1972 A Year of Expansion

1972 Annual Report
Pharmaceutical Manufacturers Association Foundation, Inc.

Contents

1972 A Year of Expansion

The 1971 decision of the Board of Directors to increase the level of funds directed to educational support was implemented in substantial fashion during 1972. Two priority educational programs which were developed earlier and activated this year are consistent with the goal of directing 80% of future support towards educational programs and the remaining 20% for research.

Since 1970, the proportion of the Foundation's funds placed into educational programs has shifted from six to nearly seven of every ten dollars awarded. During the next three to five years as existing educational programs are expanded and new ones added, it is anticipated that the 80%-20% relationship of education to research support will be realized.

Direct educational support moved to the fore in the PMA Foundation's plans on the premise that such support represents a more lasting way for the Foundation to contribute to the future of the biomedical sciences upon which health progress and the growth of the pharmaceutical industry vitally depend.

The PMA Foundation's expanded set of programs includes a sequence of awards in clinical pharmacology which provide assistance at the medical student, postdoctoral and faculty levels. In the field of basic pharmacology, the newly-offered faculty support program is a valuable addition and will provide assistance to the growth of the basic discipline upon which clinical pharmacology so vitally depends. An interdisciplinary program in pharmacology and morphology adds a significant dimension to Foundation's support of individuals engaged in basic research. Through the program of research starter grants, investigators beginning their independent research careers have access to funds which are crucial at this point in career development.

The common element of all of these programs is the identification of individuals who show substantial promise of productive careers. This the PMA Foundation believes has been achieved very well to date. The Foundation is confident that future awards will attract equally high-caliber scientists. With the steadily increasing level of financial support each year, the Foundation looks to the establishment of new programs and the appropriate expansion of existing programs.

Thus, 1972 can be characterized as a year of progress and expansion along the new paths set for the PMA Foundation. With the excellent assistance from its scientific advisory committees, the PMA Foundation hopes to continue and expand its support of those who most assuredly will be among the leadership in the biomedical sciences in the years to come.

Reports of Progress

For the third time since 1969, recipients of awards under the PMA Foundation's two postdoctoral education programs and members of the Foundation's three advisory committees spent a productive day and one half discussing current issues of importance to their fields. This December 4-5, 1972, New York City meeting also provided the opportunity for the awardees to report to the Foundation and to each other the status of their current activities.

H. W. Blades, Chairman of the PMA Foundation Board of Directors, welcomed the new awardees and extended greetings to those who attended the prior meetings. Dr. I. C. Winter, member of the Scientific Advisory Committee, covered the purposes of two programs newly announced in November, that of faculty awards in basic pharmacology and the fellowship program for clinicians wishing to enter careers in clincal pharmacology.

Dr. Frederick E. Shideman, Professor and Head, Department of Pharmacology, University of Minnesota, gave the keynote address covering the past, present and future role of pharmacology in the biomedical sciences.

He identified the challenges to the pharmacologist mentioning areas such as: a cure for hypertension, better methods to evaluate drugs for genetic, teratologic or carcinogenic activity, the impact of environmental chemicals on biological systems, and treatment of cardiac arrhythmias.

The meeting divided into two groups. The clinical pharmacologists, in a discussion group under the chairmanship of Dr. John Oates, Professor of Medicine and Pharmacology, Vanderbilt University, heard presentations by four of their group. The group also had most productive exchanges on the drug analysis laboratory as a teaching device and a discussion of the use of the computer in clinical pharmacology education. This latter discussion covered the topic in relation to the teaching of pharmacokinetics, pharmacokinetics analysis in the drug analysis laboratory, and text retrieval in toxicology.

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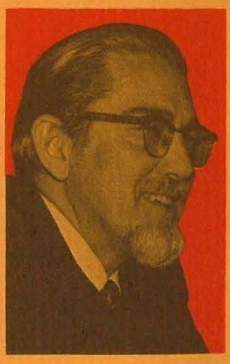


c

The group also engaged in a wide-ranging discussion of curriculum needs, teaching methods and communication with house staff and the practicing physician.

In a workshop jointly moderated by Dr. Don W. Fawcett, Hersey Professor of Anatomy, Harvard Medical School and Dr. Leon Z. Saunders, Director, Pathology and Toxicology, Smith Kline & French Laboratories, the pharmacology-morphology fellows explored the range of their research interests, including teratologic concerns in drug testing, the use of fine-structure techniques to localize the cellular actions of drugs, and pharmacology-morphology in the study of function and drug action in the nervous system.

d

e

f

An added dimension of value to the discusions of both groups of awardees resulted from the presence of the members of the Foundation's advisory committees, all recognized leaders in fields covered by the postdoctoral programs.

A joint session between those attending the Foundation meeting and the Board of Directors of the Pharmaceutical Manufacturers Association was also held. In his welcoming remarks, Fred Coe, Chairman, PMA Board of Directors, commended the awardees for their excellent beginnings in careers which obviously will be most productive. Mr. Coe also commented on the value of the continuing opportunity to meet with the Foundation awardees.

The meeting concluded with a general session at which Dr. Leon Saunders covered the role of pharmacology-morphology in drug development.

In summary, this meeting served well its purpose of providing an opportunity for reports of progress, both from the Foundation on its program development and from the awardees on their continuing career development.

a. Keynote speaker, Dr. Frederick E. Shideman, discussing the role of pharmacology at the December, 1972 Foundation meeting

b. Faculty awardees Drs. Alan Nies (left) and Harold Strauss

c. Dr. Don W. Fawcett making a point in the pharmacology-morphology discussion group

d. Pharmacology-morphology fellows Drs. Carole Kimmel and Robert Seegmiller

e. Pharmacology-morphology fellow Dr. Anna Drakontides

f. Faculty awardee Dr. Urs Meyer

Activities

Since its formation, more than $4,000,000 has been authorized by the PMA Foundation for a variety of workshops, conferences, research projects and educational programs. Of this amount $1.2 million has gone to support research and about $2.4 million to educational awards. The remaining $400,000 has been used to sponsor scientific meetings, with a smaller portion for publications.

WORKSHOPS AND CONFERENCES

Since assistance for the first workshop in drug metabolism was authorized by the Foundation in late 1965, particularly pertinent meetings have continued to receive financial aid.

Clinical Pharmacology. An award of $110,000 was made to support a four-year effort by the American Society of Pharmacology and Experimental Therapeutics directed at advanced pharmacology students. The funds supported four to six week courses for Ph.D. candidates at selected univerities where highly specialized studies are offered. Up to 50 doctoral candidates were accommodated each year. The American Foundation for Pharmaceutical Education also has provided financial support for this activity. With the 1972 workshop this grant has concluded.

The first host was the University of Minnesota, Department of Pharmacology, and the director was Dr. Gilbert J. Mannering, Professor of Pharmacology. This four week session held in 1969 dealt with drug metabolism and biochemical pharmacology.

The second location was the College of Physicians and Surgeons, Columbia University, New York City for four weeks beginning July 6, 1970. The directors were Drs. Brian F. Hoffman and S. C. Wang. The area of instruction was cardiovascular pharmacology.

The third location was the University of California, San Francisco Medical Center for four weeks beginning July 7, 1971. The directors of the session were Drs. Robert M. Featherstone and Anthony Trevor. The area of instruction was molecular pharmacology.

The last of the sessions was hosted by Vanderbilt University, School of Medicine, from June 11-July 1, 1972. The director of the session was Dr. Allan Bass. The course dealt with neuropsychopharmacology concerns.

Drug Metabolism. A grant of $15,000 was made to the Drug Research Board, National Academy of Sciences-National Research Council, for support of the Second International Symposium on Microsomes and Drug Oxidations, held at Stanford University, July 29-31, 1972. Since 1968 when the first such international symposium was held, considerable progress has been made toward a better understanding of drug oxidation by liver microsomes. The objective of the current symposium was to provide an overview of the current state of knowledge in the field, with the papers from the meeting to be published. Dr. Ronald W. Estabrook, Chairman of the Biochemistry Department, University of Texas, Southwestern Medical School, was Chairman.

Pharmacology-Morphology. A grant of $2,000 was made to the Electron Microscopy Society of America for a special session during the Society's annual meeting August 14-17, 1973 to promote interest in the combined pharmacological and morphological, especially electron microscopic, approach to medical research. The meeting will discuss research which exemplifies the successful application of ultrastructural procedures in combination with other methods more commonly employed in the study of the interaction of drugs with physiological processes.

The co-chairmen are: Richard L. Klein, Ph.D., Professor, and Asa Thureson-Klein, Ph.D., A PMA Foundation Fellow in Pharmacology-Morphology and Assistant Professor, Department of Pharmacology and Toxicology, The University of Mississippi Medical Center.

Geographical distribution of Foundation awards under its "Faculty Development Awards in Clinical Pharmacology" program, 1967-1972.

● One
○ More than one

EDUCATION AND TRAINING PROGRAMS

To further its objectives in the field of education, the PMA Foundation sponsors three programs in clinical pharmacology, one in the combined fields of pharmacology-morphology and one in basic pharmacology.

The three clinical pharmacology programs provide educational opportunities at the student, fellow and faculty levels, the newest of which is the program of fellowships for careers in clinical pharmacology. The first fellowships are scheduled for July 1, 1973.

Clinical Pharmacology. *Through the Faculty Development Awards in Clinical Pharmacology program,* the Foundation makes two-year awards to medical schools for salary and fringe benefit support of full-time junior faculty members. The level of support is variable and is in keeping with the existing salary structure of the applicant university. The Board of Directors has established a fund of $150,000 to finance the yearly awards.

With the awards scheduled to begin July 1, 1973 a total of 27 individuals have been supported under this program since its inception in 1967. While the award is for a two-year period, a third year of support is available to those awardees who, at the end of their first year, show sufficient need for the third year. An additional fund of $75,000 has been authorized to provide for the contingency of requests for a third year of support.

Recipients of new faculty awards, which began July 1, 1973 are:

☐ Robert J. Roberts, M.D., Ph.D., Assistant Professor of Pharmacology, The University of Iowa College of Medicine. Dr. Roberts will investigate mechanisms responsible for drug and chemical induced hepatotoxicity and explore various aspects of carbon monoxide toxicity. He will be involved in a training program for hospital pharmacy students, interns and residents in treating ingestions of poisonous materials, and will devote special efforts to pediatric problems in toxicology.

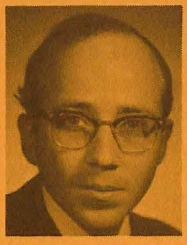
☐ Thomas F. Rolewicz, M.D., Ph.D., Instructor, Pharmacology and Pediatrics, University of Minnesota Medical School. Dr. Rolewicz will investigate antibiotic disposition in pediatric patients. The study will enable a rapid determination of antibiotic blood levels in patients to improve drug therapy for all infants. He will be involved in the bi-weekly

clinical pharmacology rounds, and will be a participant in the unit's clinical pharmacology tutorial program.

☐ Richard M. Weinshilboum, M.D., Assistant Professor of Pharmacology, Mayo Medical School. Dr. Weinshilboum will investigate the function of sympathetic nerves and the effects of drugs on them. He will apply the findings in clinical problems. He will be engaged in teaching pharmacology courses to medical students and in seminars for house staff and permanent staff.

Robert J. Roberts
M.D., Ph.D.

Thomas F. Rolewicz
M.D., Ph.D.



Richard M. Weinshilboum, M.D.

Recipients of the awards which began July 1, 1967 are:

☐ Faruk S. Abuzzahab, Sr., M.D., Ph.D., Clinical Assistant Professor of Psychiatry and Pharmacology, University of Minnesota, is conducting research in both basic and clinical psycho-pharmacology.

☐ John S. Holcenberg, M.D., Associate Professor of Medicine and Pharmacology, University of Washington, Seattle, is interested in biochemical approaches to clinical pharmacology.

☐ John L. McNay, Jr., M.D., Assistant Professor of Pharmacology and Professor of Medicine, Emory University School of Medicine, is conducting research in renal physiology and pharmacology.

Recipients of awards which began July 1, 1968, and which were extended until June 30, 1971 are:

☐ William Y. W. Au, M.D., Associate Professor of Pharmacology and Medicine, University of Rochester, is engaged in research on the effects of hormones and other agents affecting bone metabolism.

☐ Arthur H. Hayes, Jr., M.D., Chief, Division of Clinical Pharmacology, Milton S. Hershey Medical Center has research interests in the cardiovascular field.

☐ Donald S. Robinson, M.D., Associate Professor of Medicine and Pharmacology and Director, Clinical Pharmacology Unit, University of Vermont, College of Medicine, is involved in studies in biochemical pharmacology.

Recipients of awards which began July 1, 1969 are:

☐ Vincent S. Aoki, M.D., an Assistant Professor, University of Iowa, when the award was made, was involved in studies of the

effects of drugs on the pulmonary vascular bed. He resigned a third year of support in December, 1971 to enter the private practice of medicine in Hawaii.

☐ Lester F. Soyka, M.D., Associate Professor of Pharmacology and Pediatrics, University of Illinois, College of Medicine, is involved in research dealing with immaturity at the biochemical level and other developmental studies.

☐ Pate D. Thompson, M.D., an Instructor, University of California, San Francisco Medical Center, when the award was made, resigned the second year of the award to take a position of Chief of Cardiology at Alta Bates Hospital, California.

☐ Stanley C. Ushinski, M.D., an Assistant Professor of Pediatrics and Pharmacology, University of Pittsburgh, when the award was made, resigned the second year of the award to enter private practice.

Recipient of the awards which began July 1, 1970, are:

☐ Arthur J. Atkinson, Jr., M.D., Assistant Professor of Medicine and Pharmacology, Northwestern University Medical School, is conducting research into cardiac drugs in relation to their effectiveness.

☐ Samuel A. Cucinell, M.D., an Assistant Professor of Medicine, Emory University School of Medicine, when the award was made, was involved in drug metabolism research in man. He resigned the second year of the award to assume the responsibility as Chief, Clinical Research Branch, U.S. Army Edgewood Arsenal.

☐ Aryeh Hurwitz, M.D., Associate Professor of Medicine and Pharmacology, Clinical Pharmacology-Toxicology Center, University of Kansas Medical Center, is conducting research into the mechanism of action of compounds which are poisonous to liver cells.

Recipients of the awards which began July 1, 1971 are:

☐ I. David Goldman, M.D., Associates Professor of Medicine and Assistant Professor of Pharmacology, University of North Carolina School of Medicine. Dr. Goldman is studying the mechanisms which facilitate drug-cell interactions.

☐ Urs A. Meyer, M.D., Assistant Professor of Medicine, University of California, San Francisco Medical Center. Dr. Meyer's primary research interest is in the area of drug metabolism, with the goal of developing an *in vitro* model of drug-induced increase in synthesis of P-450 enzymes using cell culture techniques. A third year of support was granted, extending the award until June 30, 1974.

☐ Alan S. Nies, M.D., Associate Professor of Medicine and Pharmacology, Vanderbilt University, School of Medicine. Dr. Nies is studying the effects of alterations of regional blood flow

by disease or drugs. A third year of support was awarded, extending the award until June 30, 1974.

☐ Harold C. Strauss, M.D., Assistant Professor of Medicine, Duke University Medical Center. Dr. Strauss is engaged in studies designed to improve understanding of antiarrythmic drug actions.

☐ Wilmer Leigh Thompson, Jr., Ph.D., M.D., Assistant Professor of Medicine and Assistant Professor of Pharmacology and Experimental Therapeutics, Johns Hopkins University, School of Medicine. The award has enabled Dr. Thompson to continue his research on drug therapy in seriously-ill patients.

☐ Thomas L. Whitsett, M.D., Associate Professor of Medicine and Assistant Professor of Pharmacology, University of Oklahoma, School of Medicine. Dr. Whitsett's research is involved in cardiovascular and renal effects of autonomic and antihypertensive agents. A third year of support was granted extending the award until June 30, 1974.

Recipients of faculty awards which began July 1, 1972 are:

☐ David S. Alberts, M.D., Instructor, Cancer Research Institute, University of California, San Francisco, is investigating, in humans, the correlation of drug concentration, distribution, route and method of administration of cancer chemotherapeutc agents with their effectiveness in tumor cell kill.

☐ Carlos A. Dujovne, M.D., Assistant Professor of Medicine and Pharmacology, University of Kansas Medical Center, is conducting clinical evaluation of drugs, especially hypolipidemic agents and evaluating hepatotoxicity through a variety of methods.

☐ John S. Kaufmann, M.D., Ph.D., Assistant Professor of Medicine and Pharmacology, The Bowman Gray School of Medicine, Wake Forest, is evaluating drugs used in the treatment of high blood pressure, malignant diseases and those which effect blood cells and coagulation.

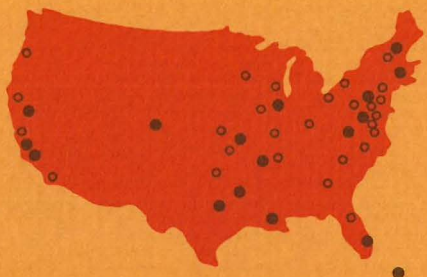
☐ Robert A. Mueller, M.D., Ph.D., Associate Professor of Anesthesiology and Assistant Professor of Pharmacology, University of North Carolina, School of Medicine, is investigating cardiovascular and respiratory effects of Δ-9 tetrahydrocannabinol, a marijuana component, and is examining both sympathetic nervous system activity and the administration of anesthetics to hypertensive patients.

☐ August M. Watanabe, M.D., Assistant Professor of Medicine and Pharmacology, Indiana University School of Medicine, is conducting research on the effects of certain drugs on myocardia metabolism.

The Medical Student Traineeships in Clinical Pharmacology program provides opportunities to students to learn the basic techniques used in the field of clinical pharmacology. Hopefully, these students will sustain their interests in clinical pharmacology and choose this field as a career. The program provides a stipend of $1,000 to each student for a three month period. A yearly fund of $20,000 has been authorized for this program. Since 1967 when the first awards were made, 113 awards have been made to medical schools across the United States.

The aim of all of the Foundation's programs is to identify those individuals who demonstrate a high degree of interest in a career in the particular field covered. While this medical student program has been successful in that a number of students have continued careers in clinical pharmacology, the awards in 1973 will be the last under this present approach to medical student support.

The Foundation will continue its support of medical students, but through a program which will attempt to identify those who have a high degree of interest in a research and teaching career in clinical pharmacology. The new program will offer support for an entire year to enable a student to spend fulltime in an investigative project in pharmacology-clinical pharmacology. The details of this program will be announced in the fall, 1973 with first awards in 1974.



Geographical distribution of Foundation awards under the "Medical Student Traineeships in Clinical Pharmacology" program 1967-1972.

● One
○ More than one

The universities and students who received awards in 1972 are:

University of California, Irvine
Dennis R. Nagel

University of California, San Diego
Albert Gomez

University of California,
San Francsico
David M. Tully-Smith, Ph.D.

Case Western Medical School
R. Thomas Grotz

Dartmouth Medical School
Robert Martensen

Emory University
John M. Read, III

University of Florida
Warren E. Ross

The Johns Hopkins University
Pamela R. Oster

The Johns Hopkins University
George Vann Bennett

University of Louisville
Walter M. Williams, Ph.D.

Medical College of Wisconsin
Michael P. Miller

University of Minnesota
Gerald R. Watkins

New York Medical College
Howard W. Goldman, Ph.D.

Temple University
Ronald E. Ballek

University of Tennesee
Robert S. Green

Vanderbilt Universtiy
Thomas P. Kennedy

Vanderbilt University
David H. Robertson

Washington University
Thomas C. Namey

West Virginia University
David C. McClure

Fellowships for Careers in Clinical Pharmacology is a newly authorized program which provides clinicians with an opportunity for intensive study in any of the basic sciences that fall within the general field of pharmacology. The program is open to physicians, dentists and veterinarians who are well into their clinical training and decide to pursue a career in clinical pharmacology. With the year or two of support offered by this fellowship program, depending on the particulars of the training program, the individual can pursue full-time the basic pharmacologic science needed to complement his clinical skills.

The first awards under this program will be made for the year beginning July 1, 1973. A yearly fund of $60,000 has been authorized for this program.

Pharmacology. *The purpose of the newly authorized program of Faculty Development Awards in Pharmacology* is to strengthen basic pharmacology by helping maintain the present academic capability and, ultimately, to expand this capability by enlarging the faculty base. To accomplish these goals, support is provided to junior faculty members committed to careers in pharmacology who give promise of outstanding accomplishments. Implicit in the decision to offer this faculty program is the recognition that the future development of clinical pharmacology depends on the impetus and scientific principles which the basic discipline supplies.

The first awards, which are for a two-year period, will be made for the period beginning July 1, 1973. Salary and fringe benefits provided are expected to be in accord with the existing structure of the applicant university. A yearly fund of $80,000 has been established to finance this program.

Pharmacology-Morphology. *A postdoctoral program offered is the Fellowship Awards in Pharmacology-Morphology.* Recent developments indicate the need for studies of drug-evoked changes in structure and their functional significance. The aim of the fellowships is to advance understanding of drug action through the discovery of specifically related cellular and tissue changes; and, concurrently, to uncover associations between normal and abnormal function in particular tissues and cellular structure.

The awards are for two years each and, in exceptional circumstances, may be extended for an additional year. The level of support is variable and is aimed at keeping within the existing stipend levels for similarly trained individuals within the applicant university. Since 1968 when the first fellowships were offered, 21 awards have been made.

The fellowship program is designed to support individuals trained to study the actions of drugs in relation to morphologic approaches (cytology, histology, ultrastructure, pathology). Although the program requires that a candidate be qualified primarily either in a morphologic speciality or in pharmacology, training in the complementary discipline need not be formal. The aim is to have the candidate gain familiarity with a new disciplinary approach by using his primary discipline as a medium for acquiring the second. A yearly fund of $70,000 has been set aside for this program.

Recipients of awards which began July 1, 1972 are:

☐ Anna B. Drakontides, Ph.D., Instructor, Cornell University Medical College, New York City. Dr. Drakontides will study the relationship of the site of drug action within the mammalian neuromuscular junction to the state of innervation and attempt to define critical points of loss in pharmacologic responsiveness.

☐ James L. Lessard, Ph.D., Assistant Profesor of Research Pediatrics, Children's Hospital Research Foundation, Cincinnati. Dr. Lessard will study the molecular basis of palate shelf movement, specifically determining whether the contractile protein actin is involved in the process.

☐ Juliet Morgan, Ph.D., Research Associate, The University of Chicago, Pritzker School of Medicine, Chicago. Dr. Morgan will investigate the influence of various stilbenes on the ultra-structural characteristics and lipid composition of cell membranes isolated from normal and dystrophic muscle cells grown in tissue culture.

☐ Myron L. Seligman, Ph.D., New York University Medical Center, School of Medicine, New York City. Dr. Seligman will study the effects of prostaglandins on the molecular anatomy of membranes using magnetic resonance techniques and electron microscopy.

☐ Sarah A. Tjioe, Ph.D., Instructor, The Ohio State University, College of Medicine, Columbus, Ohio. Dr. Tjioe will study the subcellular brain neuron and glial changes that develop under the influence of psychoactive drugs.

Anna B. Drakontides, Ph.D.

James L. Lessard, Ph.D.

Juliet Morgan, Ph.D.

Myron L. Seligman, Ph.D.

Sarah A. Tjioe, Ph.D.

Recipients of awards which began July 1, 1968 are:

☐ David W. Hiott, Ph.D., Teaching Fellow in Pharmacology, Medical University of South Carolina. He gained additional experience with the procedures of autoradiography and in certain techniques and interpretations of histochemistry, particularly at the electron microscopic level. His research efforts are directed toward the investigation of ultrastructural changes in the canine and hamster cardiac muscles by quinidine and daunomycin.

☐ John O. Lindower, M.D., Ph.D., Assistant Professor of Pharmacology, The Ohio State University, College of Medicine. Dr. Lindower studied the effect of digitalis by correlating the changes the compound produces in heart cells. Isolated small animal hearts were perfused with the digitalis medium while a recording device measured the more forceful contraction that the drug produced in the heart. After the drug effect was demonstrated, small samples of the heart muscle were examined by the electron microscope to detect any changes that had been produced by the drug.

☐ Timothy J. Mathew, M.B.B.S., Renal and Electrolyte Division, Georgetown University Hospital. He was engaged in studies directed to examination of platlets in the pathogenesis of transplant rejections. An attempt was made to alter histologic pattern rejection by using drugs directed at chang-

ing the platlet function. Following the conclusion of the fellowship, Dr. Mathew returned to Australia to assume responsibilities as Assistant Director, Renal Unit, Royal Melbourne Hospital.

Recipients of the awards which began July 1, 1969 are:

☐ Andrew K. S. Ho, Ph.D., Assistant Professor, Wayne State University. Dr. Ho is extending his training through studies of the effect of cell structure and tissue function by the various psychopharmacologic drugs using a combination of techniques of electron microscopy, histochemistry and biochemical pharmacology. The findings are correlated to the therapeutic use of these drugs and their effect on behavior.

☐ William J. Scott, Jr., D.V.M., Ph.D., Children's Hospital Research Foundation, Cincinnati. The award enabled Dr. Scott to advance his training through a series of studies in rats and primates of the teratogenicity of a group of carbonic anhydrase inhibitors. His focus was on the mechanism of teratogenetic action. In 1971 he accepted a position as Assistant Professor of Research Pediatrics at the University of Cincinnati.

Recipients of the awards which began July 1, 1970 are:

☐ Roy J. Baerwald, Ph.D., Assistant Professor, University of Miami, School of Medicine. Dr. Baerwald is investigating structural changes induced by such drugs as colchicine, vinblastine and vincristine in a range of invertibrate and vertibrate cells.

☐ Patricia J. Bingham, D. Phil., Associate in Pharmacology, University of Rochester at the time of the award. Dr. Bingham is using autoradiography techniques to study the mechanism of action and localization of hormones and other agents which affect bone formation and resorption. She is now at the University of Melbourne, Australia, as Senior Research Officer in the Department of Medicine.

☐ Richard F. Hoyt, Jr., Ph.D., Research Fellow in Pharmacology, Harvard School of Dental Medicine. He is studying the relationship between hormone and drug-induced changes in subcellular structure, particularly three strains of cultured mammalian tumor cells.

☐ Carole Kimmel, Ph.D., in the Division of Toxicology, Kettering Laboratory Department of Environmental Health, College of Medicine, University of Cincinnati when the award was made. Dr. Kimmel is studying the effects of betapropiolactone on the rabbit embryo and fetus to determine how this agent binds to DNA, RNA protein and other subcellular components, and

any teratogenic or carcinogetic relationships. Dr. Kimmel is now in the Department of Anatomy at Harvard Medical School.

☐ Robert E. Seegmiller, Ph.D., Assistant Professor of Zoology, Brigham Young University. Dr. Seegmiller is studying the genetic-environmental interactions in mice which influence the differentiation of cartilage and, subsequently, the morphology of limbs.

Recipients of the awards which began July 1, 1971 are:

☐ Sharon E. Corey, Ph.D., West Virginia University, Medical Center is training in cell biology by using various methods including electron microscopy and cyto-chemistry. An epigenetic system in cell transformation is being used.

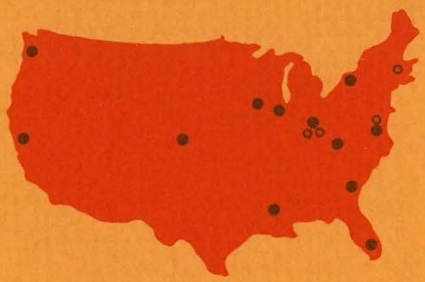
☐ William A. Croft, Jr., D.V.M., Division of Clinical Oncology, University of Wisconsin, resigned the last months of the award to undertake responsibilities on the university's faculty. Dr. Croft was involved in pharmacology-morphology of thymic lymphoma induced in rats by a human cancer chemotherapeutic drug.

☐ Penelope A. Fenner-Crisp, Ph.D., Department of Anatomy, Georgetown University, School of Medicine and Dentistry is studying the effects of certain pharmacological and physiological substances upon fine structure morphology and the function of corpora lutea.

☐ Anita P. Hoffer, Ph.D., Instructor in Anatomy, Harvard Medical School, is extending her skills in electron microscopy and radio-autography and studying of the site of action and ultrastructural effects of a variety of pharmacological agents which influence spermatogenesis, sperm release, and sperm maturation.

☐ Michael C. Lowe, Ph.D., Department of Pathology, University of Washington, School of Medicine, is studying the mechanisms involved in the production of cardio-myopathies by catecholamines.

☐ Åsa K. Thureson-Klein, Ph.D., Assistant Professor of Pharmacology, University of Mississippi Medical Center, is studying noradrenaline storage vesicles of sympathetic nerves, stressing the pharmacological effects on the uptake storage and release of catacholamines from the vesicles.



Geographical distribution of Foundation "Fellowship Awards in Pharmacology-Morphology," 1968-1972.

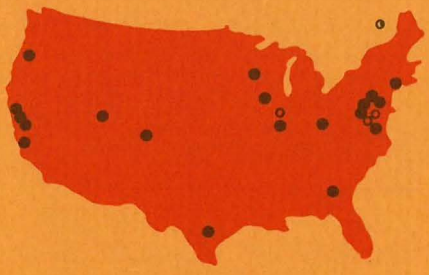
● One
○ More than one

RESEARCH GRANTS

An important aspect of the PMA Foundation's efforts has been support of fundamental research in drug toxicology.

Since 1966 a total of 26 general research grants have been made for this purpose. Support on 13 of these has terminated. The remaining 13 grants continue over various periods of time through 1973.

There were no new grants made in 1972. While general research support is still available, the decision to place greater emphasis on educational support has resulted in a much reduced probability of grant support. Also, research funds have been shifted to provide the means to offer the Research Starter Grants program described below.



Geographical distribution of Foundation general research grants, 1966-1972.

● One
○ More than one
◑ Outside U. S.

Thirteen grants current in 1971 continued into 1972. These are:

☐ Medical College of Georgia, Department of Cell and Molecular Biology, Augusta, Georgia

☐ University of Illinois, Department of Microbiology, Urbana

☐ Universities Associated for Research and Education in Pathology, Washington, D.C.

☐ Rutgers University, College of Pharmacy, Department of Pharmacology, New Brunswick, New Jersey

☐ Georgetown University School of Medicine and Dentistry, Department of Pharmacology, Washington, D.C.

☐ University of Illinois at the Medical Center in Chicago, Department of Pediatrics

☐ University of Minnesota School of Medicine, Department of Pharmacology, Minneapolis, Minnesota

☐ Rochester University School of Medicine, Department on Pharmacology and Toxicology, Rochester, New York

☐ University of Oregon Dental School, Department of Biochemistry, Portland, Oregon

☐ Hahnemann College of Medicine, Department of Anesthesiology, Philadelphia, Pennsylvania

☐ State University of New York in Buffalo, Department of Pediatrics

☐ The University of Texas Medical Center in Dallas, Department of Pediatrics

☐ Stanford University Medical Center, Department of Pediatrics, Stanford, California

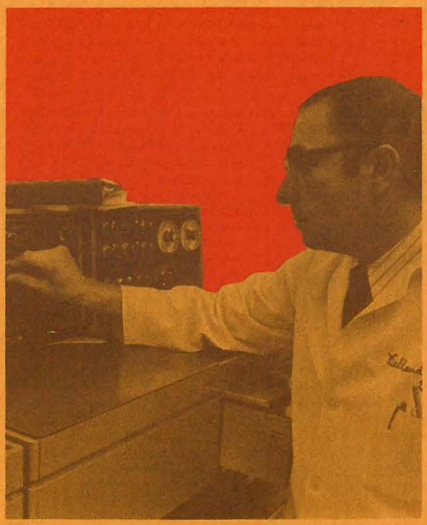
The 13 current general research grants fall into the following categories.

Animal-Human Predictability Studies. A grant of $15,000 for one year beginning July 1, 1971 made to Henry L. Price, M.D., Professor of Anesthesiology, Hahenmann College, to support research into the state of circulatory depression which attends the administration of most anesthetics concluded in 1972.

A grant of $8,000 over a two year period beginning March 1, 1971 made to Edward W. Voss, Jr., Associate Professor, Department of Microbiology, University of Illinois to allow the continuation of immunochemical studes with lysergic acid (LSA) and lysergic acid diethylamide (LSD) entered its final year in 1972.

Clinical Pharmacology. A grant of $51,850 for two years beginning July 1, 1970 made to William T. Beaver, M.D., Associate Professor of Pharmacology, Department of Pharmacology, Georgetown University School of Medicine and Dentistry, to establish a facility for studying the comparative effects of drugs on subjective responses concluded in 1972.

A grant of $40,000 over a two-year period which began March 1, 1971, made to John J. Miller, III, M.D., Ph.D., Assistant Professor of Pediatrics, Department of Pediatrics, Stanford University School of Medicine for a study of the relation of drugs to the lupus syndrome entered its final year in 1972.



Dr. Edward Bresnick, Medical College of Georgia, conducting one of the studies in his drug metabolism project.

Drug Metabolism. A grant of $30,000 over a two-year period beginning November 1, 1971 made to Edward Bresnick, Ph.D., Chairman, Department of Cell and Molecular Biology, Medical College of Georgia for study of the mechanisms by which the mixed-function oxidase system is regulated during liver development entered its final year in 1972. A second aspect of the study will deal with research aimed at understanding the mechanisms by which environmental factors such as polycyclic hydrocarbons are able to induce the drug metabolizing enzyme system.

Drug Surveillance. A grant of $25,000 was made to the Universities Associated for Research and Education in Pathology for support during 1971-1972 of the Registry of Tissue Reactions to Drugs, Armed Forces Institute of Pathology. Nelson S. Irey, M.D., is the Registrar.

The Registry obtains biopsy and autopsy tissue specimens on a voluntary reporting basis from participating pathologists, from industry and the government. The Registry subjects the specimens to microscopic examination and reports its findings to the referring pathologist. This grant concluded in 1972.

Fetal and Neonatal Pharmacology. A grant of $30,000 over a two-year period which began February, 1971 was made to Charles E. Mize, M.D., Ph.D., Assistant Professor of Pediatrics, The University of Texas, Southwestern Medical School at Dallas for a study of selective antibiotic action on mammalian membrane assembly. The co-investigator is Howard G. Worthen, M.D., Ph.D., Professor of Pediatrics. The grant entered its final year in 1972.

A grant of $58,000 over a two-year period beginning May 1, 1970, made to Richard E. Behrman, M.D., then Professor of Pediatrics, Department of Pediatrics, University of Illinois at the Medical Center (Chicago) has been extended to June 30, 1973. The study aims to characterize the pharmacologic effect of phenobarbital on fetal and newborn monkeys by evaluating the effects on blood pressure, heart rate, ECG, cardiac output, oxygen consumption and organ blood flows. Dr. Behrman accepted the Chairmanship of the Department of Pediatrics at the College of Physicians and Surgeons in late 1971, but remains a consultant to the study.

Nutritional Deficiencies—Drug Action. A grant of $29,459 over a two-year period beginning March 1, 1970 to Christina Vander-Wende, Ph.D., Professor of Biochemistry and Pharmacology, Rutgers University, concluded in 1972. The funds provided support for studies of the interaction of vitamin deficiencies and drug action. The extension of these studies will eventually include studies of protein deficiencies and a generalized malnutrition state on drug action and drug toxicity.

A grant of $44,590 over a two-year period, which began April 15, 1971, was made to Sumner A. Yaffe, M.D., Professor of Pediatrics, Department of Pediatrics, State University of New York at Buffalo, to study the effect that malnutrition may have on the activity of hepatic drug-metabolizing enzymes. Both acute and long-term effects of nutritional deficiency are being studied. This grant entered its final year in 1972.

Research Starter Grants. A program of Research Starter Grants was offered for the first time in 1971. These grants are intended to provide financial support for beginning investigators. The program offers a sum of $5,000 a year for two years, with the second year contingent upon a continuing need for the funds. The research areas of interest within this program are in the fields of pharmacology, clinical pharmacology and drug toxicology. The program has a budget of $200,000 a year, allowing for up to 20 new research grants each year.

This program is designed to assist investigators starting their independent research efforts. The Foundation was motivated by the belief that a very real need exists among beginning investigators for "starter" funds, funds which could be used to generate data to serve as the basis to obtain greater amounts of support. The experiences from the offering of the program for its first two years have proved this to be the case.

The 23 research starter grants, beginning January 1, 1973 went to schools of pharmacy, schools of medicine and veterinary schools in all parts of the United States. The schools and the recipients of the research starter grants for 1973 are:

☐ Verna L. Armstrong, Ph.D., College of Pharmacy, University of Cincinnati

☐ Kenneth Blum, Ph.D., The University of Texas Medical School at San Antonio

☐ Robert P. Bolender, Ph.D., Harvard Medical School

☐ David R. Brown, Sc.D., School of Pharmacy, University of Maryland

☐ Clinton N. Corder, Ph.D., M.D., School of Medicine, University of Pittsburgh

☐ Arthur L. Craigmill, Ph.D., College of Pharmacy, Washington State University

☐ Harold L. Crossley, Ph.D., School of Dentistry, University of Maryland

☐ Jean D. Deupree, Ph.D., College of Medicine, University of Nebraska Medical Center

☐ Dennis R. Feller, Ph.D., College of Pharmacy, The Ohio State University

☐ Michael R. Franklin, Ph.D., College of Pharmacy, University of Utah

☐ Matthew J. Friedman, M.D., Ph.D., Dartmouth Medical School

☐ Stephen R. Gross, Ph.D., School of Medicine, University of California, San Diego

☐ Robert L. Gulley, Ph.D., University of Miami Medical School

☐ Martin D. Hamburg, Ph.D., Cornell University Medical College

☐ Louis J. Ignarro, Ph.D., School of Medicine, Tulane University

☐ Daniel A. Koechel, Ph.D., Medical College of Ohio at Toledo

☐ Chang-seng Liang, M.D., Boston University School of Medicine

☐ David T. Moran, Ph.D., School of Medicine, University of Colorado

☐ Joseph O. Owasoyo, D.V.M., School of Veterinary Medicine, Tuskegee Institute

☐ Philip Posner, Ph.D., College of Medicine, University of Florida

☐ Michael J. Reichgott, M.D., University of Pennsylvania School of Medicine

☐ Janice L. Stickney, Ph.D., School of Medicine, Michigan State University

☐ Carol T. Walsh, Ph.D., Boston University School of Medicine

Of the 20 research starter grants awarded January 1, 1972, only 15 grantees continued to demonstrate a need for the second year of support. Five individuals had successfully gained larger amounts of funds from other sources during 1972, providing them with the resources to further their independent research careers. The 15 grantees who were provided a second year's $5,000 grant are:

☐ Frederic C. Beuthin, Ph.D., College of Pharmacy, Idaho State University

☐ George M. Brenner, Ph.D., School of Pharmacy, South Dakota State University

☐ Yun-Lai Chan, Ph.D., School of Medicine, University of Louisville

☐ Claudia A. Crow, Ph.D., Woodruff Medical Center, Emory University

☐ Susan B. Horwitz, Ph.D., Albert Einstein College of Medicine

☐ Phillip C. Jobe, Ph.D., and Gary G. Ferguson, Ph.D., School of Pharmacy, Northeast Louisiana University

☐ William R. Kem, Ph.D., College of Medicine, University of Florida

☐ Horace H. Loh, Ph.D., School of Medicine, University of California, San Francisco

☐ George D. Olsen, M.D., University of Oregon Medical School

☐ Casey P. Robinson, Ph.D., College of Pharmacy, University of Oklahoma

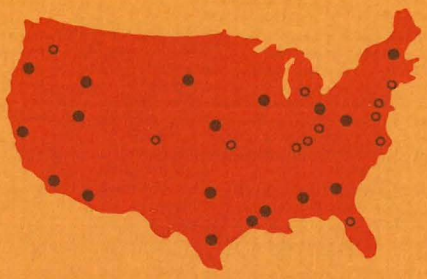
☐ Charles F. Ryan, Jr., Ph.D., School of Pharmacy, University of Nebraska

☐ Robert C. Schnell, Ph.D., College of Pharmacy, Purdue University

☐ Paul M. Stephen, M.D., Ph.D., and John O. Lindower, M.D., Ph.D., Ohio State University College of Medicine

☐ Paul D. Thut, Ph.D., College of Medicine, University of Arizona

☐ W. David Watkins, Ph.D., University of Colorado Medical Center



Geographical distribution of Foundation awards under the "Research Starter Grants" program, 1972, 1973

● One
○ More than one

PUBLICATIONS

Pharmacology Principles. A grant of $12,000 beginning in 1971 was made to Ruth R. Levine, Ph.D., Professor of Pharmacology, Boston University of Medicine, to assist in the preparation of a textbook on the principles of pharmacology for use at the undergraduate level in the general curriculum of a college concluded in 1972. The purpose of this textbook is to provide a concise source of the kind of pharmacologic knowledge that would be useful to anyone wishing to understand the ways in which chemicals interact with living organisms. It is written primarily for the non-professional to provide the opportunity to acquire and share the basic information that will help him cope with a society where exposure to chemicals can hardly be avoided.

The emphasis in the book is on the basic concepts and principles which are fundamental to understanding the action of drugs at any level of complexity. The biochemical and physiologic concepts needed to understand the pharmacologic principles are an integral part of the text. Readers of diverse backgrounds need have in common only a working knowledge of general chemistry and biology. Hopefully, the availability of a textbook will serve the further purpose of implementing the presentation of courses in pharmacology in non-professional schools as part of a liberal arts curriculum.

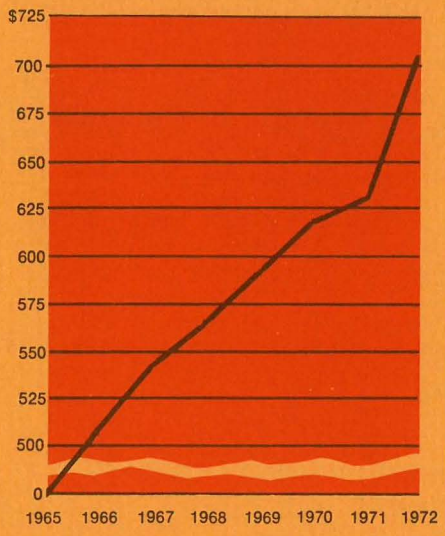
The book is in two volumes, the first covering topics in general pharmacodynamics and the second specific pharmacodynamics. Volume I entitled "Pharmacology: Drug Actions and Reactions" has been published. Further information can be obtained from Dr. Levine.

Foundation Finances

The Board of Directors of the PMA Foundation decided at the outset that, as a minimum, total annual contributions of $500,000 would be sought, with larger amounts anticipated thereafter. For 1972 and each year until changed, the Board of Directors increased the contribution goal to $750,000. In requests for voluntary support to PMA Member Firms, a guideline is suggested. Each firm is asked to consider a contribution equal to .015% of its domestic and international pharmaceutical sales.

Income. The total income in 1972 was $763,759. Of this amount $705,181 came from contributions. The balance of $58,578 came from investments and refunds on unexpended balances from grants.

PMA Foundation Contribution Income 1965-1972 (Thousands)



Contributions were received from approximately three of every four PMA Member Firms. Contributions were also received during 1972 from several individuals and groups in the health field.

Expenditures. Grants, Foundation-sponsored programs and administrative expenses for 1972 amount to $654,446. Of this amount, $571,929 represented expenditures for grants and Foundation-sponsored programs. There was a fund balance of $999,674 as of December 31, 1972. This figure, however, does not reflect the tentatively authorized, undisbursed amounts for some of the grants and programs described earlier. The Foundation reports these amounts as expenditures when the funds are distributed. As of December 31, 1972, this contingency liability totaled $971,792. Some of these grants represent amounts to be paid over the next two years. During 1973 the estimated amount to be paid on this tentative commitment is $571,000.

Financial Reports. The Foundation's financial position as of December 31, 1972 has been audited by the accounting firm of Ernst and Ernst. Copies of this statement will be supplied upon request.

Financial statements have been issued to contributors quarterly during 1972. These reports are prepared by the Washington, D.C. accounting firm of Buchanan and Company. Quarterly reports will continue to be distributed during 1973.

STATEMENT OF INCOME AND EXPENDITURES

For the year ended December 31, 1972

Income

Contributions—Note a	$705,181
Income from Investments	55,108
Miscellaneous Income	3,470
TOTAL INCOME	$763,759

Expenditures

Grants—Note b	
American Society of Pharmacology and Experimental Therapeutics—Supplemental Training	$ 28,476
Children's Hospital of Buffalo	22,292
Clinical Pharmacology Faculty Program	232,711
Georgetown University School of Medicine	13,925
Medical College of Georgia	7,500
Medical Student Traineeships in Clinical Pharmacology	19,000
National Academy of Sciences	35,350
Pharmacology-Morphology Program	65,175
Research Starter Grants	100,000
Stanford University Medical Center	15,000
Universities Associated for Research and Education in Pathology	12,500
University of Illinois, Urbana	5,000
University of Texas Southwestern Medical School at Dallas	15,000
	$571,929
Administrative expenses	82,417
Total expenditures	$654,446
Excess of income over expenditures	$109,313
Fund balance at January 1, 1972	$890,361
Fund balance at December 31, 1972	$999,674

Note a—The Foundation received contributions of $136,800 prior to December 31, 1972 which the Foundation considered applicable to 1973 and, therefore, are not recorded as income in 1972.
Note b—The Foundation has committed itself, subject to review, to make certain grants. At December 31, 1972 the amounts still to be disbursed with respect to these grants aggregated $971,792 of which approximately $571,000 is expected to be disbursed during the year 1973. No liability has been reflected for these amounts at December 31, 1972.

Purpose

The PMA Foundation was established to promote the betterment of public health through scientific and medical research, with particular reference to the study and development of the science of therapeutics. In achieving this goal, The Foundation plans and initiates scientific and medical research activities, collects and disseminates the results of these activities, and provides financial support and aid to individuals or institutions whose purposes are scientific, educational or charitable.

Certain guidelines have been developed to promote the wise and proper use of the limited resources available. The areas of interest agreed to initially, and which still govern the distribution of funds, are support of fundamental research in drug toxicology, and the support of programs of research and training for personnel in clinical phamacology and drug evaluation.

Throughout the year, programs have been supported and developed which provide the means of achieving the goals of the Foundation. Many worthwhile proposals have been submitted. It has been necessary to limit support to those which hold the highest promise of advancing the purposes of the Foundation.

Those areas not supported within the existing guidelines are:

(1) Research on specific drugs. This exclusion is not meant to preclude support of projects which, of necessity, use a number of drugs or a class of drugs to establish a methodology or screening program of potential general applicability. It does exclude those efforts primarily aimed at learning more about specific drugs or classes of drugs.

(2) Funds for construction. The Foundation is not unmindful of the needs and the tremendous pressures for private funds for construction projects. However, it is believed that the scientific community can be better served by channeling the Foundation's available resources into other areas.

(3) Funds for travel.

(4) Funds to cover entertainment costs.

In 1971, the Board of Directors authorized a major shift in program emphasis. While Foundation support of research continues, such support is to be primarily available in a redirected fashion, such as the Research Starter Grants program discussed on page 20. General research support of the type described in the Research Section, pages 16-22, is still offered, but on a scale much reduced from that which characterized the Foundation's earlier years.

In line with this change of emphasis, the Foundation is expanding support within its current educational programs as outlined in the Education and Training Programs Section on page 6. To further increase the amount of funds available for expanding the Foundation's educational programs, the Board of Directors has substanitally reduced its support of meetings. While meetings have never received a large portion of the support dollar, only in very exceptional circumstances will meetings receive support in the future.

Beginnings

For those of you who, through this Annual Report, learn of the Pharmaceutical Manufacturers Association Foundation, Inc. for the first time, a brief resumé of the history which led to its formation is in order.

One event most influential in promoting the establishment of the PMA Foundation was the work and Final Report of the Commission on Drug Safety, a study group formed by the Pharmaceutical Manufacturers Association in the fall of 1962. The Commission was charged to make a study of the entire problem of drug safety and to come forth with recommendations. It carried out its work during the time of the urgency of the thalidomide situation. Special attention was given by the Commission initially to drug-induced fetal malformations. It became evident, however, that the most profitable line of inquiry would be to attack the overall problem of drug safety. This Commission composed of experts from universities, industry and government, arrived at a series of recommendations.

A continuing theme expressed in a variety of ways by these authorities was that the pharmaceutical industry should show more interest in the conduct of basic studies in drug toxicology, with the suggestion that co-operative sponsorship of such fundamental projects would have the greatest potential for undercovering new information. To make such studies possible, the Commission suggested a number of alternative mechanisms.

One was to establish a foundation. This, as well as many of the Commission's other recommendations, was considered by the PMA Board of Directors for some months following publication of the Commission's report. On May 13, 1965, the PMA announced the establishment of the PMA Foundation. The initial operating funds were supplied by the PMA, and sustaining support for the Foundation has come from voluntary contributions from PMA Member Firms and Associates, industrial concerns, organizations and individuals with an interest in health care research.

Organization and Administration

The PMA Foundation operates through a Board of Directors and three advisory committees. The Chairman of the Board is H. W. Blades, Chairman of the Board, Wyeth Laboratories, C. Joseph Stetler is President and Thomas E. Hanrahan is Executive Director. In May, 1972, Mr. Blades was reelected as Chairman of the Board; H. Robert Marschalk, President, Richardson-Merrell, Inc. was re-elected Vice Chairman and Daniel C. Searle, President and Chief Executive Officer, G. D. Searle & Co., was reelected Secretary, Treasurer.

In reaching decisions on the most worthwhile activities for support, the Board of Directors has had the advice of extremely knowledgeable individuals serving on three advisory committees.

The Scientific Advisory Committee has the responsibility of making recommendations to the Board of Directors on all general scientific grant requests and on the Research Starter Grants program. Until December, 1972, Earl H. Dearborn, Ph.D., M.D., President, Therapeutics Research Division, Dome Laboratories was Chairman of the Committee. Ill-health, forcing his resignation, culminated in his untimely death March 1, 1973. Ira Ringler, Ph.D., Director of Research, Lederle Laboratories, succeeded Dr. Dearborn as Chairman. To increase its effectiveness, the Chairmen of the Medical and the Research and Development Sections of the PMA are invited to serve as members of the Committee.

The Advisory Committee to the Faculty Development Awards in Clinical Pharmacology program is charged with making recommendations to the Board of Directors on all applications received for these awards, as well as those applications received under the Medical Student Traineeships in Clinical Pharmacology program. It also has the responsibility for applications received under the new fellowships for careers in clinical pharmacology award. The Chairman of this Committee is John A. Oates, M.D., Professor of Medicine and Pharmacology, Vanderbilt University, School of Medicine.

The Advisory Committee to the PMA Foundation Fellowship Awards in Pharmacology-Morphology program has the responsibility for making recommendations to the Board of Directors on all applications under this program. The Chairman of this Committee is Walter F. Riker, Jr., M.D., Chairman, Department of Pharmacology, Cornell University Medical College.

OFFICERS AND STAFF

H. W. Blades

C. Joseph Stetler

Thomas E. Hanrahan

H. W. Blades, Chairman
H. Robert Marschalk, Vice Chairman
Daniel C. Searle, Secretary, Treasurer
C. Joseph Stetler, President
Thomas E. Hanrahan, Executive Director

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Nutley, New Jersey

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Research Triangle Park
North Carolina

H. Robert Marschalk, President
Richardson-Merrell, Inc.
New York, New York

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G. D. Searle & Co.
Chicago, Illinois

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Parke, Davis & Company
Detroit, Michigan

Donald van Roden, President †
Pharmaceutical Products
Smith Kline & French Laboratories
Philadelphia, Pennsylvania

Foster B. Whitlock
Vice Chairman, Executive Committee
Johnson & Johnson
New Brunswick, New Jersey

† Named to the Board, May, 1972
** Served until May, 1972*

ADVISORY COMMITTEES

Scientific Advisory Committee

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Ira Ringler, Ph.D., *Chairman*[1]
Director of Research
Lederle Laboratories
Pearl River, New York

George N. Aagaard, M.D.
Professor of Medicine
Head, Division of Clinical Pharmacology
University of Washington
Seattle, Washington

Edward J. Cafruny, M.D., Ph.D.
Chairman and Professor
Department of Pharmacology
Medical College of Ohio at Toledo
Toledo, Ohio

Earl H. Dearborn, Ph.D., M.D.[2]
President, Therapeutics Research Division
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Research Division
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Merck Sharp & Dohme Research Laboratories
West Point, Pennsylvania

Walter F. Riker, Jr., M.D.
Chairman, Department of Pharmacology
Cornell University Medical College
New York, New York

Joseph F. Sadusk, Jr., M.D.
Senior Vice President
Warner-Lambert Company
Morris Plains, New Jersey

E. Leong Way, Ph.D.
Professor and Acting Chairman
Department of Pharmacology
School of Medicine
University of California
San Francisco, California

Murray Weiner, M.D.
Vice President, Research
Merrell-National Laboratories
Cincinnati, Ohio

Irwin C. Winter, M.D., Ph.D.
Vice President, Medical Affairs
G. D. Searle & Co.
Chicago, Illinois

[1]*Named Chairman, December, 1972*
[2]*Resigned December, 1972*

Faculty Development Awards in Clinical Pharmacology Advisory Committee

John A. Oates, M.D.

John A. Oates, M.D., *Chairman*
Professor of Medicine and Pharmacology
Vanderbilt University, School of Medicine
Nashville, Tennessee

John J. Burns, Ph.D.
Vice President for Research
Hoffmann-La Roche Inc.
Nutley, New Jersey

Glenn W. Irwin, Jr., M.D.
Dean, School of Medicine
Indiana University
Indianapolis, Indiana

Walter F. Riker, Jr., M.D.
Chairman, Department of Pharmacology
Cornell University Medical College
New York, New York

Ira Ringler, Ph.D.[3]
Director of Research
Lederle Laboratories
Pearl River, New York

Joseph F. Sadusk, Jr., M.D.
Senior Vice President
Warner-Lambert Company
Morris Plains, New Jersey

Albert Sjoerdsma, M.D., Ph.D.
Vice President, Research
Merrell International
Division of Richardson-Merrell Inc.
New York, New York

Alan B. Varley, M.D.
Medical Director, Pharmaceutical Marketing-Medical
The Upjohn Company
Kalamazoo, Michigan

Louis G. Welt, M.D.
Professor and Chairman
Department of Internal Medicine
Yale University School of Medicine
New Haven, Connecticut

[3]*Ex-officio as Chairman of the Scientific Advisory Committee*

Pharmacology-Morphology Fellowships Advisory Committee

Walter F. Riker, Jr., M.D.

Walter F. Riker, Jr., M.D., *Chairman*
Chairman, Department of Pharmacology
Cornell University Medical College
New York, New York

Kurt Benirschke, M.D.
Professor and Chairman
Department of Obstetrics and Gynecology
University of California
San Diego School of Medicine
La Jolla, California

Kenneth P. DuBois, Ph.D.[4]
Director, Toxicity Laboratory
The University of Chicago
Chicago, Illinois

Don W. Fawcett, M.D.
Hersey Professor of Anatomy
Harvard Medical School
Boston, Massachusetts

Carlos Kozma, M.D.
Director, Division of Pathology and Toxicology
Abbott Laboratories
North Chicago, Illinois

Bernard H. Marks, M.D.[5]
Professor and Chairman
Department of Pharmacology
The Ohio State University
Columbus, Ohio

Leon Z. Saunders, D.V.M., Ph.D.
Director, Pathology and Toxicology
Research and Development Division
Smith Kline & French Laboratories
Philadelphia, Pennsylvania

Arnold M. Seligman, M.D.
Chief, Research Oncology and Cell Biology
Sinai Hospital of Baltimore, Inc.
and
Professor of Surgery
Johns Hopkins University
Baltimore, Maryland

David A. Wood, M.D.
Director, Cancer Research Institute
University of California
San Francisco Medical Center
San Francisco, California

[4]*Deceased, January 24, 1973*
[5]*Additional member named to Committee, January 1, 1973*

Contributors

PMA MEMBER COMPANIES AND FOUNDATIONS

Abbott Laboratories
Ross Laboratories
Alcon Laboratories, Inc.
American Home Products Corporation
Ayerst Laboratories
Ives Laboratories, Inc.
Wyeth Laboratories
Armour Pharmaceutical Company
B. F. Ascher & Company, Inc.
Astra Pharmaceutical Products, Inc.
Baxter Laboratories, Inc.
Fenwal
Flint Laboratories
Hyland Division
Travenol Laboratories, Inc.
Wallerstein Company
Becton, Dickinson and Company
BioQuest, BBL Division
Ivers-Lee
Beecham-Massengill Pharmaceuticals
Bristol Laboratories (Bristol-Myers Fund)
Mead Johnson & Company (Foundation)
Westwood Pharmaceuticals Inc.
Burroughs Wellcome Co.
The Central Pharmacal Company
Cole Pharmacal Company, Inc.
Commercial Solvents Corporation
Cooper Laboratories, Inc.
Cutter Foundation
Davies Rose Hoyt
Difco Laboratories Incorporated
Endo Laboratories, Inc.
C. B. Fleet Company, Inc.
Hoechst Pharmaceuticals, Inc.
Hoffmann-La Roche Foundation
Hynson, Westcott & Dunning, Inc.
Johnson & Johnson Associated Industries Fund
Cel-Fibe
Chicopee Manufacturing Company
Devro
Ethicon, Inc.
McNeil Laboratories, Inc.
Ortho Pharmaceutical Corporation
Permacel
Personal Products Company
Knoll Pharmaceutical Company
Lakeside Laboratories, Inc.
Lederle Laboratories
Eli Lilly and Company Foundation
Mallard, Inc.
The Mallinckrodt Fund Inc.
Marion Laboratories, Inc.
Merck & Co., Inc.
Merck Chemical Division
Merck Sharp & Dohme
Miles Laboratories Foundation
Ames Laboratories
Dome Laboratories
Norwich Pharmacal Company (The Norwich-Eaton Charitable Trust)
Organon Inc.
The S. B. Penick Foundation
Pennwalt Prescription Products (Pharmaceutical Div., Pennwalt Corporation)
The Pfizer Foundation, Inc.
Pharmaceuticals Division, CIBA-GEIGY Corporation
Rexall Drug Company
Richardson-Merrell Inc.
J. T. Baker Chemical Company
Merrell-National Laboratories
Riker Laboratories, Inc.
A. H. Robins Company
William H. Rorer, Inc.
Sandoz-Wander, Inc.
Dorsey Laboratories
Schering Corporation
G. D. Searle & Co.
Smith Kline & French Foundation
E. R. Squibb & Sons, Inc. (Squibb-Beechnut)
Stuart Pharmaceuticals (Division of ICI America, Inc.)
Syntex Laboratories, Inc.
The Upjohn Company
Wallace Laboratories (Division of Carter-Wallace, Inc.)
Wampole Laboratories (Division of Denver Chemical Mfg. Co.)
Warner-Lambert Charitable Foundation
Parke, Davis & Company
Warren-Teed Pharmaceuticals Incorporated
Winthrop Laboratories
Breon Laboratories Inc.

Applications

PMA ASSOCIATES

American Medical Association
Clark-O'Neill, Inc.
Medical Economics, Inc.
Modern Medicine Publications, Inc.
Owens-Illinois
Sieber & McIntyre, Inc.
Sudler & Hennessey, Inc.
Robert E. Wilson, Inc.

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Frank J. Corbett, Inc.
Fairleigh S. Dickinson, Jr.
Daniel C. Searle
E. Claiborne Robins
Ushkow Foundation Inc.
The Huisking Foundation, Inc.
S. Barksdale Penick, Jr.

The Foundation accepts requests for support and suggestions for pertinent general research projects from qualified institutions and individuals. However, please see page 26 for a discussion of the Foundation's priority of program support.

Requests for assistance should take the form of a letter, outlining the subject, purposes, scope, brief description of methods or procedures to be used, principal researchers, percentage of time to be devoted to project by each of the principals, curriculum vitae, bibliographies of the principal researchers, the budget, other sources of present or anticipated financing of this same undertaking, a listing by title of other research projects presently involved in by the principal researchers and the amount of time devoted to each, and the amount and source of funds for these activities. All of the above information must be supplied.

In 1968, a policy was instituted which limits initial research and support to no more than a two-year commitment, but allows the grantee to request an extension for a third year at the end of the first year's activity, with a report of the first year's activity.

Letters should be addressed to:

C. Joseph Stetler
President
Pharmaceutical Manufacturers Association Foundation, Inc.
1155 Fifteenth Street, N.W.
Washington, D.C. 20005

Pharmaceutical Manufacturers Association Foundation, Inc.
1155 Fifteenth Street, N.W., Washington, D. C. 20005