapolis, Maryland, headed by Mr. James B. Engle and engaged primarily in oyster ecology and population dynamics, was directed to undertake a mission-oriented research program covering all aspects of "MSX" and related oyster problems.

An 11-acre site was acquired at Oxford, Maryland, on the Tred Avon River, a tidal estuary of mid-Chesapeake Bay and a modern laboratory complex was constructed, including 13,000 square feet of laboratory space, support facilities, and four ¼-acre experimental ponds. The facility was occupied during the fall of 1960. A multi-disciplinary team of biologists, histologists, parasitologists, and microbiologists was recruited and has been actively engaged ever since in attacking problems of oyster diseases on several fronts. Additionally, programs relating to the general biology and recruitment of both oysters and sea clams have been actively pursued.

Concurrent with mitigation of the "MSX" epizootic and a broadened staff expertise, research was extended to include diseases of Crustacea, fin fishes, and to international surveys related to the import of exotic oyster species. Ultrastructural and virological capabilities were enhanced by the acquisition of a Zeiss 9S electron microscope, with complete preparatory and photographic facilities.

An early decision to support library facilities to the maximum feasible extent has remained in effect and the library now receives about 200 serial publications and includes nearly 7,000 bound volumes.

In 1970 the Bureau of Commercial Fisheries was removed from the Department of the Interior to metamorphose in the U.S. Department of Commerce as the National Marine Fisheries Service, one of the line components of the newly-established National Oceanic and Atmospheric Administration (NOAA). Under NMFS the Oxford Laboratory has been administratively merged with other former Fish and Wildlife Labs to form the Middle Atlantic Coastal



*The Oxford Laboratory with one of the four 1/4-acre ponds in the foreground*

Fisheries Center, with Dr. Carl J. Sindermann as Center Director and Dr. Aaron Rosenfield as Officer in Charge at Oxford and Director of Pathobiology Investigations.

A sampling of published work resulting from in-house and contract research includes: improved histological staining techniques; numerous reviews of marine and estuarine diseases; landmark papers on Minchinia nelsoni (the etiological agent of Delaware Bay disease) and related protozoa; histochemistry of oyster enzymes; neoplasia in mollusks and fish; bacteriological studies of oysters, clams and blue crabs from Chesapeake and Chincoteague Bays; and parasitological studies of pathogenic and saprophytic amoebae from these bays and the New York Bight. Recent electron photo-micrographic studies have supplied evidence that viruses may be a significant factor in marine and estuarine disease.

The laboratory has established a policy of cooperation with state-supported and privately-endowed universities, especially from New York to Virginia, and in continuation of this policy enlarged on-site facilities are being provided for short-term academic use.

*Haskell S. Tubiash  
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## PATHOLOGUE

The entire membership of the Society can take credit for a successful meeting at Tempe which was characterized by a full program of four days with standing room only through the last paper of the last session. The Society is indebted to Patrick Vail and Albert Smith for their superb efforts and encouragement to members to participate in the meeting, and the excellent scheduling which minimized those difficult decisions as to which sessions we could attend. A special bouquet goes to Betty Davidson, who served as local representative for the Society, guided the social schedule, and assured all of us access to the hospitality of the great southwest. I understand that Betty has written a guide for future local representatives for Society meetings--long overdue!

In 1975 the Society plans to meet with the American Institute of Biological Sciences at Oregon State University, 17-22 August. This is an excellent location and date because the Thirteenth Pacific Science Congress will be convened in Vancouver, B.C., Canada 18-30 August 1975. We are expecting to cooperate with the organizers of that Congress to provide emphasis in the Society meetings on invertebrate pathology in the Pacific region. The Society is planning a 1976 meeting in Canada. In a future issue of the NEWSLETTER we can expect to begin developing details for the 1975 and 1976 meetings.

In 1976 several international congresses will be held in North America--the Fifth International Congress of Protozoology, the Fourteenth International Congress of Cell Biology, and the Fifteenth International Congress of Entomology. The precise dates for the first two congresses of 1976 are not available at the moment. The Congress of Entomology will be held in Washington, D.C., August 19-27, 1976. Tentatively the Society meetings will be held the first part of September in 1976. The Council of the Society is aware of the apparent concentration of meetings in North America. The concern of the Council is to assure individual members of the Society that all efforts are being made to anticipate the scheduling of international meetings which will minimize travel costs and assist Society members in planning attendance at more than one meeting in a particular area of the world. A permanent Program Planning Committee is to be appointed by your new President. This Committee will have the responsibility of assisting the Council of the Society and its membership in identifying both locations for meetings of the Society and program emphasis in order to assure continued service of the Society to the international scientific community.

The text of an important resolution passed by Council at its meeting appears in the report of the annual business meeting (p.2). The consensus of the Council is that the Society should assist organizers of symposia for Society meetings in the publication of the proceedings. Further, the Council appreciates its responsibility and that of the Publication Board to identify the Society for Invertebrate Pathology as the focal point for important activities through its annual meetings and special programs sponsored independently or in cooperation with other societies and institutions throughout the world.

I am indebted to the members of Council with whom I have had the pleasure to serve as President these last two years. Of particular importance to all members is the communication of ideas, comments and suggestions for the operation and responsibilities of the Society. Each officer of the Society should be considered an

individual to whom a member can address himself; the Trustees are individuals who can serve as centers of communication in those areas of the world where they are professionally located. In addition to specific matters concerning the function of the Society, communications by individual members to the entire membership and to other scientific professional organizations can be accomplished through the NEWSLETTER. The Editor of the NEWSLETTER regularly exchanges our NEWSLETTER with similar publications from other societies. Please use your NEWSLETTER to meet your professional needs in invertebrate pathology.



## REPORT ON THE ANNUAL BUSINESS MEETING

### SOCIETY FOR INVERTEBRATE PATHOLOGY TEMPE, ARIZONA; JUNE 17, 1974

President John D. Briggs called the meeting to order at 11:00 A.M. and made the following announcements:

The Society has been designated as the Commission for Invertebrate Pathology in the Division of Zoology of the International Union of Biological Sciences.

The program of the International Congress of Parasitology in Munich, August 25-31, 1974 will include two half-day sessions--one on "Pathology of Parasites" (August 28, 9:00-13:00) and one on "Invertebrate Pathology" (August 26, 15:00-18:00).

There will be a meeting of the International Association of Microbiological Societies, with programming on the microorganisms of invertebrates, in Tokyo in September 1974.

SIP will sponsor a program on microbial control and invertebrate pathology at the International Congress of Entomology in 1976. Drs. H. T. Dulmage and W. G. Yendol have agreed to serve as program coordinators.

Representation on the Governing Board of AIBS has been changed from appointed representatives to the elected presidents of member societies in order to strengthen the role of AIBS in representing the interests of its adherent societies. In addition, AIBS has begun to provide additional services to its member societies; for example, access to computer-assisted systems.

The following resolution was passed by the Council of the Society at its meeting of June 16:

*Be it resolved that the publication of proceedings of symposia, workshops, and colloquia organized and held under the auspices of the Society shall be published only with the permission of the Publications Board acting for the Executive Council and by a publisher acceptable to the Board. Furthermore, the Board shall decide on the disposition of the royalties resulting from the sale of the resulting volume, and the published work shall include notification that*

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## SESSION SYNOPSES

VIIITH ANNUAL SIP MEETING  
June, 1974; Tempe, Arizona

### BIOLOGICAL INFORMATION RETRIEVAL

This session covered three different aspects of information storage and retrieval.

- (1) Rigorously structured literature analysis.
- (2) Comprehensive personalized literature search.
- (3) Collection and dissemination of information in a research area.

For the pathologists interested in a very specialized documentation file, Barbara M. Pilley (Glasshouse Crops Research Institute, Littlehampton, Sussex, England) presented a computer-assisted information storage and retrieval system adapted to cope with the Microsporida. This system is based on FAMULUS, the program developed in 1969 by Burton (who also spoke at this session), Russell, and Yerke.

Hilary D. Burton (Data Systems Application Division, National Agricultural Library, Beltsville, Maryland, USA) described the Current Awareness Literature Service of the US Department of Agriculture, and how this secondary information service can help a scientist to obtain bibliographic citations in one or more specific subject areas, by means of computer-based specialized searching of various data bases. This service is now available to invertebrate pathologists affiliated with the US Department of Agriculture, and alternatives are being considered for groups outside USDA.

Marilyn J. Anderson (Institute of Laboratory Animal Resources, National Research Council, Washington, D.C., USA) discussed yet another area of biological information storage and retrieval: the Animal Models and Genetic Stocks Information Exchange Program. The objectives of the Program are to inform comparative pathologists and biologists in general of the various animal models available for research, and to provide data that will assist scientists in selecting and locating a particular strain of animal or model.

The presentations stimulated the interest of the small, but very involved audience. It is hoped that the use of information storage and retrieval systems will become a progressive component of the activities of the Society for Invertebrate Pathology.

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### COMPARATIVE AND INVERTEBRATE PATHOLOGY

The papers given during the session on bacteria concerned Bacillus popilliae, Bacillus thuringiensis, and Serratia marcescens.

Grant St. Julian reported on the metabolic pathways in vegetative and sporulating cells of Bacillus popilliae. He found that no tricarboxylic acid cycle occurs during growth or sporulation of the organism.

L. A. Bulla, Jr., gave a paper on the chemical characterization of the parasporal crystal of Bacillus popilliae. The crystals appear to be glycoprotein and contain no lipid.

C. Y. Kawanishi reported observations on the defensive reaction of larval European chafer cells to Bacillus popilliae. Inflammatory reactions were observed in the midgut epithelium and hemocytes. Hemolymph capsule formation was illustrated by photomicrographs.

C. M. Splittstroesser described germination of Bacillus popilliae as observed by phase contrast microscopy of hemolymph.

J. V. Bell reported problems in an insect rearing program to mass produce the parasite Microplitis croceipes using Heliothis zea larvae as the host. Serratia marcescens was isolated from dead parasites which had emerged from diseased bollworm larvae. It was found that the bacterium was transmitted by the ovipositor of the parasite.

D. W. Murphy reported on the action of delta-endotoxin of Bacillus thuringiensis on insect cells cultivated in vitro.

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### CURRENT RESEARCH ON MICROSPORIDA

The invited paper by Dr. Gary Wilson, Insect Pathology Research Institute, Sault Ste. Marie, Ontario, Canada, entitled "Studies on Nosema fumiferanae, a microsporidan parasite of the spruce budworm Choristoneura fumiferana," provided a review of factors affecting infections and insight into the potential applied use of the pathogen.

The invited paper by Dr. William Kellen, Stored Products Insect Research Branch, USDA-ARS, Fresno, California, entitled "Protozoa of Granivorous Insects" provided an over-all view of this rather large complex of insects and microsporidians.

Dr. D. P. Harlan, Bioenvironmental Insect Control Research Laboratory, USDA, Stoneville, Mississippi, presented a paper entitled, "A microsporidan of Tabanus subsimilis (Diptera: Tabanidae) from Mississippi," describing the pathogen and infection process.

Three of the submitted papers were withdrawn, but the remainder of the time assigned to the session was devoted to an informal discussion of Microsporida.

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SESSION SYNOPSES

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WORKING GROUP ON SAFETY OF MICROBIAL CONTROL AGENTS

There were up to 49 participants at the fourth session of SIP's Working Group on Safety of Microbial Control Agents. As previously, the exchanges emphasized informality. Information tabled included the fact that a species of Lagenidium has been reported from the marine fish, Lampanyctus ritteri, off California and Oregon. This finding, for a representative of a group of phycomycete fungi currently rated highly as candidate biocontrol agents against mosquitoes, raises obvious safety issues. So does recent information on mammalian encephalitozoonosis, in view of the biocontrol potentialities of Microsporida against mosquitoes, blackflies, and even helminth cercariae. Nevertheless, present evidence does not support the likelihood of microsporidians of specifically arthropod pests and disease vectors becoming established in warm-blooded hosts.

There was discussion at Tempe on whether strains of each particular species of candidate microbial control agent must individually pass through a full safety-testing protocol. In an exchange of views on future requirements that the responsible government agencies (such as the U.S. Environmental Protection Agency) might associate with the issue of permits for the field-testing of such organisms, there was widespread agreement that mermithid nematodes, for example, are hardly likely to be regarded as posing risks comparable to those of many viruses and bacteria (although in the latter context it was again pointed out that neither health nor environmental hazards have yet been linked with any entomopathogenic virus). However, it was also generally felt that it would be in the interests of smooth relations and proper liaison for those wishing to conduct such testing to take the initiative in so notifying responsible agencies some months ahead of the target date.

It was agreed that at next year's meeting (Corvallis, Oregon, August 1975) the Working Group will not only provide for the usual informal discussion on the broadest possible basis and with input from the university, industrial and governmental sectors, but also feature a special topic. This will be advertised well in advance, together with the names of speakers invited to present up to three 20-minute review papers.

Dr. Marshall Laird, Research Unit on Vector Pathology  
Memorial University of Newfoundland,  
St. John's, Newfoundland, CANADA

COMPARATIVE AND INVERTEBRATE PATHOLOGY

Of the eight papers presented in Section 23, seven dealt with either basic or practical research on entomogenous fungi.

In the sole paper on yeasts, various species were isolated and identified from the intestines of honey bees and the effect of Terramycin, Fumidil B and 2-4 D on yeast survival was determined (Gilliam et al., USDA).

In experiments with Coelomomyces punctatus, results indicated that zoospores released from sporangia may not be the infective units of this fungus (Federici and Roberts, Boyce Thompson Institute). Blastospores

of Paecilomyces farinosus produced in submerged culture were infective both topically and via ingestion to noctuid larvae (Agudelo, U.C., Berkeley). Resting spores of Entomophthora thaxteriana were produced successfully in submerged culture in a media containing corn syrup and peptone in a salt solution (Gröner and Müller-Kögler, Institut für Biologische Schädlingsbekämpfung, Darmstadt). In scanning electron microscope studies, the mode of infection of Metarrhizium anisopliae on Hylobius pales was discussed. Conidial germination was affected by the presence of bacterial and fungal contaminants on the cuticle (Schabel, U. of Wisc.).

In pest management studies, planting soybeans early and in narrow rows tended to increase the epizootic potential of Spicaria rileyi (Sprenkel et al., U. of N.C., Chapel Hill) and the use of selective fungicides and nutritional elements, as well as raising the spray threshold for citrus rust mite populations, increased the efficiency of Hirsutella thompsonii in citrus groves (McCoy and Allen, U. of Fla., Lake Alfred).

The session was well-attended by invertebrate pathologists and mycologists alike, and was highlighted with excellent discussion among all speakers and the audience.

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SPONTANEOUS DISEASES

C. S. Richards gave two papers; one on genetically determined abnormal pseudobranch growths and one on tissue nodules containing host-specific bacteria--both conditions occurring in freshwater planorbid snails. Other papers were on marine invertebrates. D. V. Lightner and C. T. Fontaine described a mycosis of cultured lobsters, caused by Fusarium sp., which attacks gills and exoskeleton. The fungus causes mortality, especially during molting. D. L. Feigenbaum reported on an extensive survey of parasites in two shrimp of the genus Penaeus. P. T. Johnson described an epidermal and connective-tissue lesion of unknown cause, occurring in blue crabs, Callinectes sapidus, from Delaware Bay. P. A. Cunningham and M. R. Tripp discussed the accumulation of mercury in oysters, Crassostrea virginica. Of tissues sampled, most concentration of mercury was in the gills, least in muscle. M. C. Mix reviewed information on a proliferative ("neoplastic") disease of mussels, Mytilus, and oysters, Ostrea, in Yaquina Bay, Oregon. There were two reports on viruses: J. A. Couch described a nuclear polyhedrosis of pink shrimp, Penaeus duorarum, which perhaps is enhanced by stress, as crowding and exposure to chemicals, and constitutes the first report of a polyhedrosis in arthropods other than insects; C. A. Farley showed electron micrographs of a virus which attacks nuclei of oocytes of oysters, Crassostrea virginica, and which appears to be related to the papovaviruses.

The paper by Narasimhamurti on morphology and sporogony of a coccidian, Aggregata sp., in a cephalopod, Sepia sp. was not presented.

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INVERTEBRATE TISSUE CULTURE AND IN VITRO  
PATHOGEN PRODUCTION

W. F. Hink presented data showing that insect viruses had been produced in various types of suspension cultures up to 1 liter. By reducing the number and levels of various supplements in the medium the cost per larval equivalent approached economic feasibility. R. H. Goodwin, J. R. Adams, and J. L. Vaughn reported on aberrant virus forms resulting from the serial passage of nuclear polyhedrosis viruses in cell cultures. Incomplete virion formation and/or failure to occlude complete virions occurred as early as the 5th passage in cell culture. When the culture fluids were passed in insects, normal polyhedra formation occurred in the second passage. S. R. Webb, J. D. Paschke, G. W. Wagner and W. R. Campbell reported on the replication of mosquito iridescent virus in cell culture. Infection was by viropexis and new virus obtained a membrane from the plasma membrane before release. Infected cells were agglutinated with virus anti-serum. C. Barry and J. L. Fowler reported typical replication of a mosquito cytoplasmic polyhedrosis virus in the Aedes albopictus cell line when inoculated with either infected mosquito larvae homogenates or filtered cell culture supernatants. W. F. Hink and W. A. Ramoska reported isolation of two plaque variants from a supposedly homogenous source of the alfalfa looper NPV. Both variants could be isolated in pure form.

S. S. Sohi and G. G. Wilson reported that some entomogenous protozoa could be grown in insect cell cultures or in cell cultures from vertebrates if the latter were incubated at 28°C rather than 37°C. Both the hemolymph from diseased insects and germinated spores could be used as inoculum. Persistent infections could be maintained in cell lines during cell transfer.

The migration and differentiation of nerve axons and neurosecretory cells in primary cultures of cells from the sea urchin was reported by J. T. Cecil, G. D. Ruggieri and R. F. Nigrelli. Successful primary cultures, containing an intracellular symbiont, from a freshwater pulmonate snail were reported by C. J. Bayne, W. E. Noonan, and A. Owczarzak.

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PICTURE CAPTION (see page 7)

1. (left to right) Gröner and Soper; 2. Falcon; 3. Brooks; 4. Laird; 5. (1. to r.) Kawanishi, Splittstoesser, and Anderson; 6. (1. to r.) Martignoni and Mix; 7. Davidson; 8. (1. to r.) Goodman and Singer; 9. (1. to r.) Unestam, Johnson, and Söderhäll; 10. (1. to r.) Otieno and Sparks; 11. Sorensen; 12. (1. to r.) Undeen and Pilley.

K. J. Marschall and B. Zelazny reported on investigations concerning the transmission of Rhabdionvirus oryctes and the use of this virus as an autocidal means to control Oryctes rhinocerus in Western Samoa. It was determined that the virus is spread mainly by exposure to contaminated feces during mating. Field releases of artificially-infected beetles are being made to determine the efficacy of this method of controlling the coconut beetle. J. S. Robertson reported the work of C. C. Payne on isolation and characterization of a rod-shaped virus from Oryctes rhinocerus. Virus particles had a density in sucrose of 1.18 g/cm<sup>3</sup> and contained eleven proteins. The major nucleic acid component had a sedimentation velocity of 57.2 S and a molecular weight of 8.7 x 10<sup>7</sup>. It was proposed that this virus be placed in the Baculovirus group since the density in CsCl was characteristic of double-stranded DNA and 9% was present as covalently closed circles. D. K. Reed and P. R. DesJardins reported a spherical virus-like particle associated with healthy and diseased citrus red mites. These particles were found only in laboratory cultured mites. Preliminary studies suggest an associated nucleic acid and show that these particles possess antigenic properties.

F. D. Stewart, P. V. Vail, and A. J. Martinez reported that replication of an NPV of Autographa californica in a Trichoplusia ni cell line (TN-368) is similar to that observed in vivo. Occlusion of bundles containing 1-11 virus rods occurred at 24 hours. At this time a fibrous material was noted in the cytoplasm and within the nucleus in membranoid-profiles near the nuclear envelope. It was postulated that these fibers are associated with "finishing" the polyhedra after occlusion is completed. C. P. Bell and G. B. Orlob reported on differences in immunogenicity when intact polyhedra and/or polyhedron protein of an NPV of Trichoplusia ni were used as antigen. Antiserum to polyhedron protein gave rise to only one precipitin band upon reaction with varying concentrations of either protein or solubilized polyhedra but antiserum to intact PIB produced single or multiple bands dependent upon the purity and concentration of antigen. R. A. DiCapua and P. W. Norton reported on studies which demonstrated cross reactivity of antisera to viral components of NPV's of Porthetria dispar and Neodiprion sertifer. Antisera to both polyhedron protein and nucleocapsid protein of N. sertifer NPV would inhibit hemagglutination of chicken erythrocytes by polyhedron protein of P. dispar NPV. Interspecies and intraspecies cross-reactivity of intact PIB, polyhedron protein and nucleocapsid protein were also demonstrated by immunodiffusion. I. Gard reported work concerning the attraction of wild insect populations to virus-contaminated foci for the dissemination of insect viruses on crops. Virus was observed at least 250 meters from the contamination point with a maximum of 50% of the leaf samples containing virus. Higher rates of disseminated virus could be correlated with wind direction.

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## ACTIVITIES REPORT, DIVISION ON MICROSPORIDA

At the recent AIBS meetings in Tempe, Arizona, the Division on Microsporida held a very successful meeting during which many matters of particular significance to the objectives of the Division were discussed. Following presentation of the Secretary's report, a report on means of improving the operational activities of the Division was presented by W. Brooks. V. Sprague announced the recent death of Richard Weisenberg, an eminent microsporidologist and honorary member of the SIP. New officers of the Division were elected and the executive committee for 1974-76 consists of the following:

Chairman: E. U. Canning  
Vice Chairman: J. E. Henry  
Secretary: W. M. Brooks  
Council Member: J. P. Kramer  
Council Member: E. Vivier

Two new standing committees were also established and, along with previously established committees, include:

Type Slide Collection: B. W. Erickson, Jr., Chairman  
Data Storage and Retrieval: B. M. Pilley, Chairman  
Atlas of Electron Micrographs: A. Cali, Chairman  
Culture Storage and Index: J. V. Maddox, Chairman

The division is particularly pleased with the efforts of B. Erickson who presented a set of expanded guidelines concerning deposition of slide materials in the International Protozoan Type Slide Collection of the Smithsonian Institution. A list of recently deposited slides was also presented.

The highlight of the divisional program was a very stimulating presentation on microsporidan taxonomy by E. I. Hazard.

W. M. Brooks, Secretary  
Division on Microsporida

## SIP OFFICERS, COMMITTEE MEMBERS, AND REPRESENTATIVES

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J. E. Henry, Vice Chairman  
W. M. Brooks, Secretary  
J. P. Kramer, Council Member  
E. Vivier, Council Member

## GLOSSARY COMMITTEE MEETING Tempe, Arizona, June 19, 1974

The Editorial Committee of the Abridged Glossary of Terms Used in Invertebrate Pathology (AGTUIP) met for an informal discussion during the Annual Meeting of the Society for Invertebrate Pathology and AIBS Meeting at Arizona State University. Present were the following members: Thomas C. Cheng, John C. Harshbarger, Phyllis T. Johnson, Mauro E. Martignoni, Michael C. Mix, Harold Rossmore, and Albert K. Sparks. This is a brief account of the items considered by those present.

(1) Some of the members voiced the opinion that occasionally it might be appropriate to list in the Glossary certain terms not restricted to invertebrate pathology. In such cases, as stated in the "Guidelines for Editorial Committee Members," the definitions or explanations should relate to the situation as found in invertebrates, and should be directed particularly to the use of the terms in invertebrate pathology. An example in the present (second) edition of the Glossary is "enterolithiasis," which is listed with a general definition and a specific definition (honey bee pathology).

(2) Some members inquired about the first-time publication of neologisms or neologies in the Glossary. It is the Glossary Editor's opinion that the Glossary is not the most ideal proving ground for linguistic pyrotechnics, and that such neologisms should be published first in an appropriate scientific periodical. Later, if the Committee so decides, such newly coined (and published) terms may be listed in the Glossary. There appeared to be no clear consensus on this subject at this initial Committee meeting. Certainly, this question of neologisms can be solved by the Committee's decision, should a specific case arise during preparation of the third edition.

(3) Each Committee member is to submit a list of additional terms to be included in the Glossary to the Editor, Mauro E. Martignoni. Please note that the terms only (not the definitions) need be submitted at this time. Target date for these lists is the beginning of December of this year, 1974. The combined list will then be sent to each Committee member for a final decision with a request for definitions. The Editor announced that the first draft printout of the third edition should be available for distribution to the Committee at the end of 1975.

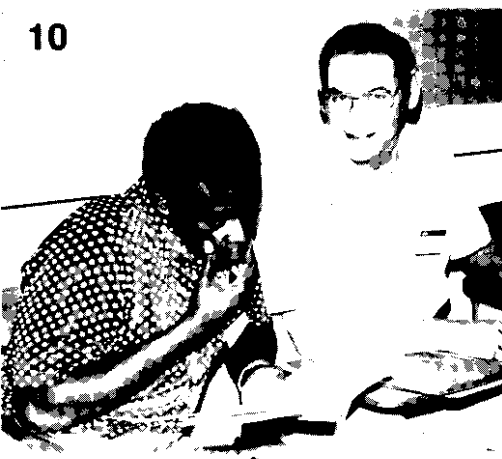
Submission to the Glossary may be made by members of the Society not on the Glossary Committee. In addition, comments and criticisms are solicited from the Society membership.

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## GLOBAL DISTRIBUTION OF THE GENUS BACILLUS

Dr. Samuel Singer is interested in receiving isolates of Bacillus spp. known to have been associated with pathologies of invertebrate animals. Pure cultures or dry specimens of invertebrates can be sent to:

Dr. Samuel Singer, Biological Sciences, Western Illinois University, Macomb, Illinois, 61455, USA



## WORKING GROUP ON SAFETY OF MICROBIAL CONTROL AGENTS

The documents repository of the SIP Working Group on the Safety of Microbial Control Agents now includes:

Present regulatory situation of insect viruses in the United States, Canada, and other countries.

*Dr. Reto Engler, EPA, Washington, D.C., USA*

Laboratory safety at the Center for Disease Control  
*Center for Disease Control, Atlanta, Georgia, USA*

Screening tests for toxicity on *Beauveria bassiana*  
*Nutrilit Products, Inc., Lakeview, California, USA*

Conference on the safety of biological agents for arthropod control  
*WHO, VBC, Geneva, Switzerland*

Susceptibility of aquatic vertebrates and invertebrates to the infective stage of the mosquito nematode, *Reesimermis nielsenii*  
*Dr. Carlo Ignofio, USDA/ARS, Columbia, Missouri, USA*

Environmental impact of insect control by microorganisms  
*Dr. M. Laird, Memorial University of Newfoundland, St. John's, Newfoundland, Canada*

Considerations on the use of viruses for the control of insect pests and disease vectors  
*Virus Diseases Unit, WHO, Geneva, Switzerland*

A production control procedure for nucleopolyhedrosis virus preparations  
*Dr. M. E. Martignoni, USDA/Forest Service, Corvallis, Oregon, USA*

*Nosema algerae*, a mosquito microsporidan in mammalian kidney cell tissue culture  
*Dr. A. Undeen, University of Illinois, Urbana, Illinois USA*

Requests for these documents may be addressed to:

*Dr. Marshall Laird, Chairman  
SIP Working Group on Safety of Microbial Control Agents  
Research Unit on Vector Pathology  
Memorial University of Newfoundland  
St. John's, Newfoundland, CANADA*

## SECOND INTERNATIONAL CRAYFISH SYMPOSIUM

The Second International Crayfish Symposium was held at the Louisiana State University at Baton Rouge, April 7-11, 1974. The scientific papers presented at the Symposium provide an overview of the crayfish situation internationally, commercial crayfish production, propagation of the crayfish in the laboratory, ecology, taxonomy, life history, and physiology of the crayfish.

Inquiries may be addressed to:

*Dr. James W. Avault, Jr.  
249 Agriculture Center  
Louisiana State University  
Baton Rouge, Louisiana 70803 USA*

## SUSTAINING MEMBERS

Abbott Laboratories is the most recent addition to sustaining industrial membership of the Society for Invertebrate Pathology.

## PUBLICATIONS

A Report of Diagnoses of Diseased Insects from 1962-72 has been published in *Hilgardia*, 42:8, December 1973. This publication is from the diagnostic laboratory of the Department of Entomological Science, University of California, Berkeley.

## CHANGES OF ADDRESS

All changes of address for Society membership or Journal subscriptions should be forwarded to:

*Dr. Gordon R. Stairs  
Department of Entomology  
The Ohio State University  
1735 Neil Avenue  
Columbus, Ohio 43210*

## POSITION WANTED

Comparative physiologist-immunologist. Ph.D. August 1974. Interested in teaching/research. Teaching experience at university level. Research experience includes TEM and SEM of biological techniques for the analysis of proteins and carbohydrates. Publications and curriculum vitae upon request.

*John I. Stagner  
601 Science II  
Department of Zoology  
and Entomology  
Iowa State University  
Ames, Iowa 50010*

\* \* \* \* \*

Ph.D., 1970, University of California; experienced in invertebrate pathology, microbiology, virus characterization and biochemistry; tissue culture and pest control. Please contact: *Jorge Leong, 6654 Curran Road, New Orleans, Louisiana, 70126, USA; Phone: (504) 241-8683*

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Report of the Annual Business Meeting  
Continued from page 2

*it is published under the auspices of the Society for Invertebrate Pathology. Finally, the persons responsible for editing the manuscript shall carry out this task in accordance with the customary ethical practices relative to this process.*

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Those officers' reports which have not already been published in the NEWSLETTER will appear in the next issue.

\* \* \* \* \*

The meeting was adjourned by the new president, A. M. Heimpel, at 12:05 P.M.

*Marion A. Brooks, Secretary*

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## SIP NEWSLETTER

*Beatrice A. Weaver, Editor  
c/o Department of Entomology  
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# AIBS At The Crossroads— History and Future for U.S. Biology

**Robert W. Krauss**

# AIBS At The Crossroads— History and Future for U.S. Biology

Robert W. Krauss

It is useful from time to time to assess the productivity and accomplishments of organizations. The American Institute of Biological Sciences is no exception. The accomplishments of any society result from the free service to it by its members plus the additional assistance it is able to attract by judicious expenditure of its resources. In most scientific societies, by far the greatest input is free. The major output is the journal, the authorship of which is unremunerated effort by the members. Publication costs are even paid by dues which represent the primary expenditure. The AIBS differs from the sub-disciplines of biology in that a greater part of the activity of the organization is paid for by dues and is handled by professionals under the direction of elected officers. The AIBS returns to the biological community services other than its journal, many of which are poorly perceived by the membership. To evaluate the special role of the AIBS and to chart its future, a "Summit Meeting" was held in Washington, D.C., on 6 and 7 December 1973. That meeting was attended by the presidents or chief executive officers of 37 of the Adherent Societies of the AIBS plus the presidents of a number of societies who should be Adherents. Also in attendance were three of the past-presidents of the AIBS. The participants reviewed the operations of the AIBS since its inception some 26 years ago, and gave counsel and advice for its future course. At the conclusion of the meeting, it was the consensus that the information presented to the presidents should be of great interest to the membership. This article recapitulates that meeting and seeks to acquaint the membership with actions that have been taken by the AIBS for their benefit.

To many members, the apparent return for the annual dues to the AIBS are copies of *BioScience* and the organi-

The author is Dean of the College of Science, Oregon State University, Corvallis, OR 97331, and was President of the AIBS in 1973.

zation of scientific meetings during the course of the year. Although these functions are important for the AIBS, they are only the visible tip of the iceberg. Much takes place which is often completely unknown or only partially understood by the membership. Since its inception by a group of senior biologists working with strong support from the National Academy of Sciences, the AIBS has served to promote the welfare of the science of biology and to realize the aspirations of biologists in achieving the maximum support and productivity for their science. The strength and influence which the AIBS has been able to develop has no other goal than to benefit the biological scientists of the nation in pursuit of their scientific goals. To a very large extent, the prestige, visibility, and health of the AIBS as the national biological society will determine the attention which is paid to biology by society at large, by its representatives in Washington, and by state and local governments. Scientists are beginning to recognize that there is an increasing struggle for survival by various segments of society. Any group that does not make clear its value to the national welfare rapidly becomes neglected and is ignored in the development of national policy.

There is currently a crisis for all of science! Few would deny the fact that there has been a slackening of the influence of science in both executive and legislative branches of government. Scientists have solutions to many problems and their voices are scarcely heard. There are many instances in which additional research would fill gaps in our knowledge—knowledge that is fundamental to the solution of many ills of society. In Washington there is agreement among the major scientific societies that there must be an increased effort to make the nation aware of the value of science. Congress and the Federal Government do look to the scientific societies for advice. The American Chemical Society, The American

Institute of Physics, The American Mathematical Society, and the National Society of Professional Engineers are taking major steps to improve their negotiating positions in Washington. It is absolutely crucial that the AIBS take similar action or fundamental policy decisions will be denied adequate biological input.

To those who are close to the Washington scene, it is very clear that the Washington switchboard has a plug labeled *Biology*. It is essential that there be a qualified and unified response to questions directed to this line on the switchboard. It is the function of the AIBS to channel information between scientists and the Federal Government in order to ensure maximum use of their capabilities. More and more frequently the AIBS is being called upon to discuss matters of science policy with representatives in Washington. More and more it is asked to identify experts from its various subdisciplines to give counsel and testimony in the national interest. It is crucial that the AIBS continue to increase its visibility on Capitol Hill and to the executive branch. This is not a visibility that is quickly created and it is a presence which must be maintained through many Administrations and many Congresses.

Among the scientific societies, the most successful with the Federal Government has been the American Chemical Society in whose Board Rooms the AIBS "Summit Meeting" was held. Through the American Chemical Society, our sister science has attracted a remarkable amount of governmental support. It has achieved a great many things for the various subdisciplines of chemistry that they could not have done individually. Professionally, the lot of chemists is excellent. They have achieved a position of respect in Congress and have an effective full-time political action staff working constantly for their benefit. Chemists know that a strong, united professional society is essential for sur-

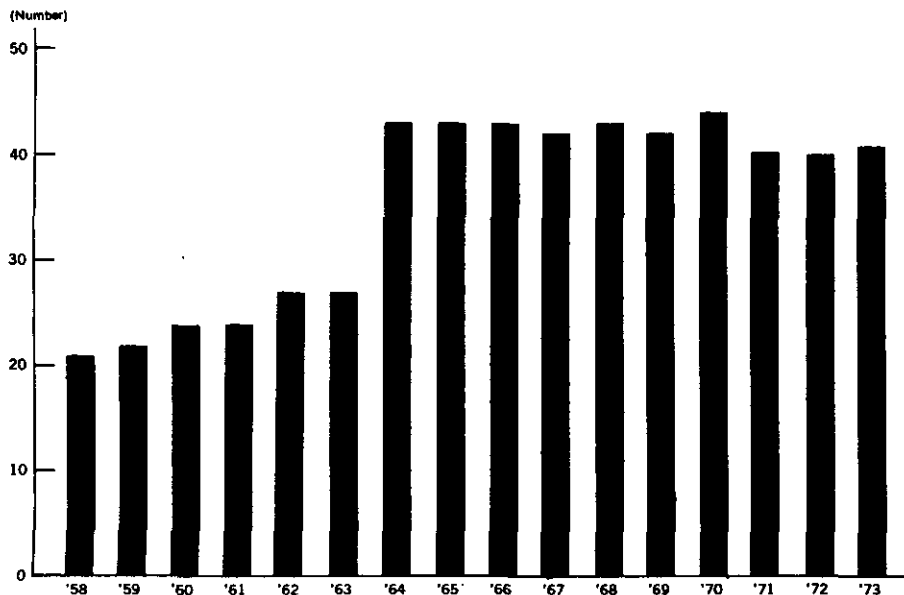


Fig. 1. Adherent Society membership in the AIBS between the years 1958 and 1973.

vival in the modern political context and they are willing to contribute significant sums of money to its support—not just for the scientific journals they receive, but for the central headquarters which represents them. Dues in the American Chemical Society are several times larger than those in the AIBS and have been so for many years.

Let us review briefly some statistics relating to the structure of biology in the United States. There are between 80,000 and 100,000 professional biologists. These scientists are contributing to the creation and propagation of biological knowledge by teaching and research. The collective membership of the societies, which are currently adherent to the AIBS, amount to some 60,000. There are overlapping memberships and it is extremely difficult to arrive at a precise figure. Nevertheless, a major portion of professional biologists in the United States through membership in the 40 Adherent Societies do, in fact, reside within the AIBS. At the present time the bill for the operation of the AIBS is paid primarily by the dues of 12,000 dedicated and generally senior biologists who recognize the importance of a national biological society. This core of members is really responsible for carrying the remainder of the biological community. The Adherent Societies pay comparatively small dues. There was a time, shortly after its inception, when membership in an Adherent Society was sufficient to insure membership in the AIBS, and each member of such an affiliated society was assessed \$.50 for that privi-

lege. This, of course, was a ridiculously small amount, but the mechanism of having all members of the subdisciplines of biology automatically members of the AIBS is a goal which must some day be realized. If biology is to be a national force, it is inevitable that its practitioners must accept a greater financial responsibility.

Some statistics concerning the current membership are helpful. Fig. 1 illustrates the numbers of the subdisciplinary societies currently enrolled as Adherents of the AIBS. Each of these societies has a representative on the AIBS Governing Board. The large increase in societies after 1962 is the result of the constitutional change at that time. Fig. 2 represents the individual membership in the AIBS. It shows a large increase after 1962 and an essentially static situation to date. Further comments concerning the reorganization in 1962 should be useful at this point.

In 1962, the National Science Foundation and various other government agencies questioned the logic of the AIBS as a representative of biology when membership dues were only \$.50, and when large federal expenditures for the benefit of the members were being made. Without going into details, which have been presented in earlier issues of *BioScience* and elsewhere, biology was forced to make a major change in its national organization. At a meeting of biological society presidents and senior biologists from throughout the nation, a new constitution for the AIBS was ratified which provided for financing

through individual memberships which are now a major source of discretionary income. Also at that time, the AIBS accepted the responsibility for repayment of a debt to the National Science Foundation which had resulted from the use of Foundation funds for biological programs which had not been specifically authorized. Although all of the programs that the AIBS had undertaken with these funds were scientifically sound and to the benefit of biology, a major error had been committed in not obtaining prior approval. This major financial setback for the AIBS was probably a blessing in disguise in that it made biologists recognize that they could no longer continue as beneficiaries of a large national organization without being willing to accept the responsibility for its financial support and management. Fig. 3 shows the progress toward elimination of that debt. Biologists can be proud of the responsible way in which they have met their obligations. The drain on AIBS resources which could have funded many programs has been regrettable but the debt is no longer a threat to its operations.

The two major sources of income to the AIBS are dues from individual members and Adherent Societies, and from overhead obtained on the grants and contracts which the AIBS administers for the benefit of biology (Fig. 4). It is obvious that even now, in spite of the dedicated allegiance of some 12,000 members, a relatively small amount of the total AIBS income is obtained from

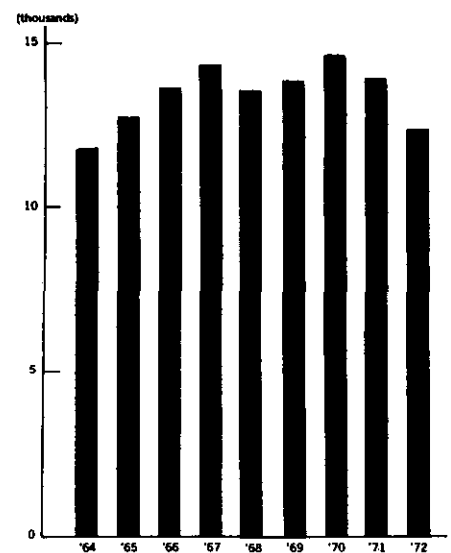


Fig. 2. Individual membership in the AIBS between the years 1964 and 1973. This class of membership was established in 1963.

dues. The remainder comes from overhead from grants and contracts. Some brief discussion of the nature of the grant and contract activity should correct some misconceptions.

The AIBS contracts with various federal agencies for numerous kinds of services. These are designed to involve larger numbers of biologists in the decision-making processes of government. The majority of AIBS grants and contracts are for the assembling of advisory boards, panels, symposia, workshops, visiting teams, and other activities which bring a flow of biological expertise to the Government or to make biologists aware of governmental problems that are associated with national goals. Thousands of biologists have participated in such meetings and much of the national biological policy has been delineated during these sessions. The AIBS in turn has been able to pay travel, and in some cases, honoraria to the biologists participating in these conferences. Funds have also been obtained by the AIBS for the launching of projects such as the Flora North America and the BioSciences Curriculum Study which resulted in the BSCS textbooks. It has also made possible participation of biologists in numerous international meetings and conferences. In no case have the grants and contracts obtained by the AIBS been used for biological research per se. Funds have been channeled back to the biological community to enlarge the participation of biologists in just those areas of government to which biologists themselves are demanding access.

Fig. 5 illustrates the grant and contract activity of the AIBS since its inception. During this period an excess of \$16 million has been obtained from the Federal Government and private foundations and returned to the biological community. During the last 2 years, almost 1,000 biologists were supported in activities of crucial concern to biology. These scientists have been selected from the Adherent Societies and are identified by recommendations of the major subdisciplines. This is obviously a return to the biological community many times in excess of the dues paid in. By the crassest standards, it is a high return on the investment of membership dues. Of greatest importance, however, is the fact that this represents involvement of biologists in national policy—an involvement which is too frequently unknown to biologists-at-large. These funds, of

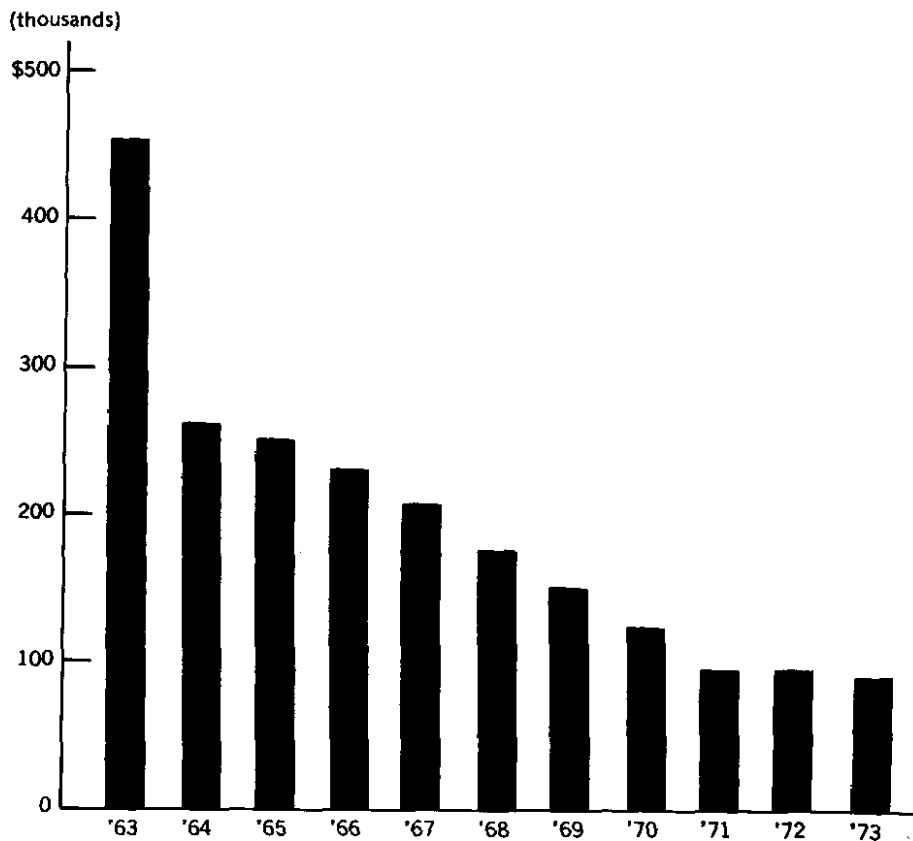


Fig. 3. The record of AIBS repayment of indebtedness to the National Science Foundation between the years 1963 and 1973. The bars represent remaining indebtedness at the end of each year.

course, have been secured for biology from the involvement with government by the AIBS staff and could not have been obtained without respect for their integrity and dedication by the government and private agencies with which they have dealt. Figs. 6 and 7 illustrate the total disbursements in terms of honoraria and travel paid to biologists since the inception of the AIBS. The remaining funds from grants and contracts were used for the payment of publication costs, printing, preparation of reports, and for various other expenses. Also included in the total is overhead which is available to the AIBS to assist it in maintaining those facilities necessary to carry out the grants and contracts. Without that overhead, the AIBS could not maintain its biological programs with anything like the magnitude it has achieved.

It is worth mentioning that since the reorganization in 1962, the federal auditing agencies which have watched the AIBS books very closely, have given operations a clean bill of health. It is of special credit to the management of the AIBS in the persons of its Business Manager, Mr. Charles Ossola, and its Director, Dr. John Olive, that not a single disallowance of expenses has been

claimed by the Federal Government since 1963. There is at this time no financial operation in Washington that has more strict management and rigorous procedures for accounting and auditing than does the AIBS.

The formulation of AIBS policy is often a source of discussion. On careful scrutiny, it is an excellently balanced system with a Governing Board made up of the representatives of each of the Adherent Societies plus 12 members-at-large elected by the individual membership. Although the financial support to the AIBS from Adherent Societies has been small, they control the development of policy. The AIBS depends on the various subdisciplines in order that it shall have integrity in representing all of biology. It is nevertheless interesting to note that although individuals pay the major bills for the AIBS, the management rests securely in the hands of the Adherent Societies. It is the Adherent Societies, through their membership on the Board, that determine the policies of the AIBS, review its budget, and instruct the Executive Committee and staff. The members-at-large serve to keep the broad view of biology-at-large a prominent factor in all decisions. It is some-

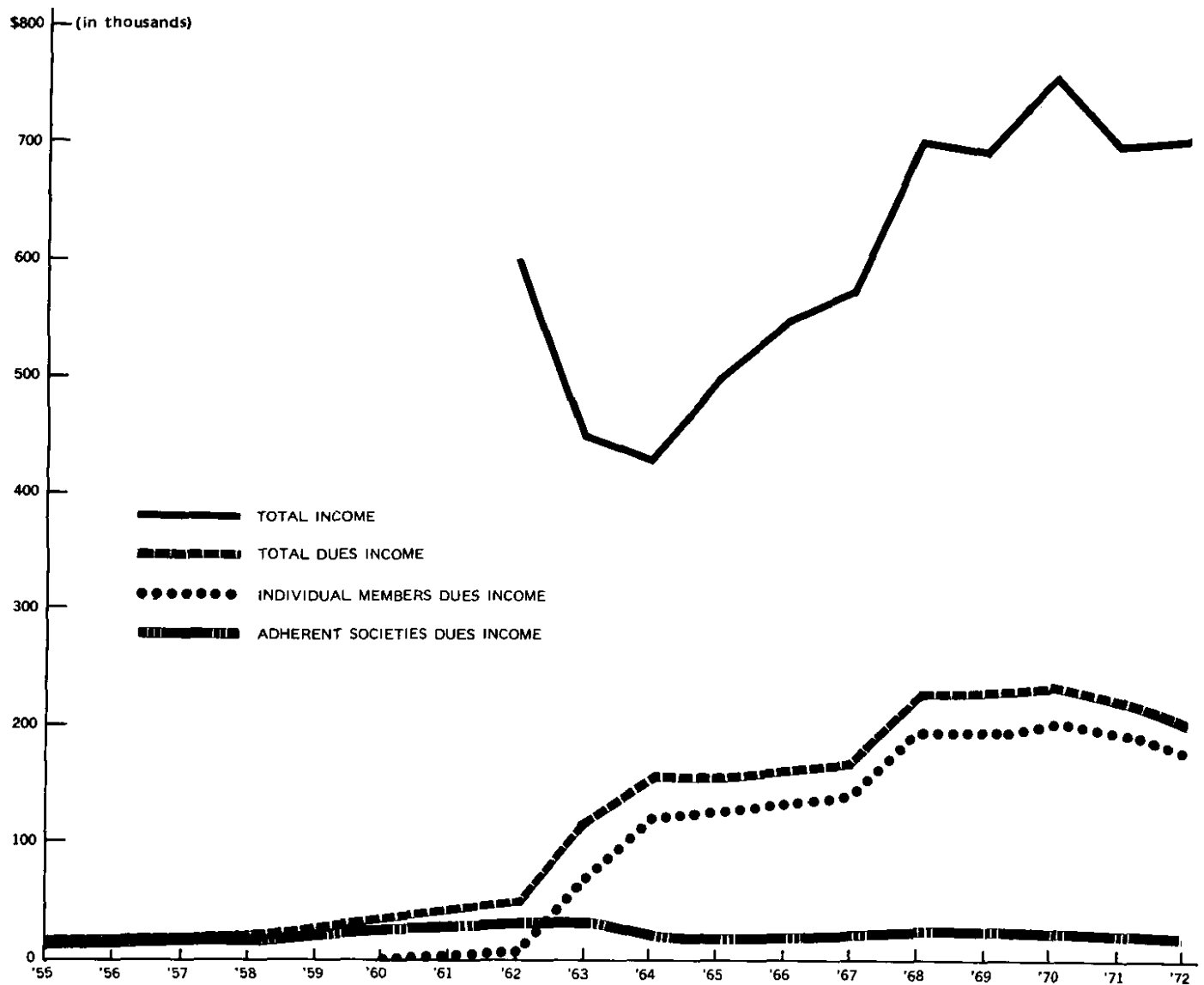


Fig. 4. Sources of discretionary income available to the AIBS from 1955 to 1972. Records of total income are not complete prior to 1962 because of incomplete overhead recovery figures. The difference between total dues income and total income represents overhead recovery from grants and contracts.

times discouraging to hear disgruntled Adherent Societies referring to the AIBS as "they" rather than as "us." They already have, in fact, control of the AIBS. They elect its president and have authority to change policy in any direction that appears to be beneficial to the biologist. Biologists must understand that the AIBS is largely in the hands of their subdisciplinary societies. Therefore, it is vital that the channels of communication between the societies and the AIBS be open, candid, and cordial.

The Governing Board has several meetings each year. To initiate policies and programs it is subdivided into study sections so that new incentives can be brought to the total Board for action. In recent years, the Governing Board has operated with increasing effectiveness, devoting more and more of its energies

to external problems facing biology rather than to the difficult task of past years for assuring financial survival and improving internal structure.

A major activity of the AIBS is its action in the Washington political arena. It is essential to keep in mind that the AIBS is not legally a lobbying organization. As a scientific society it can speak to Congress and to the executive branch, especially to provide up-to-date information and sources of expertise for the solution of national problems and for development of national science policy. It is important not to forget that the Congress and the executive branch, as well as most governmental agencies, recognize comparatively few fields of science. They recognize principally chemistry, physics, mathematics, biology, and engineering. The national organizations representing each of these

branches are the first to be contacted when there is a need for information or assistance. As contacts are increased in the federal bureaucracy it is more likely for the key persons to reach the AIBS. It is the development of this kind of rapport and the generation of respect for our scientific expertise that is time-consuming, expensive, and indispensable.

It is not always advisable to discuss at great length the activities of the AIBS staff, Executive Committee, and officers on the Washington scene. We have not been anxious to proclaim our accomplishments and document the ways in which we have helped the biologists for obvious reasons. Not only can this be considered self-serving, but documentation of such information can often defeat our purposes. However, it may be useful to list some examples of what the AIBS has done within the past 2 years:

1. The AIBS was invited to present the views of biology at a White House conference concerning the future of biological sciences in the nation. These discussions, which were followed by correspondence and communications to the President's staff, served to develop our concern about the abolition of training grants, the lack of sufficient funding for renewable resources research, and the absence of adequate agricultural support in the time when a food crisis was upon us. We were also able to discuss our apprehension about the real and growing world population crisis, the absence of U.S. leadership in this area, and the need for sound biological advice.

2. Discussions were held on Capitol Hill with Representative Mosher, ranking Republican member of the Committee on Science and Astronautics of the House. They were also pursued with members of his staff. At these meetings, the Public Responsibilities Committee made clear to Mr. Mosher our concern about numerous problems. The damage caused by the reduction of the Hatch Act funds and the reduction of support to the Agricultural Experiment Stations was emphasized. Development of laws regarding the abolition of phosphate detergents were reviewed and our concern for a logical solution to pollution of lakes and rivers of the nation was voiced. We also discussed the loss of graduate training grants, and the loss of support for biological science in cuts from the National Science Foundation budget. Concern was expressed for the overly applied nature of some of the research in RANN. The major contributions that basic research has made to the welfare of the nation in the past were reviewed.

3. Discussions were held with Senator Packwood—specifically about the Alaskan Pipeline. In the past, the AIBS has supported the vigorous action of Senators Packwood and Kennedy for improvement in population control mechanisms. In the last analysis, the burgeoning planetary population with its increasing dependence upon all renewable resources as well as the resultant exploitation of fossil energy is the primary factor contributing to the current energy crisis. Only biologists seem to comprehend this. A world population of reasonable dimensions would need have no fear of an energy or materials crisis. This fact is dimly perceived by most of our representatives in Congress.

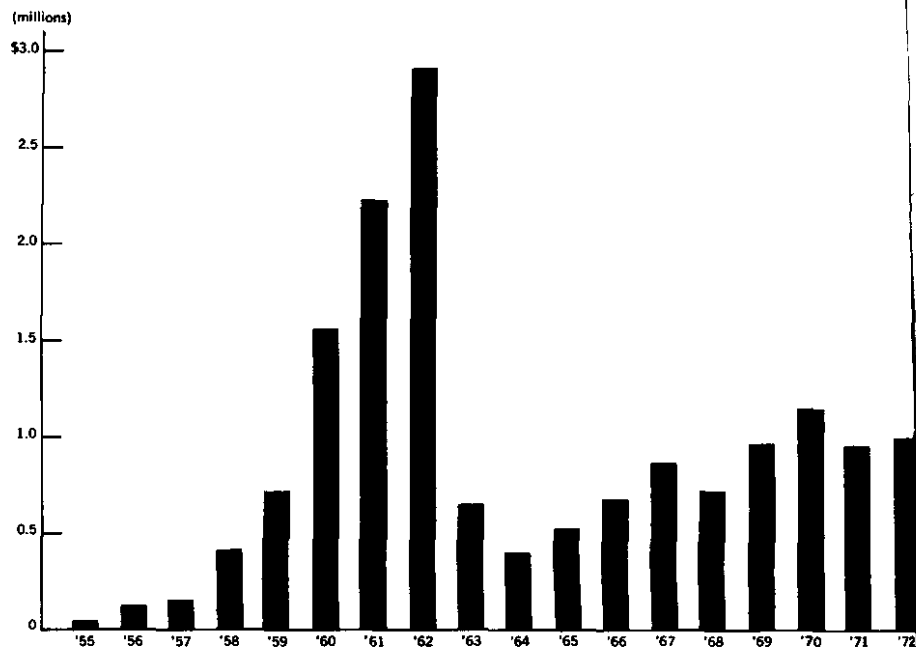


Fig. 5. AIBS grant and contract disbursements from 1955 to 1972. Bars represent total expenditures from public and private sources for each year. Total disbursements for the period amount to \$16,221,800.

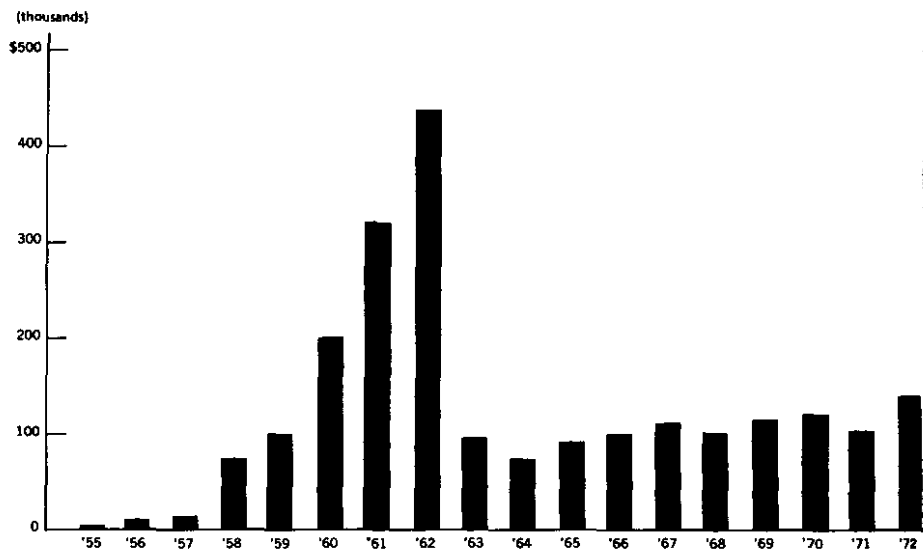


Fig. 6. Payments of honoraria to biologists for services to advisory panels, workshops, committees, and symposia from funds made available through grants and contracts during the period 1955-1972. Total payments for the period amount to \$2,389,800.

4. Concern was expressed to the White House and to Congress about the disbalance in the National Science Board. In the name of biology, the AIBS protested the insufficient number of biologists on the Board of the National Science Foundation. It addressed letters to President Nixon and, through its State Public Responsibilities officers, contacted numerous Senators and Congressmen in support of in-

creased biological input to national science policy.

5. Discussions were held with the Associate Director for Research at the National Science Foundation concerning the selection of the new Director of the Division of Biological and Medical Sciences to succeed Dr. Harvey Carlson.

6. The Foundation was advised of the importance of the Flora of North

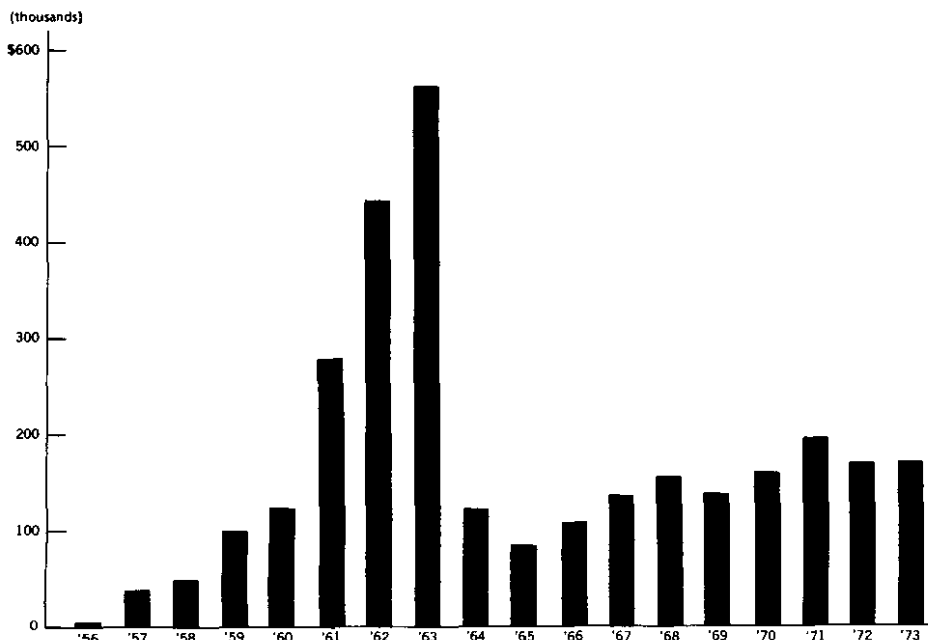


Fig. 7. Travel reimbursements to biologists for attendance at panels, workshops, committees, and scientific meetings during the period 1956-1973. Total reimbursements for the period amount to \$3,246,200.

America—a project which the AIBS supported and managed initially. Recommendations were made whereby Flora of North America could again resume its activities and play an important role in the development of data retrieval systems for biology. The great need for biological data retrieval systems was emphasized and mention was made of the fact that millions of dollars of NSF money were devoted to the development of a similar system for the American Chemical Society.

7. The effectiveness of the Washington Public Responsibilities Committee has been increased by creating Public Responsibility Officers in each of the states to deal directly with members of Congress who are formulating science policy and who are voting on bills of concern to biologists. At this time, there is a representative in each state who has the official AIBS sanction to represent the Institute to Senators and House members as well as to governors and state legislators. These individuals have served magnificently in bringing to the attention of Congress numerous problems which were of concern to the biological community.

8. A direct approach to President Nixon was made—an approach which was supported by the State Public Responsibilities Officers—to the effect that the time had come for scientific societies to have a voice in the development of science policy. This should provide

more direct access to the “scientist at the bench.” As a result, Dr. Guyford Stever, Director of the National Science Foundation, invited the presidents of major scientific societies including the American Chemical Society, the AIBS, and the American Institute of Physics, to form an advisory council in Washington so that a direct line to the scientific community could be maintained in developing national policies.

9. Dr. Russell Drew, Director of the new Science and Technology Policy Office at the National Science Foundation, met with the Executive Committee of the American Institute of Biological Sciences to discuss the role of his office. Very strong representations were made to the effect that biologists should be represented on Dr. Drew’s staff. As a result, the AIBS has been asked to identify a prominent biologist to serve in this capacity.

10. As members of the Committee of Scientific Society Presidents, Dr. Sprugel, myself, and Dr. Olive visited with Vice-President Gerald Ford to express our concern with the development of new avenues for science to contribute to the solution of national problems. At this time, we demonstrated that basic science had contributed enormously to the welfare of the United States and we wished “to do it more effectively in the future.” We pointed out that we depend upon the ingenuity of individuals like Vice-President Ford to create the mechan-

isms whereby science would better interface with government.

The officers of the AIBS are not yet satisfied with the progress that has been made. Consequently, new steps are being taken to increase the flow of communication between the membership and the AIBS Headquarters, and between the AIBS and the Government. These can be outlined briefly as follows:

1. The Executive Committee has carved out a position in the current budget for an Associate Director of the AIBS for Public Responsibilities and to enhance liaison with the Adherent Societies.

2. The Governing Board has amended the Constitution of the AIBS to seat the presidents of Adherent Societies on the Governing Board. Such a change guarantees that the Governing Board representatives will either be the presidents-elect, presidents, or immediate past presidents of each of the Adherent Societies plus members-at-large. This will assure that the top level of Adherent Society management will determine the policies of the AIBS. It will inevitably increase the degree of communication to the subdisciplines and should provide more responsive and strong guidance for the Institute.

3. The editor of *BioScience* has been instructed to double the pages dealing with public affairs. He has also been instructed to eliminate research reports from the journal, which will in the future carry only articles of broad scientific interest. He will develop the journal to add the kind of content found in *Chemical and Engineering News* published by the American Chemical Society.

4. A new science writer has been hired to deal with biology on the Washington scene. She will serve in a new Public Responsibilities Department which will report more effectively to the members of the societies the positions that are being taken on important national issues.

5. A new AIBS Directory of Bioscience Departments is currently underway under the editorship of Dr. Peter Gray. This Directory should be available to the membership in the coming year.

6. The AIBS is asking the presidents of societies to support an appeal for increased membership in the AIBS. Ultimately, the Institute can function most effectively when all members of biological societies which are adherent to it are also members of the AIBS.

There is no question that the AIBS is at a crossroads. We are not in a financial crisis, but our membership is not increasing at the rate it must if we are to have the financial capability to represent biology. Furthermore, many societies which are not adherent members must be persuaded to join. At present, there are 40 Adherent Societies in the AIBS—at least 20 more should join within the next 2 years. Efforts will be made to persuade these societies to take such action promptly. For this we are counting on the help of the current Adherent Society presidents. United, the biologists of the nation are a potent

force for increasing the understanding of the role of man in the universe. They will be agents for social progress and the scientific advances which will enhance the welfare of mankind both in this nation and abroad. Divided, the many subdisciplinary societies can never hope to have the influence on the National Science Policy that is so vital. In the AIBS a structure exists for a united effort with democratic mechanisms for establishing policy. It must be used effectively. We are confidently anticipating that biologists will recognize this so that we may move forward with the Adherent Societies—fighting battles

for each of them, for groups of them, and for all of them during the months and years ahead.

It is inevitable that the AIBS must enlarge its membership and its influence. The speed with which this is accomplished will depend upon the support, enthusiasm, and understanding of political realities by the presidents of the Adherent Societies, their officers, and their members who represent the grass-roots of biology. The "scientist at the bench" must have representation in the development of science policy both in national and local government.



Reprinted from  
*BioScience* 24(4): 205-211  
published by  
AMERICAN INSTITUTE OF BIOLOGICAL SCIENCES  
1401 Wilson Boulevard  
Arlington, Virginia 22209  
Telephone: (703) 527-6776