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Stimulation of Health Research

Catalytic activities of Public Health Service study sections from 1946 to 1964 are discussed.

James H. Cassedy

The Public Health Service is well known as the channel through which flows a large part of the funds appropriated by Congress for health-related research. The scientific community is especially familiar with this agency's extensive extramural program of grants and other awards aimed at supporting and strengthening research. In contrast, relatively few scientists are aware of the extent and nature of other kinds of assistance which the Public Health Service, particularly through the

institutes and divisions of the National Institutes of Health and their advisory groups, has given to the development of research. This article describes one aspect of this assistance—the work of the advisory groups known as study sections. These bodies, organized in NIH's Division of Research Grants and working in close collaboration with the institutes, have paid much attention to problems of research development of specific scientific disciplines (1).

The 21 study sections which the Pub-

lic Health Service organized in 1946 had grown in number to 51 by 1964. These bodies are composed of eminent scientists from universities, hospitals, foundations, and other research institutions. Since their memberships change partially every year, they serve as constantly renewed sources of independent viewpoints for the Public Health Service.

Study sections have two responsibilities. The first is to evaluate the scientific merit of research grant applications. This is in itself a demanding task which requires members to spend a great deal of time both in studying applications and in preparing preliminary review comments, as well as in actual participation, on visits to project sites and in study section meetings, in the discussions leading to ultimate recommendations. The second responsibility of these scientists is to survey the status of research in their fields in order to determine where research activities should

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be initiated or expanded. These two responsibilities complement one another, for, in the course of reviewing proposals for research, the members develop an acute awareness of the needs of a field. The advisory position of the study sections within the Public Health Service, together with their close relationship to the scientific community, enables them to help turn this awareness into constructive action.

Widely varying activities have been carried out (2), both formally and informally, by these groups. Study sections have surveyed their particular fields to uncover neglected areas of research or to identify obstacles to research. They have facilitated scientific communication and stimulated special research efforts through conferences, workshops, or publications. They have secured production of biologicals and other materials needed for research. Often such study section work has required financing. This usually has been accomplished through the regular Public Health Service support mechanisms. Occasionally, outside support has been secured. For example, study sections have encouraged commercial laboratories to test biologicals and provide free research materials to investigators; interested publishing houses and journals have been asked to underwrite the costs of issuing proceedings, tests, or other printed materials giving research results; and scientific societies have cosponsored symposia and other meetings, managed them, and borne their expenses.

Study section activities of these types have often set in motion chain reactions which have continued to influence the various scientific fields long after the original stimuli were removed.

Stimulative Work

There follows a small selection of examples of the *ad hoc* activities of individual study sections. The examples are grouped under eight subheadings which, for the most part, indicate general areas of research rather than names of study sections. Limitations of space prevent reference to the work, no matter how significant, of every study section, while no one study section is treated exhaustively. The names of participating scientists are not given; the composition of individual study sections can be found in published rosters of Public Health Service advisory bodies. Since this article is concerned principal-

ly with the processes of stimulation of scientific activity there is no systematic attempt here to trace investigations through to their conclusions.

Therapeutic Agents

By the end of World War II after strenuous efforts by many investigators, penicillin was finally in mass production. Several of the newly organized study sections, however, showed that there was a need for further research on penicillin. Early in 1946 the Antibiotics Study Section began to stimulate such research through a program of cooperative fundamental pharmacologic and biologic studies of penicillin. To further these studies the members, after correspondence with penicillin-manufacturing firms, made arrangements to centralize in the study section the distribution to investigators of supplies (in amounts adequate for pursuing the studies fostered by the section) of individual species of penicillin, of modified penicillins, and of impurities contained in commercial penicillin. The Public Health Service had already agreed to provide funds to purchase such materials and, through the study section, to make crystalline penicillin available, without cost, to investigators. The study section also determined the availability of scarce penicillin F from British laboratories and made arrangements for its distribution to American investigators as needed. The logistics of supplying experimental penicillin assumed such proportions that the study section for several years hired an executive assistant to handle the routine of correspondence with manufacturers and investigators, to coordinate the procurement and distribution of the various species of penicillin, to establish mechanisms for testing these supplies, and to collect information about new species as they were found. The Syphilis Study Section, which likewise was concerned in 1946 with the state of penicillin research, recommended penicillin G to investigators as the most promising species upon which to focus syphilis research. This recommendation was widely followed.

Research on antibacterials other than penicillin also received study section impetus. The Tuberculosis Study Section in 1947 cooperated with the American Trudeau Society in furthering a study on clinical use of streptomycin. The Experimental Therapeutics Study Section, during the 1950's, was

interested in colchicine and tropozone. The Antibiotics Study Section established an antibiotics reference file and in 1947 sponsored a large national symposium on research in antibiotics. Coming at a time when comparatively few people were aware of the implications in antibiotics research, this conference was a potent stimulus. During the following year many of the societies in the field of general biology and medicine held sessions devoted to antibiotics research.

Malaria, which had been a major war-time concern, remained a matter for continued research attention in the postwar period. The Malaria Study Section, therefore, put much of its early energy into promoting research on malaria chemotherapy. It disseminated news in this field through the *NIH Malaria Reports* and organized periodic meetings of its investigators to exchange research information. Also in the late 1940's it stimulated phases of the large-scale field trials by Public Health Service scientists overseas of such drugs as chloroquine, oxychloroquine, paludrine, pentoquine, and SN13,274.

Research on Specific Diseases

Apart from its concern with penicillin research, the Syphilis Study Section tried to interest appropriate laboratories in undertaking long-range and large-scale fundamental research in syphilis as well as in gonorrhea and other venereal diseases. In addition, the study section established a subcommittee to conduct, through selected laboratories, a coordinated study of biologic false positive reactions. Another subcommittee worked in 1948 with the Cardiovascular Study Section to organize, again with selected investigators, a study of cardiovascular syphilis. And in 1948 the Syphilis Study Section organized the first of a series of large yearly symposia on venereal disease, sponsorship of which it ultimately turned over to the American Venereal Disease Association and other organizations.

The Tropical Diseases Study Section, meanwhile, initiated arrangements for a research team to go to Japan to study ekiri, a children's disease. It arranged scientific symposia to facilitate exchanges of knowledge about such diseases as amebiasis, schistosomiasis, and toxoplasmosis. Throughout the late 1940's, it helped find additional forms

of American support, both scientific and financial, for the new Liberian Institute of Tropical Medicine.

Study sections concerned with microbiology and related areas aroused interest in particular areas of their disciplines through a considerable number of small working meetings and larger conferences. There were, for instance, symposia on brucellosis; a seminar on histoplasmosis; a 1955 symposium on the common cold, cosponsored by the Common Cold Foundation; and a 1960 symposium focused on the phenomena of the tumor viruses. One section, in 1953, conducted a survey of infectious ectromelia in laboratory mice.

In 1957 several study sections expressed concern over the increasingly severe problem of staphylococcus infections in hospitals. New research appeared to be necessary if effective control measures were to be developed. In response, in a move coordinated by the NIH Division of Research Grants, representatives of six of these advisory panels met early in 1958 to assess the situation. This meeting was followed, later that year, by a 2-day conference of representatives of 25 study sections. Participants at this conference identified some 100 specific research problems in relation to staphylococcus infections. Work on several of these, such as staphylococcal genetics and studies of the process of localization of infection in the body, was directly stimulated by the conference.

Nutrition, Metabolism, and Endocrinology

The many processes connected with metabolism are other areas of concern. In 1947 the Biochemistry and Nutrition Study Section found a critical need for more accurate analyses of foods. Over the next dozen years, largely through conferences, it promoted discussion of many aspects of nutrition research. In 1961 the Nutrition Study Section helped organize an International Conference on Marine Food Resources and World Nutrition, a gathering which was of much interest to the American Food for Peace Program as well as to the U.N. Food and Agriculture Organization's Freedom from Hunger drive.

The Metabolism Study Section made several recommendations to laboratories and to the Public Health Service aimed at helping to relieve the critical shortage in the postwar supply of in-

sulin. This done, conferences were organized to exchange knowledge about many special aspects of diabetes, insulin therapy, and metabolism generally. In 1960 and 1961 the study section organized discussions of metabolic influences on the incidence of coronary heart disease. During the same period it began working with the National Heart Institute on a program in which reference samples of lipid compounds were distributed to investigators. The aim was to provide qualified research workers with small samples of fatty acids and radioactive lipids of high purity, not commercially available. Such samples are still being distributed.

Hardly any discipline has received more vigorous and sustained research impetus from study sections than endocrinology. Soon after its establishment late in 1946, the Metabolism and Endocrinology Study Section began a program to support the production of purified steroids as reference standards and to furnish these to investigators. The study section hoped to relieve researchers of the necessity of performing this time-consuming and research-delaying operation themselves.

The study section also initiated studies on the standardization of normal levels of gonadotropin and developed criteria for the purity of pituitary hormone preparations. As launched in 1948, the project was aimed at the production of purified growth and adrenotropic hormones. Under Public Health Service financing the study section set in motion a production and distribution program of such research materials not commercially available.

Through the 1950's the Endocrinology Study Section went on, through its subcommittees, to advise in the preparation and supervise the distribution of a variety of radioactive steroids and pituitary hormones. Quality and standardization of products were the principal objects. Human growth hormone, follicle-stimulating hormone, luteinizing hormone, prolactin, thyroid-stimulating hormone, and bovine-growth hormone, among other pituitary hormones which had been isolated in highly active form, were distributed to qualified research workers. Steps to establish a national stockpile of gonadotropins from special types of urine were also initiated. These measures were aimed at, and eventually achieved, the distribution of high-potency urinary gonadotropins for use as a world-wide research standard. To assist some of its projects, the study section obtained free radioactive materials

from the Atomic Energy Commission. It also initiated a procedure, adopted by NIH, which enabled qualified investigators to obtain supplies of certain steroids from and in cooperation with the Medical Research Council of Great Britain. The study section now performs a continuing service to investigators in providing information about the availability of free research materials (3).

A major interest of the Endocrinology Study Section since early 1962 has been promotion of the idea of a national human pituitary registry and bank, established recently by the National Institute of Arthritis and Metabolic Diseases (4). Although the project is aimed at recovering human pituitaries for research purposes, some foresee that such an institution may eventually play as vital a direct role in correcting threatened dwarfism in children as the national eye bank now plays in saving sight.

Morphology and Genetics

One concern of the Genetics Study Section has resulted in a comprehensive compilation of research methodologies applicable to medical genetics. In order to develop such information, the study section first planned and held a series of three international symposia which emphasized new or special techniques as well as opportunities for genetic research. These covered methodology in human genetics, methodology in mammalian genetics, and methodology in basic genetics. The materials presented at the symposia then were expanded to include practical information on resources and were published in three volumes. Designed to aid research workers in broadening the scope of their genetic investigations, these volumes contain, for example, besides extensive bibliographies, a proposed standard system of nomenclature for human chromosomes, with a synopsis of cases of chromosomal abnormalities in man; illustrations of systems for keeping records on laboratory animals; and explanation of standardized genetic symbols used for mice, together with information on the husbandry and procurement of these experimental animals (5).

The Morphology and Genetics Study Section was for some time concerned with ensuring supplies of various inbred strains of rats. This study section also found a need for a national research

center in cell biology. Although organization of such an institution by the Public Health Service proved to be unfeasible, the efforts of this study section, along with other pressures, contributed to strengthening of departments or to establishment of new institutes of cell biology at existing institutions.

One concrete result of the focusing of interest upon research in cell biology was the emergence in 1958 of a separate study section for this field. Another was the movement, through 1960 and 1961, which resulted in establishment of the American Society for Cell Biology. Members of the Cell Biology Study Section played leading roles in the formation of this society.

Radiobiology

Activities of advisory groups in the area of radiobiology were in response to an environmental health problem which had hardly concerned mankind before World War II but which, after the war, quickly grew to the magnitude of a universal social obsession.

The Radiation Study Section took steps to assist investigators in the calibration of their radiation equipment. Together with the Radiation Research Society, in 1954 it established a volunteer Committee on Radiation Dosimetry (6). The work of this committee over several years ultimately helped lead to greater standardization of methods of measuring and reporting amounts of radiation exposure. One substantial and lasting contribution was the achievement of uniformity of the standard roentgen unit of dosage at a number of major radiation therapy centers. Members of this committee also did considerable groundwork for a number of handbooks on radiation measurement which were issued by the National Bureau of Standards.

The Radiation Study Section tried to interest competent researchers in making epidemiological and biostatistical studies of the hazards of exposure of patients to diagnostic x-rays. Members of the Human Embryology and Development Study Section also were concerned with aspects of this problem, due to the increased use of radioactive isotopes during human pregnancy.

A joint meeting of several interested study sections in 1958 resulted in a number of recommendations which the Public Health Service soon adopted as

policy on the experimental use of isotopes by its grantees. Thereafter investigators and applicants were required to provide full information as to their radiation facilities as well as proof of licensing from the Atomic Energy Commission and proof of approval for their projects by the isotope committee of their institutions.

Laboratory Animals

One concern which the Radiation Study Section has shared with several other study sections, as well as with several NIH institutes and other research institutions, is the problem of the primates used in laboratory research. In the years after 1950 the successive advisory bodies on radiobiology organized a series of national conferences dealing with aspects of radiation and primate research. Some of their members also participated, with other scientists, in investigations on primate care and handling which eventually contributed to the completion of the text *Diseases of Laboratory Primates* (7). During the mid-1950's the Radiation Study Section spent much time in stimulating long-term studies of the effects of irradiation upon primates.

The Primate Research Study Section (8) performs a continuing service for the Surgeon General in certifying the needs of scientists for rhesus and other monkeys imported from India for medical research purposes and for the production of vaccines. This certification program was set up in 1955 at the request of the Government of India. Problems in the supply of primates led members of the advisory panel in 1959 to conduct an epidemiological study of the high death rate among these imported monkeys. The study, conducted in India and the United States, yielded fundamental knowledge which resulted in standards for the care of imported primates. The study section also gave important assistance, beginning in 1959, to the National Advisory Heart Council and the National Heart Institute in surveying the needs for large primate research centers and recommending the establishment of the seven centers now existing. The Human Embryology and Development Study Section, as early as 1956, had recommended establishment of somewhat similar centers in order to ensure adequate supplies of pregnant rhesus monkeys.

One of the many activities of the

Surgery Study Section resulted in the publication of its booklet "The Dog in Medical Research." Issued first in 1949, this pamphlet has been revised and republished twice, the last time in 1961 (9). It contained specifications for the humane handling and experimental use of dogs to which section members felt all experimental laboratories could be expected to subscribe.

Biophysics and Biophysical Chemistry

Perhaps no study section has done more to help a new discipline of science than has the Biophysics and Biophysical Chemistry Study Section. The work of this study section was, in fact, expressly facilitated by special funds which the Public Health Service made available. With these funds a consultant was engaged as program director to organize and conduct the many phases of an extensive development plan.

In an early stage of its planning, to assist the members themselves in learning more about the state of the field of biophysics, the study section in 1955 and 1956 organized three regional conferences, which were attended by leaders in the field. An even more important activity was the organization in 1958 of a 4-week study program at Boulder, Colorado, where about 100 distinguished scientists met to discuss research development in the field. This meeting served to broaden the knowledge of investigators already active in biophysics and to attract to biophysical science able scientists from other fields. Among the concrete results of the discussions were a number of cooperative research efforts by some of those who attended. Proceedings were published for the discipline as a whole, first in a leading physics journal and then in book form (10).

The ferment in biophysical science brought many new developments in which the study section was intimately involved. For example, the section took a leading role in the formation of the National Biophysical Society and later assisted in the organization of the International Biophysical Society. It was active in assisting universities to establish new departments, laboratories, or groups working in the broad area of biophysical science and to strengthen those already existing. It organized or supported many special meetings on research, training, and instrumentation. In many cases, efforts were made joint-

ly with such organizations as the Biophysical Society, the American Institute of Biological Sciences, the National Academy of Sciences, and the Josiah Macy, Jr. Foundation. For example, working with the Biophysical Society, the study section developed and distributed approximately 100,000 copies of a pamphlet on biophysical science for high schools. Under the same auspices, leaders in the field lectured at small colleges around the country on the challenge of, and opportunities in, biophysics.

A final example of the study section's activity is its attempt to develop relatively inexpensive but accurate atomic models for use in research and training. Between 1960 and 1962, the principal consultant to the study section, through feasibility studies conducted with study section members and with a special *ad hoc* committee of experts, brought such models to a fairly advanced stage of development. The production stage of this promising project has been turned over to the American Society of Biological Chemists, with support by the National Science Foundation.

Other Areas

During these years many other study sections have been providing leadership in their respective areas. Some have had highly organized long-range programs. Others have initiated fewer but nonetheless significant projects.

Conferences, seminars, and symposia organized by several study sections have helped to stimulate thinking and research on a complex of post-World War II problems of environmental health. For instance, large meetings which were initiated by the Environmental Health Study Section and its successors, together with the publications which frequently emerged from these meetings, have influenced research on milk and food sanitation, on occupational health, on water and sewage analysis, on industrial wastes, on water reutilization, and on other aspects of sanitation and pollution. The study section conscientiously prepared itself for its catalytic role by arranging talks at its meetings by experts in various special areas.

The Public Health Study Section took steps in 1952 to interest private organizations in renewed discussion of the problems of adequate medical care. The same section, beginning in 1955, re-

quested selected universities to train nurses in research and to apply for PHS support for such a program. The Nursing Research Study Section, itself a tangible result of that activity, has gone on to organize a series of conferences to encourage research in this and auxiliary disciplines.

The Physiology Study Section, as part of its effort to stimulate research in physical rehabilitation, encouraged a 5-year "model project" on human performance. While this project did not develop as originally visualized, it did lead a number of investigators to work on previously neglected problems. Their work is continuing. The Behavioral Sciences Study Section, in the late 1950's, found an urgent need for the translation and adequate abstracting of Russian literature relating to mental health and the behavioral sciences. Its recommendations to the Public Health Service helped lead, among other things, to the regular translation of the *Pavlov Journal of Higher Nervous Activity*. Members of the Sensory Diseases Study Section, in 1952 and 1953, cooperated with the National Institute of Neurological Diseases and Blindness in organizing a cooperative study of blindness in incubator babies. This study decisively confirmed previous findings that high oxygen concentrations in the incubator led to retrolental fibroplasia.

In 1946 the Dental Study Section noted a shortage of competent investigators and of research money in its field. It organized conferences on selected research problems, endorsed a Kellogg Foundation proposal to train dental researchers, and in 1949 approached industrial concerns (though without success) to try to obtain funds for research work on dental materials. After congressional funds became available in the mid-1950's, study section members began working with the National Institute of Dental Research to survey and promote research in dental schools.

Some study sections, like the Biophysics and Biophysical Chemistry Study Section, simply by their membership composition have achieved cross-disciplinary exchanges of knowledge. Other study sections, like the Pathology Study Section, have helped bring about effective cooperation of several organizations within particular disciplines. Through the initiative of the Pathology Study Section, five leading groups in the field of pathology joined to create the Inter-Society Committee

on Pathology Research (later changed to Inter-Society Committee for Research Potential, Inc.) (11). Interplay between the study section and this committee has been extremely productive of ideas and projects. Among these was the preparation and publication of a laboratory manual of experimental pathology for medical students (12).

Conclusion

Study sections, like the NIH institutes and advisory councils with which they have worked, have thus been concerned with many aspects of the research process. Some of their activity has related to research facilities, some to manpower. It has touched on such matters as research animals, standardized biological products, instrumentation, and other research resources. It has sometimes brought about the assessment of old knowledge, and often the dissemination of new knowledge.

Study section members have the difficult and delicate task of trying, both in their evaluation of individual research projects and in their general stimulation of research, to avoid even the appearance of directing research or favoring a particular school of scientific thought. The heterogeneous composition of study sections and the yearly replacement of some of their members help ensure that different varieties of good research get adequate hearing. This yearly replacement of members also serves to ensure that applications which may have resulted from catalytic activities of the study section are evaluated as critically as any other proposals.

Several conditions have determined the amount of special activity of a given study section. Young disciplines usually have demanded more attention than older ones. Disciplines with few active investigators, inadequate teaching, and marginal laboratory facilities have also needed, and are receiving, consideration. Conversely, where units of the Public Health Service have themselves already conducted active stimulative work in a given area, there has been no need for study sections to do such work. In any case, the amount of such activity has depended largely upon the initiative and available time of the members, particularly the chairmen (13).

Three general conditions also have governed this work. Public Health Ser-

vice administrative and financial support has been a fundamental condition for the conduct of such activities. In addition, study sections have been given considerable latitude of judgment in meeting problems. Finally, little could have been done without the ready acceptance of study section work by the scientists, or without the cooperation of universities, foundations, industries, professional societies, hospitals, and other public and private agencies.

Perhaps the success of the study sections has depended most of all upon the impressive dedication of their members to the advancement of science. Most scientists have enthusiastically accepted appointment to a study section and have willingly carried out their time-consuming duties.

As typical offspring of mid-20th-century civilization, study sections have leaned heavily on the means of rapid communication which World War II hastened into being. Consultants on these and other Public Health Service advisory panels have become, perhaps, latter-day counterparts of the peripatetic medical men of the 19th century—of physicians like Daniel Drake, Austin Flint, Sr., or Josiah Bartlett—who moved about helping to spread or generate medical ideas. Scientific conferences or workshops held in eastern hotels are now increasingly supplemented by conferences held in western and southern motels. In the process, the relative isolation of scientists west of the Mississippi is being diminished.

Activities of study sections (as well as of NIH institutes and other bodies) have provided the American scientist with a broadening and enlightening experience (14). A retiring study section

chairman a few years ago commented: "I think it has been interesting to see how democratic everything has been, and I have always felt that in calling in several hundred non-government professional and civilian experts in various categories and utilizing their advice, any mistakes which have been made are ones of democracy and not the organization itself." Some scientists have been exhilarated at the realization that their activities were helping to push what one called the "frontiers of life sciences" far beyond the modest stage which Vannevar Bush in 1945 projected for federal research (15). Intelligently applied study section activity at the level of the individual scientific disciplines, as part of the total Public Health Service effort, has played an important role in this expansion of research horizons.

References and Notes

1. There are at present nine research institutes at NIH: Allergy and Infectious Diseases, Arthritis and Metabolic Diseases, Cancer, Child Health and Human Development, Dental Research, General Medical Sciences, Heart, Mental Health, and Neurological Diseases and Blindness. For details on the administrative growth of NIH and on the setting of the study sections, see Donald C. Swain, "The rise of a research empire: NIH, 1930 to 1950," *Science* 138, 1233 (1962). For more information on the background and operation of the study sections, see "The Division of Research Grants of the National Institutes of Health: Its History, Organization and Functions, 1945-1962," *Public Health Serv. Publ.* 1032 (1963). The PHS research grants program also includes activity in the Divisions of the Bureau of State Services.
2. For details on the relation of some of this stimulative work, notably in the area of antibacterials and malaria research, to wartime programs of the Office of Scientific Research and Development, see "The Division of Research Grants of the National Institutes of Health," *Public Health Serv. Publ.* 1032 (1963); see also I. Stewart, *Organizing Scientific Research for War* (Little, Brown, Boston, 1948), and J. P. Baxter, *Scientists Against Time* (Little, Brown, Boston, 1950). Some of the study sections mentioned no
- longer exist, or now exist under a different name. Examples cited are drawn, in large part, from unpublished minutes of meetings of the study sections, from the files of NIH's Division of Research Grants. Supplementary information was obtained through interviews with some of the participating scientists.
3. See the notice which appears monthly on the inside back cover of *Endocrinology*; the clearing house is handled by the executive secretary of the study section.
4. The registry and bank is operated at Johns Hopkins University as the National Pituitary Agency, under contract from the Public Health Service.
5. See Walter J. Burdette, Ed., *Methodology in Human Genetics* (Holden-Day, San Francisco, 1962); *Methodology in Mammalian Genetics* (Holden-Day, San Francisco, 1963); *Methodology in Basic Genetics*, (Holden-Day, San Francisco, 1963).
6. The Radiation Research Society, which had its first meeting in 1953, was another result of the same scientific ferment which had helped bring the study section itself into being.
7. T. C. Ruch, *Diseases of Laboratory Primates* (Saunders, Philadelphia, 1959).
8. The study section was first (1955) known as the National Advisory Committee on Rhesus Monkey Requirements, and later (1959-60) as the National Advisory Committee on Primates.
9. The original title of the pamphlet was "Care of the Dog Used in Medical Research," *Public Health Rept. U.S. Suppl.* 211 (1949).
10. See *Rev. Mod. Phys.* 31, Nos. 1 and 2 (1959); also *Biophysical Science: A Study Program* (Wiley, New York, 1959).
11. These societies included the American Society of Clinical Pathologists, the American Association of Pathologists and Bacteriologists, the International Association of Medical Museums, the college of American Pathologists, and the American Society for Experimental Biology.
12. *Manual of Experiments in Pathology*, Hans G. Schlumberger, Ed. (Hoeber, New York, 1959).
13. A partial account of the role of study section executive secretaries, who actively assist in such work, is found in D. H. Merritt, *Clin. Res.* 8, 154 (Apr. 1960).
14. This view was expressed by J. Walter Wilson (personal communication).
15. See V. Bush, *Science: The Endless Frontier* (National Science Foundation, Washington, D.C., new ed., 1960).
16. This article was prepared at the request of and with the collaboration of members of the Research Development Committee of the Research Grants Review Branch, Division of Research Grants, National Institutes of Health: Dr. J. Palmer Saunders, Mrs. Helen Tibbitts, Dr. Seymour Baron, Dr. Irvin Fuhr, Mr. Morris Graff, Dr. Thomas O'Brien, Dr. Falconer Smith, and Dr. Katherine S. Wilson.

Odyssey of a Psychotherapist

Harry A. Wilmer

I have drawn a picture of a fantasied land through which hopeful psychotherapists journey. Only a few of the pitfalls, dangers, and allegorical tasks are shown. In a pilgrimage of mutual acculturation the therapist and the patient are fellow travelers. Both may fail, and both are beset by difficulties.

The particular tasks and labors of the therapist reflect his orientation. This is achieved in a variety of ways.

The therapist enters the gates to the Land of Psychotherapy through the Wall of Defence, past the Watchtower of Resistance. His first trial is to bypass the seductive music from the band-

stand on Cliché Heights, surrounded by Statistics Hedge. Here he can be perpetually entertained by the Hole Man Band when the orchestra of sychophancy plays. If he wanders far he risks a fall into the Selfish Sea.

Now he must not become lost in Echo Canyon, hidden by the Perseveration Pinnacles, where he will forever repeat the words and attitudes and techniques his teachers have taught him. At the end he might fall in Echolalia Lake (hidden at the far end of the valley).

His path leads him by the Compulsive Hills in which the caves of the

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