

Forty Years of Leprosy Research

History of the Leonard Wood Memorial (American Leprosy Foundation) 1928 to 1967^{1, 2}

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ORIGINS OF THE LEONARD WOOD MEMORIAL

The Leonard Wood Memorial for the Eradication of Leprosy, to the title of which "American Leprosy Foundation" was subsequently added, was set up with the expressed intention of leaving "no scientific step untaken that holds any promise of finding the ultimate solution of this age-old curse of the human race."

It had its origin in the early 1920's in the desire of Major General Leonard Wood, Governor-General of the Philippines, and himself a physician, to improve the treatment of leprosy patients in the Islands, and the wish of Dr. H. W. Wade, Professor of Pathology and Bacteriology in the College of Medicine and Surgery of the University of the Philippines in Manila, to coordinate the treatment of the many leprosy patients in the Islands with a program of training and research. In this Wade

hoped to take advantage of the broad opportunity at hand for improvement both in understanding the natural history of the disease, and in procedures for its therapy.

General Wood, former Army Chief of Staff and a leading candidate for President of the United States in 1920, had become Governor-General of the Philippines, under United States military and administrative responsibility, in 1921 (^{47, 95}) (Fig. 1). One of his first humanitarian acts was to visit the Islands' principal leprosarium, in Culion, with a special mission to improve the lot of the 7,000 leprosy patients segregated there. Shortly afterward, Wade, as an academic medical investigator, sought permission to visit Culion in the interest of his own research on leprosy, which had to do with the pathology of the disease on the one hand, and the efficacy of the current chaulmoogra oil treatment on the other. Wade's report interested General Wood, and Wade followed it up with enthusiastic recommendations for use of the opportunities for research in Culion.

At approximately this time, in conference with General Wood, Dr. Victor G. Heiser of the International Health Division of the Rockefeller Foundation and former Director of Health of the Philippines, who had promoted the use of Culion as a center for the isolation and treatment of leprosy patients, strongly supported the projected im-

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FIG. 1. Major General Leonard Wood, 1860-1927. Governor General of the Philippines, 1921-1927. The Leonard Wood Memorial was named in his honor in 1928.

provement in medical service there. General Wood pushed ahead with a comprehensive plan of improved medical practice and research, and made Wade the key person for the development of a superior medical program at Culion. Wade resigned from his university position and hospital posts in Manila, and early in 1922, on General Wood's invitation, moved to Culion as Pathologist and Acting Chief Physician, with a substantial staff of physicians and nurses, recruited by Wade from the Philippine General Hospital with General Wood's support.

The Philippine Legislature was deeply interested in the project and at General Wood's request made an appropriation for a special "modern leprosy treatment fund" to provide for the salaries of Wade and his staff and furnish financial support for the projected research program at Culion. This was a move of far reaching importance. The sum furnished, based on estimates from Wade, covered expenses from 1922 to 1925. The total health budget of the Islands, with this addition, was now so

large that General Wood was disinclined to ask for any further government help for leprosy work in Culion, and it became clear that any possible financial support for expanding needs was in the United States.

Among the physicians at Culion was Dr. Jose N. Rodriguez, a well informed leprologist, who later succeeded Wade as Chief Physician at Culion and entered on a life-long career of clinical and epidemiologic studies of leprosy. In the course of subsequent developments he became a principal consultant to the Leonard Wood Memorial.

Once established in Culion, Wade fostered its opportunities for research, in which he was deeply interested, and, in a succession of meetings, persuaded General Wood to seek the needed funds, through voluntary American subscription, for a truly scientific program, supplementing the funds available through official channels for the general program of treatment and care. General Wood's initial efforts were not highly successful, and through the initiative of Dr. and Mrs. Wade an entirely new type

of appeal was set up. Mrs. Wade (Dorothy Paul Wade), who became the prime figure in the campaign, moved back to the United States in 1925 and over a period of years, marked first by failures and disappointments, ultimately succeeded, with the help of associates, in raising substantial sums of money for the creation of a voluntary, in contrast with an official, organization for the study of leprosy. In raising the money, with a projected goal of \$2,000,000, Mr. Perry Burgess, at the time the national campaign manager of a New York fund-raising firm (Ward, Wills, Dreshan and Gates), who had directed the Near East Relief campaigns and worked with Wilfred Grenfell in his famous Labrador medical mission, left his previous posts to devote the major part of his time to fund-raising for the Philippine leprosy project. A large national committee, the American Committee for the Eradication of Leprosy, sponsored the appeal. Its executive committee included such notable men as General James G. Harbord, one-time Chief of Staff of the United States Army, who had served in the Constabulary in the Philippines and was for years Chairman of the Board of the Radio Corporation of America; Henry L. Stimson, Governor General of the Philippines and later Secretary of State and Secretary of War; Charles Evans Hughes, former Secretary of State and later Chief Justice of the Supreme Court, and the financier Owen D. Young, Chairman of the Board of the General Electric Company and a former Chairman of the Board of the Radio Corporation. Helpful too were William Howard Taft, Chief Justice of the Supreme Court and former President of the United States, George Horace Lorimer, Editor of the *Saturday Evening Post*, and W. Cameron Forbes, Boston banker, and a former Governor General of the Philippines, and Charles P. Summerall, U. S. Army Chief of Staff.

In the course of a long series of meetings, sometimes stormy, in America and the Philippines, the project gradually took shape. A prominent New York capitalist, Eversley Childs, took an active part in the donation and acquisition of funds, which included a substantial provision for a leprosy research project on the Philippine

island of Cebu. During the five years of promotion of the project, Wade in the Philippines acted continuously as advisor. In 1927, in the midst of this long period, General Wood himself died. It appeared fitting that the finally completed organization be set up in his name, and in 1928 The Leonard Wood Memorial for the Eradication of Leprosy was incorporated in New York as a nonprofit organization. In the Certificate of Incorporation the salient objectives of the Leonard Wood Memorial were clearly set forth in a paragraph that began: "It is within the purpose of the Corporation to carry on, maintain and support laboratory investigation, clinical observation and all manner of research with respect to the disease leprosy; to disseminate information concerning the source, diagnosis, treatment and prevention of leprosy. . . ."

In 1930 Mrs. Wade, after her years of intensive and devoted service, and final successful accomplishment, returned to Cullion, which, in the interim, under Wade's stimulus, had become a well-known center of leprosy research. In the new organiza-



FIG. 2. Mr. Perry Burgess, Director, Leonard Wood Memorial, 1928, President 1930-1958.

tion, which was set up with a Board of Trustees of distinguished members, Mrs. Wade served as Permanent Secretary of the Board. Perry Burgess was made Director in 1928 and became the first President in 1930 (Fig. 2). Construction of numerous suitable laboratories for research, and of a department for medical care, was inaugurated at Culion and Cebu with Memorial funds, and a research program, financed by the Memorial, was established. Wade was appointed Medical Director of the Leonard Wood Memorial on 1 January 1931 (Fig. 3).

During the formative period fear had been expressed by various volunteer and mission leprosy organizations that they might lose the support of their contributors if another organization came into the field. This fear was allayed when it was made clear to them that the Memorial, although its Certificate of Incorporation (January 1928) was broad in its provision for leprosy work, would in practice confine its attention to research and allied activities, and concern itself with hospitalization and the social aspects of leprosy only insofar as it was necessary for it to use hospitals and other facilities as a means of studying the disease. This would leave the welfare field wide open for volunteer organizations that were interested mainly in finding support for the hospitalization and care of leprosy victims. In brief, the Memorial would limit itself almost entirely to research on the nature of leprosy and its epidemiology, transmission and treatment.

The first expenditures by the Memorial were for establishment of a base of operations for field study of the epidemiology of leprosy and methods for its control. The island of Cebu was selected because it was at the time the region with the highest prevalence of leprosy in the Philippines. The Committee that made the selection included Maj. Parker Hitchens, advisor to General Wood on public health, Mr. Manuel Mañosa, sanitary engineer of the Bureau of Health, J. N. Rodriguez, leprologist at Cebu, and Wade. An entirely new leprosarium was built there, designed and laid out in large measure by Wade and Rodriguez, built by the Memorial in co-operation with the Government of the Philippines, on 120 acres of land. Construction



FIG. 3. Dr. H. W. Wade, Medical Director, Leonard Wood Memorial, 1931-1948. Editor, *INTERNATIONAL JOURNAL OF LEPROSY*, 1933-1963. Pathologist Emeritus, Leonard Wood Memorial, 1959- ; Editor Emeritus, *IJL*, 1963-

included a treatment center, the Eversley Childs Treatment Station, consisting of some 50 concrete buildings, with the most modern accessory installations available at the time, and a modern skin clinic in the City of Cebu, where skin ailments of all kinds, including those incident to leprosy, could be diagnosed and treated. The feature in the construction of the Eversley Childs Treatment Station that really excited Wade most, however, was the use of bamboo lattice-work as reinforcements in the concrete walls and roofs of the buildings. A long monograph⁴ was written by him on this subject, complete with numerous photographs illustrating various stages of the process. In addition a travelling clinic was set up for rural work with a

⁴According to Dr. J. N. Rodriguez this monograph was never published. Copies furnished to the Philippine Bureaus of Health and Public Works were destroyed during World War II.

pecially equipped truck provided with a small laboratory and a motion picture projector for educational purposes.

At the same time the Memorial provided facilities for intensification of research at the Culion Leper Colony, then an institution with more than 6,000 inmates. The Memorial constructed a two-story concrete research laboratory (Fig. 4), a number of wards with service and auxiliary laboratories, with a nurses' home and residences for the staff, and provided a fifty-ton cabin cruiser for the use of the staff, particularly for essential trips to Manila (⁸⁴).

Medical Advisory Board. An Advisory Medical Board composed of physicians with medical research interests was appointed for general supervision of the program in 1932, with William H. Welch of Johns Hopkins University as chairman, and the following members: Hugh S. Cumming, Surgeon General of the U. S. Public Health Service; Victor G. Heiser of the Rockefeller Foundation; W. G. MacCallum, Professor of Pathology, Johns Hopkins University;

E. B. McKinley, Dean, School of Medicine, George Washington University; Theobald Smith of the Rockefeller Institute for Medical Research, and H. W. Wade of Culion. An Advisory Committee on Research also was appointed in 1932, consisting of F. P. Gay, Professor of Bacteriology, Columbia University, chairman; E. W. Goodpasture, Professor of Pathology, Vanderbilt University; E. R. Long, Director of the Laboratories of the Henry Phipps Institute, University of Pennsylvania; E. B. McKinley, Dean, School of Medicine, George Washington University; T. M. Rivers, member of the Rockefeller Institute; M. H. Soule, Professor of Bacteriology, University of Michigan, and Hans Zinsser, Professor of Bacteriology, Harvard Medical School (Fig. 5). J. A. Doull, Professor of Hygiene and Public Health at Western Reserve University, who was beginning a series of epidemiologic researches on leprosy for the Memorial, was soon added to the Advisory Committee's membership.

After initial meetings in 1932 and 1933



FIG. 4. The Leonard Wood Memorial Laboratory, Culion Leprosy Colony, Culion, Philippines, designed by Dr. Wade and built in late 1920's. This laboratory has continued in use by Dr. Wade and the Philippine Government.

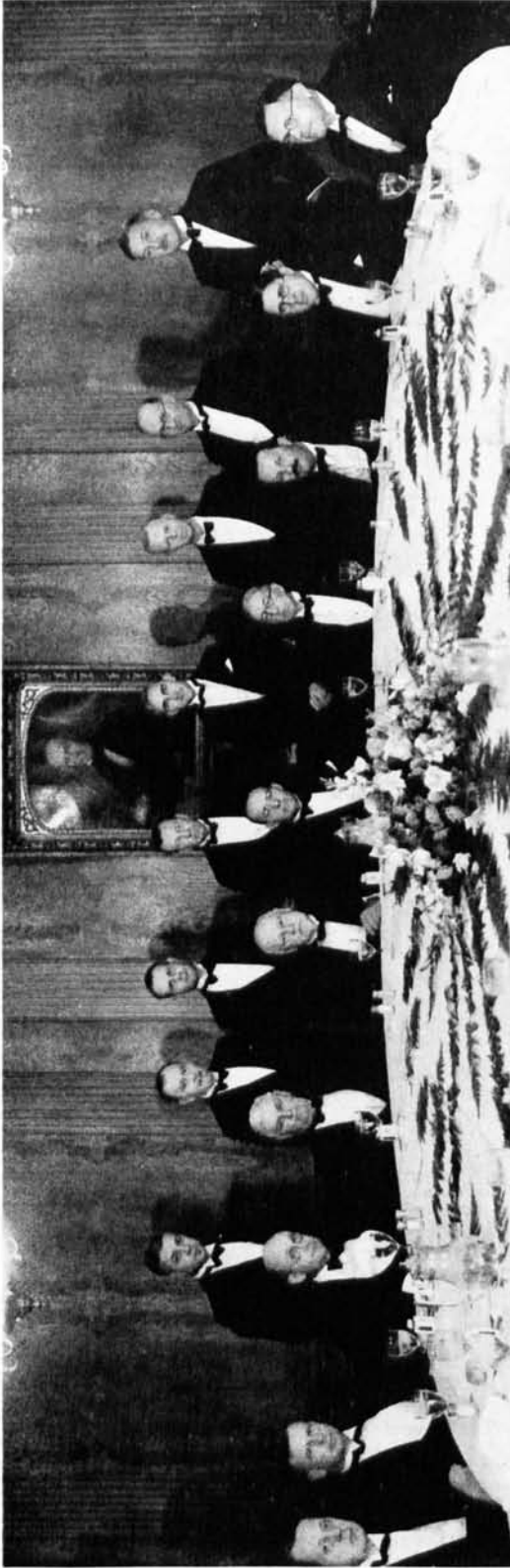


FIG. 5. Members of the Medical Advisory Board and Advisory Committee on Research of Leonard Wood Memorial, together with members of the LWM Board of Trustees and guests, at dinner meeting of the Board, Committee and Trustees, Union League Club, New York City, 18 October 1932. *Seated*, left to right: Dr. William G. MacCallum; Dr. Ernest W. Goodpasture; Dr. Frederick P. Gay; Mr. Samuel McRoberts; Dr. William H. Welch; Mr. Perry Burgess; Dr. Hugh S. Cumming; Mr. Kermit Roosevelt; Dr. Earl B. McKinley; and *Standing*, left to right: Dr. Thomas M. Rivers; Dr. Esmond R. Long; Dr. Canby Robinson; Dr. Malcolm H. Soule; Dr. Stanhope Bayne-Jones; Dr. James W. Jobling, and

the Advisory Medical Board and the Advisory Committee on Research were combined in 1934 in a single Medical Advisory Board under the chairmanship of Dr. Gay.

RELATION OF THE MEMORIAL TO THE INTERNATIONAL LEPROSY ASSOCIATION

Manila Conference, 1931. Initially the Memorial's scientific activities were centered in the Philippines. From the outset, however, international activity was envisioned. In January 1931 the Leonard Wood Memorial sponsored a two-week international conference on leprosy in Manila for the consideration of methods of leprosy control, including diagnosis and treatment, prevention, and research (¹⁷). Many of the world's leading leprologists attended (Fig. 6). Wade, representing the Memorial, served as chairman of the Conference. The following were in attendance:

DR. ET. BURNET, Secretary, Leprosy Commission, League of Nations
DR. R. G. COCHRANE, Secretary, British Empire Leprosy Relief Association

DR. H. I. COLE, Chief Chemist, Culion Leper Colony
DR. J. FAJARDO, Director of Health, Philippine Health Service
MAJ.-GEN. J. D. GRAHAM, I.M.S., Public Health Commissioner, Government of India
DR. G. GUSHUE-TAYLOR, Superintendent, Mackay Memorial, Hospital, Taihoku, Formosa
DR. V. G. HEISER, Director for the Far East, Rockefeller Foundation
DR. LEE S. HUIZENGA, Superintendent, Mission Hospital, Jukao, Ku, China
DR. A. N. KINGSBURY, Director, Research Institute, Kuala Lumpur, Federated Malay States
CAPT. P. H. J. LAMPE, Director of Health, Dutch Guiana
DR. C. B. LARA, Chief Physician, Culion Leper Colony
DR. J. LOWE, Medical Superintendent, Dichpali Leprosy Hospital, India
DR. J. L. MAXWELL, Henry Lester Institute of Medical Research, Shanghai
DR. E. MUIR, leprosy research worker, Calcutta School of Tropical Medicine
DR. E. E. NEFF, Superintendent, Mogokai Central Leper Hospital, Fiji
PROF. DR. B. NOCHT, President, Leprosy Commission, League of Nations
DR. M. OTA, Tohoku Imperial University, Japan



FIG. 6. After the Leonard Wood Memorial Conference in Manila, Philippines, some of the Conference members visited Eversley Childs Treatment Station, Cebu. *Left to right* (on the front porch of the Administration Building): Maj. Gen. J. D. Graham; Dr. N. E. Wayson; Dr. R. G. Cochrane; Dr. E. Muir; Dr. H. W. Wade; Dr. J. Fajardo; Dr. E. E. Neff; Dr. H. I. Cole; Dr. V. G. Heiser; Dr. J. N. Rodriguez; and Dr. J. C. Tull.

- DR. J. N. RODRIGUEZ, Supervisor of Leprosy-treatment Stations, Philippine Health Service
DR. J. C. TULL, Government pathologist, Singapore
DR. H. W. WADE, Chief Pathologist, Culion Leper Colony; and Medical Director, Leonard Wood Memorial
DR. N. E. WAYSON, Director, United States Leprosy Investigation Station, Hawaii
DRS. LEROY-DESBARRES and H. JOYEUX of French Indo-China, who participated in the first session only.

International Leprosy Association. In addition to scientific accomplishments, measures were set up at this conference for creation of an organization for the study of leprosy, worldwide in scope, and for an international medical periodical suitable for the publication of informative papers on the treatment and control of leprosy. A once projected Société Internationale de Leprologie, which had never been active, served as a precedent, and a new organization, the International Leprosy Association (Société Internationale de la Lèpre) was founded during the course of the conference (⁶⁷). Victor G. Heiser was chosen as the first president and Robert G. Cochran as Secretary of the general governing council. The remaining officers were made up of other world leaders in the treatment and care of leprosy.

International Journal of Leprosy. An important second action was taken at the Manila Conference, viz., establishment of the INTERNATIONAL JOURNAL OF LEPROSY (⁶⁷). It was obvious, in view of the small number of subscribers anticipated, that such a journal could not be self-supporting. The Leonard Wood Memorial, however, under the authority of its Certificate of Incorporation "to disseminate information concerning the source, diagnosis, treatment and prevention of leprosy . . ." undertook to underwrite the deficit in its operation. Wade was appointed by the governing council of the Association as Editor, with H. P. Lie of Bergen and James L. Maxwell of Shanghai as Associate Editors. The first number of the new journal came out in January 1933, in a format established by Wade, which was continued until 1966, when the subtitle, "and Other Mycobacterial Diseases," was added, and

type and column arrangements were revised for improved appearance and economy in meeting THE JOURNAL's increased content (see page 268) (⁸²).

After the Manila meeting Wade resigned from the Philippine Government staff, and as Medical Director of the Leonard Wood Memorial with funds made available by the Memorial, set off on a trip around the world for visits with leading leprologists in Japan, India, Africa, England and continental Europe. It was on this trip that he became aware of the ubiquity of the tuberculoïd form of leprosy, which later was the subject of many of his publications (see page 247).

THE LEONARD WOOD MEMORIAL FROM 1933 TO WORLD WAR II

Expansion of activities, Philippines. During the years succeeding the incorporation of the Leonard Wood Memorial, the foundation of the International Leprosy Association, and the establishment of the INTERNATIONAL JOURNAL OF LEPROSY, and up to the time of American participation in World War II, the Memorial's program in research expanded steadily. Income from the Memorial's endowment funds and from private donors answering appeals from the New York office, provided for the increasing expense. Mr. Burgess, his assistant, Harold L. Elias, and an office staff in New York, all under supervision of the Memorial's Board of Trustees, which included financial and health-minded leaders in New York, furnished the necessary administration. Continuous observation of the leprosy programs sponsored by the Memorial in the Philippines, was maintained by the Medical Advisory Board⁵ and new projects involving the Memorial and its funds were brought to the Board's attention.

The Medical Advisory Board itself changed in a process of self-initiated rotation. In addition to those named above (see page 243), the revolving membership,

⁵In its early years this was the Medical Advisory Board. In 1945 the name was changed back to Advisory Medical Board.

before World War II, included the successive surgeons general of the U. S. Public Health Service and a group of pathologists, bacteriologists, internists, and public health experts interested in leprosy, including Brig. Gen. George Dunham of the Army, Dr. O. E. Denney of the U. S. Public Health Service Hospital for leprosy patients, and Drs. Stanhope-Bayne-Jones, Howard T. Karsner, and Ray Lyman Wilbur. In 1953 the surgeons general of the Army, Navy and Air Force were added to the membership.

The largest of the projects sponsored were in the Memorial's laboratories in the Philippines, where an effective liaison was maintained continuously between the Memorial's own staff and official medical officers of the government in the Philippines. This was accomplished through an overlapping succession of appointments, in which governmental medical officers served part-time as investigators for the Memorial's program, and the Memorial itself assumed some of the extra expense involved in programs initiated and maintained by the official Bureau of Health of the Philippines.

Pathology, epidemiology. Prominent among these programs were Wade's studies of the pathology and clinical course of leprosy, carried out in Culion, and Rodriguez' epidemiologic investigations, which were based in large part in the jointly operated center (Memorial and government) in Cebu. As a stimulus to bacteriologic studies in leprosy, M. H. Soule of the Medical Advisory Board, on leave of absence from his post as Professor of Bacteriology at Michigan, spent some months in Culion in 1933 on bacteriologic problems and attempts at cultivation of the leprosy bacillus.

In the years following, Soule and E. B. McKinley, in a series of papers reported success in cultivation of the leprosy bacillus on media under modified oxygen and carbon dioxide tension (^{101, 102}), and claimed a limited transmission of the disease to monkeys on inoculation of the apparently cultivated bacilli (⁸⁶). The work was not confirmed by investigators elsewhere, but remains of interest and to some extent an unsolved enigma.

This was a productive period in Wade's studies of leprosy. He and Rodriguez, in a succession of observations on patients at Cebu, reported on the course of neural and tuberculoid leprosy. As noted above (see page 246) during his trip around the world in 1931 he had developed a deep interest in tuberculoid leprosy. In 1934 and 1935 he published four important articles on this subject (¹¹⁴⁻¹¹⁷). Then in subsequent years he wrote many editorials and comments on this type of leprosy, and its place in basic classifications of the disease. This carried him into the wide field of macular and neural lesions in leprosy; he made studies with experts in the Philippines and other countries that elucidated some of the problems involved (^{118, 119, 123-125}). Many of his own clinical observations were carried out in collaboration with Rodriguez, with whom he published a notable paper on major tuberculoid leprosy (¹²²). In 1940 they published an influential article on "Borderline tuberculoid leprosy," (¹²¹) based on Cebu material, which stimulated research everywhere on the anatomic forms leprosy may assume. The borderline form was soon incorporated in standard classifications of the disease.

The cooperation at Cebu between the public health services of the Philippine government and the Leonard Wood Memorial made such studies possible, involving, as they did, joint participation in the work of the Cebu Skin Dispensary and the Eversley Childs Sanitarium, an institution of 1,250 beds, for which Eversley Childs, who had become a strong patron of the Memorial, had made a large gift.

Leprosy center, Cebu. In 1926 Rodriguez left his post as Chief Physician at Culion, where he was succeeded by C. B. Lara, authority on childhood leprosy, in order to develop the leprosy center at Cebu. This soon included three units, a sanitarium for leprosy patients, which opened in May 1930, a state skin dispensary, and a traveling clinic. Rodriguez was the first director of the Eversley Childs Sanitarium; Dr. Jose G. Tolentino was Resident Physician. They remained on salary from the Philippine government, but, after its foundation in 1928, always maintained a close association with the Leonard Wood Memorial. Rod-

riguez began his epidemiologic studies in Cebu in 1927. He started surveys modeled in large measure on the technics used successfully in tuberculosis. In 1931, on the recommendation of Burgess and the Medical Advisory Board, he was awarded a one-year fellowship for study in the United States. He was the first of a long line of Fellows and trainees sponsored by the Leonard Wood Memorial. He obtained the Master of Public Health degree at Johns Hopkins University and visited numerous institutions concerned with public health practice and the control of tuberculosis.

Epidemiologic surveys of leprosy. The survey work by Rodriguez and his associates in the Philippines laid the ground work for a long series of epidemiologic studies by James A. Doull, Professor of Hygiene and Public Health at Western Reserve University and for many years a member of the Memorial's Medical Advisory Board. In 1933 Doull and Perry Burgess of the Memorial met Rodriguez, who had already done much work in the field, in the Philippines, and with Rodriguez and R. S. Guinto, then a recent graduate of the medical school of the University of the Philippines,

Doull instituted an intensive epidemiologic program based in Cebu. Doull commenced his studies in the Philippines in 1933 in a program centered in the municipality of Cordova, on Mactan Island adjacent to the city of Cebu (Fig. 7). The enterprise was a cooperative one involving Western Reserve University, the Leprosy Section of the Philippine Bureau of Health, the locally based epidemiologic unit of the Leonard Wood Memorial, and the Cebu Skin Dispensary of the Philippine Bureau of Health. The first publication emanating from the project, entitled "A field study of leprosy in Cebu," by Doull, Rodriguez and two associates engaged for the purpose, R. S. Guinto and F. C. Plantilla, and published in the *INTERNATIONAL JOURNAL OF LEPROSY* in 1936 (²⁴), was the first of a long series of epidemiologic studies on leprosy in the Philippines, and stands as a mile-stone in leprosy investigation. Guinto was appointed Assistant Epidemiologist of the Leonard Wood Memorial at this time. In the succeeding year's other members of the staff at the Cebu leprosy center were brought into the study, under Leonard Wood Memorial sponsorship, in an effective



FIG. 7. Dr. James A. Doull and his staff, in 1933, when he instituted an extensive epidemiologic program centered in the municipality of Cordova, on Mactan Island adjacent to the city of Cebu. Prof. F. P. Gay stands at Dr. Doull's left. Far right: Dr. R. S. Guinto and next to him Dr. J. N. Rodriguez.

way. Guinto, it may be noted here, was appointed Epidemiologist on the Memorial's permanent staff in 1948.

Expansion activities, United States. Other funds now available to the Memorial were used in the United States and elsewhere on recommendation by the President of the Memorial, Perry Burgess, and on approval of the Medical Advisory Board and Board of Trustees. Burgess himself traveled widely in the interest of the campaign against leprosy. His well-known book "Who Walk Alone" (⁷) was a product of these travels. As a property of the Memorial, it brought considerable revenue, in the course of time, to the organization. Specific travel grants for trips to leprosy centers were provided by the Memorial for various investigators who wished to incorporate work on leprosy in their researches. On approval by the Medical Advisory Board the Memorial provided a number of grants-in-aid of research, small by modern standards, but effective in stimulating research among American workers.

Also of this period was the initiation of grants for fellowships, of which the one to Rodriguez, mentioned above, was the first. Training for leprosy research was ultimately to prove a large enterprise of the Leonard Wood Memorial.

As early as August 1935, the Medical Advisory Board began plans for an investigator who could work on a full-time basis on problems in the epidemiology of leprosy. Dr. George M. Saunders of New York, recommended by Dr. Wilbur Sawyer, Director of the International Health Division of the Rockefeller Foundation, was appointed as epidemiologist in a trial move. He initiated studies in the Virgin Islands (⁹⁹), which were reported to the Medical Advisory Board in detail, and outlined a program for Puerto Rico. Guinto, who had been associated with Rodriguez and Doull in surveys in the Philippines, took part with Saunders in these studies. Saunders worked in close association with Doull, and Doull, Saunders, Guinto and the governmental officers in Puerto Rico made preliminary studies of leprosy there (¹⁰⁰). The exigencies of World War II made continuation of these studies impracticable.

During this period an appointment was

made that initiated an enterprise of long duration, viz., the designation of Dr. John H. Hanks, then Associate Professor of Bacteriology at the School of Medicine of George Washington University, as Bacteriologist of the Leonard Wood Memorial. Hanks had been associated with E. B. McKinley and was well versed in procedures that might be applied to leprosy. He joined the staff at Culion in 1939, and in the succeeding months made studies leading to publication in the *INTERNATIONAL JOURNAL OF LEPROSY* in 1941 of a paper on the behavior of leprosy bacilli in a number of bacteriologic media fortified with additional nutrients (^{54, 58}). In attempting to cultivate the leprosy bacillus he developed a variety of tissue culture techniques (⁴⁹⁻⁵³). No multiplication was observed, but a program was initiated that was to become a major element among the Leonard Wood Memorial's laboratory investigations of later years. During these years, in connection with his tissue culture work, Hanks developed an autoclavable physiologically balanced salt solution, now widely used also as a diluent and suspending medium for bacteria, and designated in scientific literature as Hanks' Balanced Salt Solution or BSS (⁶²).

A smaller project during this period was an attempt by Dr. E. R. Long and his associate, H. J. Henderson, with Memorial support, at the Henry Phipps Institute of the University of Pennsylvania, to isolate antigenic substances and intact leprosy bacilli themselves, by physical and chemical means, from heavily involved visceral organs removed at autopsy from cases of lepromatous leprosy (^{65, 66}). A relatively large amount of almost pure dried bacilli (approximately 1 gram) was secured. Use was made of some of this material, prepared by Henderson, in skin tests by E. B. McKinley in the Philippines (^{72, 85}). As it turned out, however, most of the dried bacilli were lost in 1938 in the tragic flight that resulted in the death of McKinley en route to Manila (Fig. 8).

In December 1941 most of the work sponsored by the Memorial in Culion and Cebu was terminated abruptly by the outbreak of World War II and the Japanese occupation of the Philippine Islands. Pres-

ervation of existence superseded scientific investigation as a way of life.

WORLD WAR II YEARS

Philippines. The Japanese invasion of the Philippines in December 1941 affected the research program of the Memorial profoundly. Free communication between the office of the President of the Memorial and the staff in Culion and Cebu was cut off abruptly, although for a short time the president received fragmentary classified reports through secret government channels. The last communication from Wade was a despairing cablegram in March 1942, sent through military channels. The hazards and hardships met by the Memorial's staff and Filipino coworkers were not known to friends and associates in the United States until the end of the war, four years later. Funds could not be supplied for the work in the Philippines, and, as was learned later, the investigators and employees on the Memorial's staff, of necessity, had to turn immediately to the task of keeping up a sufficient supply of food from local sources and their own farming efforts, supplemented by barter of their possessions, to ensure living even at a low level of sustenance. Salaries were paid by checks issued by Wade, nonnegotiable at the time, but to be redeemed in full after the war. A still more difficult matter, although not directly a responsibility of the Memorial, was the provision of rudimentary maintenance for leprosy patients in the Islands' principal leprosy centers. Many patients died. Others deserted by one route or another.

Cebu, second largest port in the Philippines and, as noted, a medical center in the Memorial's program, was shelled, and there was severe damage by bombing of some of the buildings constructed with Memorial funds. The staff at Culion remained essentially intact, however, and some laboratory work went on, restricted by lack of supplies and the conflicting demands of self-preservation. That the staff could remain and avoid internment in Manila, was credited to Dr. J. O. Nolasco, head of the Culion colony, who was later transferred to Manila for public health

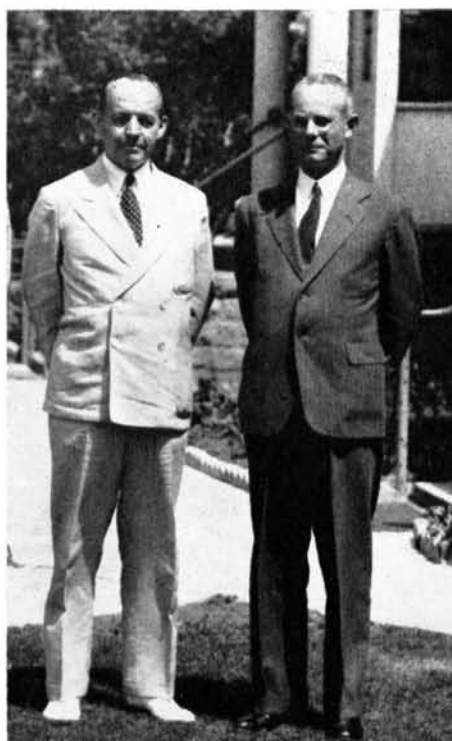


FIG. 8. Mr. Perry Burgess, President, Leonard Wood Memorial and Dr. Esmond R. Long, Director, Henry Phipps Institute, University of Pennsylvania, at Symposium on "Tuberculosis and Leprosy. The Mycobacterial Diseases" at meeting of the American Association for the Advancement of Science, Denver, Colorado, 22 June 1937. Reference was made to the McKinley and Henderson studies at this meeting.

responsibilities under the occupation government.

At Culion Wade was of inestimable help to local officials in reaching decisions on the care of patients and safety of the community as a whole. The final liberation and recovery of the Memorial's staff in 1945 was a dramatic event, a story in itself.

Careful records of the events affecting the Memorial's staff in the Philippines were kept by several of the Memorial's principal workers, including particularly Wade, Rodriguez and Hanks. These furnish a deeply interesting account not only of the efforts made to keep the scientific research of the Memorial going, but also of the hazards and hardships endured by the leprosy patients and all associated with them, and the

extraordinary exigencies met by the staff. Guinto had rendered an exceptionally valuable service by keeping the important epidemiologic records intact in a cave on Mactan Island during the war years. Unfortunately many other records were lost.

United States. The New York office and associated Memorial workers during this four year period were engaged in the completion of projects started before the onset of the war, and assistance and stimulation, where possible, of workers in the leprosy field. Doull, Saunders and other associates finished their studies of leprosy in the Virgin Islands and Puerto Rico, and Doull and his associate Huldah Bancroft at Western Reserve University continued with analysis of data obtained in collaboration with Guinto, Rodriguez and associates in the Cebu region before the onset of the war (1, 22, 23). Saunders resigned early in the war to enter military service, and did not return to the Memorial staff.

A major program was set up by the Leonard Wood Memorial to bring Central and South American physicians interested in leprosy to appropriate public health centers and laboratories in the United States on fellowships in epidemiology and public health. An especially productive program was organized by Doull at Western Reserve University. In these programs there was close cooperation between the Memorial and the Office of Inter-American Affairs. Malcolm Soule of the Memorial's Medical Advisory Board went to South America on behalf of the Memorial for personal interviews with prospective candidates. Several of the physicians, including Dr. Jacinto Convit of Venezuela, and Dr. L. M. Bechelli and Dr. R. D. Azulay of Brazil, continued in leprosy research, and became leaders in the International Leprosy Association.

During the war the Memorial provided assistance and travel funds for various British and Indian leprologists whose work had been interrupted by the hostilities. The Memorial contributed directly to the work of the Armed Forces of the United States by provision of accurate up-to-date information on the epidemiology of leprosy in key areas in the combat zones, and on

accepted procedures for the care and treatment of leprosy patients.

A vital service to the campaign against leprosy was furnished when the Memorial undertook to keep the *INTERNATIONAL JOURNAL OF LEPROSY* in operation. For five years, until Wade was able to reassume his editorship, Doull served as Acting Editor. The *JOURNAL* was published and sent at the Memorial's expense to those members of the International Leprosy Association with whom communication by mail was still possible.

An event of special significance for leprosy control during the war period was the report, in 1943, by G. H. Faget and associates (32) at the U. S. Public Health Service Hospital at Carville, Louisiana, of beneficial effect of Promin, a derivative of 4,4'-diaminodiphenyl sulfone, in the treatment of leprosy in man. Prompt notice of the event, in the form of a Spanish translation of the article, was given in the pages of the *INTERNATIONAL JOURNAL OF LEPROSY* (33). Ever since then the Memorial has been intimately associated with investigation of the chemotherapy of leprosy.

Early in the postwar years the Memorial assisted physicians in other parts of the world in obtaining supplies of the sulfone drugs. A notable example was the provision for Dr. Robert G. Cochrane of Vellore, India, of sufficient Promin and related drugs for several years of closely observed treatment of 50 patients. During the war years Dr. Norvin C. Kiefer, an experienced public health administrator, was of great assistance to Perry Burgess in making information then at the disposal of the Memorial available to the Armed Forces in such a way as to help them meet problems in leprosy overseas. Liaison was particularly close with Brig. Gen. James S. Simmons, Chief of the Preventive Medicine Service of the Army, who was elected a member of the Memorial's Medical Advisory Board. With the Memorial's aid, his office brought out important informational documents on leprosy for the Army's medical officers in leprosy-endemic areas, including a special brochure "World Wide Distribution of Leprosy" (129). The Deputy Chief of Gen. Simmons' service, Brig. Gen.

Stanhope Bayne-Jones, was active in proper distribution of the material. He too served for several years as a member of the Board.

For a number of years Malcolm Soule served as chairman, and Howard T. Karsner as secretary of the Medical Advisory Board. Dr. F. A. Johansen of the U. S. Public Health Service Hospital staff at Carville had been elected a member of the Board, succeeding Dr. O. E. Denney, and served effectively in the liaison between the Memorial and the Public Health Service's leprosarium at Carville. Much of the discussion by the Medical Advisory Board had to do with investigation of synthetic and antibiotic drugs that might be used effectively in leprosy, the support of research on these drugs, and the provision, insofar as possible, of supplies of promising drugs to qualified investigators. These discussions had the benefit of advice from two internists, newly elected to the Medical Advisory Board, Drs. Francis G. Blake and Chester S. Keefer, who had had wide experience in the general field of chemotherapy in infectious diseases.

At the end of World War II the Leonard Wood Memorial was tentatively committed to several continuing leprosy programs, including (1) projects in basic pathologic research under Wade in the Philippines, (2) a Department of Bacteriology under Hanks or an equally qualified laboratory investigator, preferably at some designated institution in the United States, (3) epidemiologic studies in strategic locations, based in Cebu if postwar developments made it practical, (4) support of guest scientists of distinction for further training and research in the United States, (5) grants-in-aid of research, either in the United States or abroad, that offered promise for improved understanding of leprosy, (6) fellowships for younger men, principally from abroad, who might undertake careers in leprosy research, (7) support of the *INTERNATIONAL JOURNAL OF LEPROSY*, and (8) support as needed for world and regional conferences on leprosy.

In August 1945 a budget of \$125,000 was tentatively adopted for these purposes. At the time the sources of income were listed as endowment income, the general

promotion campaign conducted by the New York office, royalties from Perry Burgess' book "Who Walk Alone,"⁽⁷⁾ and sale of a number of pamphlets issued by the Memorial. One estimate indicated that "Who Walk Alone" was of sufficient distribution and interest to add 20,000 annual contributors to the memorial.

POSTWAR ACTIVITIES

With peace again, and world-wide restoration of communications, the activities of the Leonard Wood Memorial stepped up rapidly. The war had shown the need for international cooperation in health programs more clearly than ever before, and at the same time the United States Government, with greater financial resources than were available to other nations, assumed increasing responsibility in the international public health field. It was clearly desirable for the Memorial to expand from its previous concentration on programs in the Philippines and devote more attention to international needs.

The Advisory Medical Board⁵ explored the question of further fellowships for training in the United States and at the same time recommended numerous small to moderate grants-in-aid to leprologists outside the United States to facilitate travel and provide supplies for projects suffering from lack of funds. The Memorial indicated a willingness to help insofar as its funds could be made available, in the financing not only of world conferences but also of regional conferences on leprosy.

All of this was coincidental with a new interest in chemotherapy and an expanded interest in public health aspects of leprosy. G. H. Faget of the U. S. Public Health Service Hospital at Carville, where the sulfone chemotherapy of leprosy had its origins⁽³²⁾, became a consultant to the Memorial, and an increasing number of Fellows, chiefly from South America, were sent to Western Reserve University and the School of Hygiene and Public Health at Johns Hopkins University for training. More and more the idea of large scale, international clinical trials of drugs for leprosy grew.

Work in the Philippines was not curtailed with the expansion of interest. The President, Perry Burgess, visited the Islands soon after the cessation of hostilities in 1945. It was now evident that more had been accomplished than had been supposed in the long period of silence. Wade had kept up his studies as well as possible, and had developed new and important information on the role of key body cells in leprosy and the characteristic mycobacterial globi in the disease. Hanks reported his war-time studies at Culion in detail in 1947 in the *INTERNATIONAL JOURNAL OF LEPROSY* (49-53).

A suitable budget for the Philippine epidemiologic surveys was again set up. Close liaison was maintained with U. S. military services in the Philippines and with the emerging government of the Philippines as an independent nation. In 1948 R. S. Guinto was engaged in reestablishing the surveys cut short by the war, starting with records he had preserved during the Japanese occupation. After a period of conferences in the United States the leprologist, J. G. Tolentino, who had rendered devoted service to leprosy patients at Cebu during the war, was soon again actively engaged, with his associates, in clinical research in Cebu, and an expanded budget for Cebu was set up. Fiscal problems were ironed out, salaries were readjusted, and retroactive compensation was made for personal privations of Memorial staff members during the war.

With the Memorial's enlarged interests in leprosy as an international problem, and concomitant increase in its activities in connection with the new chemotherapy of leprosy, the need became apparent for a Medical Director residing in the United States. On this there was full agreement by the Advisory Medical Board and by Wade, who had been Medical Director, although residing in far-away Culion, from the earliest days of the organization of the Memorial. At a meeting of the Board in New York in May 1948, at which Wade was present, there was full and appreciative discussion of the question. Wade was just back from London, and had renewed old associations among leprosy investigators.

He concurred in the view of the Board that the Medical Director of the Leonard Wood Memorial should be on a full-time basis and live in the United States. He had been urged by the Board to move back to the United States, to fulfill the responsibilities of the medical directorship there. He indicated an unchanging wish, however, to continue residence in Culion, and it was also evident that his current responsibilities were already heavy enough, as Chief Pathologist of the Memorial, with abundant material available for study, as Editor of the *INTERNATIONAL JOURNAL OF LEPROSY*, and as President of the International Leprosy Association.

The choice for successor fell upon James A. Doull, who had left his position as Professor of Hygiene and Public Health at Western Reserve University in 1945, to accept a commission in the U. S. Public Health Service in the Office of Surgeon General Thomas Parran. In that year Doull was made Chief of the Office of International Health Relations of the Service. With that program well established, the Surgeon General showed his interest in furthering leprosy research by granting to Doull, as a commissioned officer of the Public Health Service with the rank of Medical Director, leave from the Service to become the Medical Director of the Leonard Wood Memorial. Doull was ideally suited for the position. He had been a member of the Advisory Medical Board for many years, and its Chairman during the war years, had initiated and worked actively in epidemiologic studies of leprosy in the Philippines under the sponsorship of the Memorial since 1933, and had a keen clinical appreciation of the prospects for advance in the control of leprosy through the new chemotherapy, which was now arousing enthusiastic hope. He assumed his new duties on 1 November 1948, with his office in Washington, D. C. An appropriate notice, paying tribute at the same time to Wade's long service in this position, was carried as an announcement by the Memorial in the final issue of the *INTERNATIONAL JOURNAL OF LEPROSY* for 1948 (91) (Fig. 9).

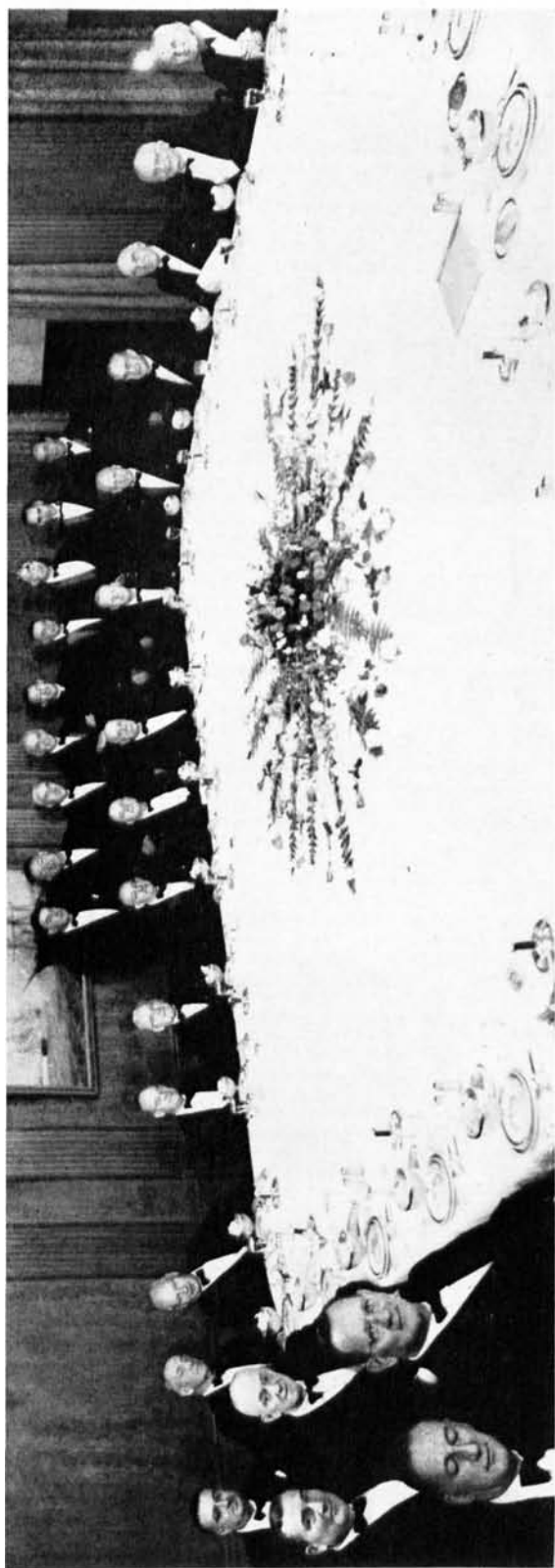


FIG. 9. Leonard Wood Memorial dinner, Union League Club, New York City, 4 November 1948. *Seated, left to right:* Mr. H. L. Elias, Executive Secretary, LWM; Dr. F. A. Johansen, Medical Officer in Charge, U. S. Marine Hospital, Carrollville, La. and member, Medical Advisory Board, LWM; Mr. R. R. Reed, President, American Express Co. and Director, LWM; Dr. W. H. Feldman, Mayo Foundation and member, Medical Advisory Board, LWM; Dr. F. C. Coombes, Professor of Dermatology, New York University and member, Medical Advisory Board, LWM; Dr. H. T. Karsner, Professor and Director of Institute of Pathology, Western Reserve University, and Secretary, Medical Advisory Board, LWM; Dr. J. H. Mueller, Professor, Harvard Medical School; Dr. G. K. Strode, Director, International Health Division, Rockefeller Foundation; Dr. J. A. Doull, Medical Director, LWM; Mr. P. Burgess, President, LWM; Dr. R. C. Williams, Assistant Surgeon General, U. S. Public Health Service, Chief, Bureau of Medical Services; Mr. E. Childs, President, Bon Ami Co., former Director, LWM; Dr. S. Bayne-Jones, President, Joint Administrative Board, New York Hospital, Cornell Medical Center; Mr. F. F. Randolph, Partner, J. & W. Seligman Co. and Director, LWM; Dr. F. G. Blake, Professor Yale School of Medicine and member of Chemotherapy Committee, LWM; Dr. V. G. Heiser, Industrial Medical Consultant, and ex-president, International Leprosy Association; Dr. M. Greenberg, Director, Bureau of Preventable Diseases, Department of Health, City of New York; Dr. E. R. Kellersberger, General Secretary, American Mission to Lepers. *Standing, left to right:* Mr. P. A. McManus, Investment Department, the Chase National Bank; Dr. F. L. Soper, Director Pan American Sanitary Bureau and member, Medical Advisory Board, LWM; Dr. M. H. Soule, Professor of Bacteriology, University of Michigan and Chairman, Medical Advisory Board, LWM; Mr. J. F. Abbott, President, The American Sugar Refining Co. and Director, LWM; Father Smith, Maryknoll Mission; Mr. C. I. Crowther, Comptroller, LWM; Mr. J. T. Madden, President, Emigrant Industrial Savings Bank, and Director, LWM; Dr. J. H. Hanks, Director of Bacteriology, LWM, Harvard University; Mr. A. H. DeBra, Director of Community Relations, Motion Picture Industry.

**ESTABLISHMENT OF NEW PROGRAM
BY THE MEMORIAL WITH J. A.
DOULL AS MEDICAL DIRECTOR**

**Epidemiology and Clinical Evaluation of
Drugs**

It was a time of progress in many lines. Treatment of leprosy had been revolutionized. The old chaulmoogra oil treatment was being abandoned rapidly in favor of an increasingly successful therapy with sulfones. A growing appreciation of the importance of epidemiologic surveys as a means of assessing the gravity of leprosy as an endemic problem had come about. Coincidentally the need for technically skilled workers in all phases of the leprosy control program was clearly evident, as it was in other fields of medicine. An expanded Public Health Service in the United States took measures to meet new problems through provision of funds, not only for research, but, equally importantly, for the training of investigators and control officers. Through its National Institutes of Health it set up grants-in-aid for research and technical training that soon became the country's most ample resource in this expanding field. It was made clear that leprosy would be among the domains for which financial support would be available.

For all of this Doull was well prepared (Fig. 10). Without delay he reinstituted an active program by the Memorial in Cordova, Cebu Province, Philippines, where with J. N. Rodriguez, R. S. Guinto and F. C. Plantilla (²⁴) he had carried out an extensive epidemiologic survey in the early 1930's. In 1951, Doull, Guinto, Rodriguez and Huldah Bancroft, who had become Professor of Biostatistics at Tulane University and been appointed Assistant Editor of the *INTERNATIONAL JOURNAL OF LEPROSY* (see page 267), published the results of a resurvey of leprosy in Cordova in 1941, made eight years after the original survey (⁴⁶). This reopened the field for what soon became again a major enterprise of the Memorial, for which the Cebu region was used as a proving ground.

Clinical evaluation studies. In 1952, under Doull's direction and supervision, a

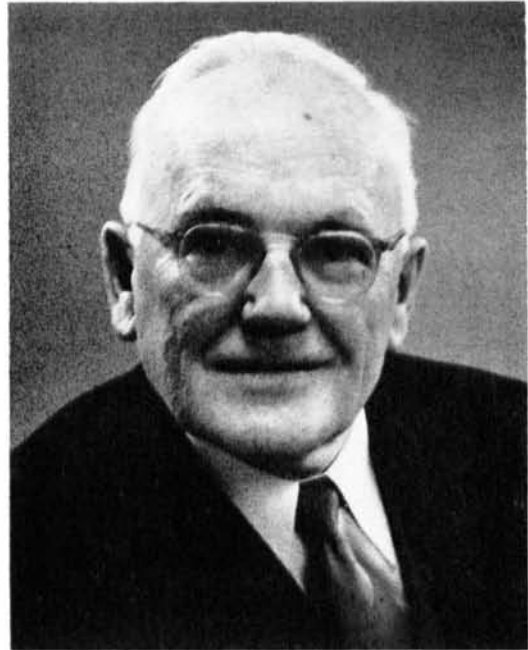


FIG. 10. Dr. James A. Doull, Medical Director, Leonard Wood Memorial, 1948-1963.

series of clinical evaluation studies of far reaching influence was started on the efficacy of several drugs in lepromatous leprosy. Noting that although sulfones had largely replaced the time-honored chaulmoogra oil in the treatment of leprosy, Doull pointed out that critical evaluation of new drugs was urgently needed. A program was planned and carried out that was truly international. Its objective, in brief, was to determine (1) whether or not the relatively inexpensive diaminodiphenyl sulfone (DDS) was as effective in the treatment of leprosy as the molecularly larger sulfone compounds, of which Promin was the prototype, and (2) whether other drugs, notably certain antibiotics, with or without sulfones, might be even more effective. The study, as it developed, comprised a total of nearly a thousand patients with lepromatous leprosy in four leprosaria located in Japan, the Philippines and the Union of South Africa (²⁰). In conducting this study, in three different geographic areas, a carefully planned protocol was followed in order that clinical, bacteriologic, pathologic, and photographic procedures

could be performed uniformly and recorded consistently. The study was completely "double-blind." Assignment of matched patients to groups was made in the United States by William G. Cochran, Professor of Biostatistics, Johns Hopkins School of Hygiene and Public Health. The monitoring of the operations, so that uniformity could be achieved, was done by Dr. Jack W. Millar, a Medical Officer of the U. S. Navy, who was assigned by the Navy to the Leonard Wood Memorial during 1952-1953 for the purpose of working periodically with the staff in the four leprosaria. Dr. Millar was well qualified for the assignment; previously he had been in charge of the leprosy control and treatment program for the Trust Territories in the Pacific.

Fortunately, just as the clinical evaluation studies were getting underway, Miss Delta Derrom, who had been Dr. Doull's secretary at Western Reserve University, became his assistant in the Office of the Medical Director of the Memorial. Her introduction to leprosy had taken place in Cleveland, where she assisted Dr. Doull in the earlier years of World War II in editorial work on the *INTERNATIONAL JOURNAL OF LEPROSY*. Immediately upon her employment by the Memorial in May 1952, she was given responsibility for many of the innumerable details required in operation of the current international program of the Memorial and the Working Clinical Conference being planned for Japan later in the year. To her, later, fell the almost overwhelming task of compiling, from recorded data, the tabulations required for the final published reports for the first through the fifth of the Clinical Evaluation Series.

The participants in the first series were: *Leonard Wood Memorial*: J. A. Doull, J. G. Tolentino, R. S. Guinto, F. C. Kluth, J. W. Millar, and H. W. Wade; *Japan*: T. Miyata, M. Namba, Y. Hayashi, and T. Nojima; *Philippines*: J. N. Rodriguez; *Union of South Africa*: A. R. Davison, F. E. Drewe, and J. Marshall; *United States*: L. F. Badger, C. H. Binford, and W. G. Cochran.

In addition to financial support provided by the Board of Trustees of the Leonard Wood Memorial, Doull was awarded a substantial grant from the National Institute

of Allergy and Infectious Diseases (NIAID), National Institutes of Health (NIH). The U. S. Government furnished additional financial support through the Veterans Administration. Six drug companies gave both drugs and money and eight other drug companies supplied drugs. Invaluable logistic support was provided by two shipping companies. An international airline contributed the international travel of several staff members.

In addition to the field work of Millar, uniformity in the performance of this comprehensive and complex clinical evaluation study was assured through a Working Clinical Conference, held in Japan, 15-27 September 1952, after the study had been underway for approximately six months. This conference ⁽¹⁵⁾ was organized and conducted under the auspices of the Leonard Wood Memorial and the Ministry of Health and Welfare of the Japanese Government. Doull served as General Chairman of the Conference. The distinguished Dr. Kensuke Mitsuda, originator of the widely used Mitsuda reaction ⁽⁸⁷⁾, was Chairman of the Japanese Committee. In attendance at the Conference were the key participants from the several leprosy hospitals where the studies were being conducted, and several scientists, in addition, who were contributing to the program. In addition several leprologists from the United States and a number of leprologists and other scientists from Japan participated (Fig. 11).

After two days of general conference in Tokyo, preliminary to an intensive working conference of a week's duration, the group moved to the leprosarium at Aisei-en, where the Director, Dr. Mitsuda, was host. In morning, afternoon, and evening sessions all details of the evaluation studies were thoroughly discussed and misunderstandings resolved. On its final working day the group moved to the Komyo-en Leprosarium, where Dr. R. Jingu was Director.

Thus, and probably for the first time in the history of leprosy investigation, leprologists from widely separated geographic areas joined in comprehensive working clinical sessions in which patients were actually examined by all participants, and in which, in the presence of patients, concepts on classification and the terminology used



FIG. 11. Leonard Wood Memorial Clinical Evaluation Studies (First Series) Working Clinical Conference, Japan, 15-27 September 1952. *Seated*, left to right: Dr. T. Nojima, Director, Seisho-en Leprosarium; Dr. L. F. Badger, U. S. Public Health Service; Dr. C. H. Binford, U.S. Public Health Service; Dr. J. G. Tolentino, Leprologist, LWM staff; Dr. R. Jingu, Director, Komyo-en Leprosarium; Dr. J. A. Doull, Medical Director, LWM; Dr. K. Mitsuda, Director, Aisei-en Leprosarium; Dr. H. W. Wade, Pathologist, LWM; Dr. Y. Hayashi, Director, Tama Zensho-en Leprosarium; Dr. J. N. Rodriguez, Chief of Leprosy Division, Philippines, *Standing*, left to right: Dr. J. W. Millar, MC, USN, between Drs. Nojima and Badger; Dr. A. R. Davison, Superintendent, Westfort Institution, South Africa, behind Drs. Doull and Mitsuda; Dr. W. G. Cochran, Professor Biostatistics, Johns Hopkins University School of Hygiene and Public Health, between Drs. Mitsuda and Wade; Dr. F. C. Kluth, Associate Epidemiologist, LWM, behind Dr. Rodriguez. In center of back row, Dr. and Mrs. H. H. Gray, U.S. Public Health Service.

in describing lesions were discussed freely and informally.

The results of the first series (²⁰) confirmed the therapeutic effectiveness of the sulfone group of drugs. Dihydrostreptomycin (DHSM), an antibiotic drug known to be effective in tuberculosis therapy, showed similar activity, but had the disadvantages of greater expense and a tendency to cause undesirable side effects. The combination of DHSM with sulfones did not enhance the therapeutic activity of these drugs given singly. The sulfones themselves, viz., Diasone (or Diamidin) and DDS—to use their abbreviations—were about equal in their activity. As is well known, in the long run, in the light of such considerations as cost, convenience of administration, and relative freedom from toxic effects, DDS has become the drug of choice throughout the world, but attempts to secure a still more effective drug continue.

After the successful completion of the first series, with continuing NIAID-NIH support and drug company donations, the Leonard Wood Memorial, under Doull's leadership, conducted other series. The Japanese participation closed after the first series, but a second Philippine unit was established at the Central Luzon Sanitarium at Tala, near Manila.

In the course of ten years (1952 to 1962) six series of trials were conducted (^{20, 27-31}). Doull, who died in 1963, did not live to see completed publication on the series. His close associates, Guinto and Tolentino, continued with the series, retaining Doull's name as co-investigator. The later studies in the series were concerned less with the treatment of lepromatous leprosy *per se* than with the treatment of its acute and damaging complications.

The serial group as a whole included tests with (1) a number of sulfone drugs, of which DDS became the prototype, (2) drugs shown to have specific ameliorating action in the mycobacterial disease tuberculosis, including isoniazid, streptomycin, pyrazinamide (²⁶) and cycloserine (²⁵), and (3) a considerable number of drugs introduced by well-known investigators in the field of chemotherapy, made available by various drug manufacturing firms, and

widely tested by other leprologists in scattered studies throughout the world, including particularly a substituted thiourea, designated DPT for short, and diethylthiolisophthalate (Etisul). These were tested sometimes alone, and more often in combination with DDS. Significantly enhanced therapeutic effect, over that of DDS alone, was not apparent, but a substantial background was laid for subsequent studies. A major result was a clear demonstration of the necessity and practicality of adequately controlled trials in the treatment of lepromatous leprosy. The researches as a group have received wide recognition throughout the world, in the light of their organization and control, as well as their specific contributions to improvement in therapy.

In the more recent extensions of this program Tolentino, now Chief of the Clinical Research Branch of the Philippine Division of the Memorial, had conducted a trial of the value of the drug Ethambutol in the treatment of leprosy, and, later, in cooperation with C. C. Shepard of the Communicable Disease Center of the U. S. Public Health Service in Atlanta, Georgia, has carried out a pilot study of one of the sulfone drugs characterized by long retention in the body and slow action in the treatment of leprosy. Tolentino and Guinto, at the Cebu Center, have undertaken a study of the value of the standard drug DDS in the treatment of chronic tuberculoid leprosy, a form in which drug-induced changes are less spectacular and less readily apparent than in the more diffuse and destructive lepromatous form. Tolentino, it may be noted here, has represented the Memorial frequently in clinical conferences on leprosy in the Orient.

Epidemiologic studies in Cebu, Philippines. Coincidentally with the clinical evaluation studies of the activity of antileprosy drugs, the majority of which were carried out at Cebu by Memorial staff and associated leprologists in Philippine government service, research on the epidemiology of leprosy in the Cebu region continued (Fig. 12). Under Memorial auspices Doull, Guinto as epidemiologist on the Memorial's staff, and J. N. Rodriguez, leprologist of

the Bureau of Health in Manila, and a former Fellow of the Memorial and long continuing consultant, each of whom participated in the initial studies, had continued field studies in Cebu up to the time of World War II, reporting epidemiologic data in periodic publications (^{38, 39}). Occasional analyses of previously secured data, by the same authors, with the statistical assistance of Huldah Bancroft, were published in the abbreviated issues of the *INTERNATIONAL JOURNAL OF LEPROSY* and elsewhere during the war. A resurvey of leprosy in one of the municipalities in Cebu, made in 1941, as noted above, was analyzed and reported by these four authors in 1951 (⁴⁰). Thereafter reports

by Doull, Rodriguez, Guinto and other associates appeared from time to time, on basic studies in which the population so thoroughly surveyed was utilized to unravel some of the mysteries in standard immunologic tests for leprosy as well as to provide additional data on prevalence in relation to sex, age, exposure and other factors (⁴⁰⁻⁴⁵). These investigations were closely correlated with the clinical evaluation studies for which the Cebu laboratories and clinics served as a base.

LWM-ECS Leprosy Research Laboratory, Cebu, Philippines. Thus the Cebu units, in which the traditional cooperation of the Leonard Wood Memorial and the Philippine Government was maintained,



FIG. 12. Staff members of the Epidemiology Branch, Philippine Division, Leonard Wood Memorial, Cebu. *Left to right:* Dr. Roland V. Cellona, Medical Specialist, Cebu Skin Clinic; Dr. Amando B. Arriola, Jr., Chief, Cebu Skin Clinic; Dr. Ricardo S. Guinto, Epidemiologist and Chief of Branch; Dr. Jose N. Rodriguez, Consultant, LWM; Dr. Tranquilino T. Fajardo, Jr., Assistant Epidemiologist, LWM; Dr. Conrado Pineda, Acting Regional Leprosy Consultant, Department of Health; Dr. Pedro M. Mangubat, Chief, Cebu Traveling Skin Clinic.



FIG. 13. Front of the Leonard Wood Memorial-Eversley Childs Sanitarium Leprosy Research Laboratory, Cebu, Philippines.

continued to serve effectively as proving grounds for the solution of problems in leprosy public health practice and therapy. The value of these units was greatly enhanced by the construction of the Leonard Wood Memorial-Eversley Childs Sanitarium (LWM-ECS) Leprosy Research Laboratory at Mandawe, Cebu, Philippines, which was formally opened 15 February 1964⁽⁷⁵⁾ (Fig. 13). This research unit, modern in every respect, was recognized as the result of broad imaginative planning by the late Dr. Doull. The Leonard Wood Memorial financed its construction, and financial support for the research staff and purchase of equipment was furnished by a grant from the National Institute of Allergy and Infectious Diseases (NIAID), National Institutes of Health (NIH) of the U. S. Public Health Service (Figs. 14, 15). Guinto was named the Principal Investigator for the grant. On guide lines prepared by Doull the detailed supervision of the construction and planning of the laboratory rooms and

equipment were carried out by Dr. C. V. Reich, Microbiologist, who was transferred in September 1962 to Cebu from the Johns Hopkins-Leonard Wood Memorial (JH-LWM) Leprosy Research Laboratory in Baltimore, Maryland. At the opening ceremonies, on the grounds of the sanitarium in front of the new laboratory, tributes were paid to the three pioneers who had done so much in the cooperative enterprises in which the Memorial and the Philippine Bureau of Health shared, Doull, Rodriguez and Wade. Dr. Floro V. Dabu, Secretary of Health in the Philippine Government, Minister Richard M. Service of the U. S. Embassy in Manila, and Mr. C. I. Crowther, President of the Memorial, made the principal addresses. Bronze plaques commemorating the work of Wade and Doull were unveiled (Fig. 16). Attending the ceremonies were the patients of the Eversley Childs Sanitarium and a large number of friends from Cebu and elsewhere.



FIG. 14. Central Facilities Room of the Leonard Wood Memorial-Eversley Childs Leprosy Research Laboratory, Cebu, Philippines.

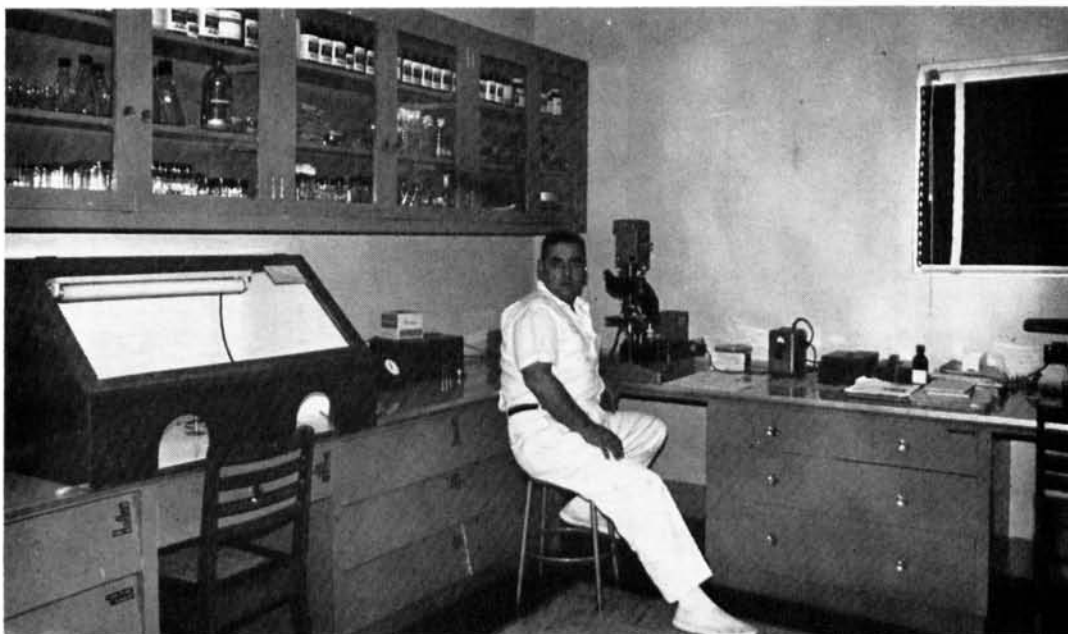


FIG. 15. Dr. Claude V. Reich, Microbiologist, LWM, Director, Leonard Wood Memorial-Eversley Childs Sanitarium Leprosy Research Laboratory, in microbiology room in the laboratory.

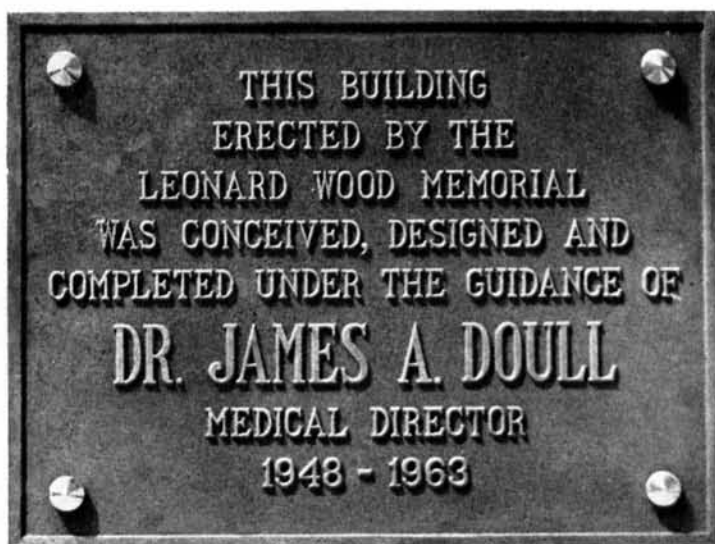


FIG. 16. This plaque was placed on the wall of the entrance hall of the Leonard Wood Memorial-Eversley Childs Sanitarium Leprosy Research Laboratory, Cebu, Philippines, in honor of Dr. James A. Doull, Medical Director, LWM, 1948-1963.

Philippine Division of the Memorial. In recognition of the expansion of the Memorial's research program in Cebu, on 21 February 1964 Mr. Crowther established the Philippine Division of the Leonard Wood Memorial, composed as follows: *Epidemiology Branch*, R. S. Guinto, M.D., Chief; *Clinical Research Branch*, J. G. Tolentino, M.D., Chief; *Research Laboratory Branch*, C. V. Reich, Ph.D., Chief. Reich, who had served from 1960 to 1962 as Associate Bacteriologist in the JH-LWM Leprosy Research Laboratory, Baltimore, Maryland, was named Director of the Research Laboratory (Fig. 17). A system of overall supervision was established in which the Medical Director of the Memorial, C. H. Binford (see page 284) visited the Philippine Division from time to time. On occasion D. A. Power (see page 287) relieved Reich in administrative activities. At such times Reich pursued his program of research in a special laboratory created for the purpose at the Johns Hopkins School of Hygiene and Public Health in Baltimore. At the time of writing, under the general direction of Reich and Power, a research program is underway, directed primarily toward cultivation of *M. leprae*, but with consideration of numerous related problems (⁹⁷). Dr. Rodolfo M. Abalos, Chief Pathologist, and Dr. Corpus O. Ortigoza, a LWM-NIH trainee of the Memorial in the pathology of leprosy, are carrying out investigations and teaching in the field of

pathology. Dr. Eduardo de la Cruz, also a LWM-NIH trainee, a veterinarian, supervises the animal laboratory and is being trained in experimental pathology and microbiology.

In the long range program Guinto continued as Chief Epidemiologist of the Philippine Division of the Leonard Wood Memorial, with assistants and consultant services. In his care were the records of many families, which had been carefully preserved by him during the war years. The Chief Consultant in this field from the beginning has been the long-time promoter of the Memorial's work in the Philippines, Jose N. Rodriguez. Several years after his retirement as Director of the Philippine Bureau of Disease Control, Rodriguez' continued keen interest in leprosy resulted in his undertaking, as Consultant to the Memorial's Philippine Division, a study of the natural history of leprosy in patients in the pre-sulfone period, based on the carefully kept records of epidemiologic studies by the Memorial on families in the municipalities of Cordova and Talisay. In collaboration with Tolentino and Guinto, Rodriguez is engaged also in studies on clinical leprosy.

Epidemiology Unit, Corpus Christi, Texas. Another epidemiologic project in which the Leonard Wood Memorial played a significant part was carried out in Texas. It was evident that while much was to be learned on epidemiologic aspects of leprosy

in Cebu and other locations outside the United States, an opportunity for more restricted but well controlled studies existed in the United States itself in the south-central region that provided a large portion of patients at the U. S. Public Health Service Hospital at Carville, Louisiana. In 1949 Doull proposed that the Memorial join forces with the U. S. Public Health Service and the Texas State Department of Health in a study of endemic aspects of leprosy in that state. It was hoped that early diagnosis of cases, recognition of sources of contagion, and improved public health practice would result.

Dr. Fred C. Kluth of the Johns Hopkins School of Hygiene and Public Health, well trained in public health methods, was appointed associate epidemiologist on the Me-

memorial staff and as such conducted survey operations in Texas from 1949 to 1956, using Corpus Christi as a base of operations (^{73, 74}). Dr. L. F. Badger of the Communicable Disease Center, U. S. Public Health Service, Atlanta, Georgia, took an active interest in the project, and expenses were shared by the three organizations concerned. It developed that of some 200 leprosy patients located in Texas, the majority of whom were already known to state authorities, a relatively small proportion were born in Mexico. Examination of household contacts yielded a few new cases. In more than 70 per cent of cases of leprosy a history of contact could not be established, a result agreeing in general with findings in the Philippine Islands studies. More than 10 per cent were born in nonendemic areas



FIG. 17. Staff, Philippine Division, Leonard Wood Memorial. Left to right: Dr. R. S. Guinto, Chief, Epidemiology Branch; Dr. J. G. Tolentino, Chief, Clinical Research Branch; Dr. C. V. Reich, Chief, Research Laboratory Branch; Dr. T. T. Fajardo, Jr., Assistant Epidemiologist.

in the United States. Obviously an important question, viz., the usual source of contagion, was left unsolved. The study was closed in 1956, and its results were left with the Texas authorities as valuable background material. In 1961 the State Department of Health established a leprosy control program, which has been pursued vigorously by Dr. M. S. Dickerson, Director of Leprosy Program of the Department, at Austin, who had registered, at the end of 1966, 420 leprosy patients.

Ryukyu Islands survey. The Memorial took part in other epidemiologic studies from time to time, e.g., in a study of leprosy in the Ryukyu Islands in 1954, in which Doull and Kluth took part⁽²¹⁾. This study was set up by the Department of the Army with a view to minimize opportunities for contagion in resident U. S. armed forces. A population sample of approximately 10,000 persons was examined, with only a minor element of selection. Few cases of leprosy were discovered, and the risk of contraction of leprosy by military personnel was rated as very low.

This was just one of numerous epidemiologic projects in many places in the world in which the Memorial took part, by actual participation of its expert epidemiologists in field work, by advice on projects in course, or through grants-in-aid to projects in need of support. It is noteworthy in this connection that the Memorial at all times maintained close relations with the Army, Navy, Air Force, Veterans Administration, Pan American Health Organization, National Research Council, and various divisions of the Public Health Service, as well as the World Health Organization, in mutually beneficial operations. Representatives of many of these services on the Advisory Medical Board greatly facilitated these operations.

Publications. Note should be made here of several publications of specialized import by the Memorial, including a bulletin on leprosy, first prepared in 1954 by Doull and revised in 1965 by Guinto and Binford, for the Veterans Administration⁽³⁷⁾, and certain other documents more or less widely used by investigators and other organizations concerned with leprosy research:

"The Eye in Leprosy. Abstracts from the Literature, Second Edition, 1933-1960,"⁽¹⁰⁷⁾ and "Leprosy: Neuritis and its Sequelae; Disfiguring Infiltration; Rehabilitation. Abstracts from the Literature 1933-1960."⁽⁷⁹⁾ Members of the Memorial's staff, on invitation have written chapters on leprosy for several leading American medical texts. Doull wrote the chapters on leprosy for several editions of M. J. Rosenau's "Preventive Medicine and Public Health" and Tice's "Practice of Medicine." He also wrote the account of leprosy in a volume on communicable diseases in the U. S. Army's "Preventive Medicine in World War II." Binford contributed the chapter on leprosy in a series of editions of J. H. Top's "Communicable and Infectious Diseases," and a corresponding chapter for the fifth edition of W. A. D. Anderson's "Pathology."

RESEARCH IN PATHOLOGY BY H. W. WADE AT CULION

While studies sponsored by the Memorial were under way in epidemiology, clinical evaluation of drugs, and the bacteriology of leprosy, Wade contributed steadily to understanding of its pathology. From the outset he was interested in definitive classification of forms of the disease. During his wide travels following the Manila conference of 1931 noted previously, he became increasingly interested in the tuberculoid form of leprosy, which had received scant attention at Manila, but which, in the course of years, thanks in considerable measure to the research of Wade and his associates, came to occupy the position of one of the two "polar" types of leprosy.

Also, as noted previously, in 1940 Wade and Rodriguez⁽¹²¹⁾ introduced the concept of "borderline" tuberculoid leprosy, a form with features of both tuberculoid and lepromatous disease, described in their original article as unstable, and prone to relapse. The concept stimulated much research and not a little controversy, so much so that subsequent congresses of leprology were forced to set up two terms for what was

apparently in essence the same condition, "borderline" and "dimorphous."

Since an important element in the natural history of the tuberculoid and lepromatous forms is a difference in their reactivity in the lepromin test, Wade was led into extensive studies of the lepromin reaction. In 1941, following up previous leads by his associate Rodriguez, he induced lepromin sensitivity experimentally in normal dogs, an immunologic result that came to be known as the "Wade phenomenon" (¹¹³). In later years Wade contributed significantly to methods for the purification of lepromin (^{109, 110}). Coupled with these diagnostic procedures he developed methods for detecting *M. leprae* in lesions. His "scraped incision" method for finding the bacilli in skin lesions and his concern with fixing and staining procedures for bacilli in tissues became influential technical procedures. He had used these for many years before his printed publications on the two procedures in 1952 (^{108, 111}).

In the light of his constant occupation with the pathologic characteristics of the polar and intermediate types of leprosy, Wade was at all times deeply concerned, as noted above, with classification of the disease, a field marked by continuous debate and contention. He took an active part in discussions of the subject at the successive congresses of leprology, and, as Editor, used the INTERNATIONAL JOURNAL OF LEPROSY as a forum for his own commentaries on the divergent views of leading leprologists. These commentaries have had much to do with such agreement as has been attained up to the present time.

In subsequent years he modified histologic staining procedures for leprosy bacilli developed by George L. Fite of the U. S. Public Health Service in Washington, D. C. and Carville, Louisiana. These technics have been used widely throughout the world.

During his later years, both before and after his nominal retirement from the position of pathologist of the Leonard Wood Memorial in 1959, Wade continued with pathologic investigations in his laboratories at Culion. These investigations led to his recognition of an atypical, incompletely defined, nodular form of lepromatous lep-

rosy, which he designated as the "histoid type" (¹¹²). This type is characterized by tumor-like organized histiocyte tissue, rather than the inflammatory granulomatous structure of ordinary lepromatous leprosy. Wade's descriptions of this type of leprosy have stimulated productive research by other observers.

Wade had a broad outlook on leprosy in all its aspects. His penetrating analysis of the remarkable epidemic of leprosy in the Pacific island Nauru, made in collaboration with the local health officer V. Ledowsky (¹²⁰) is a good example of the wealth of knowledge at his command.

ESTABLISHMENT OF LEONARD WOOD MEMORIAL LABORATORY UNDER J. H. HANKS FOR STUDY OF THE BACTERIOLOGY AND MICROBIOLOGY OF LEPROSY

With reorganization and increased efficiency in mind the Advisory Medical Board had long desired to see a research laboratory, or laboratory research facilities, set up in the United States. These would be quite apart from those of the Public Health Service at Carville, Louisiana, and would be under direct control of the Memorial.

After his six years in Culion, John H. Hanks, who had returned to the United States in 1945, was receptive to the idea of developing such facilities. The Board now visualized a program in at least three major fields, as follows: pathology under Wade, bacteriology under Hanks, and epidemiology under Doull. This was in addition to several projects in the chemotherapy of leprosy, to which the Memorial was giving support in one way or another. An additional project was under consideration for a time, viz., a program in chemistry in its several relations to leprosy, under Howard I. Cole, who was at one time chief chemist at the Culion Leper Colony, but this never fully materialized.

An independent laboratory for bacteriologic research, owned and operated by the Leonard Wood Memorial, was considered for a time, but the Advisory Medical Board finally recommended utilization of existing

academic facilities under suitable contract provisions. Such an arrangement proved practical at the Harvard Medical School. Hans Zinsser, Professor of Bacteriology and Immunology at Harvard, was an active member of the Board until shortly before his death in 1940, and his successor, J. Howard Mueller, was cordial to an arrangement with the Memorial. Hanks himself, before going to George Washington University Medical School, had held a fellowship in the Department of Bacteriology at Harvard, and was familiar with the opportunities that would be available.

In mid-1946 plans were consummated with Mueller and the Dean of the Harvard Medical School, C. Sydney Burwell, whereby Hanks was given space to carry out a program, as a staff member of the Leonard Wood Memorial for cultivation of the leprosy bacillus. The terms of the agreement were elastic. The Board of Trustees of the Memorial, in quite simple manner, "agreed to support Dr. Hanks' work." Careful plans for the research were drawn up by Hanks for the Advisory Medical Board, in which Mueller concurred. Correspondence during the period pointed up the cordiality of the relation established.

Thus came into being a long range project of the Memorial, with an initial budget of \$21,000, and unrestricted opportunity to follow any developing leads in the difficult problem of growing the leprosy bacillus in artificial culture. The U. S. Public Health Service Hospital at Carville furnished leprosy tissues for the research. At the time Hanks was inclined to the use of tissue culture methods; these had been the subject of his series of publications in the *INTERNATIONAL JOURNAL OF LEPROSY* in 1947 (⁴⁹⁻⁵³), which represented the efforts of his war years in Culion. Before long, in the new project at Harvard, he embarked on studies of a close relative of the leprosy bacillus, the mycobacterium of mouse or rat leprosy, which had one great advantage over the leprosy bacillus, viz., that animals could be infected with this organism by animal to animal inoculation, even though this organism, too, could not be cultivated artificially. The subsequent history of this department will be noted in some detail later.

INTERNATIONAL LEPROSY ASSOCIATION AND INTERNATIONAL JOURNAL OF LEPROSY

Most of the normal activities of the International Leprosy Association (ILA) were necessarily in abeyance during the years of World War II. With the cessation of hostilities, however, official action commenced again. Wade was elected President of the ILA in 1946. Preparations were soon underway for one of the periodic congresses of leprology, in the organization of which the International Leprosy Association was primarily concerned. This was held in Havana in April 1948, following one in Cairo in 1938, in which the Memorial had had some representation. The Leonard Wood Memorial was deeply interested in the success of the Havana Congress and took measures to ensure adequate representation from the United States, with provision for travel and participation by members of the Advisory Medical Board and other representatives of the Memorial, including Mr. Burgess and Dr. Wade. These two, and Malcolm H. Soule, Chairman of the Advisory Medical Board, took an active part in the congress, which in the course of its week-long session made decisions that paved the way for increased accord in concepts for the classification of leprosy and orientation of studies in the newly developing field of its chemotherapy. Changes in the constitution were approved by the ILA, and the full revised Constitution and by-laws were published in the following year in the *INTERNATIONAL JOURNAL OF LEPROSY* (⁷⁰). These remained in effect until they were superseded by a new revision in 1953 (⁶⁸). That revision in turn was superseded by another revision in 1963 (⁶⁹).

During this period the Memorial played an important role in preservation of the *INTERNATIONAL JOURNAL OF LEPROSY*. During the forced internment of Wade in Culion, and for a year or more afterward, Doull served as Acting Editor of *THE JOURNAL*. During the war years the Memorial carried the cost of publication of *THE JOURNAL*, which brought out one volume, of reduced size, each year. Analysis of past operations at that time indicated that, in

THE INTERNATIONAL LEPROSY ASSOCIATION

While the undersigned Vice-Presidents and members of the Council of the International Leprosy Association desire to express to our profound appreciation of the great services he has rendered to the Association since its foundation in 1931 as Councillor, and during the past seventeen years as its President. To this high office he brought great knowledge, wide experience, and sound judgment, and successive International Congresses have owed much to his counsel. His unusual editorial gifts exercised over thirty years have given the International Journal of Leprosy a worldwide reputation. Through its pages a generation of Leprologists have found a forum for the sharing of new knowledge, and high standards have added dignity to the science of leprology. All leprosy workers are indebted to Dr. Wade for his scientific contributions particularly in the spheres of pathology and immunology. A sincere and penetrating scientist, he is equally a kindly and genial colleague. His decision not to accept another term as President is greeted by all members of the International Leprosy Association with profound regret. It is unanimously resolved to appoint Dr. Wade as President Emeritus in recognition of his great services to the International Leprosy Association and his outstanding devotion to the cause of leprosy eradication.

Ref. name *Para. name* *Ref. name*
VICE-PRESIDENTS

Ensayo Aguirre *Sancti Spiritus* *Dr. R. L. H. H. H.* *J. H. H. H.*
Chambers *Sancti Spiritus* *Thom. H. H.*
S. H. H. *A. R. H. H.* *Ref. name* *M. H. H.*
Sancti Spiritus *J. N. H. H.* *J. H. H.* *(Sancti Spiritus)*
COUNCILLORS

Eighth International Congress of Leprosy, Rio de Janeiro, September 1963



FIG. 18. Illuminated plaque drawn up by the officers and councillors of the International Leprosy Association for Dr. H. W. Wade in recognition of his long service to the ILA and the INTERNATIONAL JOURNAL OF LEPROSY.

addition to the services of Wade, the Memorial had paid more than three-quarters of the expenses of publication of THE JOURNAL up to 1940.

During the war years, and in subsequent years up to 1958, the business office of THE JOURNAL was maintained at Western Reserve and Tulane Universities. As Assistant Editor, Dr. Huldah Bancroft, who had long been associated with Doull at Western Reserve University, but had recently moved to Tulane as Professor of Biostatistics, took over the processing formerly handled in Culion, with Miss Bess LeFevre as her editorial assistant.

With Doull's relinquishment of responsibility as Acting Editor of THE JOURNAL and the resumption of the duties of Editor by

Wade in Culion in 1948, the need for some reorganization and consolidation became increasingly evident. The first necessity was to define more closely the Memorial's relations with the International Leprosy Association. The latter had contributed some \$1,150 up to 1940, representing 85 per cent of its receipts of dues of members. After some consideration, including a suggestion that THE JOURNAL carry the caption "published by the Leonard Wood Memorial," final decision was made to carry the words "published with the aid of the Leonard Wood Memorial" on the cover of THE JOURNAL, a practice that has been in effect ever since.

In 1958 Dr. Bancroft retired from her post on the faculty of Tulane University.

The Publication Office of THE JOURNAL was then moved to Washington, D. C., and Miss delta derrom, Assistant to the Medical Director of the Memorial, and at the time Editor of the Memorial's *Leprosy Briefs* (see page 268), was made Assistant Editor of THE JOURNAL, responsible for the details of publication and management of its business office. Wade continued as Editor until 1963, when ill health forced him to resign⁽⁸¹⁾. In recognition of Wade's long service to the International Leprosy Association and the INTERNATIONAL JOURNAL OF LEPROSY the officers and Council of the ILA, at the VIIIth International Congress of Leprology, Rio de Janeiro, September 1963, drew up an illuminated plaque in his honor, which was forwarded to him in Culion⁽³⁴⁾ (Fig. 18). At the VIIIth International Congress of Leprology in Rio de Janeiro in that year the ILA elected as his successor Dr. Esmond R. Long, Emeritus Professor of Pathology at the Henry Phipps Institute of the University of Pennsylvania, a former member of the Memorial's Advisory Medical Board⁽¹⁷⁾ (Fig. 19). Since then THE JOURNAL has undergone some reorganization, and changed its format to some extent, as noted previously, and added the subtitle "and Other Mycobacterial Diseases" to its original title INTERNATIONAL JOURNAL OF LEPROSY.

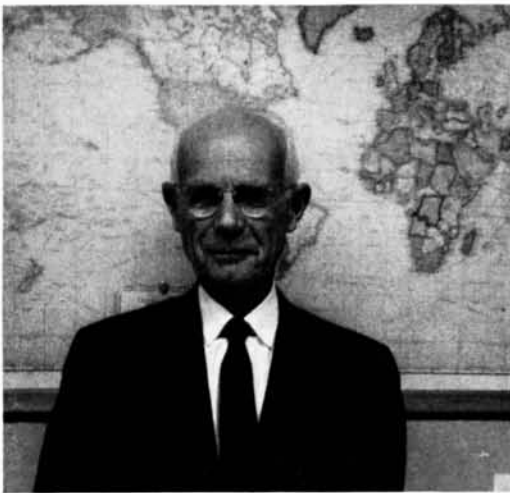


FIG. 19. Dr. Esmond R. Long, Editor, INTERNATIONAL JOURNAL OF LEPROSY, and Consultant, in the Office of the Medical Director, Leonard Wood Memorial, Washington, D. C.

LEPROSY BRIEFS

In January 1950, on the initiative of Doull the Memorial undertook another service in the interest of leprosy practice and research, through the monthly dissemination of a short brochure originally mimeographed as "Notes from the Medical Department" and later printed as *Leprosy Briefs*⁽⁸⁰⁾. This 4-page monthly pamphlet gave a wide variety of information on such items as Laws and Regulations Relating to Leprosy in the Continental United States⁽⁷⁶⁾ (first item in the new publication), leprosaria of the United States and Territories⁽⁷⁸⁾, news of national and international conferences on leprosy and scientific matters of related interest, news of newly recognized diseases with similarity to leprosy, abstracts of important articles on leprosy, special reviews of current and past leprosy investigations, geographic surveys of the prevalence of leprosy in all countries⁽³⁶⁾, miscellaneous items on leprosy throughout the world, information on activities of the Leonard Wood Memorial, and other matters.

The pamphlet continued as a publication of the Medical Department of the Memorial, and the services of staff members of the department were used in its production. The issues for 1952 were set up by Miss derrom, Assistant to the Medical Director, who was later to become Assistant Editor in charge of the Publication Office of the INTERNATIONAL JOURNAL OF LEPROSY. In January 1953 she was named Editor of *Leprosy Briefs*. For a total of 13 years the publication was circulated to a mailing list of approximately 2,500 interested persons, and much valued by its recipients. It was partially supported for a time by a special fund raised in honor of the former Executive Secretary to the Memorial, Mr. Harry L. Elias⁽⁶⁴⁾. On the death of Dr. Doull in 1963⁽⁹³⁾ publication of *Leprosy Briefs* was discontinued, but with the expectation of resumption of publication at a favorable time. Miss derrom prepared a cumulative subject and author index for the 13 years of its publication.

ADVISORY MEDICAL BOARD

Later Years

This is perhaps the place to reemphasize the fact that from its earliest days the Memorial had promoted the concept of research. Under the terms of incorporation the funds of the Memorial could have been devoted to philanthropy and medical care, but from the very start, as noted previously (see page 242) the Board of Trustees, Perry Burgess, H. W. Wade, and the first Medical Advisory Boards had taken the stand that the best usage of funds in the long run was research that might ultimately lead to improved methods of treatment and control. This tradition was maintained continuously by succeeding presidents and medical directors. In the later years, more than during the early years, the Advisory Medical Board was concerned with definitive advice on budgets for research.

During the years following the postwar reorganization, the Advisory Medical Board met at annual stated intervals, and was available at all times of the year by ordinary media of communication to the President and Medical Director for advice and decisions. Normally the Board consisted of eight elected members serving on four year appointments and the surgeons general of the U. S. Army, Navy, Air Force and Public Health Service. Usually guests with qualifications in specific fields attended meetings of the Board. In addition the Board itself had a number of special experts from the outside. A notable example was the Committee on Chemotherapy, made up of distinguished experts in that field from the United States and other countries as well.

In these formative years the Memorial, with advice by the Advisory Medical Board, was a powerful force of support in two major fields, viz., the treatment of leprosy, and the training of leprologists. Members of the Board, as well as the President, Perry Burgess, traveled widely in the interest of these projects. Before their untimely deaths in 1938 and 1939 respectively, E. B. McKinley and the bacteriologist, F. P. Gay, who had served as first chairman

of the Advisory Medical Board, traveled extensively in promoting these aims. Malcolm H. Soule of the University of Michigan, who became Chairman of the Board in 1945, embarked on an even more time-consuming program, with the cooperation of the Office of Inter-American Affairs, and ultimately traveled in the interest of leprosy projects on an almost full-time basis.

Interest in the chemotherapy of leprosy was running high in the postwar years, in the light of chemotherapeutic success in acute bacterial infections and tuberculosis. In November 1947 a joint meeting was held of the Advisory Medical Board and a consultant group of experts in general chemotherapy, comprised of Drs. Francis G. Blake, J. S. Lockwood, E. S. Marshall, M. I. Smith, W. W. Spink, H. B. Van Dyke and Arnold D. Welch, with additional observers from the Army and Navy and National Research Council. The Board itself included notable experts in the field in the persons of W. H. Feldman and C. S. Keefer. An abundance of groundwork was laid in the meeting for subsequent consideration by the Board.

The names of early members of the Board are listed in preceding pages. The provision of four-year appointments, followed by reelection, if desirable, after a year, or election of a replacing new member, resulted in a steady influx of new members with special competence in diverse fields, and at the same time in stabilization of program through the continuing reelected members. By and large, over the years, a useful rotation took place, in which a high proportion of physicians who achieved positions of distinction in American research medicine and public health served as members of the Board. The Board elected its own chairman, and itself nominated new members for approval by the Board of Trustees of the Memorial. The President of the Memorial and the Medical Director were almost always present at meetings of the Advisory Medical Board (Fig. 20).

The Medical Director and the Advisory Medical Board had in addition the services of a group of consultants, appointed as special needs arose, but regularly including experts in pathology, epidemiology and statistics, and clinical leprosy.



FIG. 20. Advisory Medical Board meeting of the Leonard Wood Memorial, Cosmos Club, Washington, D. C., 27 March 1965. *Standing, left to right:* Dr. W. H. Wright, formerly Director, Laboratory Tropical Diseases, National Institutes of Health; Maj. Gen. R. L. Bohannon, Surgeon General, U. S. Air Force; Dr. R. M. Herriott, Professor, Biochemistry, Johns Hopkins School of Hygiene and Public Health; Dr. H. L. Stewart, Chief, Laboratory of Pathology, National Cancer Institute, National Institutes of Health; Dr. P. E. Sartwell, Professor Epidemiology, Johns Hopkins School of Hygiene and Public Health; Mr. C. I. Crowther, President, LWM; Dr. C. E. Taylor, Professor Public Health Administration, Johns Hopkins School of Hygiene and Public Health, and Chairman, LWM Advisory Medical Board; Col. A. J. Rapalski, representing Surgeon General, U. S. Army; Dr. C. H. Binford, Medical Director, LWM; Dr. J. W. Millar, MC, USN, Director, Preventive Medicine Bureau, U. S. Navy; Dr. J. C. Cutler, Deputy Director, Pan American Health Organization; Dr. J. H. Hanks, Director, JH-LWM Leprosy Research Laboratory. *Seated, left to right:* Miss D. Derrom, Assistant to the Medical Director, LWM; Dr. E. R. Long, Editor, INTERNATIONAL JOURNAL OF LEPROSY and Consultant, LWM; Dr. W. H. Feldman, Chief, Laboratory for Research in Pulmonary Diseases, Veterans Administration; Dr. J. M. Huntley, representing Surgeon General, USPHS; Dr. V. Knight, Chief, Laboratory of Clinical Investigation, National Institutes of Health; Rear Adm. R. B. Brown, Surgeon General, U. S. Navy.

Several members of the Advisory Medical Board served with brief statutory interruptions, and with repeated periods as Chairman or Secretary, for more than twenty years. Dr. Howard T. Karsner and Dr. William H. Feldman had particularly long terms, which were recognized with appropriate testimony by the Advisory Medical Board and officers of the Memorial.

THE PROGRAM IN MICROBIOLOGY

Later Years

LWM Research Laboratory at Harvard. During this period there had been steady growth and expansion of the bacteriologic program under Hanks in the Leonard Wood Memorial Laboratory in the Department of Bacteriology and Immunology at Harvard Medical School (see page 265). At Culion Hanks had made intensive efforts to cultivate *M. leprae* from human tissues by maintaining the infected cells of patients in cell and tissue cultures. At the Harvard laboratory efforts were made to propagate either human or rat leprosy bacilli in a variety of cell culture systems. In these studies he used *M. lepraemurium*, the etiologic agent of so-called rat leprosy, an organism resembling the mycobacterium of human leprosy in many of its characteristics but differing from it in its origin and the ready transmissibility of infection with it from animal to animal.

The work eventually involved principally the rat leprosy bacillus, because of the close correlation that could be achieved between test tube experiments and trial inoculations of laboratory animals. Simultaneous studies on the multiplication of this microorganism in the organs of rats and mice resulted in accurate quantitative methods for measuring the infectiousness of inoculated test material⁽⁵⁹⁾. These studies led progressively into investigations of fundamental facts in the physiology and metabolism of the microorganism. By 1958 limited intracellular growth of the rat leprosy bacillus had been achieved in cell cultures⁽¹²⁶⁾.

As a correlated enterprise during the Harvard period, beginning in 1949, and annually for five years thereafter, Hanks di-

rected an intensive course each year in tissue culture technics at the Imogene Bassett Hospital, Cooperstown, New York. This course was sponsored by the hospital, the Tissue Culture Association, and the National Cancer Institute of the National Institutes of Health. Trainees were to a great extent at the post-doctoral level, who planned to do tissue culture work personally in their laboratories. During the period approximately eighty alumni completed the training, which opened the way for broad application in many problems in microbiology and physiology.

Hanks and his associate, Clarke T. Gray, a biochemist, were the first to conceive that, irrespective of growth, the metabolic capacities of the noncultivated mycobacteria might permit identification of useful catalysts or nutrients^(55, 56, 61, 66). They were unable, however, to find the key compound or environmental circumstances making growth of the mycobacterium possible in nonliving culture media.

In cooperation with C. E. Taylor and others efforts were made to recover purified *M. leprae* from tissue homogenates and lepromin⁽¹⁰⁵⁾. The method developed to obtain purified samples of mycobacteria from lesions enabled Taylor and Hanks⁽¹⁰⁴⁾ to initiate studies in which skin test materials were derived directly from *M. leprae*.

Meanwhile the microscopic counting methods required to study the fate of mycobacteria in animal experiments and cell cultures⁽⁴⁸⁾ had been refined to a point where they could be used for routine counting of the concentrations of *M. leprae* in lepromin⁽⁶³⁾. This method is now widely used in the standardization of lepromin. These studies led to further work sponsored by the World Health Organization on improvements in the preparation of lepromin and its standardization for measuring levels of resistance to leprosy.

In the later years of Hanks' stay at Harvard, a grant from the National Institute of Allergy and Infectious Diseases furnished substantial support for a new line of work, which laid the groundwork for his studies in later years, viz., an investigation of capsular elements in *M. leprae* and *M.*



FIG. 21. Dr. John H. Hanks (center) Director of the Johns Hopkins-Leonard Wood Memorial Leprosy Research Laboratory, at the official opening 13 January 1960, Baltimore, Md. Left to right: Mr. C. I. Crowther, President, LWM; Dr. Milton S. Eisenhower, President, Johns Hopkins University; Dr. Ernest L. Stebbins, Dean of Johns Hopkins School of Hygiene and Public Health; and Dr. James A. Doull, Medical Director, LWM. The part of the exhibit in the photograph was prepared and loaned by the Armed Forces Institute of Pathology.

lepraemurium, and the relation of capsular structure to the penetration of stains in these microorganisms (⁵⁷).

JH-LWM Leprosy Research Laboratory at Hopkins. By 1958 it had become evident that restrictions in space at Harvard would interfere with desired expansion. A new location for the Memorial research laboratory was chosen, at the School of Hygiene and Public Health of Johns Hopkins University, in Baltimore, a site offering several advantages, including proximity to the Office of the Medical Director in Washington, D. C., and closer association with research work of the Memorial in Washington and the National Institutes of Health in Bethesda, Maryland. The new position carried with it faculty positions in the School of Hygiene and Public Health.

The move from Boston was made in

1959. The new quarters were opened formally in January 1960 in ceremonies in which the significance of the cooperation was noted by Milton S. Eisenhower, President of Johns Hopkins University, Mr. Crowther, President of the Leonard Wood Memorial, Dr. J. E. Smadel, Associate Director of the National Institutes of Health, Dr. Doull, Medical Director of the Memorial, and Dr. Willard C. Rappleye of the Memorial's Board of Trustees (⁹⁸) (Figs. 21, 22).

Hanks soon gathered a group to work as a team on problems related to the growth of the uncultivable mycobacteria, a genus including *M. leprae*, *M. lepraemurium* and other mycobacteria of more or less pathogenicity, deficient in certain factors present in less fastidious bacteria, and therefore dependent on host cells in parasitic growth,

particularly substances that were themselves components of more readily growing mycobacteria. The group assembled by Hanks included the following who became members of the Memorial's staff: N. E. Morrison, biochemist and microbiologist from the University of Otago, Dunedin, New Zealand; B. S. Tepper, biochemist and microbiologist from the University of Wisconsin, and C. V. Reich, microbiologist from Pennsylvania State University (Fig. 23). M. F. Lechat, Belgian physician, who had had extensive previous experience with leprosy in the Belgian Congo, was a member of Hanks' staff in 1960-1962, and later as a LWM-NIH trainee developed a program with wide ramifications in epidemiology and genetics (see page 287). Another staff member was B. R. Chatterjee of Calcutta, India, who served as Associate Cytologist. Chatterjee returned to India in 1965 to continue work in leprosy. Others not on the Memorial's staff but working

closely on research problems with Hanks, included the graduate student and microbiologist W. C. Wheeler.

Hanks and these associates have developed a broad understanding of the metabolism and growth requirements of mycobacteria that have thus far proved difficult or impossible to grow in artificial culture. A significant development in the experience of Hanks and his associates was gained by investigating the growth requirements of certain less well-known mycobacteria that are not easily cultivated, but have been grown by special procedures. An effort is being made to apply this experience to growth of *M. leprae* and *M. lepraemurium* on laboratory media.

In 1965 a conference with Hanks, Morrison and Tepper resulted in a decision to apply the wide experience gained in this long series of investigations more directly and specifically to renewed attempts to remove the major roadblock in objective lep-

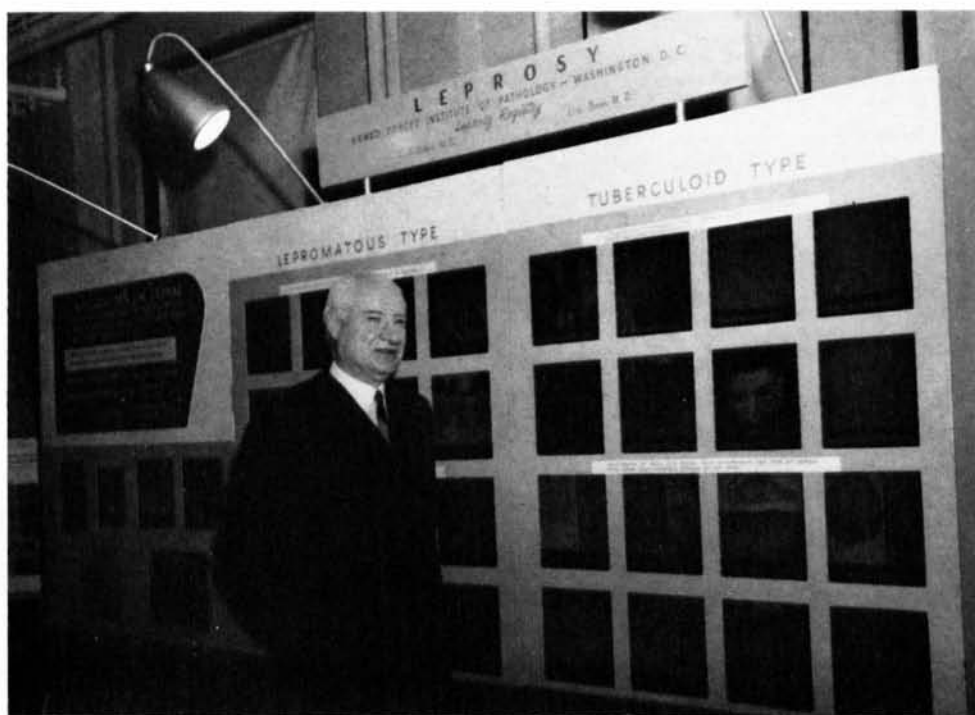


FIG. 22. Dr. Willard C. Rappleye, President, Josiah Macy, Jr. Foundation, member of Board of Trustees, Leonard Wood Memorial, and formerly Dean, College of Physicians and Surgeons, Columbia University, in front of the leprosy exhibit, at opening of the Johns Hopkins-Leonard Wood Memorial Leprosy Research Laboratory, School of Hygiene and Public Health, Baltimore, Md., 13 January 1960. Dr. Rappleye was one of the principal speakers at the dedication ceremonies.



FIG. 23. Staff members, Leonard Wood Memorial, at the Johns Hopkins-Leonard Wood Memorial Leprosy Research Laboratory at the School of Hygiene and Public Health, Baltimore, Md. *Left to right:* Dr. Norman E. Morrison, Microbiologist; Dr. John H. Hanks, Director and Chief Microbiologist; Dr. Claude V. Reich, Microbiologist and Director, Leonard Wood Memorial-Eversley Childs Sanitarium Leprosy Research Laboratory, Cebu Philippines, and Dr. Byron S. Tepper, Microbiologist. (The framed photographs above the heads of the four staff members are of Dr. H. W. Wade, Mrs. Wade and General Leonard Wood, whose far reaching vision led to the founding of the Leonard Wood Memorial.)

rosy research, the inability to cultivate *M. leprae*. In this reorientation Hanks would be concerned primarily with exploration of physicochemical environments for the propagation of *M. leprae* and *M. lepraemurium*, by the numerous technics he had developed, in an effort to effect the transition of these microorganisms from an intracellular to an extracellular growth state. Morrison, who had made penetrating studies of the role of the growth factor "mycobactin" in the propagation of mycobacteria ordinarily difficult to grow, as well as of its chemical composition and purification, would apply the information gained in order to enhance the effectiveness of growth-promoting factors. Correlated in this objective were his studies of the role of so-called immuno-suppressants in reducing the resistance of host cells, and thereby facilitating the multiplication of the hard-to-grow mycobacteria in the animal body (⁸⁸⁻⁹⁰). Tepper, who had made extended studies of the chemical composition of certain of the mycobacteria, particularly with respect to lipid and carbohydrate metabolism, would use the knowledge gained in this way in vigorously pursuing the objective of the cultivation of *M. lepraemurium* in artificial media (¹⁰⁶).

Reich who, after a period of two years in association with Hanks at the Hopkins

Laboratory had gone to Cebu, at the LWM-ECS Leprosy Research Laboratory, had already given the cultivation of *M. leprae* top priority among his research objectives. Earlier in 1965 Reich had, in addition to continuing as the Director of the LWM-ECS Laboratory, established a branch of the Philippine laboratory in Baltimore. In his frequent travels between Cebu and Baltimore he was able to provide specimens of human leprosy to Hanks and Morrison.

REGISTRY OF LEPROSY AT THE ARMED FORCES INSTITUTE OF PATHOLOGY

An important extension of the work of the Memorial, which was to bear fruit later, as well as accomplish its immediate purpose, came about through the establishment of a Registry of Leprosy at the Armed Forces Institute of Pathology (AFIP) in Washington, D.C. (Fig. 24). Dr. H. T. Karsner, who was long a member of the Advisory Medical Board, and its Chairman and Secretary several times, was actively associated, as Chairman of the Committee on the American Registry of Pathology of the National Research Council, with the numerous registries for different diseases at the AFIP. The National Re-

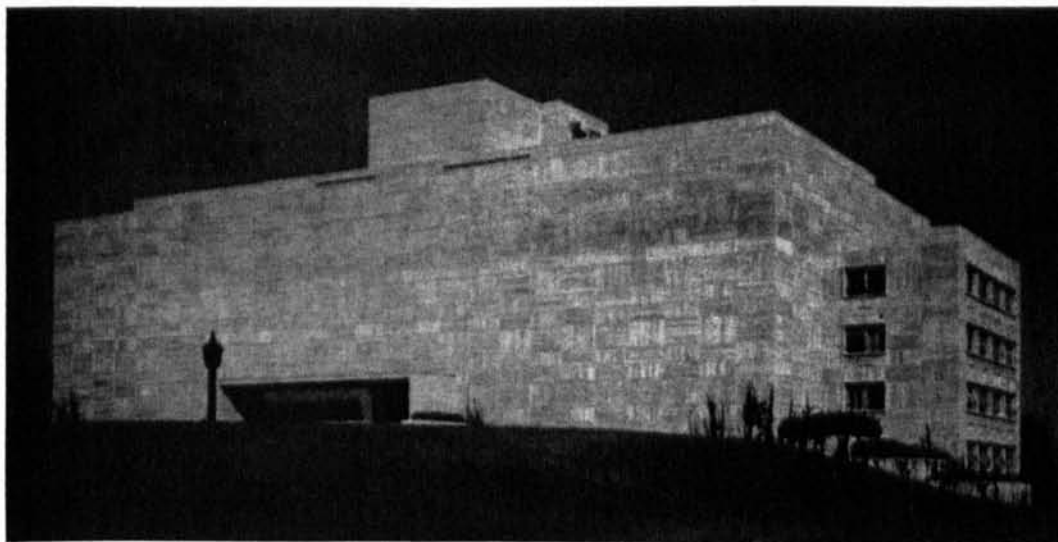


FIG. 24. The Armed Forces Institute of Pathology, Walter Reed Army Medical Center, Washington, D. C.

search Council and the AFIP proved cordial to the proposal by the Medical Director and Dr. Karsner that a registry of leprosy be set up, among the AFIP registries, to collect material on leprosy and facilitate research and teaching on the disease, under the sponsorship of the Leonard Wood Memorial, which included an annual subsidy. Several experts in leprosy were appointed to serve as consultants for the Registry of Leprosy.

These included Dr. Chapman H. Binford, a commissioned officer of the Public Health Service, who was at the time transferring from the position of pathologist in the U.S. Marine Hospital in Baltimore, to that of U. S. Public Health Service representative and Chief of Infectious Diseases Pathology at the AFIP. He was appointed Registrar for Leprosy, a position he still holds. Binford was experienced in the investigation of leprosy problems. He had been assigned in 1933 to the Leprosy Investigation Station of the U. S. Public Health Service in Honolulu. There, under the direction of Dr. N. E. Wayson and Dr. L. F. Badger, he gained experience for a period of three years, and intense interest as well, in clinical leprosy and laboratory research on the disease. Under his stimulation the staff of the AFIP, became keenly aware, through demonstrations and discussions, that leprosy is a fascinating disease in which histopathology can play an important role in diagnosis and in research. These activities, and many concomitant associations in international leprosy work, kept him in touch at all times with the Office of the Medical Director of the Memorial. Under his direction the Registry accumulated leprosy material steadily, chiefly from the U. S. National Leprosarium in Carville and the Memorial's own projects in the Philippines, but also from civilian and military pathologists in the United States and in various other parts of the world. As an outgrowth of the interest stimulated by the Leprosy Registry in 1955, Binford was allowed to give up the Branch in General Infectious Diseases at the AFIP and develop a research program on transmission of leprosy to animals. This was a collaborative project sponsored by the

Leprosy Registry, the AFIP and the Communicable Disease Center of the Public Health Service in Atlanta, Georgia.

RETIREMENT OF PERRY BURGESS AND APPOINTMENT OF C. I. CROWTHER AS PRESIDENT OF THE MEMORIAL

In June 1958, Perry Burgess, who had been in ill health for some time, retired from his position as President of the Memorial, a post he had held for 28 years following his service for a period of five years in its initial financing and organization. During this time he had handled the business affairs of the Memorial, raising new funds for operation, maintained constant liaison with its Board of Trustees, traveled extensively for the Leonard Wood Memorial and in the general interests of leprosy control, and written books and pamphlets of wide popular appeal. For 28 years he had the able assistance of Harry L. Elias, who carried the title of executive secretary of the LWM for the last 16 of these. During the later years of his tenure, and after the death of Elias in 1956 (⁶⁴), Burgess was assisted by his wife, Cora L. Burgess, who acquired a noteworthy under-



FIG. 25. Mr. Cyril I. Crowther, President, Leonard Wood Memorial, 1958-1966.

standing of leprosy and the Memorial's problems. She continued to serve for a time as secretary to Burgess' successor, Perry Burgess and Mrs. Burgess both died in 1962 (18, 19).

Burgess was succeeded as President, in 1958, by Mr. Cyril I. Crowther, an expert in economics and accounting, who had served as auditor for the Near East Relief in 1920 and with the Near East Foundation since 1930, acting successively as its principal fund raiser, comptroller, and Executive Director (Fig. 25). He had also served on a part-time basis with the Leonard Wood Memorial as comptroller since 1930. His experience with leprosy as a clinical and research problem commenced with attendance at the VIIth International Congress of Leprosy in Tokyo in 1958 (Fig. 26). He began a close relation at once with

the Medical Director and the Advisory Medical Board. He was instrumental in the institution of new policies with respect to tenure and retirement provisions for Leonard Wood Memorial staff members. During his administration many developments took place, including the establishment of the Johns Hopkins-Leonard Wood Memorial Leprosy Research Laboratory in Baltimore, a laboratory for electron microscopy, a leprosy research unit at the Armed Forces Institute of Pathology, a great increase in the Memorial's training program for investigators in various fields of leprosy research, and a broad development of the Memorial's research program at Cebu in the Philippines, including the establishment of the Leonard Wood Memorial-Eversley Childs Leprosy Research Laboratory (see page 259).



FIG. 26. Standing in front of the Leonard Wood Memorial exhibit at the VIIth International Congress of Leprology, Tokyo, Japan, November 1958, are left to right: Dr. Jose N. Rodriguez, Director, Bureau of Disease Control, Department of Health, Philippines and Consultant to LWM; Dr. Ricardo S. Guinto, Epidemiologist, LWM; Dr. James A. Doull, Medical Director, LWM; Mr. Cyril I. Crowther, President, LWM, and Dr. H. W. Wade, Pathologist, LWM, and Editor, INTERNATIONAL JOURNAL OF LEPROSY.

OTHER LABORATORY PROJECTS

Association with National Institutes of Health and Armed Forces Institute of Pathology

The Washington and Baltimore location of segments of the laboratory work of the Memorial permitted a close cooperation with the National Institutes of Health of the U. S. Public Health Service and with the Armed Forces Institute of Pathology in Washington, D. C. Among the projects in the Washington area note should be made of the studies by Dr. Y. T. Chang on the growth of *M. lepraemurium* and *M. leprae*, and Dr. R. L. Mayer and Dr. S. C. Chang on its ultrastructure.

Experimental chemotherapy. Dr. Y. T. Chang, formerly Professor of Pharmacology, National Chekiang University in China, had worked on leprosy problems as a Fellow of the World Health Organization and later, 1950-63, was a Fellow of the Leonard Wood Memorial, with facilities made available to him by Dr. S. M. Rosenthal, Chief of the Laboratory of Pharmacology in the National Institute of Arthritis and Metabolic Diseases in the National Institutes of Health in Bethesda, Maryland. Chang's early work with the Memorial was closely related to the clinical evaluation studies by Doull and his associates (Fig. 27). It led to an important method for screening for drugs with potential efficacy in leprosy, rat leprosy being used as the screening model (^{8,11}). Key observations during these studies included demonstration of the ability of different drugs to suppress the emergence of drug-resistant bacterial mutants. In this respect, B.663, a rimino derivative of phenazine dyes, was found superior to all others of a large number of drugs and antibiotics tested (⁹). This fact attracted the attention of Dr. Vernon Knight of the Clinical Center of the National Institutes of Health and initiated his valuable observations on the effect of B.633 as a bacteriostatic and anti-inflammatory agent in leprosy.

In more recent years, Chang's studies on the cultivation of *M. lepraemurium* in mouse macrophages have greatly improved

the technic for maintenance of these host cells (¹⁰) and, in particular, have indicated nutritive ingredients that must be added to the extracellular medium in order to promote continuous and successful intracellular growth of *M. lepraemurium*. The significance of this advance in knowledge is now being tested with *M. leprae* (¹²).

In 1963 Chang became a full-time staff member of the National Institute of Arthritis and Metabolic Diseases of the National Institutes of Health. In this position he has continued to devote full time to leprosy investigation, and has maintained his close association with the Memorial. A laboratory for tissue culture studies on the human leprosy bacillus was made available to him in the Clinical Center of the NIH by Knight. To facilitate his work on *M. leprae* the Memorial employed a competent technologist in bacteriology, Mrs. Roxanna Neikirk Andersen, to assist him.

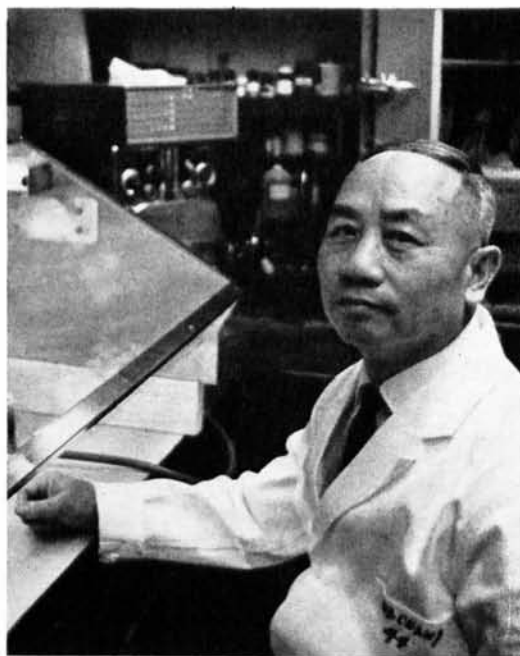


FIG. 27. Dr. Y. T. Chang, Research Pharmacologist, Laboratory of Biochemical Pharmacology, National Institute of Arthritis and Metabolic Diseases, National Institutes of Health, Bethesda, Md. Dr. Chang was formerly on the staff of the Leonard Wood Memorial and Pharmacologist engaged in experimental chemotherapy.

Electron microscope. In 1960 the Memorial began laboratory use of the electron microscope for studies of the leprosy mycobacterium, taking advantage of its greatly increased magnification capacity, as compared with that of the light microscope. Dr. R. L. Mayer, who had retired from the staff of Ciba Pharmaceutical Products, became Leonard Wood Memorial microbiologist at the AFIP (Fig. 28). He was given authority by the Director of the Institute to develop a program using the Institute's electron microscope facilities, in association with Dr. Frank B. Johnson in the Basic Sciences Division of the Institute, and with the aid of a NIH research grant. During the period he made an extensive and now widely quoted review of the chemotherapy of leprosy (⁸³).

After Mayer's untimely death in 1962 (⁹⁴), Dr. S. C. Chang, formerly Associate Professor of Veterinary Science, College of Agriculture, University of Maryland, was placed in charge of the Memorial's electron microscopic studies, using equipment provided by the National Institute of Allergy and Infectious Diseases of the

NIH and set up the Memorial's laboratory at the JH-LWM Leprosy Research Laboratory in Baltimore (Fig. 29). At the time of writing he is engaged in studies paving the way for the development of techniques applicable to the study of fine structures in human and experimental leprosy. He has developed a hematoxylin and eosin staining method to enable him to locate structures with the conventional light microscope that can be studied later in greater detail by the electron microscope. In 1965 the unit was transferred back, as a Memorial project, to the Armed Forces Institute of Pathology in Washington, D. C. and designated as the LWM Ultrastructure Laboratory, Special Mycobacterial Diseases Branch, AFIP.

SCIENTIFIC CONFERENCES OF THE LEONARD WOOD MEMORIAL

In the first year of its operation, 1931, the Leonard Wood Memorial sponsored an international conference on leprosy (see page 245) (¹⁷). The precedent has been



FIG. 28. Staff members of the Leonard Wood Memorial in one of the laboratories at the JH-LWM Leprosy Research Laboratory, School of Hygiene and Public Health, Baltimore, Md. *Left to right:* Dr. R. L. Mayer, Microbiologist, Dr. J. H. Hanks, Director of the Laboratory, and Dr. J. A. Doull, Medical Director.

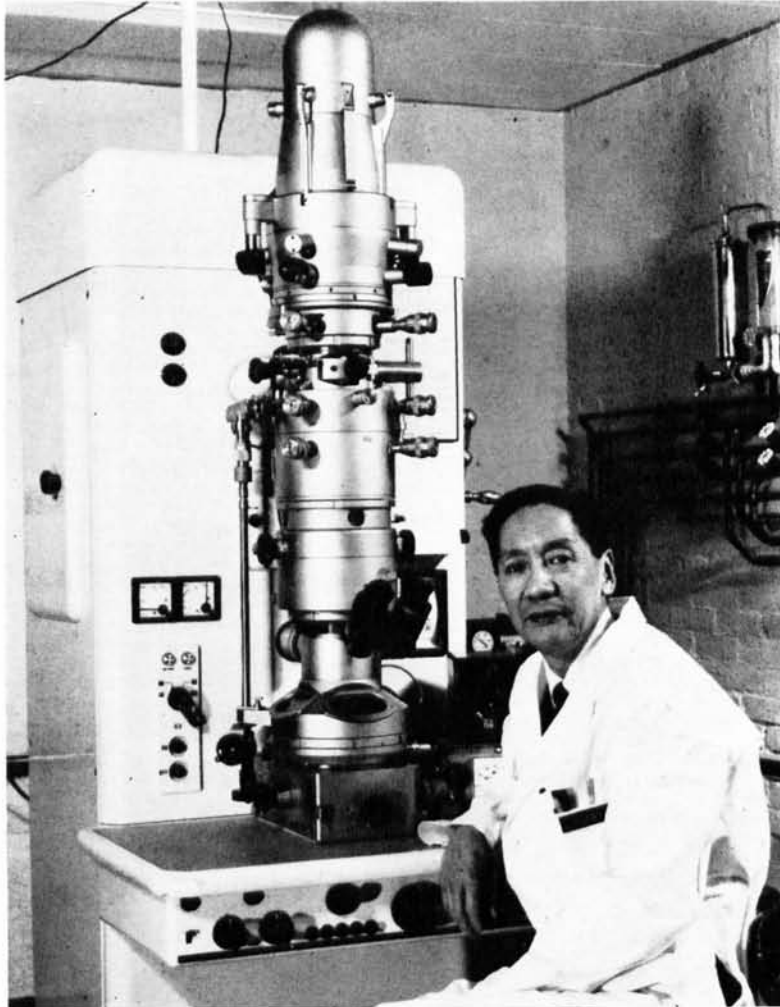
followed ever since by assistance and promotion of regional conferences and periodic international congresses of leprology sponsored by the International Leprosy Association. In addition, members of the Memorial's staff have played an active part in numerous programs aimed at the control of leprosy throughout the world. A brief summary of these activities follows.

As noted in past pages, members of the Memorial's staff have participated regularly in the congresses of leprology of the International Leprosy Association. This participation was noteworthy in Cairo in 1938, Havana in 1948, Madrid in 1953, Tokyo in 1958, and Rio de Janeiro in 1963. The presidents of the Memorial, Mr. Burgess and Mr. Crowther, attended regularly in

their respective terms. Wade was an active force in all deliberations of the congresses up to 1963, and in all of the congresses members of the Memorial staff, as chairmen or members of working conferences, assisted in setting up the program conferences. At the Rio de Janeiro conference in 1963 eleven staff members were among the 374 leprologists from 53 countries in attendance.

The Memorial has been especially active in conferences related to leprosy research in Latin America. In 1946 four representatives of the Memorial took part in the Second Pan American Conference on Leprosy in Rio de Janeiro. In 1962 Doull and Hanks assisted the Pan American Health Organization in an investigation of re-

FIG. 29. Dr. S. C. Chang, Microbiologist, Leonard Wood Memorial with electron microscope, in his laboratory at the Armed Forces Institute of Pathology Annex, Washington, D. C.



sources and personnel for programs in research in Central and South America. In this connection Doull prepared a set of cards on some 200 articles in original or abstract form published in the INTERNATIONAL JOURNAL OF LEPROSY by workers in Central and South America during the years 1958-1961. In 1963 Hanks followed this up by further advisory assistance, attending an important conference on the subject in Cuernavaca, Mexico, and organizing a work conference on serology in leprosy in preparation for the international congress in Rio de Janeiro that year.

First and last the Memorial has taken part in numerous conferences devoted to leprosy in Asia. Notable among these was the working clinical conference in Japan in 1952, to which reference has already been made (see page 256) ⁽¹⁵⁾. In 1960 the Memorial joined with the WHO and the International Society for Rehabilitation of the Disabled in sponsorship of a Scientific Meeting on Rehabilitation in Leprosy, in Vellore, India ⁽¹²⁸⁾. In 1962 Doull attended the Second Pan Pacific Rehabilitation Conference in Manila. In Honolulu in October 1965 and in Tokyo, Japan in 1966 members of the Memorial staff took part in meetings in the current (1965 ff) U. S.-Japan Cooperative Medical Science Program. Binford and Hanks are members of the U. S. Panel on Leprosy of the Office of International Research of the National Institutes of Health, which is actively concerned in the development of this cooperative program. The Panel has laid special emphasis on (1) cultivation of *M. leprae*, (2) transmission of infection by *M. leprae* to animals, (3) drugs effective against leprosy, (4) chemoprophylaxis, (5) vaccination against leprosy, and (6) antigens similar to lepromin and the mechanism of lepromin reactions.

From the outset of the World Health Organization's special program of leprosy studies members of the Memorial staff have taken an active part. In 1952 Wade participated in the first meeting of the WHO Expert Committee on Leprosy, held in Rio de Janeiro. Hanks took a similar part in the conference of this committee in Geneva in 1959, where he served as chairman of the WHO's Scientific Study Group

on Leprosy Research. In 1965 he was chairman of the committee at a Geneva conference, and Guinto of the Memorial's staff in Cebu served as a member of the committee. Doull was at all times active in WHO relationships. In 1958 he participated in WHO international leprosy conferences in Tokyo and Belo Horizonte, Brazil. Memorial representatives at these meetings urged the promotion of studies on the causes and treatment of disabilities due to leprosy. In 1960 Doull prepared a comprehensive manual for the WHO on clinical trials of the efficacy of various drugs in the treatment of leprosy, and assisted the WHO in plans for its broad leprosy research program.

Staff members of the Memorial have always been ready to promote research in leprosy. In this connection note should be made of the Subcommittee on Leprosy Research of the U. S. Public Health Service, to which Doull, who was both a Public Health Service officer and Medical Director of the Leonard Wood Memorial, was appointed in 1953. Hanks joined the Committee as Consultant. Other PHS members were Drs. Rolla R. Wolcott, L. F. Badger, George L. Fite, T. H. Tomlinson, and C. H. Binford, Chairman. For a period of five years this Committee met regularly for the sole purpose of considering ways to broaden the base of leprosy research in the United States. As a result of the stimulation of this subcommittee, Dr. Charles C. Shepard was assigned to the Communicable Disease Center Laboratory of the PHS in Montgomery, Alabama, to work on the cultivation of *M. leprae*. The Communicable Disease Center Laboratory Branch at Chamblee, Georgia, agreed to support Binford in conducting a laboratory for the transmission of *M. leprae* to animals ⁽²⁾. With the encouragement of this Committee, leprosy research was undertaken in several university laboratories. The Memorial staff participated actively in successful conferences at the Public Health Service Hospital, Carville, Louisiana, on Research Potentials in Leprosy, in 1956 and 1958 ^(13, 14); these were conducted by this Committee in cooperation with the Carville staff.

LWM-JHU Symposium on Research in Leprosy. In recent years the Memorial has itself organized two international leprosy research conferences in the United States. The first of these, set up as a Symposium on Research in Leprosy held in the Memorial's laboratory in the School of Hygiene and Public Health, Johns Hopkins University, Baltimore, 8-10 May 1961, was organized by Doull, with financial support from the Institute of Allergy and Infectious Diseases, National Institutes of Health, Public Health Service, to provide a forum for discussion of current progress in the treatment and control of leprosy and deficiencies in basic knowledge of the disease. The importance of cultivating the etiologic agent was emphasized at the outset. At the opening sessions speakers from the United States and abroad discussed fundamental pathologic problems and immunologic relations in leprosy. This discussion was followed by an important and often neglected feature, the education of physicians, with respect to leprosy, in schools of medicine and public health. Several sessions of the symposium were devoted to the mycobacterium of leprosy and leads obtained through laboratory research on its artificial cultivation and transmission to laboratory animals. In this connection there was abundant discussion of advances in knowledge of the life history of *M. leprae*, its nature and structure, its possible capacity for independent growth, its limited multiplication in host cells of the macrophage system, and its transmission for multiplication by the techniques of C. C. Shepard in the mouse foot pad and C. H. Binford in the hamster. R. S. Guinto reported on cutaneous responses to lepromin compared with those to other mycobacterial antigens. One of the most significant sessions was devoted to the prevalence and epidemiology of leprosy in human society. Another session was devoted to some of the less common mycobacterial infections, endemic in certain parts of the world, which might furnish leads in the study of leprosy.

The conference had a broad representation of leaders in research from laboratories engaged in leprosy research in England,

continental Europe and Latin America, as well as the United States. The stimulation effected by the Symposium was reflected in their subsequent investigations. The *Transactions* of the Symposium were published in monograph form by the offset process (¹⁰³). They have been widely quoted ever since.

LWM-AFIP Conference on Research Problems in Leprosy. The other of the two recent conferences to which reference was made, the Conference on Research Problems in Leprosy, held in Washington, D. C., 11-14 May 1965, was sponsored jointly by the Leonard Wood Memorial and the Armed Forces Institute of Pathology. The general plan of the conference was worked out by Binford in collaboration with a consulting committee. Staff members of the Office of the Medical Director under Binford and the AFIP under Brig. Gen. J. M. Blumberg devoted full time to its operation. International aspects of the conference were prominent from the outset. About 35 investigators from abroad participated, either with original papers or in the discussions (Fig. 30). The announced special themes of the Conference were (1) the unsolved problems of cultivation of the leprosy bacillus *in vitro*, and (2) unsolved problems in animal transmission, immunology, epidemiology, and experimental therapy. The actual program, however, was broader in scope, including fundamental presentations from the clinical point of view, and discussions, by recognized experts, on various aspects of leprosy as a human disease, and detailed presentations of research on the cultivation of other microorganisms that had long defied efforts to grow them under artificial conditions in the laboratory. Special emphasis was accorded to this part of the program in the hope that leads for the leprosy bacillus might be found in the long deferred but finally attained success with certain fungi and rickettsiae.

While no immediate opportunities developed from this part of the program, an abundance of inspiration, and not a few suggestions for future work, came out of formal papers on the subject and related discussion. The program of the conference



FIG. 30. Leonard Wood Memorial-Armed Forces Institute of Pathology Conference on Research Problems in Leprosy, Armed Forces Institute of Pathology, Washington, D. C. 11-14 May 1965. Participants in the Conference from outside the United States. *Left to right, front row:* Dr. A. C. Jovellanos (Philippines); Dr. S. J. Bueno de Mesquita (Surinam); Dr. T. Ramasoota (Thailand); Dr. B. R. Chatterjee (India); Dr. V. Möller-Christensen (Denmark); Dr. Dharmendra (India); Dr. J. G. Tolentino (Philippines); Dr. I. Mifuchi (Japan); Dr. T. Imaeda (Venezuela and Japan). *Back row:* Dr. R. G. Valladares (Venezuela); Dr. R. Watelet (Belgium); Dr. Claire M. J. Vellut (Belgium and India); Dr. B. Galindo (Venezuela); Dr. C. K. Job (India); Dr. R. J. W. Rees (England); Dr. P. D'Arcy Hart (England); Dr. G. R. F. Hilson (England); Dr. J. P. Wiersma (Holland); Dr. R. G. Cochran (England); Dr. M. F. Lechat (Belgium); Miss E. W. Garbutt (England); Dr. P. G. Janssens (Belgium); Dr. R. Abalos (Philippines); Dr. A. R. Dhople (India); Dr. R. S. Guinto (Philippines).

Unfortunately the following participants were not present when the picture was taken: Drs. S. R. Pattyn (Belgium), R. Huerta (Chile), S. G. Browne (Nigeria and England), L. Kato (Canada), F. Latapí (Mexico), J. Barba Rubio (Mexico), and C. de Paula Motta (Brazil).



FIG. 31. Dr. Chapman H. Binford, Medical Director, LWM, demonstrates nerve lesions in the ears of hamsters to Mr. C. I. Crowther, President, LWM, at the Leonard Wood Memorial-Armed Forces Institute of Pathology Conference on Research Problems in Leprosy, AFIP, Washington, D. C., 11-14 May 1965.

allowed an unusual amount of time for free discussion, and debate over controversial issues was lively. Terminal summaries, pointing up developments of special significance, stressed investigations reported at the Conference on (1) cultivation of the leprosy bacillus in macrophage systems and tissue culture (^{12, 35}), as well as in the mouse foot pad and other animal sites, and (2) possible forms of the leprosy bacillus other than the classic, walled, rod-like form. It was felt that the results of these and other studies would be reflected in future investigations. Staff members and trainees of the Leonard Wood Memorial took a large part in the program, but did not attempt to dominate it. The conference was truly one of international cooperation. Its *Proceedings* were published as a lengthy second part of the regular issue of the *INTERNATIONAL JOURNAL OF LEPROSY* for July-September 1965, and thus made wide-

ly available for research background and continued study (¹⁶). Publication costs were paid in large part from contributions and grants from some twenty organizations interested in leprosy work. Major support other than that furnished by the Memorial and Armed Forces Institute of Pathology came from the same organization that had helped in the previous conference, i.e., the National Institute of Allergy and Infectious Diseases of the National Institutes of Health (Fig. 31).

APPOINTMENT OF C. H. BINFORD AS MEDICAL DIRECTOR

Early in 1963 Dr. Doull became gravely ill in the course of strenuous travel in the Philippines and England. He died on 6 April 1963, after maintaining intimate supervision of the Memorial's many re-

search activities up to the very end. Journals and organizations over the world, wherever leprosy was a problem, mourned his passing.

On 1 July 1963, on the advice of a special Committee set up by President Crowther, the Board of Trustees of the Memorial appointed Chapman H. Binford as Medical Director (Fig. 32). His interest in leprosy had begun with an assignment as a Public Health Service Officer in 1933 to work under Dr. N. E. Wayson at the PHS Laboratory for the Investigation of Leprosy in Honolulu, Hawaii (⁴). He had been active in the Memorial's research program since 1951, when he had been assigned as a pathologist to the Armed Forces Institute of Pathology as PHS representative. There, among other duties, he had served as Registrar for the AFIP Leprosy Registry, which had been established shortly before under the sponsorship of the Leonard Wood Memorial. With facilities made available by the Communicable Disease Center Laboratory Branch of the PHS in Chamblee, Georgia in 1956 (²), and by the AFIP in 1961, he had made significant investigations



FIG. 32. Dr. Chapman H Binford, Medical Director, Leonard Wood Memorial, 1963- .

on the transmission of human leprosy to hamsters (³). On 1 October 1960, on his retirement from the Public Health Service, he had been appointed Research Pathologist of the Leonard Wood Memorial so that he could continue his work at the AFIP on the pathology of leprosy and the transmission of leprosy to animals. The Memorial authorized him to continue his contribution to the program of the AFIP by carrying out the additional duty of Chief of a newly established Division of Geographic Pathology. During the first six months after his appointment as Medical Director of the LWM Binford continued with the latter responsibility, until his successor came on duty. His work in geographic pathology had required extensive travel in Africa, the Orient and the Philippines, which enabled him to supplement his official duties for the AFIP with observations of work being done in leprosy and to promote the influence of the Memorial through contacts made.

Under Binford's direction noteworthy expansion took place in grant support for research from the NIH and other sources. Prior to Doull's administration the Memorial had financed its projects largely out of its own funds, although cooperating closely with other agencies. During Doull's and Binford's administrations grant aid to the Memorial rose sharply. The annual budget for medical research, which had been approximately \$125,000 at the end of World War II (see page 252), was more than half a million dollars in 1964.

As Assistant to the successive Medical Directors, Dr. Doull and Dr. Binford, Miss Delta Derrom has assiduously and continuously carried out her varied duties as officer-manager, including the meticulous maintenance of financial records of Government grants in conformity with official regulations. During long periods of absence of the Medical Director on international travel she has had full responsibility for operating the office.

RESEARCH AND TRAINING GRANTS TO THE MEMORIAL

Research grants. Reference has been made in previous pages to assistance from

the National Institutes of Health (NIH) in programs of research. One of the most notable programs in which such assistance was vital was the series of clinical evaluation studies in lepromatous leprosy organized by Doull (see page 255). In 1961, Binford, in the Armed Forces Institute of Pathology (AFIP), who had been active in the Memorial's research program since 1951, was made principal investigator in a research program aided by the NIH on "Studies in animal inoculation with *M. leprae*." With the assistance of this grant, research, to which some reference has already been made, was carried out on infection of the hamster. One result of the study was the demonstration that *M. leprae* in the experimental animal has a distinct predilection for nerves (⁶). This long continued research has been an important cooperative enterprise aided not only by the NIH and AFIP, but also by the Communicable Disease Center of the U. S. Public Health Service, Atlanta, Georgia.

In 1962 a substantial grant was made by the NIH for provision of personnel and equipment for the projected new Leonard Wood Memorial-Eversley Childs Sanitarium Leprosy Research Laboratory at Cebu, Philippines (see page 259). The following year an NIH grant was made for the purchase and maintenance of an electron microscope (see page 279), housed first at the Johns Hopkins-Leonard Wood Memorial Leprosy Research Laboratory in Baltimore, and subsequently at the Annex of the AFIP.

In 1965 the work on transmission of leprosy to laboratory animals was extended by provision of funds from the Leonard Wood Memorial, the NIH and other sources for a long range study of the possibility of infecting chimpanzees with leprosy (⁵). This study, started in 1965 by Binford and associates at the Delta Primate Center of Tulane University, Covington, Louisiana, was predicated on the basis of the size and longer life of this animal and its relatively close kinship with man. It was believed that the chimpanzee would be useful in study of a disease with human predilection and relatively long course of incubation and development.

Training grant. The Leonard Wood Memorial has long been concerned with the training of future leprosy investigators. Mention has been made frequently in past pages of the instruction, through Memorial provision, of physicians and public health workers in epidemiology and related fields. In 1962 a broad program with NIH support became effective in which workers from abroad and from the United States received assistance enabling them to train in the Memorial's own laboratories in Washington and Baltimore or at cooperating schools of medicine or public health elsewhere in the country.

On 1 July of that year, in response to an application by Doull, the National Institute of Allergy and Infectious Diseases of the NIH awarded a five-year grant to the Leonard Wood Memorial for training in research in leprosy. This grant has provided an unparalleled opportunity for intensive research training for promising candidates in the disciplines of epidemiology and public health, microbiology, dermatopathology and pathology.

A feature unusual for training grants supported by the NIH was the authorization, in addition to stipends and tuition, of travel for trainees from their places of residence to and from the selected training institutions. Candidates were chosen on the basis of their qualifications, plus reasonable assurance that after training they would continue in leprosy research.

The training under this program has been carried out at the following institutions:

- Johns Hopkins University School of Hygiene and Public Health, Baltimore, Maryland
- School of Public Health, University of Michigan, Ann Arbor, Michigan
- Skin and Cancer Hospital, Temple University Health Sciences Center, Philadelphia, Pennsylvania
- Department of Pathology, Medical College of Virginia, Richmond, Virginia
- Department of Surgery, College of Physicians and Surgeons, Columbia University, New York, New York
- Armed Forces Institute of Pathology, Washington, D. C.

Johns Hopkins-Leonard Wood Memorial Leprosy Research Laboratory, Baltimore, Maryland.

Leonard Wood Memorial-Eversley Childs Sanitarium Leprosy Research Laboratory, Cebu, Philippines.

Eight postdoctoral trainees from six countries have completed training periods of one to three years. Six of these are continuing in full or part-time leprosy research. These are listed in the following pages, with some indication of their background, fields of training and research, and occupations subsequent to their training programs.

ARVIND M. DHOPLE, Ph.D., previously research assistant at the Acworth Leprosy Hospital, Bombay, took three years of postdoctoral training with Hanks and Morrison at the JH-LWM Leprosy Research Laboratory in Baltimore, working largely on the influence of iron in the growth and metabolism of mycobacteria. He returned to India in June 1966 under an appointment to carry out microbiologic research at the Central Leprosy Teaching and Research Institute, Chingleput, Madras, South India.

SHAIK K. NOORDEEN, M.D., previously epidemiologist at the Central Leprosy Teaching and Research Institute in Chingleput, had one year of training at the School of Public Health at the University of Michigan, Ann Arbor. He graduated there with the degree of Master of Public Health in June 1963, and returned to Chingleput, where he has been active in epidemiologic research studies of leprosy prevalence, population surveys, and chemotherapeutic prophylaxis with special reference to disability from leprosy (⁹²).

TEERA RAMASOOTA, M.D., previously leprologist with the Thai Leprosy Control Division in Bangkok, Thailand, was brought to the Johns Hopkins University School of Hygiene and Public Health in 1964 for training in epidemiology. He received the degree of Master of Public Health in June 1965 and then began studies in dermatology and dermatopathology under Dr. J. H. Graham and Dr. Wayne C. Johnson at the Skin and Cancer Hospital, Temple University Health Sciences Center, Philadelphia, carrying out a special comparative investigation of the histopa-

thology of tuberculoid leprosy and skin sarcoidosis. On completing his training he returned to the Thai Leprosy Control Division, with an appointment as Chief of Research and Training at the Phrapradang Leprosy Hospital, Bangkok.

MICHEL F. LECHAT, M.D., from Belgium, had extensive experience in leprosy control, as Medical Director of the Yonda Leprosarium in the Belgian Congo from 1953-1959, before entering on a period of postdoctoral study at Johns Hopkins University under Leonard Wood Memorial auspices. He served as Assistant Bacteriologist in the JH-LWM Leprosy Research Laboratory in Baltimore from 1960 to 1962, and pursued studies in the Department of Epidemiology of the School of Hygiene and Public Health under Dr. Philip E. Sartwell. He was awarded the degree of Doctor of Public Health in April 1966. His thesis was on "Genetics in the Epidemiology of Leprosy." His studies in that field were carried out in collaboration with Drs. Bernice H. Cohen, J. R. Krevans and Wilma S. Bias in Baltimore, B. S. Blumberg in Philadelphia, and Guinto, Tolentino and Reich in the Philippine Division of the Leonard Wood Memorial in Cebu (⁷⁷). After completing his training under Memorial auspices he served briefly as epidemiologist on the staff of the Pan American Health Organization in Mexico City, and in January 1967 returned to Belgium as Professor of Epidemiology in the School of Public Health, University of Louvain, Brussels.

DAVID A. POWER, Ph.D., microbiologist, whose previous positions have been indicated (see page 262), began a postdoctoral training program in leprosy research under Hanks at the JH-LWM Leprosy Research Laboratory in Baltimore in 1962, taking part in several studies of mycobacterial physiology (⁹⁶). In 1964 he was transferred under the terms of his training grant to the LWM-ECS Leprosy Research Laboratory in Cebu, where he continued training in microbiology with Reich and clinical leprosy problems with Tolentino. On completing his training period in 1965 he was appointed Assistant Microbiologist of the Memorial, to continue leprosy research in its Philippine Division.

JAN P. WIERSEMA, M.D., trained in pathology at the University of Utrecht and served for five years in that field in Paramaribo, Surinam, before entering on a training program with the Leonard Wood Memorial. In Paramaribo his interest in leprosy was stimulated by Dr. S. J. Bueno de Mesquita, Surinam Leprosy Control Officer, and he had a rich experience in that field. He joined the staff of the Armed Forces Institute of Pathology in 1963, working with Binford in leprosy research in the Memorial's Pathology Research Laboratory, Special Mycobacterial Diseases Branch, Geographic Pathology Division. The results of these studies are described else-

where (see page 286) (¹²⁷). During his training period Wiersema prepared a comprehensive lantern slide teaching set and syllabus on leprosy. He was appointed Research Pathologist on the Memorial's staff in 1966.

This training grant for research in leprosy, scheduled to terminate on 30 June 1967, has been described as unique in the annals of leprosy investigation. Although the Memorial, other private organizations, some governments and the World Health Organization have all provided opportunities for formal training in leprosy research, no other program appears to have equalled this one in scope and depth. The total



FIG. 33. Presentation of Certificate of Appreciation to Mr. C. I. Crowther on the occasion of his forthcoming retirement, at interim meeting of the LWM Advisory Medical Board, 17 December 1966. *Left to right:* Dr. J. F. Garrett, Assistant Commissioner, Vocational Rehabilitation Administration, Dept. HEW; Maj. Gen. J. M. Blumberg, The Director, Armed Forces Institute of Pathology; Mr. D. V. Wilson, appointed successor to Mr. Crowther as President, LWM; Dr. C. H. Binford, Medical Director, LWM; Mr. Crowther, President, LWM; Dr. C. E. Taylor, Chairman, Advisory Medical Board, LWM; and Dr. E. R. Long, Consultant, LWM.

number of trainees has not been large, but it is believed that the ultimate impact on future research on leprosy and other mycobacterial diseases will be great.

RETIREMENT OF C. I. CROWTHER AND APPOINTMENT OF D. V. WILSON AS PRESIDENT OF THE MEMORIAL

On 31 December 1966, Mr. Cyril I. Crowther, who had been President of the Memorial since July 1958 (see page 276), retired from his position, but continued his interest as a member of the Board of Trustees. During his term of office the income of the Memorial had increased notably. Annual expenditures advanced from \$255,000 to \$552,000, with accompanying augmentation of the scientific program and increase in the Memorial's research staff. Numerous improvements and new procedures in administration were put into effect (Fig. 33).

Concomitant with his retirement was that of Miss Marcella Fox (Mrs. Louis Paladino), who had served for twenty years in the LWM New York office. Starting as secretary and bookkeeper she soon gathered numerous additional responsibilities. In her later years in the office she carried the title of Assistant Treasurer of the Memorial.

In Mr. Crowther's place, to take office on 1 January 1967, the Board of Trustees elected Mr. Donald V. Wilson, who had been Secretary-General for the past 16 years of the International Society for Rehabilitation of the Disabled, an organization of wide scope that included leprosy as one of

the deforming diseases among its projects. Mr. Wilson, a graduate in law from Western Reserve University, with long experience in social service and a master's degree in that subject from the University of Chicago, brought to the Memorial a concept of leprosy gained by his lengthy association with programs to rehabilitate victims of the disease. The appointment was timely in the light of world-wide increasing emphasis on research on the prevention and treatment of the disabilities to which leprosy patients were subject. Mr. Wilson was introduced to the Advisory Medical Board by the retiring president, Mr. C. I. Crowther at an interim meeting of the Board on 17 December 1966 (Fig. 34).



FIG. 34. Mr. Donald V. Wilson, President elect, Leonard Wood Memorial, 1967- .