ANNUAL REPORT · 1966

Pharmaceutical
Manufacturers
Association
Foundation, Inc.

Pharmaceutical Manufacturers

Association Foundation, Inc.

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history

Beginnings have a way of being small. Fortunately, significance does not necessarily depend on the size of an event. Both smallness and significance characterize the first months of operation of the Pharmaceutical Manufacturers Association Foundation. Its smallness is in relation to the research efforts by government, industry and the large private foundations. Its significance lies in its activities to date and in its capacity to adapt and respond flexibly to worthwhile ideas, or more importantly, to support an activity during a crucial period. The Board of Directors and its advisory committees have been most conscious of this need to remain flexible in consideiring the various requests for support.

Since the Foundation has so recently arrived on the scene, it is worthwhile to recap some of the efforts leading to its formation. While the concept of a "drug industry foundation" had often been discussed by interested members within the pharmaceutical industry, a most immediate event leading to the establishment of the Foundation was the Commission on Drug Safety, established by the Pharmaceutical Manufacturers Association in the fall of 1962. The Commission was established to study the entire problem of drug safety and to come forth with recommendations. It carried on its work during the time of the urgency of the thalidomide situation and the passage of the 1962 amendments to the Food, Drug and Cosmetic Act. Special attention was given by the Commission initially to drug-

induced fetal malformations. However, it soon became evident that the most profitable line of inquiry would be to attack the overall problem of drug safety.

After considerable study, with the aid of the Commission-sponsored panels of experts from universities, industry and government, the resolution of the broad problem of drug safety was seen to require the development of more knowledge concerning the fundamental requirements of drug action, a better exchange and distribution of in-

formation concerning drug action, and better use of what is already known. On each of these matters, the Commission was vocal.

A fate of many studies is that once they are completed and the reports distributed, little is heard about them again. One measure of the success of a study then, is the degree to which the recommendations are put into effect. One of the recurring themes expressed in a variety of ways by the Commission was that the pharmaceutical industry should show more interest in the conduct of the basic studies in drug toxicology, with the suggestion that cooperative sponsorship of such fundamental projects would have the greatest potential for uncovering new information. To achieve these kinds of studies, a number of alternative mechanisms were suggested by the Commission.

One was the establishment of a foundation. This, as well as other recommendations of the Commission, were considered by the PMA Board of Directors for some months following publication of the Commission's report. On May 31, 1965, the Pharmaceutical Manufacturers Association announced that it had established the PMA Foundation. The initial operating funds were supplied by the PMA, and sustaining support for the Foundation was to come predominantly from the pharmaceutical industry, based on voluntary contributions.

A seven-man Board of Directors for the Foundation was elected from the membership of the PMA Board of Directors, and the President of the PMA was designated as Foundation President. The Foundation was incorporated in the District of Columbia. Application was made for a tax exempt status from the Internal Revenue Service. This was granted, making contributions to the Foundation deductible for tax purposes.

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 purpose, 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. It was recognized by the PMA Foundation Board of Directors at the outset that the existence of numerous organizations with similar purposes plus the limited resources of the Foundation, made it necessary and highly desirable to establish guidelines to assist in forming priorities.

In arriving at these guidelines, the Foundation had sub-



stantial assistance from special committees of the Medical, Research and Development, and Biological Sections of the PMA, as well as from a variety of other professional and scientific sources. The initial areas of interest within which the Foundation is operating are (1) the support of fundamental research in toxicology; and (2) the support of programs of research and training for personnel in clinical pharmacology and drug evaluation. The role of the Board of Directors and its advisory committees is to bring ingenuity to their decisions concerning the kinds of programs that can best be supported by private efforts. It is exactly this kind of insight which has produced an exciting initial year for the Foundation.

It is important to stress that these are *initial* guidelines. As more funds become available, the Board of Directors will consider other ways to carry out its purposes. There is one activity which the Foundation will not undertake; it will *not* conduct research on specific drugs. Its concern is rather within the broad field of therapeutics, using its resources to pioneer new studies, new methodologies, new directions, and guidelines.

organization and administration



E. Gifford Upjohn, M.D.



C. Joseph Stetler



Raymond M. Rice, M.D.



Thomas E. Hanrahan

The Foundation operates with a Board of Directors and two advisory committees to the Board. The Chairman of the Board is E. Gifford Upjohn, M.D. Mr. C. Joseph Stetler continues to serve as President of the Foundation. During the year, a vice president and an executive director were employed. Raymond M. Rice, M.D., assumed the duties of Vice President on January 1, 1967. Mr. Thomas E. Hanrahan was retained as Executive Director on August 1, 1966.

At the PMA Annual Meeting in 1966, Francis C. Brown, President, Schering Corporation, was elected to the Board of Directors of the Foundation to fill the vacancy left by Mr. George R. Cain, Chairman of the Board and President, Abbott

IN MEMORIAM: The Foundation lost a firm supporter with the death of Francis C. Brown, October 2, 1966. His dedication to the many private philanthropic causes provided the Foundation with the distinct sense of mission. His total commitment to the public good was apparent through his efforts with the PMA Foundation. It is with a deep sense of regret that we observe the loss of his guidance and advice.

Laboratories, at the end of his expired term. The present members of the Board of Directors and officers of the Foundation are listed elsewhere in this report.

In developing the Foundation programs and choosing research efforts to support, the Board of Directors has had the advice of extremely knowledgeable individuals. Two advisory committees exist, the membership of which are contained elsewhere in this report. The Scientific Advisory Committee makes recommendations to the Board of Directors on all grant requests and recommends programs the Foundation may wish to institute itself. 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 under this program, as well as the "Medical Student Traineeships in Clinical Pharmacology" program, both of which are described below.

activities

To begin the discussion of current activities, it is appropriate to turn again to the Commission on Drug Safety. Since the Commission considered all aspects of drug safety, it was natural that some of the needs identified in the Commission's final report became part of the Foundation's fiber as it wove its guidelines and as it chooses specific projects within these guidelines. Among the many needs identified by the Commission were the following:

- (a) "The drug safety issue, in all of its aspects, quickly reduces to a question of knowledge: the need for greater understanding of the fundamental mechanism of drug action; the need for better exchange and distribution of information; the need for better use of available information.
- (b) "More fundamental research across a broad base of biology and chemistry is imperative to gain needed understanding of the implications of drug therapy.

"Present animal tests must be reassessed to determine the value of the information they provide, and more predictive animal tests must be developed.

"More financial support and professional encouragement must be channelled to the university to stimulate both basic research and the training of investigators.

"The short-term scientific manpower shortage can be offset, in part, by greater cooperation in recognizing manpower priorities among government, industrial, educational, and medical establishments; by pooled research efforts in noncompetitive areas; by elimination of the necessity to conduct obsolete and outmoded but time-consuming



tests to meet Federal requirements governing New Drug Applications.

- (d) "Great emphasis must be placed on drug studies in the medical curriculum, and a few medical schools should establish centers for intensified training in the disciplines associated with clinical testing and drug development.
- (e) "More effort should be made to develop effective ways of keeping the practicing physician abreast of drug developments, and medical schools and the medical profession should share this responsibility with the drug manufacturers.
- (f) "The information requirements of research scientists, clinical investigators, and all other physicians need to be reviewed thoroughly, especially in the light of the dataretrieval and statistical-analysis potentials of modern information systems."

Added to these suggestions were those distilled from the advice given to the Foundation by the various sections within the PMA, as well as by the Foundation's advisory committees. Among these were:

- (a) Investigation designed to better correlate animal and human data concerning toxicity and effectiveness in an effort to provide better predictive value to the animal studies.
- (b) Study of comparative physiology and biochemistry of various groups of animals compared to that known for man to determine whether certain species are more appropriate than others for various types of studies.
- (c) Studies to increase the significance of chronic toxicity findings such as early histochemical tests, electron microscopic analysis, and enzyme changes.
- (d) Projects to learn how to distinguish deviations from the normal due to drug effects from those due to other factors.
- (e) A review of the programs of the 33 centers for training in clinical pharmacology now in existence to determine whether more fellowship support is indicated.
- (f) A survey of the teaching of pharmacology and therapeutics in medical schools and support of a study of ways and means of improving the courses of instruction.
- (g) A study of the reliability of clinical laboratory tests and of methods for improving them.
- (h) A study of possible means for establishing "base line" information concerning the occurrences of pathology and abnormal symptoms in the normal untreated population. This is regarded as essential to the proper evaluation of reports of alleged untoward reactions to drugs.

Within these broad areas, the Foundation has made a modest but effective beginning in its support of a number of research projects and several workshops and symposia. The Foundation has also instituted two continuing programs — one aimed at increasing the competency of personnel in the field of clinical pharmacology, while at the same time providing incentives for individuals to remain in that field; and the other with a longer range goal of reaching medical students sufficiently early in their development to generate interest in a career in clinical pharmacology.

REGISTRY OF TISSUE REACTIONS TO DRUGS

One of the first activities supported by the Foundation is the Registry of Tissue Reactions to Drugs. The Registry is located at the Armed Forces Institute of Pathology, Washington, D. C. It is cosponsored and equally supported with the American Medical Association, Food and Drug Administration, and the National Institutes of Health. Nelson S. Irey, M.D., is the Registrar. The Foundation has contributed slightly over \$30,000 as its share of the operating expenses of the Registry. The Registry obtains biopsy and autopsy tissue specimens from suspected drug reaction cases, subjects them to biological and toxicological examinations, and reports its findings to the four sponsors and the physicians who submitted the material.

Each sponsor receives a quarterly report of all cases reviewed during that period. The tabulations on each case include the drug(s) related to the reaction, the drug-related diagnosis, the primary disease of the patient, comments, and a listing of other drugs administered. Judgments expressed on the degree of certainty of the cause-effect relationships between the drugs and the tissue reactions are in terms of (a) negative (b) coincidental (c) possible (d) probable and (e) causative, each category being appropriately defined.

Based on information in the report for the quarter ending December 31, 1966, all PMA member firms whose drugs were involved in the cases reviewed were informed by the Foundation of the findings of the Registry. The Foundation expects to continue this dissemination of information following receipt of each quarterly report from the Registry.

As of December 31, 1966, the Registry had accessioned 509 cases into its active files. A "reserve" file of 1,409 cases exists. In this latter group, the drug, organ and the Armed Forces Institute of Pathology accession numbers are recorded in the Registry. These cases may be retrieved from the Institute's file on call.

WORKSHOPS AND CONFERENCES

Drug Metabolism

The Foundation has supported and co-sponsored a number of workshops and conferences. The first of these was a workshop on the principles and methodologies of drug metabolism conducted at the New York University Medical Center, May 23-27, 1966. This activity was co-sponsored with the Drug Research Board, National Academy of Sciences - National Research Council and the host university. It was supported by the Foundation with a grant of \$18,060. Bert N. La Du, M.D., Chairman and Professor, Department of Pharmacology, New York University School of Medicine, was the director.

The program was aimed at pharmacologists, clinical pharmacologists, and teratologists who wished to increase their level of information concerning drug metabolism. The workshop included presentations on the physical property of drugs, principles and techniques of drug metabolism, and the role of genetics in metabolism. There was general agreement by the workshop faculty and the participants that the scientific program, demonstrations and laboratory experiments met the objectives of the workshop effectively.

Because of this high degree of interest shown in the first workshop on drug metabolism, the Foundation will support and co-sponsor with the Drug Research Board, NAS-NRC and the host university, a second workshop on drug metabolism scheduled for May 22-26, 1967, at George Washington University, Washington, D. C. A grant of \$18,000 has been made for this purpose. H. George Mandel, M.D., Professor and Chairman, Department of Pharmacology, George Washington University School of Medicine, will direct this workshop.

The George Washington University workshop, like the previous one, is specifically directed to pharmacologists, biochemists, toxicologists, teratologists and clinical pharmacologists who wish to learn about present knowledge of drug metabolism, its potential implications and the techniques available for advancing this area of research.

The program will consist of lectures, discussions, laboratory demonstrations and experiments. The topics scheduled for this workshop include physicochemical properties of drugs, absorption, distribution and excretion of drugs, metabolic pathways, techniques of studying drug metabolism *in vivo* and *in vitro*, factors which affect drug metabolism, and implications of drug metabolism studies. Some of the special research techniques in use at the National Institutes of Health will be presented as demonstrations.

Clinical Investigation

In response to a request from the American College of Cardiology, the Foundation awarded a grant of \$5,000 for a conference, held August 27-28, 1966, in Bethesda, Maryland, dealing with the relationships of the clinical investigator to the patient, the pharmaceutical industry and federal agencies. This conference brought together knowledgeable individuals from



professional associations, clinical investigation, the pharmaceutical industry and government to discuss guidelines for increasing the effectiveness of clinical investigation.

Comparative Pharmacology

The Foundation provided \$3,000 for support of the International Symposium on Comparative Pharmacology held January 24-27, 1967, in Washington, D. C. This symposium was co-sponsored by the National Institutes of General Medical Sciences, National Cancer Institute, National Heart Institute of the National Institutes of Health. The Chairman was Edward J. Cafruny, Ph.D., M.D., Professor and Chairman of the Department of Pharmacology, University of Minnesota School of Medicine. This symposium discussed the comparative aspects of absorption and excretion of drugs, mechanisms of detoxification and transformation of living organisms, comparative aspects of drug toxicity, pharmacological actions of drugs in living organisms, chemical secretions, and comparative therapeutics.

Immunology - Pharm'acology

An invitational Interdisciplinary Symposium on Immunology-Pharmacology is scheduled for March 2-3, 1967, at the National Academy of Sciences - National Research Council, Washington, D. C. This is jointly financed and sponsored by the Foundation and the National Institute of General Medical Sciences, with each providing \$11,800, and co-sponsored with the Drug Research Board, NAS-NRC. The Chairman of this symposium is Murray Weiner, M.D., Director of Clinical Pharmacology, Geigy Research Laboratories.

A group of approximately 70 scientists from both fields is scheduled to attend the symposium where recent developments in immunologic methodology and mechanisms and the application of these to the study of drugs will be considered. Also to be considered are the present concepts of drug disposition and action in their relationship to immunologic phenomena. The program will attempt to familiarize the group with current immunologic concepts, mechanisms of drug binding and localization, immune mechanisms as a cause of reactions to drugs, and techniques of assay by immunologic procedures.

Biochemistry - Pharmacology

Scheduled for June 12-16, 1967, is the Workshop on Biochemical Approaches to Clinical Pharmacology, at Vanderbilt University School of Medicine, Nashville, Tennessee. This workshop will be jointly sponsored by the Drug Research Board, NAS-NRC, the Foundation, and the host university. The enabling grant of \$20,090 for this workshop was provided by

the Foundation. The director is John A. Oates, M.D., Associate Professor of Medicine and Pharmacology, and Director of Clinical Pharmacology at Vanderbilt University School of Medicine.

The workshop is designed for clinical pharmacologists and those developing careers in that area, with participation primarily from universities and pharmaceutical firms. The program will be concerned with the distribution and disposition of drugs, radioisotopic methods in clinical pharmacology, and biochemical mechanisms of the action of selected drugs. Both laboratory and demonstration sessions are scheduled.

RESEARCH GRANTS

In furthering the aim of supporting research in drug toxicology and drug evaluation, the Foundation has made four awards. These have gone to the Division of Clinical Pharmacology, Lemuel Shattuck Hospital Medical Service - Tufts University School of Medicine, Boston, Massachusetts; the Stanford Research Institute, Menlo Park, California; the Institute for Developmental Research of Children's Hospital Research Foundation, University of Cincinnati, Cincinnati, Ohio; and the Renal and Electrolyte Division of the Georgetown University Hospital, Washington, D. C.

The award to the Clinical Pharmacalogy Division of the Lemuel Shattuck Hospital Medical Service of \$25,770 for one year beginning September 1, 1966, has enabled the Division to develop a program to monitor each drug routinely prescribed to patients in three 30-bed wards in the hospital. Hershel Jick, M.D., Director of the Clinical Pharmacology Division, is the principal investigator. Detailed information is obtained from the prescribing physician as to when each drug is initiated and discontinued. Skilled nurses, supervised by physicians from the Clinical Pharmacology Division, act as monitors and secure the needed information from the prescribing physicians. The program is designed to detect undesired side effects, to estimate drug efficacy, and to attempt a correlation of drug effects with genetic characteristics. It is estimated that 15,000 to 20,000 drug orders will be monitored in the year.

Some preliminary results of this project were published in Lancet, October 22, 1966. The article reported that the method of drug surveillance has proven eminently feasible and that it takes less than 20 minutes of the doctor's time each day. Among other findings on 190 patients investigated and 1,250 drug orders, the article indicated that 56 drugs, or 4.4% of all drugs prescribed, were stopped because of alleged side effects. Fiftyone other drugs produced adverse reactions, but these reactions were not serious enough to require withdrawal of the medication.



The grant made to the Stanford Research Institute of \$59,885 for a two-year period beginning September 1, 1966, is for a study of the metabolism of well-known drugs by sub-human primates. One objective of the research is to determine if some monkey species are more appropriate than others for various types of studies. Hopefully, the knowledge acquired in this work will also enable scientists to make more accurate and realistic predictions of the toxic and pharmacologic effects of new drugs in humans.

Dr. John H. Peters, the biochemical pharmacologist responsible for the project, plans to define the capacities of rhesus and squirrel monkeys to metabolize drugs that are commonly used in man. The drugs to be studied represent the four main classes of drug metabolism: oxidation, reduction, hydrolysis, and synthesis (conjugation). Degradation of the candidate drugs in the human body is already understood. Similar information will be obtained for the two monkey species and compared with data from humans.

Rhesus monkeys are frequently used in such preclinical pharmacologic studies. As a result, more is known about their metabolic similarities to, and differences from, humans than about squirrel monkeys. An additional advantage of the SRI project is that more will be learned concerning squirrel monkeys as laboratory animals. Smaller and more docile than rhesus monkeys, they are easier and less expensive to house, feed, care for, and handle.

The grant to Josef Warkany, M.D., Professor of Research Pediatrics, the Children's Hospital Research Foundation of \$50,000 a year for five years beginning January 1, 1967, is for partial support of the Division of Fetal Pharmacology, Institute for Developmental Research. The grant will assist in acquiring the necessary scientific personnel, including a director for the Division, and adequate equipment to conduct the basic research envisioned. The grant will accelerate the implementation of the research and training activities by the Institute in fetal and perinatal pharmacology.

The grant to the Renal and Electrolyte Division, Department of Medicine, Georgetown University School of Medicine of \$20,000 a year for up to five years starting January 1, 1967, is to support research, administrative and editorial activities relating to the dialysis of drugs, and for a proposed registry of specific reports of dialysis of drugs to be instituted with the cooperation of the American Society for Artificial Internal Organs. The latter four years of the grant have been agreed to in principle by the Foundation, but remain subject to yearly review. George E. Schreiner, M.D., Professor of Medicine, and Director, Renal and Electrolyte Division is the principal investigator.

CLINICAL PHARMACOLOGY

The field of clinical pharmacology has never been more important. While many factors have caused this to come about, a significant event was the enactment of the 1962 Amendments to the Food, Drug and Cosmetic Act and the subsequent promulgation of regulations governing clinical investigation. A primary question, of course, is how to increase the supply of personnel needed to conduct clinical studies. The Foundation has instituted two programs, one with hoped-for immediate consequences, and the other more long-term. In the first category, the Foundation has instituted a program of "Faculty Development Awards in Clinical Pharmacology", and in the second category the Foundation has established a program of "Medical Student Traineeships in Clinical Pharmacology".

Through the "Faculty Development Awards in Clinical Pharmacology" program, the Foundation will make annual awards to medical schools for salary support of full-time junior faculty positions in the area of clinical pharmacology. These awards are for two years each and, in exceptional circumstances, may be extended for an additional one or two years. The level of support is variable, and is aimed at keeping within the existing salary structure of the applicant university. Funds are also provided for employee fringe benefits at the prevailing level in the institution. The Board of Directors established an initial maximum expenditure of \$75,000 for awards at any one time under the program.

The ultimate aim of the awards program is to stimulate teaching, training and research in clinical pharmacology. It is aimed at providing an opportunity for optimal development of the research potential of clinical pharmacologists during the several years immediately following their formal training programs. Candidates should indicate a strong determination for a full-time career in clinical pharmacology, either in a medical school, or related institution, or in the pharmaceutical industry.

The three awards for 1967 under this program have been made, totaling slightly more than \$55,000. These have been awarded to Emory University, Atlanta, Georgia, on behalf of John L. McNay, M.D.; University of Minnesota, Minneapolis, Minnesota, on behalf of Faruk S. Abuzzahab, Sr., M.D.; and University of Washington, Seattle, Washington, on behalf of John S. Holcenberg, M.D.

Dr. McNay was graduated from Yale University and received his M.D. from Harvard Medical School. The award from the Foundation will enable him to conduct research at Emory University in renal physiology and pharmacology. It will also provide him the time needed to complete and publish the results of previous research in clinical pharmacology.



Dr. Abuzzahab, who earned both B.S. and M.D. degrees from the American University of Beirut in Lebanon, has also studied at Johns Hopkins University and the University of Minnesota. The Foundation award will enable Dr. Abuzzahab to receive additional training at the University of Minnesota in studying drug metabolism in psychiatric patients. His research plans include work in both basic and clinical psychopharmacology, areas in which he is currently conducting research. Other duties will include teaching medical students.

Dr. Holcenberg is a graduate of Harvard College, and he earned his medical degree at the University of Washington School of Medicine. He will pursue research in the field of clinical pharmacology at the University of Washington as a result of the Foundation's award. His teaching responsibilities will probably be concerned with training for research fellows in the Departments of Medicine and Pharmacology who wish help in those aspects of biochemical research in which Dr. Holcenberg has been particularly active.

The "Medical Student Traineeships in Clinical Pharmacology" program is aimed at providing an opportunity for students to acquaint themselves with the basic techniques applied in clinical pharmacology. Awards under this program are 20 stipends of \$1,000 each for three-month periods of work in clinical pharmacology units. The program must be primarily concerned with research and training. These awards for 1967 will be made by April 15, 1967.

foundation finances

CONTRIBUTIONS

Contributions are accepted from private, corporate and individual, sources and are deductible for income tax purposes. However, the Foundation will not accept contributions which are so restricted as to place their use outside the policies of the Foundation.

The Board of Directors of the Foundation decided that a yearly budget of \$500,000 for each of the first three years of the Foundation's existence would be the goal sought through voluntary contributions. To assist the PMA Member Firms in arriving at decisions concerning the level of corporate contributions, a guideline was suggested, which if applied by all of the PMA Member Firms, would yield \$500,000 annually. Each firm was asked to consider a contribution of .015% of its domestic and international pharmaceutical sales. In approaching the PMA Associates, other industry-related corporations, and individuals for support, no guideline was offered.

The "contribution year" for the initial solicitations for support for the Foundation's activities extended over the last few months of 1965 and the entire year of 1966, covering approximately 18 months, with an initial contribution of \$25,000 from the Pharmaceutical Manufacturers Association in June, 1965. In the interest of presenting a summation of all activities in this report, both in scientific and financial matters, this financial report will cover the 18 months ended December 31, 1966.

INCOME

Total income from contributions and interest on investments from July 1, 1965 to December 31, 1966, was \$492,500. The initial contribution of \$25,000 from the PMA in June, 1965, brings the total income to \$517,500.

Contributions were received from approximately three-fourths of the 139 PMA member firms. Half of the PMA associates joined in supporting the Foundation. Contributions were also received from a few individuals and from industry-related firms.

EXPENDITURES

Awards and operating expenses for the period of time described above amount to \$124,000. Most of this represents payments on grants, over \$101,000. The financial statement shows a fund balance of nearly \$394,000. However, this figure does not reflect the liability for the undisbursed amounts for grants authorized in 1966, since the Foundation has elected to report these amounts as expenses when the funds are disbursed. As of December 31, 1966, the liability for undisbursed grants totals approximately \$535,500. Since some of the grants represent amounts to be paid over two to five years, the liability for part of the \$535,500 will be met from anticipated income in 1967 and succeeding years. However, during 1967, the estimated amount of this liability to be paid totals \$208,000.

FINANCIAL REPORTS

The Foundation's financial position as of December 31, 1966, has been audited by the accounting firm of Ernst & Ernst, and a report made to the Board of Directors of the Foundation. Copies of this statement will be supplied upon request.

A financial statement covering the period from the initial months of the Foundation from June, 1965 to December 31, 1966, prepared by the Washington, D. C. accounting firm of Buchanan & Co., has been distributed to contributors to the Foundation. In the future, contributors will receive quarterly financial statements, beginning with the quarter ending March 31, 1967.

STATEMENT OF INCOME AND EXPENDITURES July 1, 1965 - December 31, 1966

income	Income	9
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Contributions — Note a	\$478,297.00
Interest on Investments	14,203.08
	\$492,500.08
Expenditures	
Grants — Note b	
New York University Medical Center	\$ 18,060.00
Universities Associated for Research and Education in Pathology, Inc. (Registry of	
Tissue Reactions to Drugs	30,361.22
Tufts University	12,885.00
American College of Cardiology	5,000.00
Stanford Research Institute	12,038.70
Vanderbilt University	20,090.00
Symposium on Comparative Pharmacology	3,000.00
	\$101,434.92
Administrative expenses	22,167.36
	\$123,602.28
Excess of income over expenditures	\$368,897.80
Fund balance at July 1, 1965 - Note c	25,000.00
Unexpended fund balance at December 31, 1966	\$393,897.80

- Note a The Foundation received contributions of \$111,452.00 prior to December 31, 1966, which the Foundation has considered as being applicable to 1967, and therefore has not recorded as income in 1966.
- Note b The Foundation has committed itself, subject to annual review, to make certain research grants. At December 31, 1966, the amounts still to be disbursed with respect to these grants aggregated \$535,531.30, of which approximately \$208,000.00 is expected to be disbursed in 1967.
- Note c The balance of the General Fund at July 1, 1965 represents an initial \$25,000 contribution to the Foundation by the PMA. Including this amount, total contributions recognized as income to the Foundation to December 31, 1966, have aggregated to \$503,297.00.

contributors

PMA MEMBER COMPANIES

*Abbott Laboratories

Alcon Laboratories, Inc. Conal Pharmaceuticals, Inc.

Allergan Pharmaceuticals, Inc.

*American Cyanamid Company Davis & Geck Division

Fine Chemicals Department

Lederle Laboratories Division

American Home Products Corporation Ayerst Laboratories

Ives Laboratories, Inc.

Wyeth Laboratories

Armour Pharmaceutical Company

Astra Pharmaceutical Products, Inc.

Baxter Laboratories, Inc. Flint Laboratories Hyland Laboratories

Wallerstein Company

Becton, Dickinson and Company Baltimore Biological Laboratory

Bristol Laboratories

(Bristol-Myers Fund)

Burroughs Wellcome & Co. (USA) Inc.

Carbisulphoil Company

The Central Pharmacal Company

Chatham Pharmaceuticals, Inc.

CIBA Pharmaceutical Company

Cole Pharmacal Company, Inc.

Commercial Solvents Corporation

Crookes - Barnes Laboratories, Inc. (Chemway Corporation)

Cutter Laboratories

Hollister-Steir Laboratories

Difco Laboratories

Distillation Products Industries (Eastman Kodak Company)

Dorsey Laboratories (The Wander Foundation)

Endo Laboratories, Inc. (Foundation)

First Texas Pharmaceuticals, Inc.

*C. B. Fleet Co., Inc.

Geigy Pharmaceuticals (Geigy Chemical Corporation)

*Contribution received in 1965.

Hobart Laboratories, Inc. Hoechst Pharmaceuticals, Inc. Hoffmann-LaRoche, Inc. (Foundation) Hynson, Westcott & Dunning, Inc.

Johnson & Johnson Association Industrial Fund Ethicon, Inc. McNeil Laboratories, Inc. Ortho Pharmaceutical Corporation

Knoll Pharmaceutical Company

Lakeside Laboratories, Inc. Lemmon Pharmacal Company Eli Lilly and Company

Mallard, Inc.

Mallinckrodt Chemical Works

Marion Laboratories, Inc.

Mead Johnson & Company (Foundation)

Merck & Co., Inc.

Merck Chemical Division Merck Sharp & Dohme

Miles-Ames Foundation

Ames Company Dome Laboratories

Neisler Laboratories, Inc.

Nion Corporation

The Norwich Pharmacal Company (Norwich-Eaton Charitable Trust)

The P. J. Noves Company

Organon, Inc.

Parke, Davis & Company S. B. Penick & Company (Foundation) *Chas. Pfizer & Co., Inc.

Philips Roxane Laboratories

Pitman-Moore

Richardson-Merrell Inc. J. T. Baker Chemical Co. The Wm. S. Merrell Company The National Drug Company Walker Laboratories

Riker Laboratories Rexall Drug Company

PMA MEMBER COMPANIES (Continued)

A. H. Robins Company, Inc.

William H. Rorer, Inc. (Foundation) Kinney & Company, Inc.

Rowell Laboratories

Sandoz Pharmaceuticals (Sandoz, Inc.)

Savage Laboratories, Inc.

R. P. Scherer Corporation

Schering Corporation

White Laboratories, Inc.

G. D. Searle & Co.

Sherman Laboratories

Smith Kline & French Laboratories (Foundation)

Norden Laboratories, Inc.

E. R. Squibb & Sons, Inc.

(Olin Mathieson Charitable Trust)

G. S. Stoddard & Co., Inc.

(Tilden-Yates Laboratories, Inc.)

Strasenburgh Laboratories
Strong Cobb Arner, Inc.

The Stuart Company

Sutliff & Case Co., Inc.

*The Upjohn Company

U. S. Vitamin & Pharmaceutical Corp.

The Vale Chemical Company, Inc.

Walker, Corp. & Co., Inc.

Wallace Laboratories (Carter-Wallace, Inc.)

Wampole Laboratories (Denver Chemical Manufacturing Co.)

Warren-Teed Pharmaceuticals, Inc.

Winthrop Laboratories
Breon Laboratories, Inc.

PMA ASSOCIATES

American Medical Association

Benzol Products Company

Clark-O'Neill, Inc.

The Dow Chemical Company

Gane's Chemical Works, Inc.

Hazelton Laboratories, Inc.

The Ivers-Lee Company

Medical Economics, Inc. (Foundation)

Medical Mailing Service, Inc.

Modern Medicine

Owens-Illinois, Inc.

SST Corporation

Sheffield Tube Corporation

Sieber & McIntyre, Inc.

Robert E. Wilson, Inc.

The Yorke Medical Group (The Reuben H. Donnelley Corp.)

PERSONAL AND OTHERS

N. W. Ayer & Son, Inc.

(W. M. Armistead Foundation)

Brockway Glass Company, Inc.

M. F. Charley, Chairman of the Board, Standard Pharmacal Corp.

William N. Creasy

Dartell Laboratories Manufacturing Corp.

Drug News Weekly

(Fairchild Publications, Inc.)

*Contribution received in 1965.

Florence and Maxwell Geffen Foundation, Inc.

MD Publications, Inc.

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