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THE ARMED FORCES EPIDEMIOLOGICAL BOARD

Its First Fifty Years

by

Theodore E. Woodward, M.D.

CORRECTIONS

On page 110 and 111, the names and mini biographies for Dr. Fred Davenport and Dr. Ross A. McFarland are reversed.

THE ARMED FORCES EPIDEMIOLOGICAL BOARD



The Coat of Arms
1818
Medical Department of the Army

A 1976 etching by Vassil Ekimov of an
original color print as it appeared in
The Military Surgeon, Vol. XLI, No. 2, 1917

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Dedicated, with homage and grateful appreciation, to the Founders, the many capable and inspired Board and Commission members, and the military scientists who made the Armed Forces Epidemiological Board possible.

THE ARMED FORCES EPIDEMIOLOGICAL BOARD

Its First Fifty Years

by

Theodore E. Woodward, M.D.

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Foreword

Over the past fifty years, the Armed Forces Epidemiological Board and its Commissions have provided outstanding support to the Armed Forces of the United States. The Board was called upon time after time during periods of peace and conflict to address critical medical issues of military importance These issues have varied from concerns regarding infectious diseases that confront our men and women in uniform to occupational and environmental threats associated with training and combat. The Board has also addressed questions on the military health-care-delivery system, the monitoring and surveillance of health conditions, and the prevention of chronic diseases.

The Armed Forces Epidemiological Board has always responded to the needs of the services with immediate, thorough, and sound recommendations. The guidance that this group of medical experts provided has resulted in unquestioned improvment of the health programs for the military community; morbidity and mortality have been reduced and our readiness mission has been attained. Due to their foresight, new research initiatives leading to further prevention of disease and injury have begun.

I take this opportunity, on the fiftieth anniversary of the Armed Forces Epidemiological Board, to express my heartfelt appreciation to the current and past members for their unselfish and dedicated efforts. I know that the Surgeons General of our sister services share this gratitude. The Board has served and continues to serve the military well.

Lieutenant General Frank F. Ledford, Jr.
The Surgeon General
U.S. Army

February 1990
Washington, D.C.

Preface

The quality and productivity of any endeavor depends most of all upon the dedication and wisdom of those given the responsibility to carry out that mission. Those who conceived of a medical advisory board to assist the Department of the Army were leaders with vision; they understood the current military-medical problems, and they perceived the health matters that would plague the military in the future. Not only were men like Simmons, Bayne-Jones, Blake, and MacLeod able medical scientists in their own right, but they also had uncanny insight and common sense.

The Armed Forces Epidemiological Board (AFEB) was founded on rock. A system of commissions, comprising some of the most capable medical scientists available, was assembled with the scientists being assured that they would perform relevant research that would aid the military. (This research was not intended to compete with other military medical research programs.) The founders conceived that all research activities would culminate in the maintenance of a healthy military force. World War II proved to be mankind's greatest conflict and resulted in staggering numbers of deaths and human suffering beyond belief. The new Board and its scientist-members were able to make recommendations that profoundly affected the health of the troops. The impact of some of the discoveries that the Board recommended and that the military implemented is beyond measure.

The AFEB system that was conceived in 1940 worked. I have assembled the relevant data and documented the events—by reproducing the records, accounts of events, minutes of meetings, agendae, and correspondence—that helped to shape military health standards and preventive medicine practices during World War II and thereafter. The material is organized both chronologically and by topic. There is considerable overlap in the chronology simply because the Board has considered the major medical problems of our time repeatedly.

It is refreshing to recount that those many leaders in American medicine, busy as they were, found time to contribute their capable services to this remarkable system. Their unstinting urge to participate is attributable to their proud sense of obligation and the privilege of serving our country. Personal gain was not an objective. The opportunities to meet with, work with, and argue with the leaders in infectious diseases and other fields during the Board's meetings, work sessions, and small discussions were really mini- postgraduate learning sessions. Almost everyone took away a new idea that answered a dead end question or that illuminated a detour around a difficult obstacle. Information was willingly shared among civilian and military scientists.

The spring meetings of the AFEB and its working Commissions usually lasted three days. Those who attended these meetings up to 1973 were privileged to hear the most current data pertaining to the pathogenesis, therapy, and control of the important infectious diseases that were prevalent both abroad and in the United States. Truly, these three-day sessions were dress rehearsals for the later spring meetings of the American Society for Clinical Investigation and the Association of American Physicians, usually held in Atlantic City in early May. The participating contributors were usually the same.

Some of the available former Board members and Commission Directors or members who have contributed to the AFEB's fifty-year enterprise are preparing historical accounts of the individual Commissions. The Commission's research, its field activities, and its recommendations will be described in detail. The photographs of many of the former Commission members, together with brief biographical sketches and descriptions of their contributions, will also appear in these Commission histories. The AFEB-Commission relationship was unique in its kind and productivity; it was at the Commission level, up to 1972, that the effective activities of the AFEB occurred, as the founders had intended.

After 1973, when the Commission system was abolished, the Board assumed a new role and functioned under a new Charter. (The Charters of the AFEB may be found in Appendix 4.) Indeed, during a short period in the mid-1970s, the Board experienced a sinking spell that might well have led to its demise. Happily, the Board survived. Respect and pride were maintained and a good working relationship was re-established among the three military services, the Department of Defense, and the AFEB. Necessity also played a part. In addition to the new problems that arose, (such as the need to reevaluate the physical and safety standards of the military and the emergence of new environmental concerns) the old-time infectious diseases (such as malaria, dengue, enteric diseases, Rift Valley fever, venereal diseases, and tuberculosis) never disappeared. Drug and alcohol abuse, obesity, high blood pressure, excessive smoking, and heart attacks were always present. Acquired immune deficiency syndrome provided a whole new constellation of problems. The Board was asked to direct its attention to these issues and many more, to the interest and gratification of both its members and those military personnel with whom the Board was privileged to collaborate.

I am grateful to all those who played a role in the Board and its Commissions' activities during these fifty years. I sincerely thank those special persons who willingly and unselfishly took on the immense job of preparing a Commission history. Gus Dammin was President of the Board from 1960 to 1973; in spite of his pressing daily activities at Harvard, he is preparing a separate history for the years of his tenure. Gus is the only person who can provide an accurate portrayal of the activities of the Board and its Commissions during that important and productive period. (This account that I have prepared only briefly describes some of these events.) I am grateful to Gus for his helpful suggestions to me as I prepared this volume, but am particularly beholden to him, and a host of others, for their remarkable devotion to the public good.

The Executive Secretaries of the AFEB have my profound admiration. Traditionally, they have been medical officers in the Army, Navy, or Air Force, appointed by the Secretary of the Army for a four-year rotation, subject to the approval of the Secretary of Defense, and based on nominations received from the three services. The Executive Secretary was responsible to the Secretary of the Army as the management agent on administrative matters, and to the Board on professional matters. The Board occupied a small office in the Pentagon, usually near that of the Surgeon General of the Army. This proximity allowed daily discussions between the two offices. The responsibility for the organization of the Board's office fell to the Executive Secretary; he was placed in full charge of the Board's activities, and responded to requests for help from the respective service officers. Not only did the Executive Secretary serve the President of the Board; in the days of the original

Board, he was also expected to fulfill many of the obligations that fell to the Directors of the Commissions or their contractees. With such a diverse research program, it was obviously necessary that the Executive Secretary have a background in medical science, and the character traits of diplomacy, efficiency, administrative ability, and dedication to military service problems were also desired attributes.

Just on their heels are secretaries Betty Gilbert, Jane Eldridge, Jenny McGinnis, and Jean Ward, without whom much less would have been accomplished. Colonel Robert Nikolewski, BSC, Colonel Robert A. Wells, Ph.D., MSC, and Jean Ward retrieved much valuable information from the files, which Jean willingly transcribed. I will not forget the long hours, the telephone calls beyond counting, and the many drafts of the reports of the Commission on Epidemiological Survey (which I chaired up to 1973). The endless typing and retyping of this history was done by Carol Young, my secretary for more than three decades. The AFEB and its Commissions, Subcommittees, and ad hoc Committees would have been short-lived without these secretaries.

Mr. S. Paul Klein and Mr. George Sangaleer, of the Division of Medical Audiovisual Services of the Walter Reed Army Institute of Research, provided valuable help. Without their assistance, it would have been impossible to reproduce many of the photographs that are included in this volume.

Grateful appreciation is expressed to Lieutenant General Frank F. Ledford, Jr., The Surgeon General of the U.S. Army, for his support in making this book possible. Special thanks are extended to Colonel Russ Zajtchuk, MC, and the editors of TMM Publications in the Center of Excellence in Military Medical Research and Education, Walter Reed Army Medical Center.

The purpose of this memoir is to provide our military and civilian readers with a factual account of the relevant military research that culminated in a series of objective and carefully formulated recommendations. These actions and events will help document the rich heritage of our medical services and help elucidate how civilian consultants, through their contributions to the AFEB and its Commissions, interacted with the military. I hope that these accounts will stimulate others to carry on and extend the remarkable achievements of the military health programs. Many important events may have been overlooked. Others may question the validity of some of the entries. Errors of omission or commission are attributable to a semiretired teacher and practitioner of medicine with a limited memory span.

Theodore E. Woodward, M.D.

January 1990
Baltimore, Maryland

The Founders and the Presidents of the Armed Forces Epidemiological Board

1940–1990



JAMES STEVENS SIMMONS
1940–1946

Founder of the Board



FRANCIS G. BLAKE
1941–1946

Founder and the First President of the Board



STANHOPE BAYNE-JONES
1946–1947

Founder and the Second President of the Board



COLIN M. MACLEOD
1947–1955



JOHN H. DINGLE
1955–1958

President of the Board



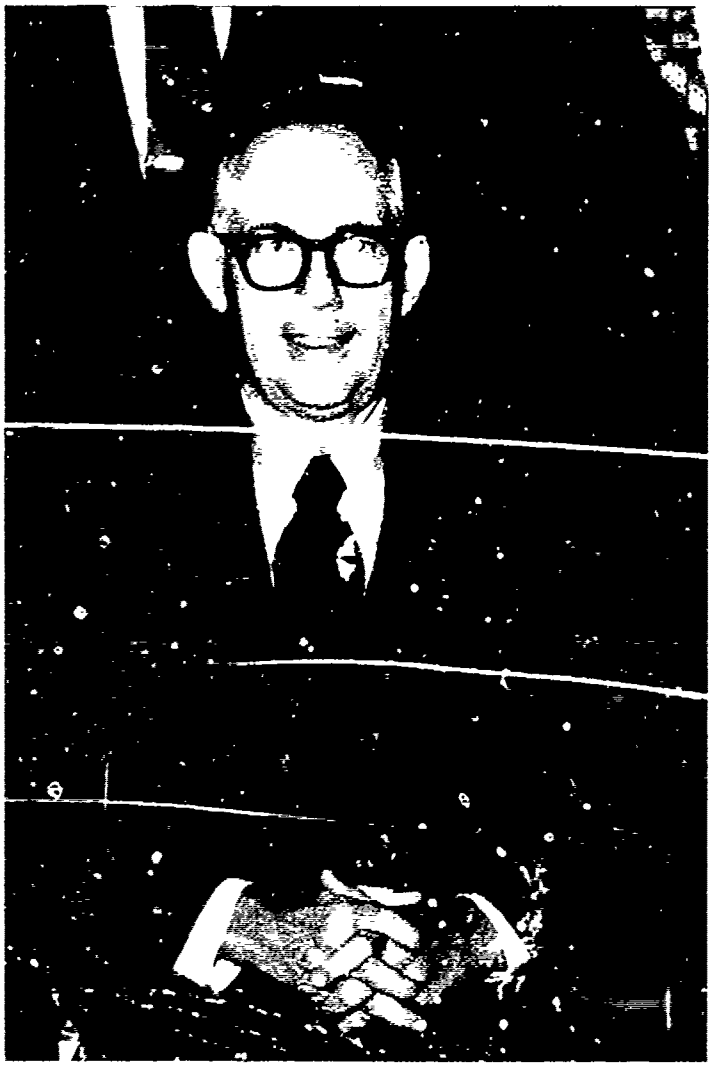
THOMAS FRANCIS, JR.
1958–1960



GUSTAVE J. DAMMIN
1960–1973

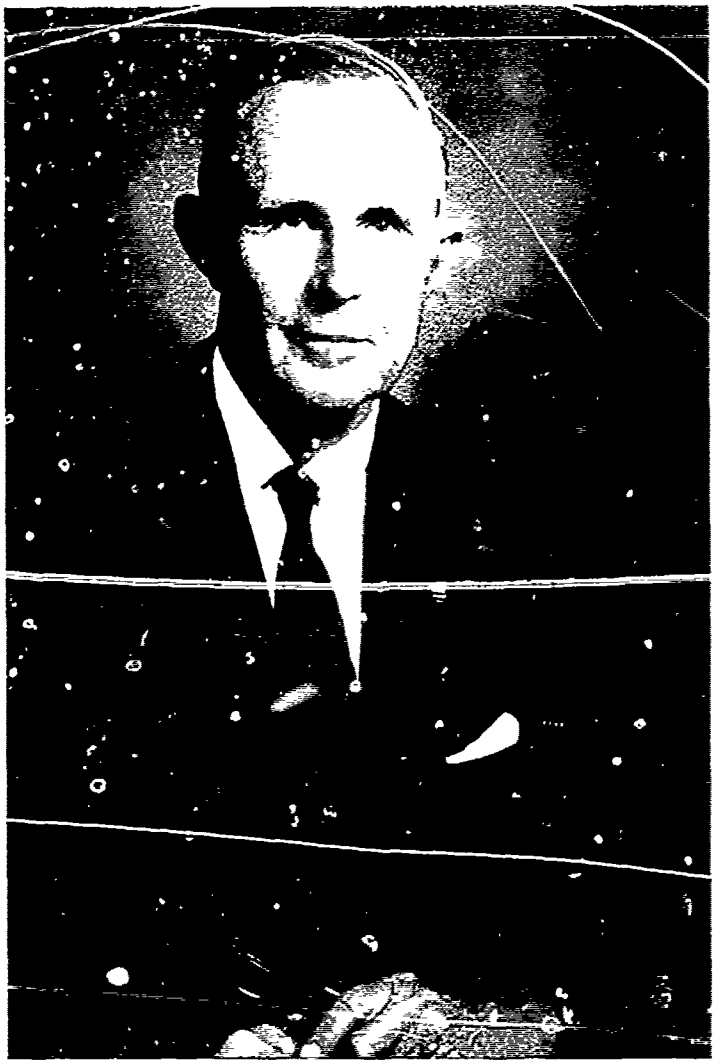


EDWIN H. LENNETTE
1973–1976



HERSCHEL E. GRIFFIN
1978–1980

President of the Board



THEODORE E. WOODWARD
1976–1978
1980–the present

SECTION 1

The Commission System

1940–1972

PART I

The Genesis of the Board for the Investigation and Control of Influenza and Other Epidemic Diseases in the Military

The noble cause of preventive medicine was served by the concept and formation of the Armed Forces Epidemiological Board. There were many contributors, but four men were directly responsible for the Board's genesis. The war in Europe (1938–1940) raised the specter of epidemic diseases such as influenza, typhus fever, malaria, and yellow fever, ancient diseases that had ravaged mankind, military and civilian alike. Brigadier General James S. Simmons, MC, U.S. Army, Chief of Preventive Medicine in the Office of the Surgeon General during World War II, and his deputy, Colonel Stanhope Bayne-Jones, MC, U.S. Army, were well aware of the medical handicaps that previous military officers had faced, in particular, their inability to control infectious diseases. General Simmons conceived the idea of a board of civilian medical advisors to the military. Colonel Bayne-Jones agreed, there was an urgent need to prevent infectious diseases in the army. Their careful planning and choice of civilian leaders were crucial to the success of the fledgling Board.[1]

Dr. Francis G. Blake, Chairman of the Department of Medicine at Yale University School of Medicine, contributed his counsel, he and General Simmons were the founding fathers of the Board. Dr. Colin M. MacLeod, then Professor and Chairman of the Department of Microbiology at the New York University School of Medicine, also made notable suggestions during the early days. When the Armed Forces were rapidly expanded in 1940 and recruits throughout the United States were assembled into large military camps, the memory of the millions of deaths from influenza and pneumonia during World War I haunted the founders. They knew that it was imperative for this country's most competent civilian specialists to work alongside military medical and scientific officers in a joint effort to prevent catastrophic outbreaks of disease. They knew that epidemics have influenced military history as profoundly as military encounters have.

To achieve a cooperative and effective apparatus, their initial plan in 1940 was to establish a civilian board to investigate and control influenza and other epidemic diseases in the army. The recommendation to establish such a board was made in late December 1940, and on 11 January 1941 the Department of War approved the establishment of a "Board for the Investigation and Control of Influenza and Other Epidemic Diseases in the Army." Colonel Bayne-Jones was appointed the first administrator (later known as the executive secretary), and he served as General Simmons's executive officer, organizing and administering the Board after its inception.

On 27 December 1940 the Surgeon General of the Army, based on a memorandum dated ten days earlier, recommended to the Secretary of War that he establish a civilian board to make available the appropriate scientific resources of the country and to assist in the control of epidemic diseases. This recommendation was approved. It, and the authorizing letter, follow.



JAMES STEVENS SIMMONS, M.D.

Following his graduation from the University of Pennsylvania School of Medicine in 1915, J Stevens Simmons took postgraduate training in bacteriology, attended the Army Medical School for a year, and was commissioned as a first lieutenant in the U.S Army in 1916 He pursued his interests in laboratory medicine as a clinical pathologist in various Army posts, including Texas, Hawaii, the Philippines, and Panama Not only did he keep abreast of microbiology and preventive medicine, he also earned a Ph.D. from George Washington University in 1934, and a doctorate from the Harvard School of Public Health in 1939 His research extended throughout the field of tropical diseases.

With the advent of World War II, he was selected to serve in the Surgeon General's Office as Chief of the Preventive Medicine Service. At this time, he and his Deputy, Stanhope Bayne-Jones, discerned the need for a board comprised of civilian academic medical scientists who could advise the Army on controlling infectious diseases among military personnel. The subsequent establishment of the Army Epidemiological Board and its Commissions was a landmark in the history of epidemiology in America.

During the war, and for a short time thereafter, General Simmons participated actively in the activities of the Board and made significant contributions He was then invited to become Dean of the Harvard School of Public Health, a position he held for eight years.



STANHOPE BAYNE-JONES, M.D.

B J. was recognized as a wise man with unflinching integrity During World War I, he served as Deputy Director of Preventive Medicine under General Simmons, and as Director of the U.S. Army Typhus Fever Commission. In addition to these responsibilities, he, along with General Sternberg, formed a board consisting of lay scientists could serve the Army. This Board was the forerunner of the AFEB. B J. served as the Board's first administrator and also as its President, and participated actively and effectively in all its activities

This simple example illustrates his character One night during World War II, B J went, after midnight, to Washington National Airport to receive special hyperimmune pertussis serum for the infant son of one of his junior officers. Most would have sent an aide; B J. went himself

B J. lived a productive life He was the first professor of bacteriology at the University of Rochester School of Medicine and Dentistry. He then served as professor of bacteriology at Yale University School of Medicine and Dean of the Medical School He was a writer, an epidemiologist, an administrator, and a General in the Army He insisted that a professional must accept responsibility and complete his assignments B J was a godfather of the AFEB, a coordinator of research who understood the need to maintain a sequential record of events



FRANCIS GILMAN BLAKE, M.D.

When he rebuilt the Yale University School of Medicine, Dean Milton Winternitz was fortunate to attract Dr. Francis Blake, a Harvard Medical School graduate, to New Haven. Schooled in internal medicine, Dr Blake ultimately chaired the Department of Medicine at Yale for three decades, and he simultaneously served the School of Medicine as its Dean Francis Blake was the compleat physician, an academician in the fullest sense, he was a teacher who taught by precept, a clinician accomplished in diagnosis, and a leader in curative and preventive medicine Additionally, he was an accomplished clinical investigator and researcher in infectious diseases, particularly influenza, pneumonia, viral diseases. and the scrub typhus fevers

It is no surprise that the original AEB succeeded, it was blessed with the membership of accomplished clinicians and medical scientists such as Stevens Simmons, Stanhope Bayne-Jones, and Colin MacLeod, and the presidential leadership of Francis Blake.

SUBJECT: Establishment of a Board for the Investigation of Influenza and Other Epidemic Diseases in the Army

TO: The Adjutant General

1 The present expansion of the Army has been accompanied by an increase in influenza and other acute respiratory diseases among troops In certain localities these diseases have reached epidemic proportions, but fortunately they are still relatively mild and their mortality is low. However, if we may judge from the experience of previous mobilization, this comparatively favorable condition probably will not continue. As larger numbers of selectees are brought together, the rapid passage of infection from one individual to another will probably cause an increase in prevalence, virulence, and fatal complications. In fact, the possibility cannot be ignored that the Army may again be confronted by another pandemic of influenza of the virulent type which caused such a large proportion of the total deaths among our troops during the last war.

2 During that period, one of the important agencies utilized in the campaign against infectious disease consisted of special boards composed of the most competent specialists available in the country, either military or civilian, whose function it was to study such conditions among troops and to advise the Surgeon General as to methods of prevention and treatment An outstanding example was the "Pneumonia Board" appointed in 1918 (Special Order 118 W D 20 May 1918) This Board, which met at irregular intervals in Washington at the call of the Surgeon General, not only rendered advisory service of inestimable value, but organized and directed the studies of groups of expert epidemiologists, bacteriologists, chemists, and pathologists, who were sent to certain camps and hospitals to investigate and combat this disease.

3 Since the World War, our knowledge of the acute respiratory diseases has been increased enormously. We now know that certain of the interpandemic types of influenza are caused by filterable viruses and as these viruses can now be isolated it seems probable that eventually it may be possible to develop specific methods for their prevention In view of the progress made recently in the study of these diseases, which are of such vital importance to the health and welfare of American troops, it is considered of urgent importance that the Army make immediate arrangements to utilize every scientific facility available in this country in a concerted effort to control these diseases and to reduce their mortality to a minimum.

4 With this objective in view, authority is requested for the Surgeon General to appoint and maintain a board for the investigation of the etiology, epidemiology, prevention, and treatment of influenza and other acute epidemic diseases in the Army, this board [is] to consist of such prominent physicians and other scientists as may be required from time to time, regardless of whether or not they are in the military establishment or other Federal Services or civilians not in the employ of the Federal Government. Because of the rapidity with which the respiratory diseases strike and the explosive nature of certain of the epidemics, it is essential that the organization of the board be made flexible and that its activities not be hampered by unnecessary administrative delays.

5. It is therefore recommended that this board be formed essentially as follows:

A. Organization and Personnel.

That the board consist of (1) a central body of such scientists and technicians as may be required, which will meet at the call of the Surgeon General, (2) an additional group of such expert scientists and technicists as may be required as consultants, who will meet with the central body when called on individually by the President of the Board, and (3) investigative teams, the number to be determined by the disease situation, each consisting of three or more scientists and technicists, who may be sent for temporary duty at military stations when deemed advisable by the Surgeon General for the study and control of epidemics. It is important that the total personnel for the board not be limited at this time, but that it be subject to change from time to time as the Surgeon General may deem necessary to meet any emergency disease situation which may arise in the Army.

B. Status of Civilian Personnel.

That the civilian members of the board who are not Federal employees be paid transportation expenses and $20 00 per day while on temporary active duty at meetings or on investigative assignments with military organizations.

C. Procedure.

That the central body of the board hold meetings from time to time, at time and places designated by the Surgeon General, in order to study the available current information concerning epidemic disease in the Army, and to formulate and recommend to the Surgeon General plans for its further study and control.

D. Control.

That when the Surgeon General selects a team to investigate an epidemic at a military station, the personnel of the team will be ordered to report to the proper local authority for temporary duty and will remain under that authority until the work is completed. The investigators will conduct their studies according to instructions from this office with as little interference as possible with the routine care of the sick. They will have the privilege of direct communication with the Surgeon General through technical channels on technical matters, and all other communications will be routed through regular military channels. A final report of the results of each investigation will be submitted to the Surgeon General through the main body of the board.

6. The establishment of this board will make available to the Army the scientific resources of the country to assist in the program for the control of influenza and the other epidemic diseases which will undoubtedly arise in our expanding Army. Incidentally, its existence will undoubtedly be a matter of great satisfaction to the citizens of the country, who remembering the tragic experience of the Army with influenza in 1918, are so vitally concerned over the possibility of a repetition of that experience. Therefore, from the viewpoints both of developing an effective agency for the study and control of this disease and the national morale, authority for the immediate formation of this board is urgently requested.

James C. Magee
Major General, U.S. Army
The Surgeon General

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War Department, AGO
January 11, 1941

TO: The Surgeon General

The plan outlined in the basic letter for the establishment of a board for the investigation of influenza and other epidemic diseases in the Army is approved, except that civilian members of the board who are not Federal employees will be paid not to exceed $20. per diem for any person so employed and necessary traveling expenses.

A. P. Sullivan
Adjutant General
1 Encl.
Cy of Ind to the Budget Officer for the War Department

Until 1942, the newly established Board for the Investigation and Control of Influenza and Other Epidemic Diseases in the Army was attached to the Preventive Medicine Division of the Office of the Surgeon General in the Department of the Army. In this division, the affairs of the Board were administered through the civilian Board on Epidemics section of the epidemiology branch. (In 1942, and until the Army Epidemiology Board was organized in 1944, the deputy chief of the Preventive Medicine Division administered the Board.)

The original seven members of the Board for the Investigation and Control of Influenza and Other Epidemic Diseases in the Army were: Dr. Francis G. Blake, President, and Drs. Oswald T. Avery, Alphonse R. Dochez, Ernest W. Goodpasture, Kenneth F. Maxcy, O. H. Perry Pepper, and Andrew J. Warren, all of whom were distinguished civilian physicians and medical scientists. The first meeting of the Board was in Washington, D.C. on 6 February 1941. In addition to the seven members of the Board, there were also 104 Commissioned members, a total of 111 civilian specialists in infectious diseases attached,

through the Board, to the Office of the Surgeon General, all of whom held appointments as consultants to the Secretary of War.

THE ORGANIZATION OF THE ORIGINAL COMMISSIONS IN 1941

The original plan contemplated using Commissions to study special medical problems, with Board and Commission members serving as as consultants to the military. (This was not unique, a similar group, the Pneumonia Board, had functioned effectively during World War I.) These civilian investigators would engage in field investigations of problems relating to epidemiology and preventive medicine. This Board and its Commissions differed from other advisory groups in that these civilians would participate actively in solving medical problems related to the military. They were to perform their research in civilian laboratories under contract; in the field, their work would be performed in collaboration with established military channels.

The initial recommendation for the establishment of the Commissions and their mission guidelines, which were prepared by Colonel Bayne-Jones and were approved by the Board and submitted by Dr. Blake to the Surgeon General in June, 1941, follow:

It is recommended by The Board for the Investigation and Control of Influenza and Other Epidemic Diseases in the Army to the Surgeon General, U.S. Army:

I (a) That the Commission on Epidemiological Survey, Dr. Stanhope Bayne-Jones, Director, be authorized to undertake the following investigations for use in the prevention and control of epidemics, particularly of bacterial diseases transmitted via the respiratory tract but also of other communicable diseases under appropriate conditions.

1 Conduct periodic surveys throughout the year to determine the prevalence of hemolytic streptococci, influenza bacilli, meningococci or other pathogens, when indicated, in the upper respiratory tract of selected groups of soldiers in designated camps in the 1st Corps Area, 4th Corps area, 9th Corps Area and Department of Puerto Rico, as set forth in detail in recommendations of the Commission under dates of February 21, 1941 (Appendix A) and March 19, 1941 (Appendix B). [NOTE. All the appendices and attachments referred to in this report have been omitted. TLW]

2. Conduct similar periodic surveys in the Department of Puerto Rico with special reference to the prevalence of *Brucella* and enteric organisms

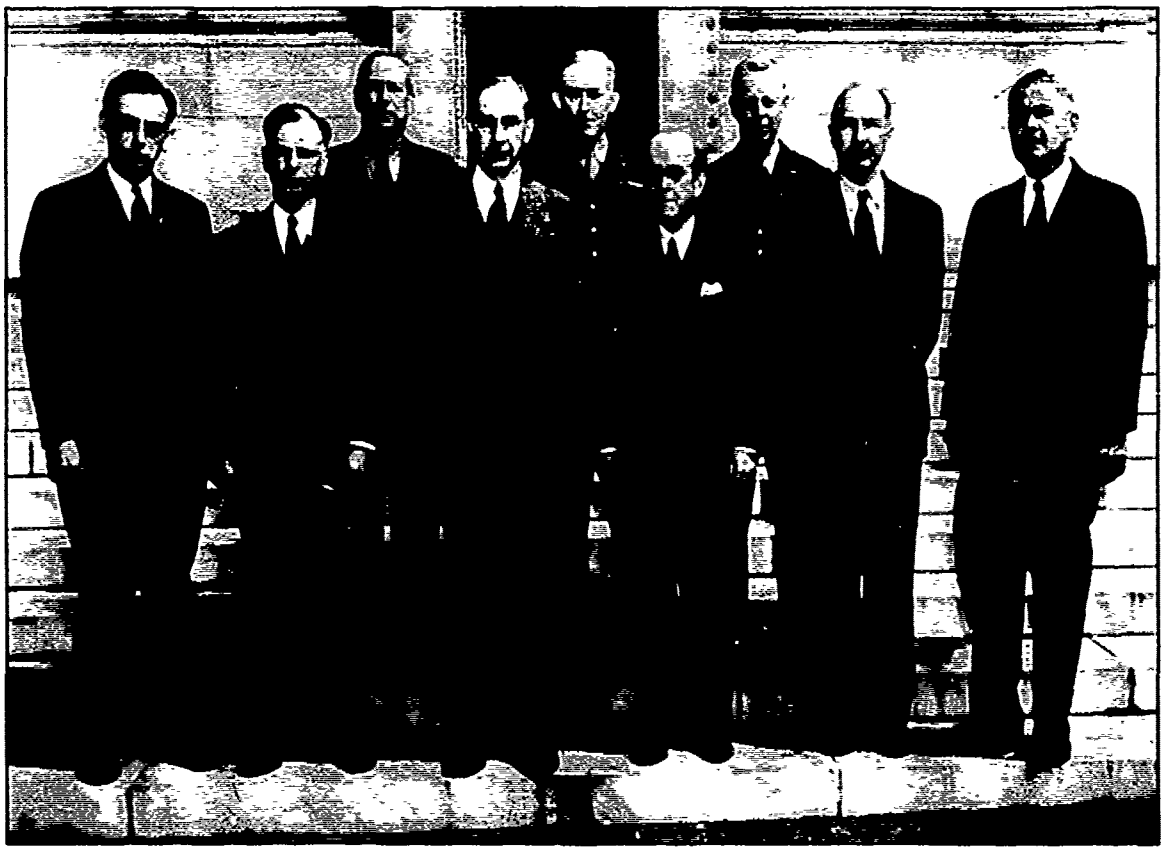
3 Conduct an investigation of coccidioidal infection in personnel at Bakersfield and Taft Basic Aviation Training Center, California, 9th Corps Area, under the direction of Dr. Edwin W. Schultz and Dr. Charles E. Smith, as set forth in recommendation of the Commission under date of May 31, 1941 (Appendix B).

(b) That the budget for the Commission on Epidemiological Survey be in the total amount of $57,375.00 as stated in Exhibit "A", prepared by the Fiscal Officer, S.G.O., and attached to the Minutes of the Third Meeting of the Board, June 19-21, 1941.

II (a) That the Commission on Hemolytic Streptococcal Infections, Dr. Martin H. Dawson, Director, be called upon, when threatened or actual epidemics of hemolytic streptococcal infections occur in the Army, to undertake field investigations of these epidemics, with particular study of the types of hemolytic streptococcus concerned, the incidence of cross-infections, the efficacy of chemotherapy in the treatment of scarlet fever and such other studies as may be necessary to provide a basis for recommendation concerning methods of prevention and control.

(b) That the Commission be authorized to undertake interim investigations of the epidemiology of hemolytic streptococcal infections by (1) arranging for the manufacture and purchase of diagnostic typing sera, (2) establishment of one or more central grouping and typing laboratories and (3) assisting in collaboration with other Commissions and with the Army Medical School in the grouping and typing of streptococcus strains.

(c) That the budget for the Commission on Hemolytic Streptococcal Infections be in the total amount of $78,600. as stated in Exhibit "A", prepared by the Fiscal Officer, S.G.O., and attached to the Minutes of the Third Meeting of the Board, June 19-21, 1941. (For further details, refer to the recommendations of the commission dated 27 May 1941



The original members of the Board for the Investigation and Control of Influenza and Other Epidemic Diseases
12–13 May 1942

Front row, left to right. Dr. Andrew J. Warren, Dr. Ernest W. Goodpasture, Dr. Francis G. Blake, President of the Board; Dr. Oswald F. Avery; Dr. Kenneth F. Maxcy; and Dr. A. R. Dochez.

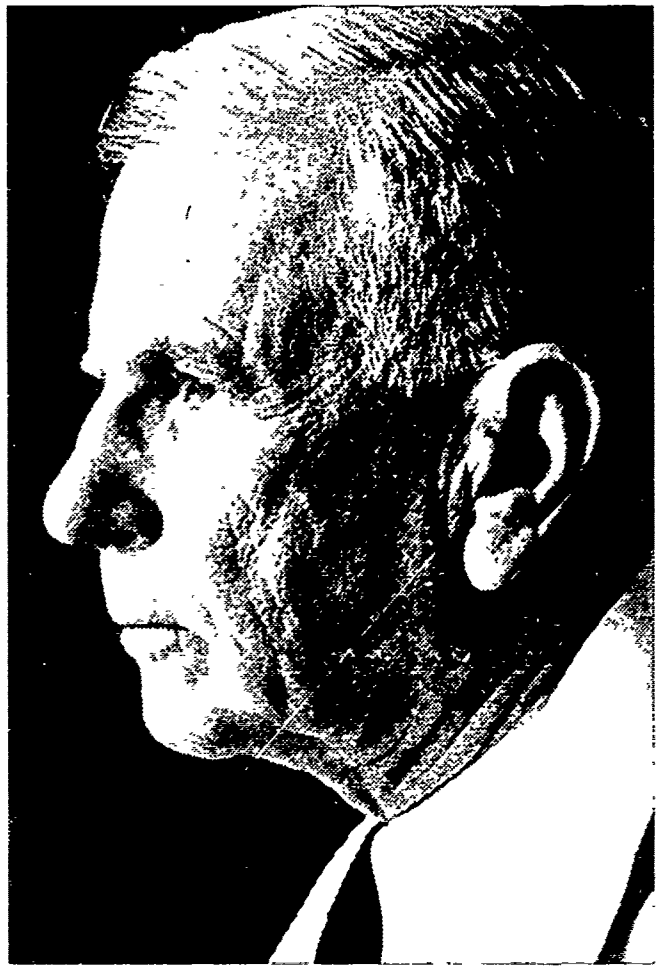
Second row, left to right. Dr. O. H. Perry Pepper, Colonel James S Simmons, and Lt. Colonel Stanhope Bayne-Jones, Administrator



OSWALD THEODORE AVERY, M.D.

Dr. Oswald Avery, or Fess, as he was known by his associates at the Rockefeller Institute of Medical Research, was a major contributing member of the original AEB and its Commissions on Pneumonia and Immunization. Perhaps he might be regarded as the dean of the original Board. His guidance and experience were of inestimable value.

Dr. Avery's comprehensive investigations of the pneumococci, their classification, and their immunologic relationships led to a wider basic understanding of heredity and environmental factors, as well as to a more advanced knowledge of the process of infection.



ERNEST WILLIAM GOODPASTURE, M.D.

Not only was Dr. Ernest Goodpasture the Distinguished Professor of Pathology and departmental chairman at Vanderbilt University School of Medicine, but he also served as Dean of that School of Medicine. Dr. Goodpasture's research included pioneer studies of the growth of viruses, bacteria, and rickettsia in the chick embryo, and the development of techniques for stimulation of such growth. These studies led to improved understanding of the host-parasite relationship and opened up a new chapter in the history of the conquest of disease through the development of better biological vaccines and deeper knowledge of pathogenesis. As a charter member of the original Board, Dr. Goodpasture gave wise advice and unstinting support to all Board and Commission activities



KENNETH F. MAXCY, M.D.

Without question, Kenneth Maxcy ranks among the top epidemiologists of the mid-twentieth century. His pioneering field and laboratory investigations helped clarify the roles of infectious agents and the epidemiological, environmental, and ecological aspects of many infectious diseases. In 1926, he proposed that "endemic" typhus had a murine reservoir, probably mice or rats, and that an insect vector, the flea, transmitted the rickettsial agent to man. This remarkably accurate prediction was demonstrated in 1930, and it clarified the nature of murine typhus. This was not armchair epidemiology, but a combination of field work, clinical observation, and laboratory investigation. Dr. Maxcy was a persuasive, objective teacher, who derived his epidemiological conclusions from factual observations, and was a most effective scientific writer. His door was always open to the young investigators who matured under his tutelage.

Dr. Maxcy was a wise choise as a pioneering member of the original Army Epidemiology Board. During World War II, he and Dr. Francis Blake visited New Guinea and its adjacent northern islands during the heat of the Pacific conflict. They carefully inspected the terrain where scrub typhus fever was infecting military personnel, and they made key recommendations regarding disease control based on their clinical and epidemiological observations.

Dr. Maxcy's later years were spent at The Johns Hopkins School of Public Health and Hygiene as Professor of Epidemiology. He was a wise and considerate man.

(Appendix B) and the minutes of the third meeting of the board, 19–21 June 1941).

III. (a) That the Commission on Influenza, Dr. Thomas Francis, Jr., Director, be organized into three teams, (1) an Eastern team with laboratory facilities offered by the Rockefeller Foundation, New York City, to serve the 1st, 2nd, 3rd, and 4th Corps Areas, (2) a Mid-western team with laboratory headquarters at the University of Michigan, Ann Arbor, Michigan, to serve the 5th, 6th, 7th, and 8th Corps Areas, and (3) a far Western team with headquarters in the Research Laboratory of the California State Department of Health, Berkeley, California, to serve the 9th Corps Area.

(b) That the Commission be called upon when threatened or actual epidemics of influenza arise in the Army, to undertake field investigations with the purpose of studying (1) different etiological and clinical types of influenza, (2) the chemotherapeutic prophylaxis of bacterial complications of influenza, (3) the epidemiological characteristics of the outbreaks, (4) the significance of various factors in immunity to influenza, and (5) such other aspects of influenza as may be necessary to provide a basis for recommendation concerning methods of prevention and control.

(c) That the Commission be authorized to undertake interim investigations as follows. (1) experimental trial of influenza vaccine should vaccine of promise be available and suitable opportunity arise, (2) studies of the efficiency of respiratory masks, samples to be submitted to the Surgeon General for approval, (3) laboratory studies of materials and samples collected in the field bearing on the etiology, epidemiology and immunology of influenza and its complications.

(d) That the directive on influenza proposed by the Commission under date of April 15, 1941 (see Appendix B) be approved.

(e) That the budget for the Commission on Influenza be in the total amount of $63,700. as stated in Exhibit "A", prepared by the Fiscal Officer, S G O., and attached to the Minutes of the Third Meeting of the Board, June 19-21, 1941).

IV. (a) That the Commission on Measles, Dr. Joseph Stokes, Jr., Director, be called upon to undertake the following investigations in the field when epidemics of measles or mumps suitable for the proposed investigations occur in the Army: (1) the experimental trial of chemotherapeutic drugs (sulfonamides) for the prevention and treatment of bacterial complications of measles in selected camp hospitals, (2) study of the clinical, bacteriological and pathological aspects of the cases of measles included in the chemoprophylactic and therapeutic investigation specified under (1), (3) the treatment of cases of measles and measles encephalitis with large amounts (150–200 cc) of convalescent measles serum intravenously, should suitable opportunity for a controlled experiment arise, (4) trial of convalescent mumps serum for the prevention or amelioration of orchitis.

(b) That the Commission on Measles be requested to draft and submit to the Surgeon General a directive regarding the use of passive immunization against measles and that for immediate needs placental extracts of known potency and known lack of toxicity be obtained by the United States Army from commercial firms for passive immunization against measles, until present legal restrictions on the collection of blood from soldiers are removed or arrangements can be made for obtaining and processing convalescent measles serum from volunteers.

(c) That the budget for the Commission on Measles be in the total amount of $18,900. as stated in Exhibit "A", prepared by the Fiscal Officer, S.G.O., and attached to the Minutes of the Third Meeting of the Board, June 19–21, 1941. (For further details reference is made to the recommendations of the Commission on Measles under date of March 16, 1941 (Appendix B) and the Minutes of the Third Meeting of the Board, June 19–21, 1941).

V (a) That the Commission on Meningococcal Meningitis, Dr. Perrin H. Long, Director, [NOTE: John J. Phair, M.D., succeeded Perrin H. Long, the initial director, who resigned to join the Army Medical Corps. EDS.] be called upon when threatened or actual epidemics of meningococcal meningitis occur in the Army, (1) to act as consultants with respect to methods of control and (2) to conduct in selected cases investigations in the field concerning the prevalence of types of meningococci, epidemiological aspects of epidemic outbreaks, effects of chemotherapeutic agents (preferably sulfadiazine) upon the incidence and duration of the carrier state, and such other studies as may be necessary to provide a basis for recommendation concerning methods of control.

(b) That the Commission be authorized to establish a central laboratory at the Johns Hopkins University School of Hygiene and Public Health, Baltimore, Maryland, to act as a center for (1) studying the classification of meningococci, (2) receiving and typing strains of meningococci isolated from carriers and cases of meningitis, (3) standardizing typing sera and (4) maintaining and analyzing epidemiological, clinical and therapeutic records on meningococcal meningitis in the Army supplied to the Commission through the Preventive Medicine Division, S.G.O.

(c) That the budget for the Commission on Meningococcal Meningitis be in the total amount of $21,800. as stated in Exhibit "A", prepared by the Fiscal Officer, S.G.O., and attached to the Minutes of the Third Meeting of the Board, June 19–21, 1941. (For further details refer to the recommendation of the Commission on Meningococcal Meningitis dated 26 April 1941 (Appendix B) and the minutes of the third meeting of the board, 19–21 June 1941.)

VI (a) That the Commission on Neurotropic Virus Diseases, Dr. John R. Paul, Director, be called upon for consultant clinical and laboratory diagnostic and advisory service when cases of neurotropic virus diseases as defined in the report of the Commission under date of March 17, 1941 (see Appendix B) occur in the Army.

(b) That the Commission be called upon when threatened or actual epidemics of neurotropic virus diseases occur in the Army to conduct epidemiological, clinical and pathological investigations in the field with a view to improving measures of control and for the accumulation of information about these diseases as they may appear in the Army camps.

(c) That designated members of the Commission be called upon and authorized to perform autopsies in the field in fatal cases of neurotropic virus diseases in so far as possible.

(d) That the Commission be authorized to make interim studies of sporadic cases of encephalitis by means of complement fixation and neutralization tests on samples of blood serum collected from the patient at time of diagnosis and three and eight weeks later, paralleling similar tests being done at the Army Medical School.

(e) That the Commission be authorized to conduct combined field and interim laboratory studies to test for the presence of neurotropic viruses in materials from patients, contacts, sewage, etc.

(f) That the budget for the Commission on Neurotropic Virus Diseases be in the total amount of $12,975. as stated in exhibit "A", prepared by the Fiscal Officer, S.G.O., and attached to the Minutes of the Third Meeting of the Board, June 19-21, 1941. (For further details refer to the recommendations of the Commission on Neurotropic Virus Diseases dated 17 March 1941, and revised 15 July 1941, Appendix B.)

VII. (a) That the Commission on Pneumonia, Dr. Colin M. MacLeod, Director, be called upon when epidemics of primary or secondary bacterial pneumonia occur in the Army, to conduct investigations in the field to determine the nature of the infecting agent or agents, the epidemiology of the disease and its clinical and pathological characteristics and to make such other studies as may be necessary to provide a basis for recommendation concerning methods of control, these field investigations to be made independently or in collaboration with the Commissions on Influenza, Measles, or Hemolytic Streptococcal Infections as determined by the particular situation.

(b) That the Commission be called upon in the case of non-bacterial pneumonia to make field studies of the disease and be authorized to conduct further interim studies of materials collected in the field in collaboration with designated civilian laboratories, such as the laboratories of the International Health Division of the Rockefeller Foundation in the case of "virus pneumonia" or the laboratories of the U.S. Public Health Service in the case of rickettsial infections.

(c) That the Commission be authorized to undertake the following interim investigations in civilian laboratories with the purpose of determining whether improved methods for the control of pneumonia and its complications may be discovered. (1) immunological classification of *Hemophilus influenzae*, (2) preparation and trial in civilian volunteers of antigens for active immunization, particularly against pneumococcus Types I, II and V, and *Hemophilus influenzae*, (3) local use of sulfonamides, gramicidin, and penicillin in the treatment of empyema.

(d) That the budget for the Commission on Pneumonia be in the total amount of $33,850. as stated in Exhibit "A", prepared by the Fiscal Officer, S.G.O , and attached to the Minutes of the Third Meeting of the Board, June 19–21, 1941. (For further details refer to the recommendations of the Commission on Pneumonia dated 6 June 1941 (Appendix B) and the minutes of the third meeting of the board, 19–21 June 1941.)

VIII. (a) That a Commission on Cross Infections in Hospitals be established and authorized to study methods for reducing the hazards of cross infection in hospital wards with special emphasis on aerosols and ultra-violet radiation but also on other procedures.

(b) That the personnel of this Commission be comprised of Consultants selected from the already established Commissions and Dr. William F. Wells, Associate Professor of Research in Air-borne Infection, University of Pennsylvania School of Medicine, Philadelphia, Pennsylvania.

(c) That the budget of the proposed Commission on Cross Infections in Hospitals be in the total amount of $41,150. as stated in Exhibit "A", prepared by the Fiscal Officer, S.G.O. and attached to the Minutes of the Third Meeting of the Board, June 19–21, 1941.



THOMAS FRANCIS, JR., M.D.

Thomas Francis graduated from Yale University School of Medicine where he was a protégé of Dr. Francis Blake, who introduced him to the field of infectious diseases, particularly influenza and pneumonia. This relationship led to Dr. Francis's being "passed on" to serve under Rufus I. Cole, chief of the hospital of the Rockefeller Institute in New York. At the Rockefeller, Francis worked with Thomas M. Rivers, William T. Tillett, Oswald T. Avery, Homer F. Smith, Colin MacLeod, Joe Smadel, and Frank Horsfall. His interests were directed to the field of virology and, specifically, to influenza. He is credited with having been the first scientist to isolate the influenza virus in this country, in 1935. His contributions to the field of influenza research included his clarification of the antigenic shifts that characterize this complicated virus. He directed the Department of Epidemiology in the School of Public Health at the University of Michigan, where he gained national prominence when he designed the trials for, and analyzed the results of, the Salk poliomyelitis vaccine. Jonas Salk was one of his protégés.

In 1941, Thomas Francis was chosen to be the first Director of the Commission on Influenza of the AEB. The contributions of this Commission to the prevention and control of influenza with biological vaccines is a remarkable achievement in American medicine. He was proud that his associate, Dr. Fred Davenport, succeeded him as Director of the Commission on Influenza. From 1958 to 1960, Dr. Francis was President of the AFEB.



JOSEPH STOKES, JR., M.D.

Joe Stokes was the ideal pediatrician. Trained in bedside pediatrics and experimental medicine related to children, Joe made lasting contributions to the field of infectious diseases. The Henry Phipps Institute of the University of Pennsylvania was his professional home. Because of his exceptional background and devotion to his work, Joe Stokes was selected to direct the first Commission on Measles and Mumps of the AEB. He performed some of the pioneering work involved in vaccine development, and showed the importance of immune serum in the prevention of measles, mumps, and pertussis. He was a charter member of the Commission on Cross Infections in Hospitals. He was a clinical pediatrician who used the laboratory to fill the gaps in knowledge that he observed in infectious diseases.

Joe Stokes's contributions to the Board and its Commissions were vital to their success. Francis Blake, Stanhope Bayne-Jones, and Alms McGuinness all leaned heavily on him for help and advice. A contribution of inestimable significance to the Board, not previously divulged, occurred soon after the beginning of hostilities of World War II and the debut of the AEB. His interaction with Secretary of War Henry Stimson is recounted in Appendix 2.



PERRIN HAMILTON LONG, M.D.

After he graduated from the University of Michigan Medical School at Ann Arbor in 1924, Perrin Long performed research in Germany and at the Rockefeller Institute for Medical Research on the benefits of antisera against pneumococci and other bacteria He joined the faculty of The Johns Hopkins University School of Medicine in 1929 and was Professor of Preventive Medicine there from 1940 to 1951. Dr. Long is credited with having introduced sulfonamides, which were the first effective antibacterial agents, to the United States.

He was appointed as the first Director of the Army Epidemiological Board's Commission on Meningococcal Infections This service was short-lived, because he joined the Army Medical Corps as a Colonel in 1942, and served as a medical consultant to the Chief Surgeon of the Mediterranean Theater Perrin Long left Hopkins in 1951 to become Chairman of the Department of Medicine at the State University of New York, Downstate Medical Center, where he remained until his retirement in 1961.



JOHN R. PAUL, M.D.

John R Paul, Distinguished Professor of Epidemiology and Preventive Medicine at Yale University School of Medicine, was an important contributor to the AFEB and its Commissions He faithfully attended all meetings, his presence alone lending stature to the proceedings. He directed the activities of several Commissions of the Board those on Viral and Rickettsial Diseases (before the formation of the Commission on Rickettsial Diseases), Neurotropic Virus Diseases, and Virus Diseases He vigorously pursued the scientific programs that he directed, and the data derived from that research were of inestimable value to the military Like other Board and Commission Members, he made numerous field trips, he went to Cairo and the Middle East in 1943, and to Japan and Korea in 1953, to study dengue, sandfly fever, and hemorrhagic fever After World War II, Dr. Paul made valuable contributions to the knowledge of poliomyelitis



COLIN M. MACLEOD, M.D.

The list of Colin MacLeod's contributions to the activities of the AFEB and various of its Commissions is lengthy and impressive. At the Rockefeller Institute for Medical Research, he, his mentor Oswald T. Avery, and Maclyn McCarty worked with *diplococcus pneumoniae*, they were the first to demonstrate the genetic transformation of inheritable traits in the pneumococci. Dr. MacLeod and his associates demonstrated that a vaccine prepared from inactivated pneumococci conveyed immunity against infection with homologous types. Following his experience at Rockefeller, Dr. MacLeod organized and developed the Department of Microbiology at New York University, which became the training ground for some of the leaders in American medicine. Later, he became Professor of Research Medicine at the University of Pennsylvania School of Medicine Soon thereafter he served in the Office of Science and Technology under President Lyndon B. Johnson.

It is doubtful that the AFEB would have been so successful without the help of Colin MacLeod He chaired the original Commission on Pneumonia, was a contributing member of various of the Commissions, including those on Immunization, Epidemiological Survey, and sparked the work of many others, and he served as President of the Board from 1947 to 1955, when the AEB was reorganized as the AFEB. Colin MacLeod was the right person in the right job at the right time The Board and its Commissions flourished under his leadership and they profited from his knowledge of microbiology, virology, and immunology He was a pioneer who never ceased to contribute.

IX That laboratory apparatus and supplies needed by Commissions of the Board for field investigations be assembled in each Corps Area Laboratory and be made promptly available to a Commission when the Commission is ordered to active duty for field studies.

X That, if possible, all funds for the work of the Commissions, except pay for Consultants, per diem and travel, be made available in the form of grants-in-aid.

Respectfully submitted for the Board,

Francis G. Blake, M.D., President
Board for the Investigation and Control of Influenza
and Other Epidemic Diseases in the Army

INTERIM REPORT OF THE ACTIVITIES OF THE COMMISSIONS

In May 1942, the Board recommended that a Commission on Acute Respiratory Diseases be established. Private funds totaling $70,000 were contributed by the Commonwealth Fund and the A. H. Kellogg, John and Mary Markle, and Rockefeiler foundations. The unit was established under the direction of Dr. John H. Dingle. Other Commissions that were established by the Board, and their original Directors, were: Cross Infections in Hospitals, Oswald H. Robertson, M.D; Epidemiological Survey, Francis G. Blake, M.D; and Tropical Diseases, Wilbur A. Sawyer, M.D.

An interim report of the activities of the Commissions from May 1942 to January 1943 was prepared by Colonel Bayne-Jones and Dr. Blake. Their report, which follows, provides valuable information on the field studies and personal contributions made by members of the Commissions:

Board for the Investigation and Control of Influenza
and Other Epidemic Diseases in the Army
Interim Report
May 1942–January 1943

The following is a brief summary of the activities of the Commission of the Board for the Investigation and Control of Influenza and Other Epidemic Diseases in the Army since its last meeting on May 12–13, 1942.

I. General

A Contracts Commission contracts for 1943–43 were completed and approved the latter part of July, 1942.

B Conferences Conferences have been held from time to time in the Office of the Surgeon General for the purpose of discussing the work of the Commissions, planning field studies, etc.

C Commissions in Army Medical Corps for Consultants. In recent months a number of Commission members of military age have resigned to accept commissions in the Army or Navy Medical Corps. In order to conserve the expert services of Commission members and to prevent disruption of the work of the Board, recommendation was made on November 16, 1942, to Brigadier General Miller Grieve White, Assistant Chief of Staff G-1, that a special allotment of twenty-five medical officers unrelated to the requirements for troops be authorized, these officers to be attached to the Office of the Surgeon General, Preventive Medicine Division, and that whenever necessary, members of Commissions of the Board be commissioned at appropriate grades and so attached. This recommendation was approved by the Secretary of War on December 7, 1942. Members of Commissions who have been offered the opportunity to apply for a commission under this allotment, and who have accepted, are Dr. Alms C. McGuinness, of the Commission on Measles and Mumps, Dr. Norman Plummer, of the Commission on Influenza, and Dr. Albert B.

Sabin and Dr. Murray Sanders, of the Commission on Neurotropic Virus Diseases. It is expected that several more will be commissioned in the near future.

D. Primary Atypical Pneumonia. Since research on atypical pneumonia has been carried on by members of the Commissions on Acute Respiratory Diseases, Influenza, and Pneumonia, the work done on this disease is being summarized under a separate heading.

1. The report of Dr. John H. Dingle and his associates on the study of atypical pneumonia at Camp Claiborne, Louisiana, from December 1941 to May 1942, entitled "Primary Atypical Pneumonia, Etiology Unknown," was completed last fall, and on November 10 was passed for publication by the Bureau of Public Relations of the War Department. The manuscript was submitted to War Medicine and accepted for publication. It is expected that it will appear in an early issue.

2. A conference on atypical pneumonia was held on September 24, 1942, at the Rockefeller Institute for Medical Research in New York, in order to exchange information with a view to promoting further studies of this disease. The conference was attended by Colonel J. S. Simmons, Colonel S. Bayne-Jones, Dr. O. T. Avery, Dr. Francis Blake, Dr. John H. Dingle, Dr. Monroe D. Eaton, Dr. Thomas Francis, Jr., Dr. Frank L. Horsfall, Dr. Colin M. MacLeod, and Dr. Thomas M. Rivers.

3. Field Trips. Investigations of atypical pneumonia were made at the following Army posts:

a. Brookley Field, Alabama, August 16–19, 1942, by Dr. A. E. Feller.

b. Chanute and Scott Fields, Illinois, September 12–15, 1941, by Dr. A. E. Feller.

c. Air Force Station, Sioux Falls, South Dakota, November 13–21, 1942, by Dr. Colin M. MacLeod (see Commission on Pneumonia).

d. Maxwell Field, Alabama, November 23–December 4, 1942, by Dr. John H. Dingle and other members of the Commission on Acute Respiratory Diseases.

II. Commissions: Interim and Field Studies

A. Commission on Acute Respiratory Diseases

In accordance with the recommendation of the Board at its meeting on May 12–13, 1942, and after approval by the Surgeon General on June 23, 1942, application was made to the Commonwealth Fund, the W. K. Kellogg Foundation, the John and Mary R. Markle Foundation, and the Rockefeller Foundation, for funds to support an investigation of acute respiratory diseases in troops under the auspices of the Board. As a result of these applications, a total fund of $70,000. was obtained, and on July 24 recommendation was made to the Surgeon General that the Commission on Acute Respiratory Diseases be established at Fort Bragg, North Carolina, under the direction of Dr. John H. Dingle. Additional personnel of the Commission were subsequently added, as follows. Drs. Theodore J. Abernethy, George F. Badger, Alto E. Feller, Alexander D. Langmuir, James M. Ruegsegger, and Elias Strauss. Pending the construction of a Commission laboratory at Fort Bragg, the group spent August and September in Baltimore, completing the analysis of the data from the Camp Claiborne study and drawing up plans for the study at Fort Bragg. On October 19, the group began work at the Respiratory Diseases Commission Laboratory at Fort Bragg, North Carolina. The Commission is currently engaged in a study of the epidemiology, etiology, and clinical features of all admissions of respiratory illness to the Station Hospital from six Army organizations. The Commission has also made an investigation of atypical pneumonia at Maxwell Field, Alabama, in November, and an investigation of over-crowding in barracks and mess halls in relation to the prevalence of respiratory infection at Fort Bragg.

B. Commission on Cross Infections in Hospitals

1. *Chanute Field, Illinois.* Field studies at Chanute Field have continued in accordance with recommendation of the Board. Studies on the effect of propylene glycol vapor on monkeys were instituted in June. The lungs of monkeys exposed to a fog of propylene glycol for three to four months appear no different from the lungs of normal control monkeys. More recently, it has appeared that triethylene glycol is superior to propylene glycol and plans are now going forward for a trial of this aerosol in barracks at Chanute Field. The Research Corporation of New York is collaborating in the engineering aspects of the investigation.

2. *Acute Respiratory Infections Among Troops on Transports.* On November 24, 1942, a conference was held at the Port of Embarkation in Brooklyn, New York, on the control of acute respiratory infections among troops on transports. This conference was attended by Colonel Bayne-Jones and Lieut. Colonel Lundeberg of the Surgeon General's

Office, Dr Francis G Blake, and Dr. O. H. Robertson and Mr. Theodore T. Puck of the Commission on Cross Infections in Hospitals, and officers of the Port Surgeon's Office. As a result of this conference, it was deemed advisable to postpone trial of aerosols on transports until more data [are] available from the projected studies at Chanute Field.

C. Commission on Epidemiological Survey

1. Bacteriological surveys in the First and Fourth Service Commands have been continued.

2. The study of coccidiomycosis in the Ninth Command under the direction of Dr. Charles E. Smith has been continued and extended according to recommendation of the Board. In addition, the West Coast Army Air Force Training Command has set up a control program for coccidiomycosis covering the entire West Coast. Dr. Smith was among those called in to formulate plans for this program.

D. Commission on Hemolytic Streptococcal Infections

1. The preparation of grouping and typing sera for hemolytic streptococci has been continued.

2 Dr Paul L Boisvert has started pilot experiments on the preparation of anti-streptococcal grouping and typing sera in chickens. The stimulus for these experiments came from Dr. John J. Phair, Director of the Commission on Meningococcal Meningitis, who found that excellent anti-meningococcal typing sera can be rapidly prepared in chickens.

3. On July 14, 1942, a preliminary report was received from Dr. Paul L. Boisvert on the studies on the streptococcal antifibrinolysin test made at Fort Sheridan, Chanute Field, and Scott Field by Dr. Boisvert and Dr. James D. Trask in May 1942 As a result of this survey it was felt that the antifibrinolysin test may offer a simple and rapid means of measuring the prevalence of Group A hemolytic streptococci in a military barrack or camp, but that more should be learned about the seasonal incidence of positive tests and the length of time a positive test generally persists.

4. An investigation of an outbreak of septic sore throat at Camp Stoneman, California, was made by Dr. Arthur L. Bloomfield and Dr. Lowell A. Rantz from June 20–23, 1942. Dr. Bloomfield and Dr. Rantz are continuing their studies of hemolytic streptococci in Army camps on the West Coast.

E. Commission on Influenza

1. An influenza vaccination study was instituted at Cornell University, Ithaca, New York, on November 19, 1942, under the direction of Dr. W. G. Smillie. By January 20, 1943, 3,000 vaccinations had been completed.

2. Another investigation of vaccination against influenza was started in November at the Eloise State Hospital and Infirmary, Eloise, Michigan, and at the Ypsilanti State Hospital, under the direction of Dr.Thomas Francis, Jr., 8,009 vaccinations have been carried out in the two institutions.

3. Virus studies are being continued by Dr. Francis in Michigan and by Dr. Monroe D. Eaton in California.

F. Commission on Measles and Mumps

1 In accordance with recommendation of the Board, a program of vaccination against measles [in] large groups of susceptible children in thickly populated districts of Baltimore and Philadelphia has been carried out under the direction of Dr Joseph Stokes, Jr. in Philadelphia, and under the direction of Dr. Horace L. Hodes in Baltimore. Results of the Baltimore study as summarized by Dr. Hodes show that after vaccination of children, some signs of infection with measles were present in 46% of the children of 9 to 18 months of age, down to 18% of the children of 5 to 6 years of age.

2 An epidemic of measles in Philadelphia in December provided the opportunity for further studies on Cohn globulin by Dr Stokes and his associates. Out of 28 children who were intimately exposed to severe measles and who were injected with globulin, 23 developed no measles, and 5 had very mild cases. At the present time, Dr. Stokes and his associates are studying in particular the effect of the injection of large doses of Cohn's globulin fractions given during the initial stages of measles at the first appearance of Koplik spots.

3 Dr Sydney Gellis has been working on studies of the measles virus at the Squibb Institute for Medicine Research since November 1, 1942.

4. *Mumps* On January 16, Dr. Aims C. McGuinness went to Camp Pickett, Virginia, to begin a study of cases of mumps at this post.

G. Commission on Meningococcal Meningitis

1. Dr. John J. Phair, Director, has found that excellent anti-meningococcal grouping and typing serum can be prepared rapidly in chickens.

2. The central laboratory of the Commission has been working on an experimental study of the possible development of a chick embryo virulence test for meningococci.

3. *Meningitis at Jefferson Barracks, Missouri.* As a result of a reconnaissance trip by Dr. John J. Phair from August 17 to 26, 1942, for the investigation of the occurrence of meningococcal meningitis in personnel stationed at Jefferson Barracks, Missouri, and Scott Field, Illinois, recommendation was made that a field observation station be set up at Jefferson Barracks, Missouri, by the Commission. The field laboratory was set up on September 28, 1942. The purpose of the study has been to determine if possible the factors influencing the continued occurrence of meningitis at this station and to collect material for interim studies of the Commission. Dr. Phair's report on the study at Jefferson Barracks emphasizes the three factors which aid the occurrence of meningococcal meningitis. crowded quarters, a high meningococcus carrier rate, and the continued addition of susceptibles (unseasoned recruits).

4. *Meningitis at Scott Field, Illinois.* On January 13, 1943, Dr. C. Phillip Miller went to Scott Field to investigate the rising incidence of meningococcal meningitis at this post. In his report of January 14, he stated that he did not believe these cases constituted an epidemic, but rather a seasonal rise which would probably continue for another month or so.

5. There has been a recent rise in the incidence of meningococcal meningitis throughout the country. Plans are being considered for further investigations at Jefferson Barracks or other posts. On January 9, Dr. Phair left for Fort Eustis, Virginia, for a survey there.

H. Commission on Neurotropic Virus Diseases

1. The experiments in Dr. Sabin's laboratory on methods of preparing mouse brain suspension containing the inactivated virus of (1) St. Louis, and (2) Japanese B encephalitis, have reached the stage where a field trial of these suspensions as immunizing agents seems feasible A similar "vaccine" for use in humans against Western equine encephalomyelitis has been prepared from the allantoic fluid of the incubating hen's egg by a group of workers in Philadelphia (Dr. Henle and Dr. Leslie Chambers, under the direction of Dr. Joseph Stokes and Dr. Peter K. Olitsky) and it is felt that this vaccine is probably also ready for a field trial. It is proposed that the tests be made on 1,000 or more volunteers who live in areas where St. Louis and Western equine virus is endemic, or has been epidemic. Sharp and Dohme has offered to make up 1,000 units of each vaccine free of charge for the Commission, and it is proposed that the experiments be carried out in the spring when the trial vaccines should be ready.

2. *Lymphocytic choriomeningitis.* In accordance with recommendation made to the Office of the Surgeon General on December 1, 1942, an investigation of the prevalence of lymphocytic choriomeningitis as determined by complement-fixation tests was set up at the Children's Hospital in Boston under the direction of Dr. Charles A. Janeway. Plans for further studies in Army posts will be held in abeyance until the study of patients in civilian hospitals is finished and results show the desirability of carrying the experiments further.

3. *Dengue-like disease at Fort Bragg, North Carolina.* On September 4, 1942, Dr. John R. Paul, Dr. Norman Topping of the U.S. Public Health Service, and Major Cornelius Philip, Sn C. went to Fort Bragg to investigate a dengue-like disease at that post. The name and type of disease and manner of spread was not determined. The disease differed in certain respects from other fevers (dengue, trench, Rocky Mountain spotted fever, typhus, tick-bite fever).

4. *Epidemic keratoconjunctivitis.* Dr. Murray Sanders, who was appointed to this Commission in October, has carried out extensive investigations of epidemic keratoconjunctivitis, or shipyard conjunctivitis, which has appeared in epidemic form both on the West Coast and in the East during the last few months. On December 4, 1942, a conference on keratoconjunctivitis was held in New York City for the purpose of giving information to medical officers concerned with the supervision of plans and arsenals. The proceedings of this symposium will soon be published. A circular letter about keratoconjunctivitis was issued by the Office of the Surgeon General, Preventive Medicine Division, January 11, for distribution to all medical officers in the U. S. Army.

5. *Poliomyelitis at San Antonio and Corpus Christi, Texas.* From December 25, 1942, to January 8, 1943, Dr. John R. Paul made an investigation of poliomyelitis at San Antonio and Corpus Christi, Texas In his preliminary report on January 15, Dr. Paul states that while poliomyelitis has not been regarded as a military disease, the presence of an epidemic in a community so closely associated with the Army would cause concern to the officers and men of Fort Sam Houston. In this sense, poliomyelitis is a military disease with serious potentialities, particularly because of its



JOHN J. PHAIR, M.D.

John Phair graduated from the University of Cincinnati College of Medicine in 1929. He served as an intern and resident in medicine at Cincinnati General Hospital. This was followed by a fellowship at the Rockefeller Foundation in 1932–1933. In 1933, he received his M.P.H. from The Johns Hopkins School of Hygiene and Public Health and received his doctorate in Public Health there in 1938.

Dr. Phair was an exceptionally well-trained epidemiologist, he had a broad range throughout microbiology. Like so many others with his background, he ws served as a consultant to the Secretary of War from 1942 to 1946. During this period, he became closely identified with the AFEB and its Commissions. He was a charter member of the Commission on Meningococcal Meningitis and succeeded Perrin Long as its Director. He contributed to developing new knowledge of meningococcal, streptococcal, and respiratory tract diseases. Following World War II, he became Professor of Preventive Medicine at the University of Louisville School of Medicine, where he served from 1946 to 1949.

occurrence in a region where poliomyelitis had not been epidemic before.

I. Commission on Pneumonia

1. Study of the problem of immunization with pneumococcal polysaccharides by Dr. Michael Heidelberger is being continued.

2. Recommendation was made on January 13, 1943, that an investigation of atypical pneumonia proposed by Dr. Jacob Furth be authorized. This proposal has been approved and the study will be carried out at the Cornell University Medical College, beginning March 1, 1943.

3. An investigation of lobar and atypical pneumonia at the Air Force Station, Sioux Falls, South Dakota, was made by Dr. Colin M. MacLeod from November 13, 1942 to November 21, 1942. Dr. MacLeod studied the clinical nature of both the upper respiratory infections as well as the varieties of pneumonia admitted to the Station Hospital between August 22 and November 20, 1942.

J. Commission on Tropical Diseases

1. *Dysentery.* An investigation of dysentery at Indiantown Gap, Harrisburg, Pennsylvania, was made by Dr. Carl Ten Broeck, Dr. John B. Nelson, and Dr. Frederick B. Bang, from July 15–19, 1942. Beginning September 25, this same group began a month's study of dysentery in the Fourth Service Command. Investigation of dysentery in the First Division and Second Armored Division at Fort Benning, Georgia, showed that an epidemic of dysentery will, to a large extent, disorganize large bodies of troops. The following recommendations were made by Dr. Ten Broeck. (1) that a more careful study be made of so-called common diarrheas to see in what proportion dysentery bacilli can be isolated, (2) that commanding officers and men be educated in camp hygiene.

2. *Typhus-spotted fever at Fort Sam Houston, Texas.* From July 18–25, 1942, an investigation of cases of typhus-spotted fever group at the Station Hospital, Fort Sam Houston, Texas, was made by Dr. Kenneth F. Maxcy, Dr. Norman Topping, and Dr. John C. Snyder. From the evidence available, it was concluded that none of the cases about which consultation was sought could be definitely diagnosed as typhus, Rocky Mountain spotted fever, or "Q" fever. On the other hand, most of them resembled two other clinical syndromes, "pneumonitis" or "primary atypical pneumonia," or "tick-bite fever." Both of these identifications were tentative in the absence of laboratory tests.

III. Resignations:

Commission on Epidemiological Survey: Dr. George Hartley, Jr., June 26, 1942.

Commission on Hemolytic Streptococcal Infections. Dr. M. Henry Dawson, Director, October 15, 1942. (Dr. Dawson resigned his directorship because of illness, but retains his status as Consultant and member of the Commission.) Dr. Francis F. Schwentker, October 1, 1942. Dr. C. V. Seastone, September 8, 1942.

Commission on Influenza: Dr. Gaylord W. Anderson, July 18, 1942. Dr. J. W. Brown, August 31, 1942. Dr. Yale Kneeland, August 31, 1942.

Commission on Measles and Mumps: Dr. E. S. Robinson, July 4, 1942.

Commission on Meningococcal Meningitis: Dr. Perrin H. Long, Director, August 31, 1942.

Commission on Pneumonia: Dr. J. F. Sadusk, Jr., July 4, 1942.

Commission on Tropical Disease. Dr. Thomas T. Mackie, Assistant Director, August 3, 1942. Dr. Frederick B. Bang, January 25, 1943.

IV. New Appointments:

Commission on Acute Respiratory Diseases. (see page 2 for list of original personnel) Dr. Charles H. Rammelkamp, Evans Memorial Hospital, 65 East Newton Street, Boston, Massachusetts.

Commission on Hemolytic Streptococcal Infections. Dr. Chester S. Keefer (appointed Director, October 17, 1942).

Commission on Measles and Mumps. Dr. Sydney S. Gellis, Johns Hopkins University School of Medicine, Baltimore, Maryland.

Commission on Meningococcal Meningitis: Dr. John J. Phair.

Commission on Neurotropic Virus Diseases. Dr. Charles A. Janeway, The Children's Hospital, 300 Longwood Avenue, Boston, Massachusetts, Dr. Murray Sanders, Columbia University School of Medicine, New York City, Dr. Robert Ward, The Children's Hospital Research Foundation, Cincinnati, Ohio.

Commission on Tropical Diseases. Dr. Frederick B. Bang, Rockefeller Institute for Medical Research, Princeton, New Jersey, Dr. John B. Nelson, Rockefeller Institute for Medical Research, Princeton, New Jersey, Dr. John C. Snyder, International Health Division, The Rockefeller Foundation, New York City.

Francis G. Blake, M.D., President
January 26, 1943

The Short-Lived Commissions

Several of the original commissions were short-lived. Sometimes, the responsibility initially assigned was too diffuse for a commission to be efficient, and sometimes a commission's responsibilities could better be incorporated into that of other commissions. For example, the activities of the Commission on Pneumonia were transferred to the Commission on Acute Respiratory Diseases. The Commission on Tropical Diseases initially embraced the field including malaria, yellow fever, rickettsial diseases, and dysentery. Three of these illnesses—malaria, rickettsial diseases, and enteric infections—were assigned to new specific commissions. Other Commissions, such as those on Viral Diseases and Immunization, addressed the problem of yellow fever, and the Commission on Tropical Diseases was terminated. When he was Assistant Director of the Preventive Medicine Division in the Office of the Surgeon General of the Army, Colonel Stanhope Bayne-Jones prepared the following report on the short-lived commissions and their personnel, which is reprinted from the Army Medical Bulletin 64 and is dated October 1942:

Commission on Cross Infections in Hospitals

Personnel. Dr. Oswald H. Robertson, Director, Drs. Clayton G. Loosli, C. Phillip Miller, Francis F. Schwentker, Wilson G. Smillie, Joseph Stokes, Jr., and Mr. William F. Wells.

In recent years, new methods have been devised for reducing the numbers of pathogenic bacteria and viruses in the air of operating rooms, hospital wards, barracks, and school rooms. The actual sterilization of the air in occupied enclosures is within the range of possibilities. These methods give promise of greatly reducing air-borne cross infections.

The function of this Commission is to investigate the application of such methods to hospital wards and barracks under actual conditions of use in the Army. For these purposes, the Commission has been carrying out a field study at the Station Hospital at Chanute Field and has been continuing research with animals in laboratories at the University of Chicago and the University of Pennsylvania. The program for the current year includes:

(1) Study of the effects of ultraviolet light, under conditions of radiation, for its bactericidal action on air-borne microorganisms and for the prevention of spread of bacteria from patient to patient.

(2) Investigation of the pharmacological effects of propylene glycol vapor on animals and the ability of this vapor to destroy pathogenic microorganisms and viruses.

(3) When satisfactory evidence is obtained showing the propylene glycol vapor is not toxic, study of the activity of the vapor in the same manner in which ultraviolet light is being investigated.

(4) Study of the comparative effectiveness of both ultraviolet radiation and propylene glycol vapor on dust-borne bacteria.

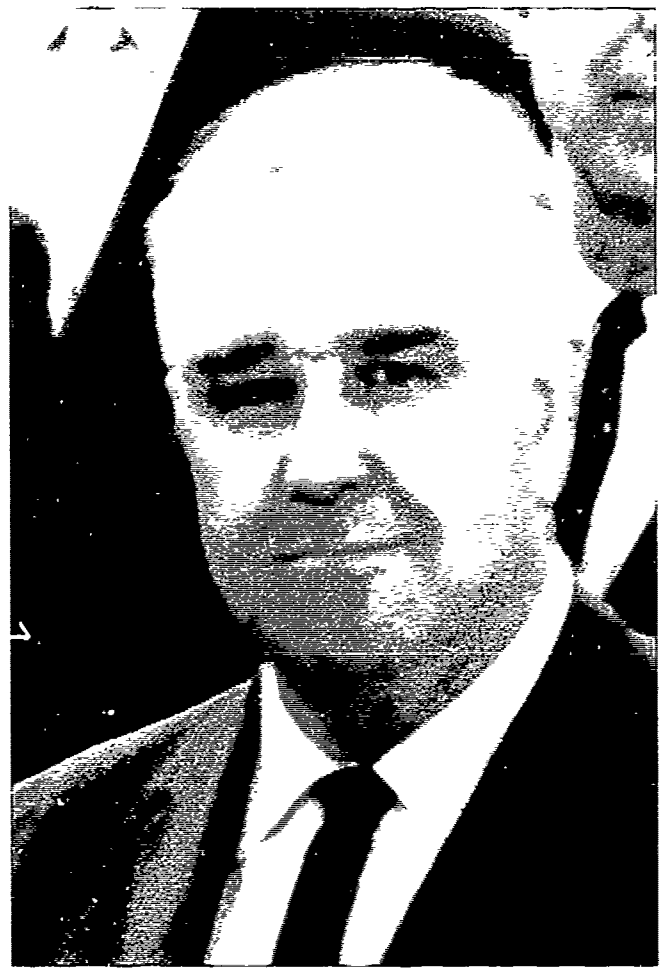
(5) Investigation of the bactericidal and viricidal properties of other glycols.

(6) When deemed appropriate, the application of these measures for the control of air-borne infection to relatively isolated and fairly large non-hospitalized groups.

Commission on Measles and Mumps

Personnel. Dr. Joseph Stokes, Jr., Director, Drs. Sam S. Blackman, Jean V. Cooke, John F. Enders, Horace L. Hodes, Ams C. McGuinness, Charles F. McKhann, Morris Shaffer.

The Commission on Measles and Mumps, with headquarters at the University of Pennsylvania, Philadelphia,



CLAYTON G. LOOSLI, M.D.

After he qualified in medicine at the Chicago Medical School in 1934, Clayton Loosli interned on the Osler Medical Service at The Johns Hopkins University School of Medicine. He was a faculty member in the Department of Internal Medicine at the Chicago Medical School from 1938 to 1949, where he worked with O H Robertson on the mechanisms and spread of infections, particularly those of air-borne viruses and bacteria. From 1941 to 1946, Dr. Loosli served in the Office of the Surgeon General of the Army, where he progressed to the rank of Major. During this period, he gained valuable experience in the epidemic diseases of influenza, pneumonia, and air-borne infections.

He was a charter member of the original Board's Commissions on Cross Infections in Hospitals and Pneumonia. He was appointed to the AFEB's Commission on Influenza in 1948, and became a member of the Board in 1957. He made major contributions to the understanding of influenza and acute respiratory diseases.

After World War II, from 1949 to 1958, Dr. Loosli was Chief of the Department of Preventive Medicine at Chicago, and from 1958 to 1964, was Distinguished Professor of Medicine and Dean of the School of Medicine at the University of Southern California

Pennsylvania, [was] concerned with problems of epidemiology, prevention, control, and treatment of these diseases. The two main features of its activities have been the collection and supervision of the processing of convalescent measles and mumps sera and the development of measles vaccine, with tests of the prophylactic value of this vaccine in civilian groups With a number of projects under way, the approved program for the year 1942–43 includes.

(1) Studies of the prevention and treatment, by means of chemotherapeutic agents, of bacterial complications of measles.

(2) Attempts to control epidemics of measles by passive immunization with human immune serum or products of serum.

(3) Study by tests in animals of the various available preparations of human immune substances, including human immune globulin prepared by ethanol fractionation.

(4) Assistance in the treatment of cases of measles with convalescent measles serum or with immune globulin.

(5) Assistance in the treatment of cases of measles encephalitis with convalescent serum or immune globulin.

(6) Investigation of the protection afforded by immunization with active egg-passage measles virus among large groups of susceptibles in thickly populated districts in cities.

(7) Study of the nasopharyngeal flora by aerobic and anaerobic methods for the possible isolation of a bacterium with synergistic action in measles.

(8) Continuation of studies concerning the reactivity of the skin to injections of inactive measles virus grown in chick-embryo, making tests in immune and susceptible individuals. Studies for the determination of immunity [also include] precipitin tests, complement fixation tests, and other tests *in vitro*.

(9) Study of postmortem material to determine bacterial flora and the distribution of measles virus in tissues and organs.

(10) Study of the treatment of various stages and complications of mumps, including orchitis and meningo-encephalitis, with mumps convalescent serum.

(11) Study of the use of the parotid gland of monkeys infected with mumps in complement fixation tests. This will be done under the direction of Dr. John F. Enders

(12) Collection and assistance in processing convalescent measles and mumps sera.

Former member of this Commission. Dr. Elliott S. Robinson, Massachusetts State Antitoxin and Vaccine Laboratory, Jamaica Plains, Boston, Massachusetts. Resignation effective July 6, 1942. On active duty with Medical Corps, U.S. Army.

Commission on Pneumonia

Personnel Dr Colin M. MacLeod, Director, Drs. Theodore J. Abernethy, Jacob Furth, Michael Heidelberger, Clayton G. Loosli, Edward S. Rogers, J[illegible] M. Ruegsegger, Wheelan D. Sutliff, William S. Tillett, W. Barry Wood.

The headquarters of the Commission on Pneumonia are at the New York University College of Medicine. While some of its work has been conducted there, much has been carried on in cooperation with other Commissions and at other institutions The initiation of investigations of atypical pneumonia was largely an undertaking of this Commission.

The approved program for 1942-43, essentially a continuation of current activities, includes:

(1) Readiness to undertake field or laboratory investigations of pneumonias, as required by circumstances.

(2) Continuation of studies on primary atypical pneumonia, etiology unknown.

(3) Continuation of investigations of active immunization against pneumococcus, Types I, II, and V.

(4) Study of the use of sulfonamides, gramicidin, and penicillin in the treatment of empyema.

(5) Continuation of the study of improvement and standardization of culture media used particularly for isolation of pneumococci and streptococci.

Former member of this Commission. Dr. Joseph F. Sadusk, Jr., Yale University School of Medicine, New Haven, Connecticut. Resignation effective July 6, 1942. On active service in Medical Corps, U.S. Army.

Commission on Tropical Diseases

Personnel. Dr. Wilbur A. Sawyer, Director, Drs. Frederick B. Bang, Mark F. Boyd, E. C. Faust, Henry E. Meleney, Karl F. Meyer, John B Nelson, Lloyd E. Rozeboom, Julian M. Ruffin, George C. Shattuck, John C. Snyder, Fred L. Soper, Carl Ten Broeck.



JOHN ENDERS, Ph.D.

No contributor to the activities of the Armed Forces Epidemiology Board and its Commissions commanded more respect than did Dr. John Enders. His pioneering work in mumps, enteroviral infections (particularly poliomyelitis), rubella, and measles have established an unforgettable niche for him in medical science. He was kind, generous, humble, and wise. Not the least of Dr. Enders's qualities was his interest in, and development of, scientists like Sam Katz, Carleton Gajdusek, Fred Robbins, and Tom Weller.

The Commission on Tropical Diseases was formed in January, 1942, and is still in the process of organization. Its program of studies within the extensive field of tropical diseases has not yet been mapped out. Malaria, yellow fever, rickettsial diseases, and the dysenteries will be of special concern to this Commission. Since July 1, 1942, several members of the Commission have made an intensive study of an outbreak of bacillary dysentery at an Army post. The results were applied practically at once and with beneficial results. This group will remain available for similar studies.

This Commission, under the direction of Dr. Sawyer, was the first in the field in the investigation of the outbreak of jaundice in the Army. It has made a large and highly significant epidemiological study of the disease and, through the International Health Division of The Rockefeller Foundation, has made available extensive facilities and the services of staff members for etiological and other investigations of this disease. Through the Board and several Commissions, thirteen investigators, with numerous assistants, have been working on problems of the outbreak of jaundice. They have conducted studies at Army posts and are continuing researches at Yale University, the University of Michigan, Vanderbilt University, the University of California, the Laboratories of the International Health Division at the Rockefeller Institute for Medical Research in New York, and at the Rockefeller Institute at Princeton. This investigation of jaundice provides one of the most striking examples of the mobility and coordination of the Board and its Commissions, working under the direction of The Surgeon General, on problems of importance to the Army.

Former member of this Commission. Dr. Thomas T. Mackie, 16 East 90th Street, New York, N. Y. Resignation effective July 28, 1941. On active service in Medical Corps, U.S. Army.

THE 1943 ANNUAL REPORT

Colonel Bayne-Jones also prepared a comprehensive report of the activities of the Board and the laboratory and field investigations of its Commissions. That report, dated 31 January 1944, and a bibliography of work completed by specific Commissions, follows:

Subject. Report on Activities of the Board for the Investigation and Control of Influenza and Other Epidemic Diseases in the Army for the year 1 January to 31 December 1943

To: The Chief, Preventive Medicine Service

Established on 11 January 1941 by the Secretary of War on the recommendation of The Surgeon General, the Board for the Investigation and Control of Influenza and Other Epidemic Diseases in the Army completed its third year at the end of 1943. During the past calendar year, the Board and its ten Commissions responded effectively to all requests for assistance made by the Office of The Surgeon General, and, with the approval of The Surgeon General, initiated a number of extensive epidemiological investigations in this country and in overseas theaters. The activities of the Board and Commissions have increased every year since 1941. The record of the past year is characterized by exceptionally large and difficult undertakings, successfully carried out. The results have been of practical benefit to the Army and have increased scientific knowledge which has been shared with numerous agencies concerned with the study and control of infectious diseases among civilians and military forces. Since 1941, 52 articles have been published in medical and scientific journals and 30 additional manuscripts, released for publication during 1943, are in press or have been submitted to journals. A copy of the bibliography is attached.

The Central Board

The membership of the central Board remained unchanged, as follows: Dr. Francis G. Blake, President; Drs. Oswald T. Avery, Alphonse R. Dochez, Ernest W. Goodpasture, Kenneth F. Maxcy, O. H. Perry Pepper, and Andrew J. Warren. While Dr. Blake was away on his mission to investigate scrub typhus in the Southwest Pacific Area, Dr. Dochez served as Acting President.

In addition to seven member of the central Board, there were 112 members of the ten Commissions, making a total of 119 specialists in infectious diseases attached through the Board to the Office of The Surgeon General. Of



KARL F. MEYER, D.V.M.

Karl Meyer, like John Enders and John Paul, was a godfather of the AFEB and its Commissions. He insisted that clarifying the pathogenesis of pestilential diseases, and studying their environmental and epidemiological features, are the keys to understanding their control and treatment. Encephalitis, plague, brucellosis, psittacosis, leptospirosis, and poliomyelitis were some of his chief interests, and he tackled problems with excitement and enthusiasm.

K. F was unmatched as a raconteur. His recollections from his vast experience made Board and Commission meetings unforgettable. Once, during a meeting at WRAIR, he spoke of the "traffic of saliva at a Mexican funeral" to illustrate the spread of *Yersinia pestis* that followed the kissing of the dead. Once he remarked that a patient in New Mexico did not die of plague but of "too many antibiotics." Another time, when discussing an early problem concerning polio vaccine, K. F. remarked, "All the others slopped in enough formalin to kill the virus, but they also killed the antigenicity."

K. F was a field scientist whose vivid expressions and remarkable sense of history made him a stimulating teacher He provided a clear view of the nature of problems and illuminated the route to their solutions. He directed the prestigious George Williams Hooper Foundation in San Francisco.

these, all remained as civilians except six who were commissioned in the Medical Corps under the special allotment of officers provided for the Board All in these groups retained their status as Consultants to the Secretary of War.

This special allotment of officers for the Board, secured by Dr. Blake's presentation of the need in December 1942, has proved of great value to the Board and to the Office of The Surgeon General. During 1943, the scope of the allotment was extended to include officers of the Sanitary Corps and of the Medical Administrative Corps. The allotment provides for twenty-five officers. No attempt has been made to fill all positions, but the allotment has been used to meet specific needs. By the end of 1943, a total of thirteen officers had been brought in under this allotment (10 M.C., 2 Sn C., and 1 M.A.C.) Of these, two Majors, M.C., have been transferred to other assignments—one to the Preventive Medicine Division to assist in administering the Board and one to Chemical Warfare Service, leaving, at the end of the year, eleven Medical Department officers assigned under this special allotment. After several rearrangements, the assignment of all Medical Department officers for the Board was transferred to the Respiratory Diseases Commission Laboratory at Fort Bragg, after that Laboratory was designated as a Class IV Installation under the jurisdiction of The Surgeon General, thus fulfilling the intention expressed in the original request for this special allotment for the Board.

The Board held its third annual meeting at the Office of The Surgeon General on 6–7 May 1943, and, in addition, held three special meetings, on 29 January and 16 July, at the Office of The Surgeon General, and on 4–5 November at the Respiratory Diseases Commission Laboratory at Fort Bragg. In addition, there were a large number of conferences with the President of the Board and with Directors and members of Commissions.

In addition to the office of the President in New Haven, Connecticut, the administrative office of the Board remained in the Preventive Medicine Division, immediately under the Director and his assistant. In spite of the complexity of problems and large amount of detail to be handled, the administrative procedures have remained as simple and direct as possible Although considerable time has been required to organize and put in motion some of the larger projects, it has usually been possible to take action promptly and there has rarely been delay in making the services of the Board and Commissions available. All members have always been ready to undertake field work immediately upon request, in addition to the load of responsibilities they were carrying at their institutions. They have always made personal convenience and certain obligations secondary to their service to the Army. Throughout the Office of The Surgeon General, and in fact, throughout the Army, as well as in relation to civilian institutions, the widely extended contacts and associations of the Board and Commissions have been maintained and developed with an extraordinary degree of harmony and mutual assistance. Excellent relations were maintained with the officers of the Air Surgeon, the Ground Surgeon, with Surgeons of Service Commands, with posts and camps, and with authorities in several overseas theaters.

The central Board, or some of its members, participated actively in five investigations. These were as follows:

(1) Troop Housing with Relation to Acute Respiratory Diseases. Begun in December 1942, an inspection of conditions in barracks, mess halls, theaters, and post exchanges was completed in January 1943. The relationship of overcrowding to the incidence of acute respiratory diseases, including meningitis, was clearly brought out from the reports of visits to Army camps. Recommendations were made for the return to an allowance of 60 square feet per man in barracks The situation was shown to be particularly precarious during the period of induction of large numbers of new recruits into the Army The recommendation was not adopted by higher command. However, the immense amount of valuable information gathered was imparted at conferences following this investigation. Even without formal adoption of the Board's recommendations, this investigation was serviceable to The Surgeon General and had beneficial effects during the year.

(2) The Outbreak of Jaundice in the Army. The extensive epidemiological investigation of the outbreak of jaundice following vaccination against yellow fever was completed in association with the International Health Division of The Rockefeller Foundation, and a comprehensive report on jaundice in troops in the Western region of the country was prepared for publication A number of lines of experimental research on jaundice were followed, with expectation of useful results in the future.

(3) Training in Malaria and Tropical Diseases in Panama and Along the Pan-American Highway. In February, Dr. Blake, Dr Meleney, Dr. Wilburt C. Davison, and Mr. Archie S. Woods accompanied General Simmons and other officers on a survey of opportunities which might be developed for training medical officers in malaria and tropical disease control at Panama and along the Pan-American Highway. The arrangements for the travel of the civilian members of this mission were made through the Board. Definite increases in opportunities for such training, including the establishment of the Army School for Malariology, developed from this mission.



ALPHONSE R. DOCHEZ, M.D.

Dr. Dochez, a distinguished member of the Rockefeller group of medical scientists, was a charter member of the Board and served on several of its Commissions, including the Commissions on Pneumonia and Acute Respiratory Diseases. Dr Dochez served as Acting President of the AEB for a short time while Dr Blake was ill With other Board members, Dr. Dochez served as a consultant to the Army Medical Department during an epidemic of atypical pneumonia at Camp Clayborne, and he gave wise consultative advice during an outbreak of an unknown febrile illness at Fort Bragg, North Carolina.

Dr Dochez was a pioneer in the field of acute respiratory infections. He is credited as the first scientist to isolate the cold virus and transmit it to humans in a controlled environment. In New York, he worked on the specific identification of pneumococcal types and the biological activities of these microorganisms.



Photo reprinted with the permission of Thomas B Turner, M D

The senior staff of the Preventive Medicine Division, Office of The Surgeon General, U.S. Army, in World War II
July 1943

Seated: Brig. General James Stevens Simmons.

Standing, from left: Dr. Thomas B. Turner, Dr. Gaylord W Anderson, Colonel Karl R. Lundeberg, Colonel William S Stone, Brig General Stanhope Bayne-Jones, Dr. Elliott S. A. Robinson, Colonel Arthur P. Long, and Colonel William A. Hardenberg.



Members of the USA Typhus Commission in New Guinea, 3d Medical Laboratory, Oro Bay, New Guinea, December 1943

Left to right: Captain Glenn Kohls, Sn.C., entomologist; Lieutenant John Bell, Sn.C., from the Rocky Mountain Laboratory; Dr. Kenneth Maxcy, epidemiologist; Dr. Francis G. Blake, technical director; Lt. Colonel Joseph F. Sadusk, Jr., MC, Commanding Officer of the Commission; and Colonel Francis E. Council, Commanding Officer, 3d Medical Laboratory.



Dr. Kenneth Maxcy, left, and Dr. Francis Blake standing in Kunai grass near Dobodura, New Guinea, 1943



JOHN HOLMES DINGLE, M.D.

John H Dingle was the compleat physician, a man without jealousy who dedicated his life to helping others One of a large family, the son of a North Dakota minister, he worked to pay his own tuition and was an honor graduate of Harvard Medical School, where he had the privilege of working with Hans Zinsser His military record was excellent He served as President of the AFEB and was a most effective contributing member to several of its Commissions Like others, and in spite of his failing health, he made field trips to various parts of the world in the public interest John was the first Director of the Commission on Acute Respiratory Diseases and he headed the work on acute respiratory diseases and atypical pneumonia at Fort Bragg during World War II

At Case Western Reserve University School of Medicine, John organized and developed one of this country's best departments of preventive medicine He planned the family studies there that established the relationship between streptococcal diseases and nephritis John was a pillar of the pioneering studies at Warren Air Force Base that showed that penicillin and other antibiotics prevent rheumatic fever

His life was full of accomplishments, every honor he received was earned and was bestowed by the donors with pride



O. H. ROBERTSON, M.D.

Oswald Robertson was born in England and emigrated to the United States in 1888 at the age of two. His graduation from the Harvard Medical School in 1913 was followed by a fellowship in pathology at the Massachusetts General Hospital from 1914 to 1915 and training in bacteriology and pathology at the Rockefeller Institute for Medical Research from 1915 to 1917. Robertson was Professor of Bacteriology at the University of Chicago School of Medicine from 1927 to 1951.

He was an expert in experimental pneumonia, particularly the pathogenesis of airborne infections and the disinfection of air. From 1941 to 1945, Dr. Robertson was Director of the AEB's Commission on Airborne Infections. The work done by this Commission was of inestimable importance to the military, particularly with respect to better understanding the aerosol spread of infection and the development of better preventive methods. He was President of the Association of American Physicians in 1952.



CHARLES E. SMITH, M.D.

After he graduated from Stanford University School of Medicine in 1927, Chuck Smith served his house officership in medicine and then received his D P.H from the University of Toronto in 1934. He returned to Stanford where he was promoted through the faculty ranks; in 1942 he was named Professor in the Department of Public Health and Preventive Medicine. In 1949, he assumed a similar post at the University of California School of Public Health; he was appointed Dean there in 1951.

During World War II, Chuck served as a consultant to the Surgeon General of the Army, and he was a consultant on epidemic diseases to the Secretary of War from 1947 to 1955. He was an original member of the Commission on Epidemiological Survey, appointed in 1951, and a member of the Commission on Acute Respiratory Diseases. Under his direction, valuable surveillance studies were conducted in the Ninth Service Command (Corps Area) on the prevalence of coccidiomycosis. These studies clarified the significance of positive skin reactions and the incidence of lung calcification, as separate from the Ghon lesions of inactive tuberculosis.

Chuck was an intrepid epidemiologist and a splendid teacher. He served as a member of the AFEB until 1964; he was also elected President of the American Epidemiological Society.



CHESTER SCOTT KEEFER, M.D.

Chester S Keefer was a giant of modern medicine who was educated at The Johns Hopkins School of Medicine in the tradition of Osler and Welch He taught and practiced their ideals of excellence throughout his life The rock upon which he built his success was the Evans Memorial Department of Clinical Research and Preventive Medicine, many leaders of American medicine trained there under him. He was Chairman of the Department of Medicine, Dean of the medical school, and Director of Boston University Medical Center, his contributions to these endeavors continued for thirty years Upon his retirement, he remained active as Emeritus University Professor and Wade Professor of Medicine

The AFEB was privileged to have him as a member of its Commission on Hemolytic Streptococcal Infections, a position he assumed in October 1942 Dr Keefer was a most effective contributor to Board activities

(4) Bullis Fever. From work started under the auspices of the Board, at the invitation of the Surgeon of the Eighth Service Command, an extensive investigation developed of the type of spotted fever which occurs in the maneuver area around Camp Bullis, Texas. The cooperation of the United States Public Health Service was readily secured. The results appear to indicate that the cause of so-called Bullis Fever has been found. The disease appears to be due to a tick-borne rickettsia. The investigation included new searches for chemical agents which may serve as tick repellents.

(5) Scrub Typhus in New Guinea. At the request of General MacArthur, a team of investigators was sent by the Office of The Surgeon General and the United States of America Typhus Commission to Australia and New Guinea to investigate mite-borne typhus, the so-called scrub typhus fever. Dr. Francis G. Blake, President of the Board, accepted the directorship of this special Commission, and Dr. Kenneth F. Maxcy, member of the Board, accepted appointment as epidemiologist. The other members were: Lt. Colonel Joseph F. Sadusk, M.C., Captain Glenn M. Kohls, Sn.C., and 1st Lieutenant E. John Bell, Sn.C. This group arrived in Brisbane on 3 October and reached Washington on their return on 21 December (except for Captain Kohls who remained in New Guinea to continue entomological studies). The Commission was highly successful. Epidemiological problems were worked out. Dimethyl phthalate was found to be a good mite repellent. Clinical and pathological observations were made. A number of strains of the rickettsia causing scrub typhus were brought back to this country for further study. Information on the way the disease occurs and recommendations for control measures have been furnished to the Surgeons of SWPA and CBI and will be made available to all medical officers.

The Commissions

There were ten Commissions under the board. The financing of the work of each Commission, with one exception, was effected through a War Department research contract with the civilian institution at which the Director of the Commission resided. Acute Respiratory Diseases was supported in part by grants from the International Health Division of The Rockefeller Foundation, the John and Mary R. Markle Foundation, the Commonwealth Fund, and the Kellogg Foundation. This Commission went on a contractual basis through Yale University on 1 July 1943 as far as certain salaries and research expenses are concerned. The maintenance of the Laboratory at Fort Bragg and numerous other expenses were borne by the Medical Department and the post. These research contracts have gradually been liberalized and on the whole have worked out satisfactorily. It is to be pointed out again that the funds coming through the contracts for work of Commissions are far from representing the value of the tremendous institutional facilities which are put at the service of the Army through the Epidemiological Board.

Each Commission was engaged in research at its home laboratories and on field investigations. With ideas, activities and results constantly circulating between field and base, and between Commissions, it is pointless as well as impossible to try to separate all phases of this work. Furthermore, the work of each Commission was not always limited to the field indicated by the name of the Commission. Commission members are not so strictly specialized that they can or should be tagged and limited to fractional jobs. Advantage was taken of their abilities in the study and control of many kinds of infectious diseases, and work was authorized according to opportunities, facilities, and the capacities of the men concerned, regardless of Commission designations.

It is not possible in this type of report to review all the work of the Commissions. The following is a selective summary:

Commission on Acute Respiratory Diseases

Director. Dr. John H. Dingle

Headquarters. Respiratory Diseases Commission Laboratory, Fort Bragg, North Carolina

The Laboratory of this Commission has flourished as a cooperative project of the Board, the Medical Department, the Fourth Service Command, and Fort Bragg. Without the hearty reception and support it has received from the Commanding Officer of the Post, the Commanding Officer of the Staff of the Field Artillery Replacement Training Center, the Surgeon of the Post, and the Commanding Officer and Staff of the Station Hospital, it could not have had the splendid facilities and opportunities for work which it has enjoyed. As previously noted, the Respiratory Diseases Commission Laboratory was designated as a Class IV Installation under the jurisdiction of The Surgeon General on 23 November. (See Circular No. 128, HQ ASF, 23 Nov 43.) The investigative program included (1) an attempt to survey the general situation with respect to respiratory diseases at Fort Bragg and (2) special studies. Studies in the Field Artillery Replacement Training Center were carried out to determine the incidence and behavior of acute respiratory disease in new recruits and to study the influence of certain factors, such as double bunking, which might have an

effect on the spread of the infections. Clinical studies again emphasized the fact that there are few differential characteristics except those due to severity in the group of cases now classified as common respiratory diseases. A close check was kept on the occurrence of meningitis, and the facilities of the Commission Laboratory were used in collaboration with the Medical and Laboratory Services of the Station Hospital.

Atypical pneumonia has been the subject of continuous investigation. In addition to clinical studies, two large experimental investigations were carried out in attempts to reproduce the disease. In cooperation with the Antilles Department Laboratory, attempts were made to reproduce the disease in the mongoose in Puerto Rico. These gave negative results. A preliminary experiment in human volunteers (conscientious objectors) at Gatlinburg, Tennessee, however, has been most encouraging. It is felt that atypical pneumonia has been transmitted to healthy men, using secretions of the respiratory tract taken from patients with the disease. In collaboration with Dr. J. W. Beard and his staff at Duke University, the three known strains of influenza virus—human influenza viruses A and B and swine influenza—have been purified and concentrated. The physical and chemical properties of these purified viruses have been determined, and electron photographs of the virus particles obtained.

Influenza virus Type A was isolated from patients at Fort Bragg during the epidemic which occurred in November and December. Two types of streptococcal infection were studied. The first consisted of endemic types of respiratory infection characterized by exudative pharyngitis and tonsillitis. The second was an explosive food-borne outbreak of septic sore throat. Systematic studies of the bacteriology of the respiratory tract were continued, and the effects of penicillin therapy upon the bacterial flora of the upper respiratory tract were noted.

Cases of coccidiomycosis were discovered in an organization transferred to Fort Bragg following maneuvers in an endemic area in Southwestern United States. The survey is being extended.

Field studies on atypical pneumonia were made at Maxwell Field and on influenza at Camp Mackall.

Commission on Air-Borne Infections

Director: Dr. O H Robertson

Headquarters: University of Chicago, Chicago, Illinois

The extensive investigation of the bacteriology of the air in barracks and in hospital wards was finished at Chanute Field in the fall. Much fundamental information has been gained with respect to cross infections in hospital wards and to the transmission of respiratory infections through air. Control measures can be based on some of the results of these studies.

On the negative side, sterilization of the air by ultraviolet light or glycol vapors does not appear to be practicable either in barracks or all hospital wards, or in theaters. In certain types of wards or rooms, where humidity and concentration of vapors can be accurately regulated, sterilization of the air by triethylene glycol may be practicable. Although the problem has been considered several times, no acceptable method of sterilizing the air on troop transports has been developed. The Commission's studies have shown that bedding, blankets and comforters, harbor immense numbers of bacteria, including hemolytic streptococci. These are liberated in great numbers when blankets are shaken in barracks. Floor dusts also contain large numbers of bacteria. By oiling the floors and by impregnation of blankets and comforters, these sources of air-borne bacteria are almost eliminated. The methods are being tried out on a large scale at Camp Carson, Colorado.

This commission joined with the Commission on Hemolytic Streptococcal Infections in a combined attack on problems of rheumatic fever. The location of this work is at Camp Carson.

Commission on Epidemiological Survey

Director: Dr. Francis G. Blake

Headquarters: Yale University, New Haven, Connecticut

By agreement with Stanford University, this Commission supervises the investigations and control of coccidioidomycosis carried on by Dr. Charles E. Smith. Most of the known areas of infection in the West have been defined by this Commission and the results of these studies have kept the Army well informed. The information has been particularly useful to the Air Forces and Ground Forces. Coccidioidin for diagnosis has been supplied to both the Army and Navy. A diagnostic and consultative service has been maintained. This work is the focus of all the Army's investigative and control programs in this field.

By agreement with Harvard University, this Commission has direction over the continuous bacteriological survey of throat cultures which has been carried on in the First Service Command, at Fort Devens and Camp Edwards,

since 1941. The work on meningococcal carriers is the most significant outcome of these studies. The Commission has stimulated studies of hemolytic streptococcal infections in Puerto Rico and has stood ready to aid other Commissions.

Commission on Hemolytic Streptococcal Infections

Director: Dr. Chester S. Keefer

Headquarters: Boston University, Boston, Massachusetts

This Commission was mainly occupied with making surveys of streptococcal infections at camps in the Seventh Service Command and with organizing and putting into operation fundamental studies of the highly important problems of rheumatic fever. A survey of the occurrence of scarlet fever was made in February. Later, an important survey of streptococcal infections was made at Fort Francis E. Warren, Lowry Field, Buckley Field, and Camp Carson. From these surveys, followed by conferences, there developed a plan for a coordinated attack upon rheumatic fever and streptococcal infections. In this attack, the Commission on Hemolytic Streptococcal Infections was joined by the Commission on Air-Borne Infections. With unstinted cooperation on the part of the Surgeon, Seventh Service Command, the Commanding Officer of Camp Carson, Colorado, the Surgeon of that Post, and medical and line officers, laboratories were provided, ward facilities made available, and barrack bacteriological studies made possible through oiling of floors and impregnation of blankets and comforters. This work got under way at Camp Carson in December. If troop strength at the post is not reduced too greatly, substantial results are anticipated. These studies are somewhat parallel to similar investigations which are being carried out by the Office of the Air Surgeon. Information will be exchanged chiefly through the headquarters organizations of each group.

Commission on Influenza

Director: Dr. Thomas Francis, Jr.

Headquarters: University of Michigan, Ann Arbor, Michigan

This Commission can record a year of extraordinary achievement providing information which promises to be of inestimable benefit to the Army and to the civilian population.

The chief achievement was the preparation of a vaccine against influenza containing both A and B viruses killed by formalin, the experimental testing of this vaccine in human volunteers (conscientious objectors), the vaccination of some 15,000 ASTP students at Army installations in a number of universities in different parts of the country, and the careful detailed observations on the vaccinated individuals and controls throughout the influenza outbreak of November and December 1943. This project required extensive organization. The Surgeon General approved making the vaccination compulsory for selected groups and this in turn was approved by the commanding directorate of the ASTP program. Put into effect in October on the basis of the preceding careful studies, it was in operation [when] influenza struck in November. The results obtained by vaccination indicate that a definite degree of protection was produced. Further developments are in progress. Early in 1943, a watch on influenza was established by the Commission for the purpose of detecting influenza as soon as it occurred at Army posts. Facilities of laboratories capable of identifying influenza virus and of making the necessary serological tests were placed back of this work. Influenza virus type A was first found in a small outbreak in March. In November and December, influenza virus was identified at camps in the 2nd, 3rd, 4th, 6th, 7th, 8th, and 9th Service Commands. It is believed that this Army work through the Commission was the only work of its kind done in the country. It furnished The Surgeon General and civilian agencies with precise and useful information.

During the outbreak of influenza, the Commission was always ready to furnish advice. The information it provided was used in weekly bulletins sent by The Surgeon General to the Secretary of War and the Chief of Staff. The Commission tested the method of passive protection against influenza by means of inhaled sprays of immune serum. The results were essentially negative. The Commission continued its interest in studies of atypical pneumonia and of jaundice.

Commission on Measles and Mumps

Director: Dr. Joseph Stokes, Jr.

Headquarters: University of Pennsylvania, Philadelphia, Pennsylvania

In the study of measles, the Commission clearly demonstrated the prophylactic value of human gamma globulin. Advances were made also in the development of a vaccine against measles.



HARRY FELDMAN, M.D.

There were those within the ranks of the AFEB who always responded to a request for help. Harry Feldman is among the top of those on this list of dedicated medical scientists and epidemiologists. For several decades, Harry served as a pillar of preventive medicine and medicine at the State University of New York Upstate Medical Center at Syracuse, New York

Meningococcal and streptococcal diseases and toxoplasmosis were his specialties, but he was knowledgeable throughout the field of infectious diseases. Objectivity, calmness, and thoroughness were his trademarks. On numerous occasions, when sizable outbreaks of meningococcal and other infections occurred, he responded to emergency requests from the military. In 1963, on very short notice, Harry interrupted his schedule at Syracuse to evaluate an outbreak of meningococcal meningitis at the Naval Training Station in San Diego, California. advice was of inestimable value to the Department of the Navy in limiting the outbreak. Again in 1966, Harry joined a hastily assembled army medical team at Fort Knox to investigate an outbreak of meningococcal meningitis, where, for the first time, sulfonilamide-resistant strains were detected. Harry's work in the laboratory, in the field, in the lecture hall, and in the conference room marked him as a distinguished leader.

In the investigation of mumps, a notable advance was made by the development of a skin test for susceptibility to mumps, using as antigen material from the experimentally infected parotid gland of the monkey, and in improvements in the complement fixation test for resistance or susceptibility to mumps. By [these] means, it would be possible to pick out the mumps-susceptible individuals in an organization and make segregations if necessary. There were promising developments in preparing a vaccine for active immunization against mumps. Epidemiological studies of mumps occurring in the Army were carried out at Camp Pickett, Camp McCoy, and Fort Lewis. These were the first studies of this kind to be made in American troops in this war.

Mumps convalescent serum was collected for possible use in prophylaxis and therapy. The usual human gamma globulin was found to be without much promise in these respects.

The occurrence of a case of jaundice in a physician injected with mumps convalescent plasma collected by the Commission stimulated the interest of the Commission in problems of the cause, transmission and characteristics of homologous serum jaundice, and in the problems of the post-vaccinal hepatitis which occurred in the Army in 1942. To carry out the experiments, human subjects are required, as the lower animals are not susceptible. Studies were gotten under way at the Commission headquarters using volunteers drawn from groups of conscientious objectors. The disease has been transmitted experimentally to human beings.

Commission on Meningococcal Meningitis

Director: Dr. John J. Phair

Headquarters: Johns Hopkins University, Baltimore, Maryland

The Commission's laboratory assisted the Army Medical School in the identification and typing of meningococci isolated from cases of meningitis in soldiers. Several thousand cultures were studied and reported upon. This work, together with analysis of case histories and the effects of sulfonamide therapy, was brought to a conclusion.

When, during the 1942–43 outbreak of meningitis, it was discovered at several Army camps that sulfadiazine taken by mouth would promptly reduce or wipe out the meningococcus carrier state, it became important for The Surgeon General to know the proper minimal dosage of the drug and how it should be administered as a prophylactic against meningitis. The Commission undertook these detailed studies at Fort Meade, Maryland, with the cooperation of The Surgeon of the Third Service Command and commanding officers at the Post. It was determined that 2 grams of sulfadiazine in a single or divided dose were sufficient to clear up the carrier state. This work was coordinated with similar studies conducted by the Fourth Service Command Laboratory. On the basis of the results, Circular Letter No. 170, subject: Prophylaxis of meningococcal meningitis by use of sulfadiazine, dated 30 September 1943, was published by the Office of the Surgeon General. The studies were continued at Fort Meade to determine the mechanism of the action of sulfadiazine, to compare the efficacy of other sulfonamides, and to serve as a basis for further improvement in the chemoprophylaxis of meningitis. During the outbreak of meningitis in the Army, the advice of this Commission was sought repeatedly.

Commission on Neurotropic Virus Diseases

Director: Dr. John R. Paul

Headquarters: Yale University, New Haven, Connecticut

Poliomyelitis, lymphocytic choriomeningitis, and all types of encephalitis are the special subjects of investigation by the Commission on Neurotropic Virus Diseases. The Commission has brought together the best workers in the country on these subjects and has enlisted the active participation of associates and the facilities of the Rockefeller Institute for Medical Research. Its work is coordinated also with the Laboratory of Virus and Rickettsial Diseases at the Army Medical Center. In addition, the Commission worked closely with the National Foundation for Infantile Paralysis, through which supplementary funds were made available by grants to Dr. Paul.

In addition to diagnostic studies and investigations of the neurotropic viruses and pathological lesions produced by these viruses, the Commission has devoted much time and effort to the development of vaccines which may be suitable for use in immunizing soldiers against encephalitis. This work is progressing. In the northwestern and western regions of the country, epidemiological surveys were made. These surveys, [backed] by laboratory studies, have given new information about the animal reservoirs of encephalitis virus and the transmission of the infections by mosquitoes.

In April, the Commission, at the request of the Surgeon of the Middle East Theater, organized an expedition to investigate sandfly fever, infectious hepatitis, and poliomyelitis in Egypt and North Africa. The group sent out to do this work consisted of Dr. Paul, Director, Major Albert B. Sabin, M.C., and Major Cornelius Philip, Sn.C. The



WILBUR AUGUSTUS SAWYER, M.D.

Wilbur A. Sawyer became Director of the State Laboratory of California in 1910 and continued in this position until 1915. He was then appointed Acting Executive Head of the California State Board of Health. During all this time he also held faculty positions at the University of California. Dr Sawyer was an authority in the field of infectious diseases, and he devoted much time to the study of latent and carrier cases as sources of infection, particularly those of typhoid fever

While he was at the Rockefeller Foundation, in 19 1, he was also appointed to the AEB as Director of the Commission on Tropical Diseases Originally, this Commission was called upon to conduct surveillance studies and render advice on such epidemic diseases as malaria, typhoid fever, dysentery, yellow fever, and rickettsial diseases Because he was a strong leader and his background in epidemiology and preventive medicine was extensive, Dr. Sawyer was able to render needed advice to the Office of the Surgeon General of the Army.

Commission established a laboratory near Cairo shortly after arrival. During the year, sandfly fever was experimentally transmitted to human volunteers, dimethyl phthalate was found to be an effective repellent for the sandfly and much epidemiological and laboratory data [were] accumulated. The Commission assisted the Army in dealing with problems of sandfly fever not only in the Middle East, but also in Tunisia and in Sicily. In August, Major Sabin returned to this country with valuable material for use in a continuation of the studies at Cincinnati. Cases of poliomyelitis in the Middle East were investigated and material returned for further study at laboratories in the United States.

The hepatitis situation was defined as one of the major medical-military problems of the American and British Forces in North Africa and the Middle East. Aside from apparent transmission of the disease (accidentally) by injections of serum, the Commission abroad did not make a direct attack on the etiology of infectious hepatitis. It plans to carry such studies forward in this country. During the outbreak of poliomyelitis in Texas in 1942–43, Dr. Paul was called upon to make a survey and to advise health officers and the Surgeon of the Eighth Service Command on measures of control. The Commission's advice was utilized also by The Surgeon General in dealing with the outbreak of poliomyelitis which occurred chiefly among ASTP students in California, Texas, and Indiana last summer. It is greatly regretted that in the course of his investigations, Dr. John R. Paul became ill with jaundice about 1 December 1943. [NOTE: Fortunately, Dr. Paul recovered fully after a short convalescence. *EW*]

Commission on Pneumonia

Director: Dr. Colin M. MacLeod

Headquarters: New York University, New York, New York

Thus far, pneumonia, other than atypical pneumona, has not been a large problem in Army Camps. The Commission has retained an interest in atypical pneumonia and has sponsored some etiological studies. Most of the work of the Commission has been carried out at its base laboratory where studies have progressed on the improvement of culture media, investigations of immunization against pneumonia, and the treatment of empyema with penicillin and fibrinolysin. Studies carried out by the Commission have shown that a prompt immunological response may be expected following a single dose of polysaccharides of Types I, II, and VII. The evidence is sufficiently good to recommend a trial of these polysaccharides at an Army post where the pneumonia rate has been relatively high.

Dr. MacLeod reported for duty at the Office of The Surgeon General, Preventive Medicine Division, on 5 August to assist in the administration of the affairs of the Board. He remained on duty at the office until 9 December. His services helped to carry the work through a difficult period and he contributed ideas, information, and help to the Epidemiology Branch and other Divisions of the SGO.

Commission on Tropical Diseases

Director: Dr. Wilbur A. Sawyer

Headquarters. The Rockefeller Foundation, New York, New York

There were four major projects of the Commission on Tropical Diseases. There were (1) field and laboratory studies of bacillary dysentery at Army camps, (2) an investigation of plasma levels of atabrine in soldiers on certain dosage regimes, (3) a survey of knowledge of leprosy, particularly in the Pacific Area, and (4) continuation of studies of post-vaccinal jaundice (previously mentioned under the section for the Board). In April, Dr. Carl Ten Broeck, with the concurrence of General King, was sent to Hawaii to investigate bacillary dysentery. He found that the previously troublesome conditions had been cleared up by excellent sanitary measures. His visit was useful to medical and laboratory officers to whom he brought information on new methods for carrier surveys and control treatments. Later in the year, at the invitation of the Surgeon, Eighth Service Command, Dr. Ten Broeck and Dr. Nelson investigated bacillary dysentery in camps of German prisoners of war in Texas. They found a high incidence of carriers and assisted in applying measures to cure these carriers and to prevent the spread of the disease. For the proper administration of suppressive therapy of malaria, it was urgently necessary to determine the plasma levels of atabrine attained in soldiers under active training, and under simulated jungle conditions, when these men were given the recommended dosages of 0.4 and 0.6 gram of atabrine per week. With the cooperation of HQ, Army Ground Forces, HQ, Armored Command, the Post Surgeon of Fort Knox, and the Commanding Officer, Armored Medical Research Laboratory, a large and intensive investigation of the problem was carried out successfully during the period from early August to 20 November 1943. Dr. James A. Shannon supervised the work for the Commission on Tropical Diseases. The experimental subjects were 250 soldiers from various units of the Armored command at Fort Knox. The results of the study have been made available in a comprehensive report which has been distributed

widely to other investigators in this country and in England, to Chief Surgeons in malarious areas overseas, and to various Divisions of the Office of The Surgeon General The report presents the information desired on atabrine plasma levels and indicates new lines of research to be followed for the improvement of suppressive therapy of malaria.

Troops in the Pacific Area, Africa, and the Middle East will inevitably come in contact with leprosy. For the estimation of the risk of infection, however minimal it may be regarded, and for the information of all medical officers, it was necessary to undertake to assemble all available information on the geographical incidence of the disease and to issue such directives as would seem appropriate.

This project of a world survey of leprosy was undertaken by the Commission on Tropical Diseases with the help of Mr Perry Burgess, President of The American Leprosy Foundation and a member of this Commission. Valuable information has been provided and Circular Letter No. 180, [on the subject of] Leprosy, was issued [on] 30 October 1943

Composed of experts on many phases of tropical medicine, this Commission is prepared to assist the Office of The Surgeon General in dealing with questions now arising constantly as a result of the extent and long continuation of the war in tropical regions.

S. Bayne-Jones
Colonel, Medical Corps, Deputy Chief
Preventive Medicine Service

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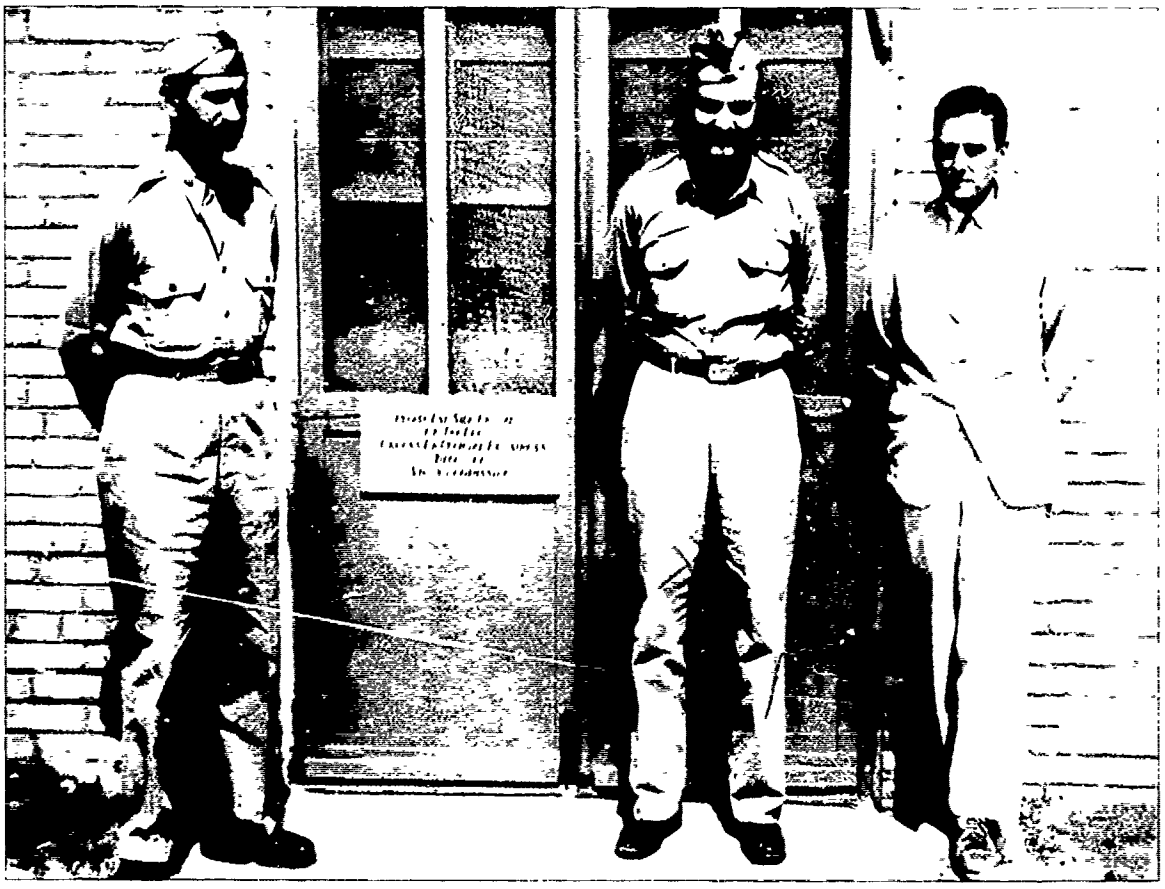
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Left to right: Albert Sabin, M.D., Neil Phillip, Ph D., and John Paul, M.D.

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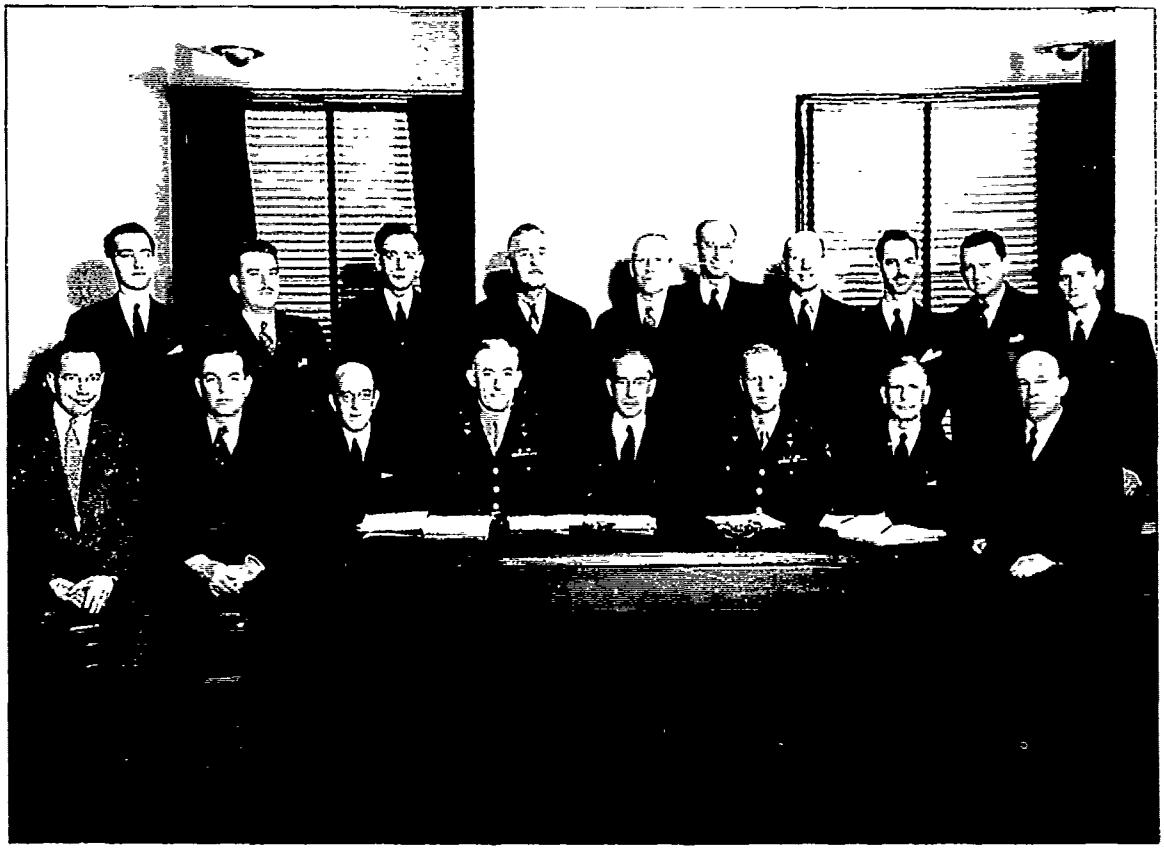
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PART II

The Transition to the Armed Forces Epidemiological Board

The Board for the Investigation and Control of Influenza and Other Epidemic Diseases in the Army and its Commissions continued to work on numerous studies, some on a continuing basis and others based on immediate needs. In 1944, the name of the organization was changed to the Army Epidemiological Board, but its relationship to the military, its functions, and its Commissions were unaffected. Some of the significant contributions that were made by the groups that were active through 1944 are summarized and follow:

- The Respiratory Disease Commission made epochal epidemiological studies of acute diseases of the respiratory tract at Fort Bragg. Some of their findings were: *(a)* that Acute Respiratory Disease (ARD) was the predominant respiratory infection at military training posts and in recruits; *(b)* that epidemic influenza A had a distinctive epidemiologic pattern different from ARD; *(c)* that patients with primary atypical pneumonia developed cold agglutinins (about one-third did; the volunteer subjects developed immunity in contrast to convalescent ARD patients); and *(d)* that other infections, such as Group A beta-hemolytic streptococcal infections, bacterial pneumonia, and rubella, were atypical of those diseases, and were not dependent on the occurrence of acute respiratory diseases.
- The spread in hospitals of air-borne microorganisms became a major program that led to studies of sterilization of air in occupied enclosures with ultraviolet light, propylene glycol vapor, and the combined effects of each on dust-borne bacteria. The bactericidal and viricidal properties of other glycols were also evaluated.
- In the Ninth Service Command, the Commission on Epidemiological Survey developed new knowledge of the incidence and epidemiology of coccidiomycosis; significant new information evolved regarding the prevention of this fungal infection, for which there was no specific cure. Clinical studies showed the variability of clinical manifestations; through surveillance, the incidence of infections, the pathogenesis, and preventive measures useful for control were elucidated.
- The streptococcal grouping and typing of sera useful for identifying hemolytic streptococcal infections made it possible to diagnose, detect, and understand how and where such infections occurred. The identification of the relationship between carrier rates and secondary cases was a major advance by the Strepococcal Commission. They investigated the practical use of the antifibrinolysin test as a measure of streptococcal infection. The Commission's confirmation that rheumatic fever developed following hemolytic streptococcal infection was of great medical significance to the military.
- The program on influenza was aimed at *(a)* developing and purifying antigens, *(b)* detecting new antigens, *(c)* studying clinical and immunological features of the disease, and *(d)* studying the genetic



1944 Army Epidemiological Board and Commission Directors

Front row, left to right John H. Dingle, Joseph Stokes, Jr., O. T. Avery; Brig. General James S. Simmons, Francis G. Blake, President of the Board, Stanhope Bayne-Jones, Administrator, E. W. Goodpasture, and Joseph T. Wearn.

Second row, left to right: (unidentified), J. J. Phair, A. J. Warren; A. R. Dochez; O. H. Perry Pepper, O. H. Robertson, Kenneth F. Maxcy; Colin M. MacLeod, Chester S. Keefer; and John R. Paul.

shifts of the virus, all of which were aimed at the development of effective methods of immunization. Working in association with the pharmaceutical industry, an influenzal vaccine containing types A and B of the inactivated viruses was produced. Research was also directed toward the development of chemical agents to decrease the dissemination of the influenza viruses during epidemics.

- There were specific efforts directed toward the development of effective vaccines for measles and mumps. This early work led directly to the availability of effective biological vaccines. The Commissions sponsored work on *(a)* the evaluation of immune globulin for passive immunization during epidemics, and *(b)* for therapy, especially for meningoencephalitis, which is a serious complication of these diseases, particularly of measles.
- Members of the Commission participated actively in the investigation of outbreaks of meningococcal meningitis in various Army posts. Strains of meningococci were collected, typed, studied, and stored for use in preparing valuable meningococcal typing sera and studying pathogenesis in animals. The Commission initiated studies, which were conducted jointly and collaboratively with intramural Army scientists, that ultimately led to the preparation of a purified polysaccharide vaccine.
- Members of the Commission worked on the isolation of virus strains and serologic surveillance that mapped, in the United States and elsewhere, the occurrence, incidence, and geographic localization of neurotropic virus diseases such as poliomyelitis, lymphocytic choriomeningitis, the eastern and western equine encephalitides, and St. Louis encephalitis. The broad objective of this program was to develop effective protective vaccines. This Commission's contributions culminated in medical advances of historical significance.
- In addition to its field and laboratory studies, the Commission on Pneumonia sponsored and investigated polysaccharide pneumococcal vaccines. Chemotherapy using sulfonalimide, gramicidin, and penicillin were evaluated by Commission members.
- Although not fully organized until January 1942, the Commission on Tropical Diseases planned studies on malaria, yellow fever, rickettsial diseases, and dysentery. This Commission was short-lived because the categories of interest were so important that separate Commissions were organized: those on Malaria, Rickettsial Diseases, and Enteric Diseases. Problems of yellow fever and dengue were distributed to the Commissions on Virus Diseases and Immunization. The Commission on Tropical Diseases conducted an intensive study of an outbreak of bacillary dysentery at Army posts in Texas, which was brought under control.

From May to December 1944 the Subcommission on Dysentery of the Commission on Tropical Diseases of the Army Epidemiological Board made an extensive survey in the India-Burma theater to evaluate the incidence, epidemiology, means of detection, methods of prevention, and control of diarrheal disorders, particularly bacillary and amoebic dysenteries. This thorough field study was conducted by Drs. Carl Ten Broeck and John B. Nelson, members of the Commission on Tropical Diseases, and Major Gustave J. Dammin, MC, Executive Officer of the mission and officer on assignment to the Preventive Medicine Service in the Surgeon General's Office. The report that Major Dammin wrote stressed the need for better means of *(a)* clinical and laboratory diagnosis of the two major types of dysentery, *(b)* the importance of training technical personnel to improve laboratory and morphological diagnoses, *(c)* the importance of rigid control of water and food supply, and *(d)* the careful monitoring of food handlers.

Viral hepatitis debuted as a global problem in 1940. The initial scientific studies on jaundice related to hepatitis (formerly called catarrhal jaundice) were sponsored by several Commissions of the Board. Dr. Joseph Stokes, Jr., and his associates Captains John R. Neefe, Jr., MC, and Sydney S. Gellis, MC, working at the University of Pennsylvania, the Pennsylvania State Hospital in Philadelphia, and the New Jersey State Hospital, conducted crucial studies on the infectivity of the hepatitis virus and the protective effect of immune globulin in volunteers. This work was conducted under the aegis of the Commission on Measles and Mumps. Dr. Thomas Francis, Jr., and his group, who had been working on influenza at



July 1947, near Bayreuth, Germany. Dr. J. R. Neefe, left, Dr. W. P. Havens, and an unidentified acquaintance on a reconnaissance mission to determine the best location for a hepatitis center.

Ann Arbor, studied the infectivity of the hepatitis virus using blood serum, hepatic and brain tissues, and mosquitoes. These studies, conducted with volunteers, were performed at the state prison in Jackson, Michigan. While at Yale, Dr. W. Paul Havens, Jr., working under Dr. John R. Paul as a member of the Commission on Neurotropic Virus Infections, studied the infectivity of hepatitis viruses in animals and humans. Charles A. Janeway, M.D., of Harvard, was a major contributor to these studies.

This hepatitis work, performed under AEB sponsorship, was the first of many studies to confirm that *(a)* infectious hepatitis is caused by a virus; *(b)* there are two or more types, not one, of viral hepatitis; *(c)* the incubation period of the two types differs (ranging from about thirty days for infectious hepatitis to six weeks or more for serum hepatitis); *(d)* immune globulin either prevents or ameliorates an attack of naturally occurring infectious hepatitis; and *(e)* contaminated water is a likely source of infection. Because the hepatitis problem was immense, the Commission on Liver Diseases was organized in 1947, and was directed until 1954 by Dr. Cecil Watson of Minnesota.

The 1945 Annual Report of the Army Epidemiological Board

In January 1946, Brigadier General Bayne-Jones prepared the following annual report, which summarizes the activities of the Army Epidemiological Board during 1945:



CECIL J. WATSON, M.D.

While he was a student at the University of Minnesota School of Medicine, Cecil Watson cultivated interests in pathology, clinical chemistry, and microbiology, which he continued during his residency training and throughout his career. As Chairman of the Department of Medicine at Minnesota he excelled as a teacher, and as a clinician and investigator he trained some of the future leaders in this field. He was, without doubt, one of the nation's leaders on porphyrin metabolism, and was one of his generation's most important medical statesmen.

The AFEB asked Cecil Watson to organize and direct its Commission on Liver Diseases, which he chaired from 1947 to 1954. Under his guidance, and with the help of other authorities on hepatic disorders, the Commission provided inestimable help to the military services. New means of detection, treatment, and prevention of hepatitis and other hepatic diseases were clarified, and new leads to the solution of these problems were identified.

Established by the Secretary of War in January 1941, this Board and its ten Commissions completed the fifth year of activity in the investigation and control of influenza and other epidemic diseases in the Army. It assisted in supervising the production of the influenza vaccine which was adopted for the Army and used for the vaccination of troops with successful results in the fall and winter of 1945. Foreseeing that Japanese B encephalitis would be a danger to troops invading Japanese territory, protective measures were planned and a vaccine produced in the first part of the year. These measures were ready for use when the disease broke out on Okinawa. When American troops landed on Leyte, they were exposed to a serious disease caused by a worm-parasite which develops in blood vessels. To combat this, a Commission was sent to the Philippines to investigate and devise methods of protection against schistosomiasis. The dengue fevers have at times been a considerable cause of sickness in troops. Various types of dengue virus were recognized and a vaccine against dengue was prepared. Pneumonia has not been a severe cause of sickness in this war, but was potentially dangerous and was important at some posts. To help prevent it, a method of immunization against pneumonia was developed, to be available in case of need. Troops in Italy and civilians at institutions were protected against hepatitis by injections of human immune serum globulin. A Commission aided in the study of diphtheria in troops in Italy and Germany and assisted in improving methods of laboratory diagnosis. A special study was made of special types of paralysis, some of which were attributable to diphtheria. A representative of the Board made a survey of leprosy in the Philippines. As a possible additional weapon against the spread of poliomyelitis, DDT was used to control flies which might carry the disease. The Board and Commissions worked on many problems and furnished much expert information and advice of value to the preventive medicine program of the Army.

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The tables showing some of the contract data and expenditures for the fiscal years 1943–1946 that originally accompanied Bayne-Jones's report are shown in Appendix 1 of this volume, which deals with the funding of the Board.

PART III

The Postwar Planning for, and the Reorganization of, The Army Epidemiological Board

In late 1945, Brigadier General Simmons and Brigadier General Bayne-Jones began to plan for the medical research that would be needed by the Army after the war. Stanhope Bayne-Jones sent the following memorandum, dated 26 November 1945, to Colonel Roger G. Prentiss, Jr., chairman of the Army Medical Research and Development Board, which discusses their postwar plans and recommendations for the Army Epidemiological Board:

a. From time to time since August 1944, reports and recommendations have been [made] regarding the postwar organization and operations of the Army Epidemiological Board. The continuation of the Board in a modified form was recommended in letter of 12 August 1944 from The Surgeon General to the Commanding General, Army Service Forces. It was stated that the Board would concern itself almost exclusively with investigation of problems of communicable diseases, although its functions might be broadened to include problems of nutrition and industrial hygiene. No fundamental change in the field of the Board's activities was contemplated. Since August, details of plans and recommendations have been changed to some extent. As they are understood by the undersigned, these details are summarized, with indications of actions taken or recommended as follows:

(1) Integration of the Army Epidemiological Board with the Army Medical Research and Development Board. This is provided for by SGO Office Order No. 194, dated 17 August 1945.

(2) The President of the Army Epidemiological Board to be a member of the Army Medical Research and Development Board. SGO Office Order No. 194, dated 17 August 1945, provides for this.

(3) Invitation to Dr. Francis G. Blake to continue as President of the Army Epidemiological Board. Recommendation to be submitted through the Army Medical Research and Development Board to The Surgeon General.

(4) Relation between the Army Medical Research and Development Board and Preventive Medicine Service in the administration of the Army Epidemiological Board. This is to be determined by conferences in the near future. It is understood that the Army Epidemiological Board, as its name implies, is to function in close coordination with Preventive Medicine Service.

(5) The present organization of the Army Epidemiological Board will be dissolved as of 30 June 1946.

(6) The reconstituted Army Epidemiological Board is recommended to consist of A Central Board composed of five (5) civilian consultants, the President and four others. Commissions to be formed from time to time for specific investigations, which may be brief or long-term investigations, in field studies and at institutional laboratories. A total of 25 civilian Consultants are recommended. Of these, five will be on the Central Board and twenty may be members of Commissions.

(7) Consultants recommended for appointment as Consultants to the Secretary of War in Epidemic Diseases.

(8) Consultants will not be paid salaries, but will be paid travel expenses, per diem and honorarium not to exceed $50. per day while on active duty under orders.

(9) Expenses of research to be provided for through War Department medical research contracts with civilian institutions.

(10) For the Fiscal Year 1947 (1 July 1946 to 30 June 1947) the sum of $200,000. for the research expenses of the Army Epidemiological Board has been recommended. Formal recommendation for inclusion of this item in the Medical Department budget has not yet been presented to the Director, Fiscal Division, SGO.

(11) Close the Acute Respiratory Diseases Laboratory at Fort Bragg (Class IV Installation) as of 30 June 1946.

(12) No new construction for the Army Epidemiological Board is contemplated.

(13) Discontinue the allotment of officers for the Army Epidemiological Board as a Miscellaneous War Department Activity as of 30 June 1946. This is now in process.

(14) Provide on the staff of the Army Medical Research and Development Board the following full time personnel to assist in the administration of the Army Epidemiological Board:

One (1) officer, Medical Corps, [preferably] in grade of Major or Lt. Colonel.

One (1) secretary, CAF-5.

b. The above summary of plans and recommendations contains the major items which have been under consideration It is not complete in all respects. It is anticipated that additional recommendations will be submitted as the result of further conferences.

S Bayne-Jones
Brigadier General, USA
Deputy Chief, Preventive Medicine Service

Forwarded with approval

James S. Simmons
Brigadier General, USA
Chief, Preventive Medicine Service

Brigadier General Simmons corresponded with Dr. Blake on 29 November 1945, further expressing his views during this critical period. In spite of his great responsibilities at Yale, Dr. Blake agreed to continue as President of the Board. That letter follows:

Dear Francis:

For some time I have been concerned about The Surgeon General's postwar plans for medical research. About two years ago, I submitted a recommendation outlining certain general principles which I thought might be utilized in developing a strong plan. Since that time the Board has been set up in the office and The Surgeon General has assigned Colonel Prentiss as its director. In the organization of this Board, provision is made for retaining the Army Epidemiological Board in the modified form as is being planned by you, B. J. and the rest of us. It is also provided that the president of the Epidemiological Board will be a member of The Surgeon General s Medical Research Board. Two other civilians, namely the Chairman of the Division of Medical Sciences, NRC, and at least temporarily, the Chairman of the CMR were also to be invited to become members of the Medical Department Board Apparently, you three civilians have not yet received letters inviting you to accept membership on The Surgeon General's Board, but I am sure that you will receive such an invitation in the near future.

Recently, I have been much concerned about the fact that while a great deal of planning is being done, some of the more basic requirements for a sound program have not yet been firmed up. I have in mind matters of overall objective[s] for the Medical Department's basic program[.] what lines of research to undertake, where this work should be done, and how to attract and provide the right sort of personnel to carry on the investigative work. One important question, for example, is concerned with whether the Army should establish a large medical research center similar to the one now operated by the Navy at Bethesda, and [another is] what relation should exist between this central institution and the satellite laboratories such as the one at Fort Knox and elsewhere.

An even more important requirement is for this Board to determine, as soon as possible, what measures should be recommended to the War Department in order to provide flexible arrangements whereby skilled investigators in civil institutions can be attracted to research positions in the Army. This brings up the question as to whether we should recommend an entire "new deal" in the matters of salaries, positions, and tenure, separate from the commissioned corps and Civil Service as it now operates. Several weeks ago, I suggested to Colonel Prentiss that in order to formulate sound principles for the future, it was my advice that he call on you, Lew Weed and Newton Richards to meet with the Medical Department Board and The Surgeon General and try to draw up a plan with teeth in it.

Prentiss has had some trouble in finding a date which fits in with the engagements of all concerned and I am not sure when he plans to have the meeting now, but I am confident that it will not be held until he can get you three civilians in with us.

I know that you are tied up until after the holidays but I sincerely hope that you will be able and willing to help on this important matter sometime shortly thereafter. In this same connection, B J. and I discussed the future of the Epidemiological Board with General Kirk yesterday We are all anxious for you to remain as President of the Board as modified and you will receive a formal invitation from General Kirk at some later date. I hope that you will be willing to continue in this position and give to the Army the wise and brilliant leadership which you have given so generously during the war.

It was nice to see you in Cincinnati and I am sorry that things were so hectic that I didn't get a chance to have a long talk with you. With kindest regards, I am
Your sincere friend,

Steve Simmons
James S. Simmons
Brigadier General, USA
Chief, Preventive Medicine Service

THE ARMY EPIDEMIOLOGICAL BOARD'S SIXTH ANNUAL MEETING

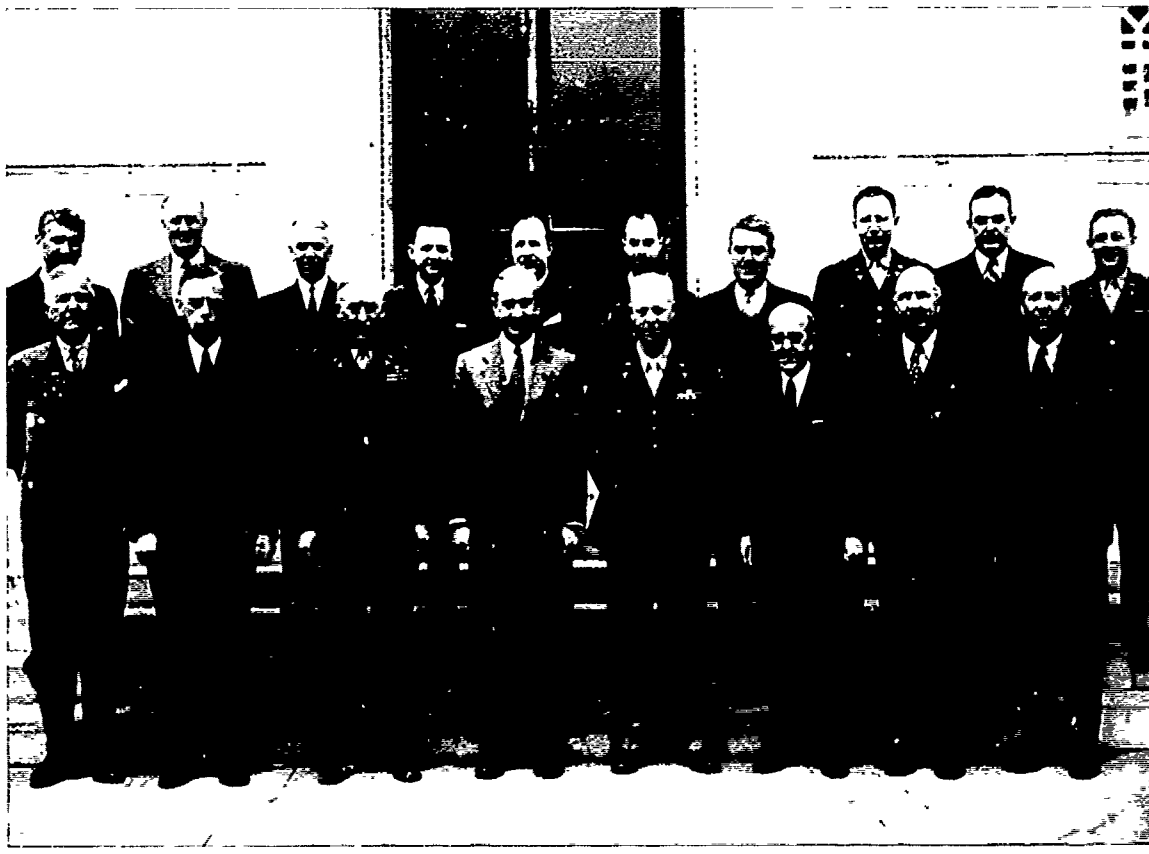
The sixth annual meeting of the AEB was held in the boardroom of the National Research Council in the National Academy of Sciences Building, 2101 Constitution Avenue, Washington, D.C., on 15–16 April 1946. The minutes of that meeting, which follow, provide insight into the Board and its activities, the various participants, and the recommendations that were made to the Surgeon General:

The eleventh meeting (sixth annual meeting) of the Board for the Investigation and Control of Influenza and Other Epidemic Diseases in the Army was held in the Board Room of the National Research Council, National Academy of Sciences Building, 2101 Constitution Avenue, Washington, D.C., on 15–16 April 1946. The executive session of the Board was held on 15 April from 9.30 a.m. to 12.30 p.m. The following individuals attended the executive session. Dr. Francis G. Blake, President of the Board, presiding, other members of the Board. Drs. O. T. Avery, A. R. Dochez, K. F. Maxcy, O. H. Perry Pepper and A. J. Warren.

Representing the Preventive Medicine Service, Office of The Surgeon General, but not voting were. Brig. Generals S Bayne-Jones and J. S Simmons, Colonel K. Lundeberg. Major E. B. Schoenbach acted as recorder. The minutes of the executive session of the Board are presented separately.

Three general sessions of the Board followed the executive session. These meetings were attended by members of the Board, Directors of Commissions and invited guests from the Office of The Surgeon General, Office of The Air Surgeon, Bureau of Medicine and Surgery, U S. Navy, Veterans Administration and the Royal Army Medical Corps. Those present were:

Dr. Francis G. Blake, President of the Board, presiding, other members of the Board. Drs. O. T. Avery, A. R. Dochez, K. F. Maxcy, O. H. Perry Pepper and A. J. Warren.



Army Epidemiological Board and Commission Directors
15–16 April 1946

Front row, left to right. Dr. A. R. Dochez, Dr. A J. Warren, Brig. General J S. Simmons, MC, Dr. F G. Blake, President of the Board, Brig General S Bayne-Jones, MC, Administrator, Dr. O T. Avery, Dr. K. F. Maxcy, and Dr O. H Perry Pepper

Second row, left to right. Dr. A. B. Sabin, Dr. O. H. Robertson, Dr H. E. Meleney, Dr. C S Keefer, Dr T. Francis, Jr , Dr. C. M. MacLeod, Dr. J. J. Phair, Major J. H. Dingle, MC; Dr J Stokes, Jr.; and Major E B. Schoenbach, MC.

Directors of Commissions Major J. H. Dingle, Drs. T. Francis, Jr., C. S. Keefer, C. M. MacLeod, H. E Meleney, J. J Phair, O H Robertson, A B. Sabin (representing Dr. J. R. Paul) and J. Stokes, Jr. Major General Normal T. Kirk, The Surgeon General, was present during the afternoon session on 15 April.

Representing the Office of The Surgeon General. Brigadier Generals J. S. Simmons and S. Bayne-Jones, Colonels K. Lundeberg, M. E DeBakey; Lt. Colonels G J. Dammin, J F. Hammond, O. R. McCoy and J. W. Regan; Major P. E. Sartwell.

From the Army Epidemiological Board. Majors T. J. Abernethy and E. B. Schoenbach, Captain E. Strauss.

From the U.S.A Typhus Commission: Captain A J Waring, Jr.

Representing the Office of The Air Surgeon: Colonel W. S. Stone.

Representing the Bureau of Medicine and Surgery, U S. Navy. Captains O. L Burton, G. B. Dowling and J. J. Sapero, Commander G. W. Mast; Lt. Commanders D. R Mathieson, J. J. McAndrew and L. A. Terzian.

Representing the Veterans Administration: Dr. A. M. Walker.

Representing the Royal Army Medical Corps: Colonel F. S. Gillespie, Liaison Officer.

Minutes Of The Meeting

The first general session of the Board was called to order by Dr. Blake, President of the Board, at 2.00 p.m., Monday, 15 April 1946. General Simmons addressed the meeting and expressed his gratitude to the members of the Board and Directors of the various Commissions for their assistance to the Preventive Medicine Service and the Office of The Surgeon General He voiced the hope that a similar organization would continue in the peace-time Army. Dr. Blake gave a report of the general decisions of the Executive Session. The following **recommendations** to The Surgeon General were adopted for the year 1 July 1946 to 30 June 1947:

a A central Board of seven members, similar to the present Board.
b Brig. General S. Bayne-Jones, President of the Board.
c. Six Commissions as follows:
   1. Commission on Acute Respiratory Diseases
   2. Commission on Environmental Hygiene
   3. Commission on Influenza
   4. Commission on Malaria
   5. Commission on Tropical Diseases
   6. Commission on Virus and Rickettsial Diseases

Dr Blake indicated that the functions of the present Commissions would be consolidated but that a considerable degree of flexibility in lines of endeavor should be maintained.

The Army Epidemiological Board has been integrated with the Army Medical Research and Development Board However, the operation of the Commissions under the Army Epidemiological Board and the Preventive Medicine Service will continue as in the past.

An appropriation of $200,000 for research contracts for the Army Epidemiological Board and Commissions has been included in the budget of the Medical Department of the Army for the year 1946-47. These funds do not become available until appropriated by the Congress In addition, the budget contains separate items for travel and honoraria of consultants.

A total of 25 consultants will be appointed, of which seven will be Board members and six Directors of Commissions.

The Board then proceeded to the reports by the Directors of the ten Commissions. The complete reports of each Commission are attached to these minutes.

Commission on Acute Respiratory Diseases

The report was presented by Major J H. Dingle, Director of the Commission.

Considerable discussion followed the report of laboratory and other epidemics of Q Fever described by Major Dingle It was pointed out that in the naturally acquired infections, cold hemagglutinins were absent and clinical differentiation from atypical pneumonia was difficult. Insect vectors could not be determined and no evidence of

secondary case spread was obtained. In the laboratory infections there was, likewise, no evidence of case to case transmission.

Major General Norman T. Kirk, The Surgeon General, arrived at about 3.00 p.m. and addressed the meeting. He expressed pride in the organization and the accomplishments of the Board. He voiced the appreciation of the Army for the excellent services rendered by the Board during the war period. The Surgeon General clearly indicated that continuation of the Board and its support to the Army was most desired.

Commission on Air-Borne Infections

The report was presented by Dr. O. H. Robertson, Director of the Commission.

In the discussion, the exact role played by dried dust particles in the spread of respiratory infections was considered. In barracks, air-borne transmission of respiratory diseases seemed to occur, whereas, in hospitals, contact infection was of greater importance. Under the latter circumstances, the factor of hand contamination was studied and it was suggested that further investigation of skin carriers of beta hemolytic streptococci should be made

The Board then proceeded to discuss recommendations on oiling of floors and blankets and on double bunking in barracks, submitted by Lt. Colonel J. W. Regan, Director, Sanitation and Sanitary Engineering Division, Preventive Medicine Service, Office of The Surgeon General. The studies previously reported to the Board were reviewed and the current experience at Fort Belvoir and Aberdeen Proving Ground examined.

It was voted to submit the following statement to The Surgeon General:

Oiling of floors and bedclothing should be adopted as standard Army procedure for the following reasons:

a. It is a worthwhile contributing factor in the control of some sources of infections for respiratory diseases.
b. The procedure produces a substantial reduction of dust and bacteria in the air and is justified as a hygienic measure.

The Board discussed the factors inherent when double bunking is resorted to in barracks. The discussions included reports of studies by the Commission on Acute Respiratory Diseases and comments by the Directors of the Commissions on Air-Borne Infections, Influenza and Pneumonia.

The following **recommendation** to The Surgeon General was voted:

> It is recommended that double bunking is justified in barracks, but should not be used to accommodate more than one man per sixty square feet of floor space (i.e., per one hundred and twenty square feet of floor space for each double bunk).

Commission on Epidemiological Survey

The report was presented by F. G. Blake, Director of the Commission.

The chief topics for discussion were the studies of Dr. Charles E. Smith on coccidiomycosis. It was noted that skin sensitivity may not be strictly specific and that cross reactions between coccidioidin, histoplasmin and antigens prepared from *Blastomyces* and *Haplosporanguim parvum* exist.

Commission on Hemolytic Streptococcal Infections

The report was presented by Dr. C. S. Keefer, Director of the Commission.

In the subsequent discussion, Dr. Robertson noted that antistreptolysin tests were a distinct aid in the work of the Commission on Air-Borne Infections in determining infections due to B hemolytic streptococci. The relative usefulness of the antifibrinolysin and antistreptolysin procedures was considered in light of possible adoption of these tests by the Army. It was noted that the antifibrinolysin procedure yields fewer positive results, does not become positive until late in convalescence and that the test is more difficult to perform than the antistreptolysin test General Bayne-Jones advised the Directors of each Commission to prepare adequate lists of all equipment in anticipation of contract terminations. He also requested that outstanding vouchers should be submitted for payment as soon as possible.

The meeting adjourned at 4:45 p.m.

The meeting of the Board was reconvened at 9.00 a.m., on 16 April 1946. The reports by Directors of Commissions continued.

Commission on Influenza

The report of this Commission was given by Dr. Thomas Francis, Jr., Director.

It was noted in the discussion that the rates for bacterial pneumonia rose during the epidemic of influenza B, although pulmonary complications had not been frequently observed among patients studied by the Commission. Chief interest in the discussion centered about the probability that influenza A might become epidemic in the fall and winter of 1946. As three years have elapsed since the last epidemic of influenza A, concern that the next epidemic might be of unusual severity and morbidity was voiced.

The difficulty and impracticality of carrying out a successful vaccination program after the recognition that an epidemic existed was stressed. Experience during the past four years has indicated that epidemics of influenza in the United States were often preceded by outbreaks of influenza in the Caribbean region and in Hawaii during the summer months of July and August. It was felt that a close watch of these areas would be of value in anticipating epidemics of influenza in the continental United States. Approximately seven (7) million military personnel were vaccinated within a period of two months in the fall of 1945. The incidence of influenza in the Army in the continental United States during this outbreak was less than expected.

Future plans for the vaccination of the Army against influenza A and B were discussed. It was the opinion of the Board that vaccination and re-vaccination against influenza A and B would be desirable in the Army. The following **resolution** was adopted by the Board for submission to the Surgeon General:

> It is recommended that all Army personnel be vaccinated or re-vaccinated against influenza in September and October 1946, unless intervening circumstances indicate that an alteration in this recommendation is desirable.

Commission on Measles and Mumps

The report was presented by Dr. Joseph Stokes, Jr., Director.

The use of mumps virus attenuated by cultivation in embryonated hens eggs for human immunization as well as the advantages of antigen prepared from chick embryos for skin testing were discussed. The occurrence of meningoencephalitis without parotitis was again noted and the diagnosis, established through the use of the complement fixation test on serial serum samples, was a distinct aid in the differentiation of the lymphocytic meningoencephalitides. Homologous serum jaundice was discussed at length. The use of various tests employed to study liver function was discussed. In addition, considerable discussion of antigenic variation in icterogenic agents, occurrence of secondary cases of jaundice in the different types of infections, disinfection of water and the significance of chronic or recurrent jaundice ensued.

Commission on Meningococcal Meningitis

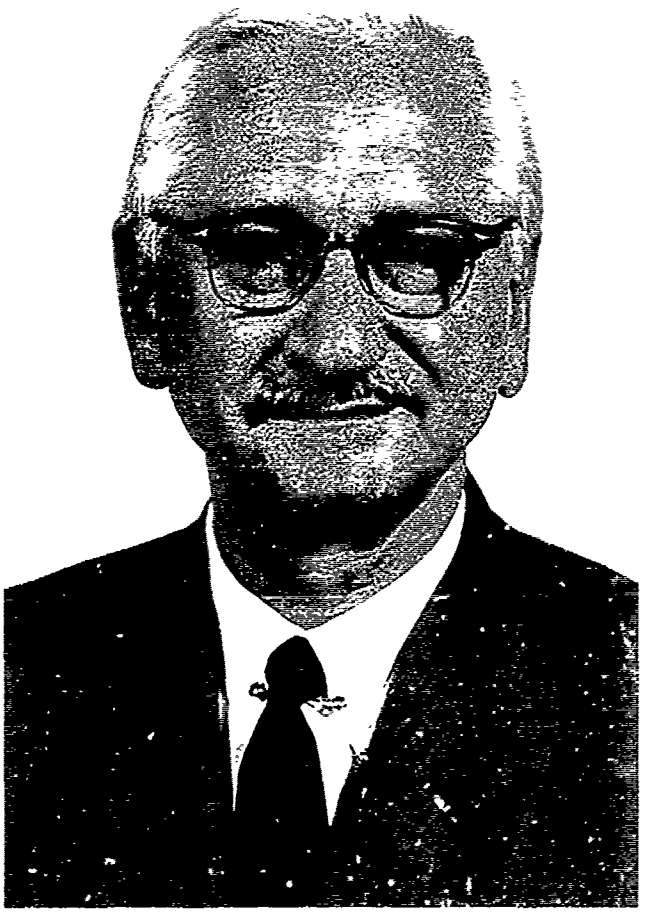
The report was presented by Dr. John J. Phair, Director.

Extensive study of case strains of meningococci for sulfonamide susceptibility had revealed that during the course of the epidemic in 1942 and 1943, no increase in the number of resistant strains had occurred. It was also evident that the number of strains of meningococci resistant to 0.5 mg% of sulfadiazine was very low. Of 350 case strains tested, only four were resistant to this concentration of sulfadiazine. The disposition of the extensive collection of meningococci, now at the Johns Hopkins School of Hygiene and Public Health, was discussed. General Bayne-Jones said that he would consult with General Callender at the Army Medical School with regard to this collection of case and carrier strains of meningococci.

Commission on Neurotropic Virus Diseases

The report was presented by Dr. A. B. Sabin, Acting Director.

Discussion of dengue fever ensued. The importance of strain variation in relation to immunity was stressed. The erroneous impression that immunity was short lived was probably due to strain variation. The immunity to dengue viruses shortly after an attack of the disease is broad but after several months only a homologous immunity remains. General Simmons pointed out the value of these studies and their applicability to the further understanding of virus diseases.



ALBERT SABIN, M.D.

Albert Sabin was an enthusiastic and dedicated contributor to the AFEB and its Commissions particularly to those that studied viral diseases and immunization. He made contributions of major military importance with his field investigations for the Board of arbovirus diseases, including Japanese encephalitis dengue and sandfly fever. Albert's mark on the development and application of living poliomyelitis vaccine is indelible.

Not one to sit passively, he entered all discussions of the AFEB and its Commissions with vigor never failing to assert objective or critical remarks. His memory was uncanny.

Sabin's contributions to the knowledge of arbor-borne infections, the encephalitides, dengue, and the live vaccine for poliomyelitis helped to shape modern medical history for the military and the public.



AIMS C. McGUINNESS, M.D.

Aims McGuinness graduated from Columbia University College of Physicians and Surgeons in 1931, and was a house officer in pediatrics at the Children's Hospital of Philadelphia. A faculty member at the University of Pennsylvania School of Medicine, he was elevated to the rank of associate professor, and was Dean of the University of Pennsylvania Graduate School of Medicine from 1951 to 1954.

During World War II, Aims served in the Office of the Surgeon General of the Army, as Deputy to General J. Stevens Simmons and Colonel Stanhope Bayne-Jones. His work directly contributed to the successful organization and development of the Army Epidemiological Board and its Commissions, by virtue of his role as Assistant Administrator. He was a charter member of the Commission on Measles and Mumps and an associate member of the Commission on Immunization.



EMANUEL B. SCHOENBACH, M.D.

Emanuel (Manny) Schoenbach graduated from the Harvard Medical School in 1937. He was a member of the faculty of The Johns Hopkins University School of Medicine, where he was an associate of Dr. Perrin Long. Manny was widely versed in the field of infectious diseases and performed much of the pioneering work done with the sulfonamides, penicillin, and the initial broad-spectrum antibiotics.

During World War II, he was assigned to the Preventive Medicine Section of the Office of the Surgeon General of the Army, where he worked both in the field and as an administrator. He worked intimately with Dr. Long and Dr. John Phair on the AFEB's Commission on Meningococal Infections, and he studied meningococcal and other serious infectious diseases in Army installations throughout the country.

He served on the Hopkins faculty for a short time after the war, then was appointed Professor of Medicine at the State University of New York, College of Medicine, at New York City. He was simultaneously Director of Medical Services at Maimonides Hospital. Manny died of myocardial infarction in 1952 at age 40.

It was noted that vaccines [against] Japanese B encephalitis were poor antigens as measured by serological response of vaccinated animals and humans. However, these serological tests were a poor index of the immune status of the individual. The optimal time for vaccination [against] Japanese B encephalitis was discussed. The cause of infections associated with pleocytosis in the spinal fluid and often considered atypical dengue or sandfly fever was discussed. No etiologic diagnosis could be made in this group of cases.

The meeting adjourned for luncheon at 12:15 p.m.
The afternoon session was reconvened at 1:30 p.m.

Presentation of the Medal of Freedom

General Bayne-Jones informed the meeting that fourteen Consultants of the Board had engaged in overseas missions. Seven of this group were eligible for the award of the Medal of Freedom under the provisions of War Department Circular No. 278, Section VI, 1945. These recommendations had been approved by the Office of The Adjutant General for the award of the Medal of Freedom. General Bayne-Jones noted that, in addition to the Certificate of Appreciation which each Consultant had received, the following awards had been approved for presentation to members of the Army Epidemiological Board:

The United States of America Typhus Commission Medal
Dr. Francis G. Blake
Dr. Kenneth F. Maxcy

The Legion of Merit
Lt. Colonel Aims C. McGuinness, MC
Lt. Colonel Albert B. Sabin, MC
Major John H. Dingle, MC

The Medal for Merit
Dr. Francis G. Blake, President of the Board

The Medal of Freedom
Dr. Ernest Carrol Faust
Dr. Thomas Francis, Jr.
Dr. William McD. Hammon
Dr. Donald B McMullen
Dr. John R. Paul
Dr. Joseph Stokes, Jr.
Dr. Carl Ten Broeck

The Army Commendation Ribbon
Certain officers serving under the Board have been recommended for the award of the Army Commendation Ribbon. Two of the awards for the Medal of Freedom had cleared the Office of The Adjutant General and the citations and medals were available for presentation. The Medal of Freedom was presented to Dr. Thomas Francis, Jr., Director of the Commission on Influenza and Dr. Joseph Stokes, Jr., Director of the Commission on Measles and Mumps, by Brig. General James S. Simmons, Chief of the Preventive Medicine Service, Office of The Surgeon General. The citations were read by Brig. General S Bayne-Jones, Deputy Chief, Preventive Medicine Service and Administrator of the Army Epidemiological Board.

The presentation of the reports by the Directors of Commissions was resumed.

Commission on Pneumonia
The report of this Commission was presented by Dr. Colin M. MacLeod, Director.

In the discussion that followed, it was emphasized that, although a significant reduction of pneumococcal pneumonia followed vaccination with specific polysaccharides, no reduction in the incidence of minor bacterial

respiratory infections among vaccinated groups, when compared to the control group, was noted. Epidemic influenza had no greater effect upon the incidence of pneumococcal pneumonia than other non-bacterial respiratory diseases.

The existing stocks of pneumococcal polysaccharide types I, II, V, VII, and XII were reviewed and their disposition, until required for future use, determined

Commission on Tropical Diseases

The report for this Commission was presented by Dr. H. E. Meleney, Director.

The work and reports of the special Commission on Schistosomiasis was discussed at length. It was pointed out that, in the control of snail vector, different species of snails were present in the various endemic areas. A single species of snail was the host in each area.

This concluded the reports from the Directors of Commissions. Dr Blake then announced that in the near future conferences would be held to develop plans for the Board and Commissions for the coming year. General Bayne-Jones thanked the Directors of the Commissions for their valuable contributions during the past year.

The meeting was adjourned at 3:00 p.m., 16 April 1946.

Respectfully submitted,

Emanuel B Schoenbach
Major, Medical Corps
Assistant Administrator, Army Epidemiological Board

PART IV

The Army Epidemiological Board is Reorganized as the Armed Forces Epidemiological Board

After the war, it was obvious to those in authority that all three of the military services could benefit from having a lay board of civilian medical scientists from whom they could seek advice. On 23 April 1948, the Committee on Medical and Hospital Services of the Armed Forces (more widely known as the Hawley Board, after Surgeon General Hawley) submitted its report entitled "Standardization of Preventive Medicine Practices and Procedures Within the Armed Forces" to Secretary of War Stimson. The report recommended that *(a)* the Army Epidemiologicaln Board be expanded to include commissions that special problems of the Navy and Air Force might require, and *(b)* it be redesignated the Armed Forces Epidemiological Board, an advisory group to the Surgeons General of the Army, Navy, and Air Force, for consultation on field problems, field investigations, and research in preventive medicine. On 29 November 1949, the Surgeon General of the Department of the Army advised the Secretary of the Army that the Armed Forces Epidemiologicai Board had been established as a tri-service board, as directed. This document appears in Appendix 4.

It had also become clear to the three Surgeons General that the activities of the Board and its Commissions should be continued during peacetime, but not until 8 October 1953 did the Department of Defense publish its Directive 5154–8, which was referred to as "The Charter." This directive, which also appears in Appendix 4, designated the Armed Forces Epidemiological Board as a joint agency of the three military services under the management of the Secretary of the Army, and subject to the authority, direction, and control of the Secretary of Defense.

The Board was enlarged from seven to nine members, all civilians, who were selected on the basis of their national standing in fields related to the Board's functions. The members, nominated by the three Surgeons General, were appointed by the Secretary of the Army to a four-year term as a consultant. The Board elected a president from among its members, who served a three-year term and could be reelected. Over the years, individual commissions were modified, reformed, or discontinued. New commissions were formed to meet military needs as they arose, after the commissions had served their purposes, they were retired. By 1955, there were fourteen commissions of the Board.

The AFEB's Role in the Establishment of the Berry Plan

In the 1960s and early 1970s, while Gustave J. Dammin, M.D., was President of the AFEB, Board members engaged in numerous activities that involved governmental policies related to the Board's interest. Dr. Frank Berry, an accomplished surgeon, had served as a consultant in surgery to the Surgeon

General of the Army beginning in 1946. Dr. Berry was later appointed Assistant Secretary of Defense for Health Affairs. In 1963, Dr. Dammin (along with various members of the AFEB who worked through Dr. Berry) rendered advice to the Department of Defense that helped formulate the policy of medical-officer deferral that became known as the Berry Plan. On one occasion, Dr. Dammin met with Admiral Rickover, who was very helpful in presenting the policy requirements to the House Appropriations Committee. Because it deferred physicians until they were trained in their specialties, the Berry Plan strengthened the officer pool not only in preventive medicine, but also in clinical internal medicine and other specialties with epidemiological interests. This action helped the Department of Defense fill a large number of vacancies with physicians who were both well-qualified and experienced.

The AFEB's Assistance to the Overseas Laboratories

Gus Dammin actively pursued the work that was done in the Department of Defense's Overseas Laboratories. During his tenure as President of the AFEB, he made site visits in 1964, 1965, and 1966 to the laboratories in Dacca, Bangkok, Kuala Lumpur, and various sites in India. His contributions as a consultant, which advanced the knowledge of acute diarrheal diseases such as cholera, were significant.

During his various trips overseas, Dr. Dammin not only visited the countries where the studies were being performed, but he also conferred with medical authorities and Preventive Medicine and Laboratory Officers in U.S. installations in Germany and other European sites, such as the 97th General Hospital, Frankfurt (in 1970 and 1972), the 9th Hospital Center, Landstuhl (in 1970 and 1972), the 4th Epidemiological Flight, Wiesbaden (in 1970); the Navy Preventive Medicine Section, Naples (in 1970); and Glostrup Hospital Group, Copenhagen (in 1970). These activities were of inestimable value to the AFEB and also to the Medical Research and Development Command, whose interests related to epidemiological surveillance, laboratory diagnosis, and disease control. In 1971, he published a report in *Military Medicine* that described the contributions to, and influences on, medicine by military research. (*Bull. N.Y. Acad. Med.* 47: 1455–1472, 1971.)

One of Dr. Dammin's major areas of interest was Balkan neuropathy, which was localized in isolated areas of Yugoslavia, Rumania, and Bulgaria. With Board member Dr. Charles Rammelkamp, Dr. Philip Hall, and others, he investigated the cause of this disease. They searched for the presence of nephrotoxic agents in not only the specific environment, but also in heavy metals, trace elements, plant toxins, and viruses, all of which had been suggested as possible causative agents. Although none of their studies produced sufficient evidence to establish the cause of this peculiar disease, it became apparent to the research team that urothelial cancers of the renal pelvis and the ureters coexisted with Balkan neuropathy in this same population group. Drs. Dammin and Hall published a comprehensive review of Balkan neuropathy in 1972.

Significant Medical Accomplishments That Helped to Improve the General Public Health

The accomplishments that led to improved health in the military services represent a series of medical landmarks. Because many of the problems of preventive medicine and disease control are shared, these achievements benefited not only the Armed Forces but also the public. When the Board investigated the preventive-medicine problems of the Armed Forces, it was expected to, and did, take into consideration *(a)* the research being conducted by governmental and non-governmental agencies on similar problems, *(b)* the propriety of the research methods that were recommended for use by the military, and *(c)* the pertinent practices emphasized by the military departments in the Preventive Medicine program. There is no better example of cooperative research between the military services and academic institutions. Some of the accomplishments that resulted from this joint research are the following:

- Development of a purified polysaccharide vaccine for pneumonia
- Development of an influenza vaccine that required annual changes of antigenic composition
- Experimental reproduction of infectious hepatitis, demonstrating that the agent resides in intestinal discharges and blood serum, which provided a firm base for developing control measures
- Demonstration that injections of gamma globulin will prevent naturally occurring infectious hepatitis
- Demonstration that the agent of primary atypical pneumonia is transmissible by filtered bacteria-free secretions from the respiratory tracts of patients with acute manifestations of illness
- Demonstration that sulfadiazine can abort or prevent outbreaks of meningococcal meningitis and arrest the carrier state
- Demonstration that penicillin and the tetracycline antibiotics prevent rheumatic fever by controlling beta hemolytic streptococcal infections
- Demonstration that streptococcal respiratory disease spreads, not from blankets or floor dust, but by personal contact, which revolutionized the hygienic protective measures aimed at control
- Proof that the automobile seat belt is effective in preventing serious injury, and that vehicular door locks are implicated as a cause of injury
- Demonstration of the first known specific cures of scrub typhus, murine typhus, and Rocky Mountain spotted fever with chloramphenicol in 1948
- Reported the chemoprophylactic field studies that showed that the intermittent administration of chloramphenicol (later tetracycline) prevented scrub typhus in volunteers, in 1948
- Reported the first known effective cure of typhoid fever with chloramphenicol in 1948
- Reported the infectious dose of *Salmonella typhosa*, in a series of studies using volunteer subjects, and demonstrated that inactivated typhoid vaccine (acetone-killed) resulted in short-term but limited immunity. (Because paratyphoid A- and B-type vaccines were of limited efficacy, newer vaccines utilized a monovalent, acetone-killed, dried product.)
- Development of the first specific chemoprophylaxis for leptospirosis
- Reported that field surveillance studies magnified the importance of leptospirosis as a common cause of Fever of Undetermined Origin in various geographic areas, and that available antibiotics were ineffective as therapeutic agents
- Reported a series of studies that showed that very small doses of diphtheria toxoid were effective in recalling established immunity, and that adverse reactions were minimized by use of a purified toxoid
- Development of tetanus and diphtheria toxoids and introduction of their use in the military, which became standard in the United States until an alum-adjuvanted tetanus and diphtheria toxoid later permitted significant extension of the booster intervals
- Sponsored and assisted in the development of jet injectors with intradermal capability, a technique for vaccine administration that was instrumental in helping control smallpox and other microbial diseases

- Reported the first therapeutic efficacy of chloramphenicol and tetracycline in bubonic, septicemic, and pulmonic plague using the oral route, which simplified the therapeutic regimen in the event of a sizable outbreak because streptomycin, a very effective antibiotic, must be injected
- Demonstration of the importance of cellular immunity (as differentiated from humoral immunity) and the transferability of this cellular immunity by the subcellular "transfer factor." (These studies sparked the whole field of immunology.)
- Development of the entirely new immunological technique of fluorescent labeling of antibodies, which enhanced the confirmed diagnoses of many microbial diseases and clarified their pathogenesis
- Sponsored the original studies of properdin, which was the basis for the greatly extended interest in complement pathways
- Greatly clarified the differing strains of dengue virus and elucidated the concept of dengue-shock syndrome, an important cause of death among children in Asian countries
- Developed new immunizing agents or vaccines for infectious diseases including the following:

  (a) vector-borne virus diseases such as dengue, yellow fever, St. Louis encephalitis, western equine encephalitis, eastern equine encephalitis, Venezuelan equine encephalitis, Japanese B encephalitis, and others;

  (b) the hemorrhagic fevers;

  (c) the rickettsial diseases such as epidemic typhus, Rocky Mountain spotted fever, and Q fever;

  (d) malaria;

  (e) measles;

  (f) mumps;

  (g) diphtheria and tetanus toxoids;

  (h) enteric infections such as bacillary dysentery, Shigella, *Salmonella typhosa*, *Vibrio cholerae*, and *Endamoeba histolytica;*

  (i) plague and *Franciella tularense;*

  (j) enteroviral diseases including poliomyelitis and others;

  (k) meningococcal and gonococcal diseases; and

  (l) adenovirus infections.

A complete list of the recommendations that were made by the Board between 1955 and 1989, including those concerning the administration of live vaccines, is found in Appendix 3.

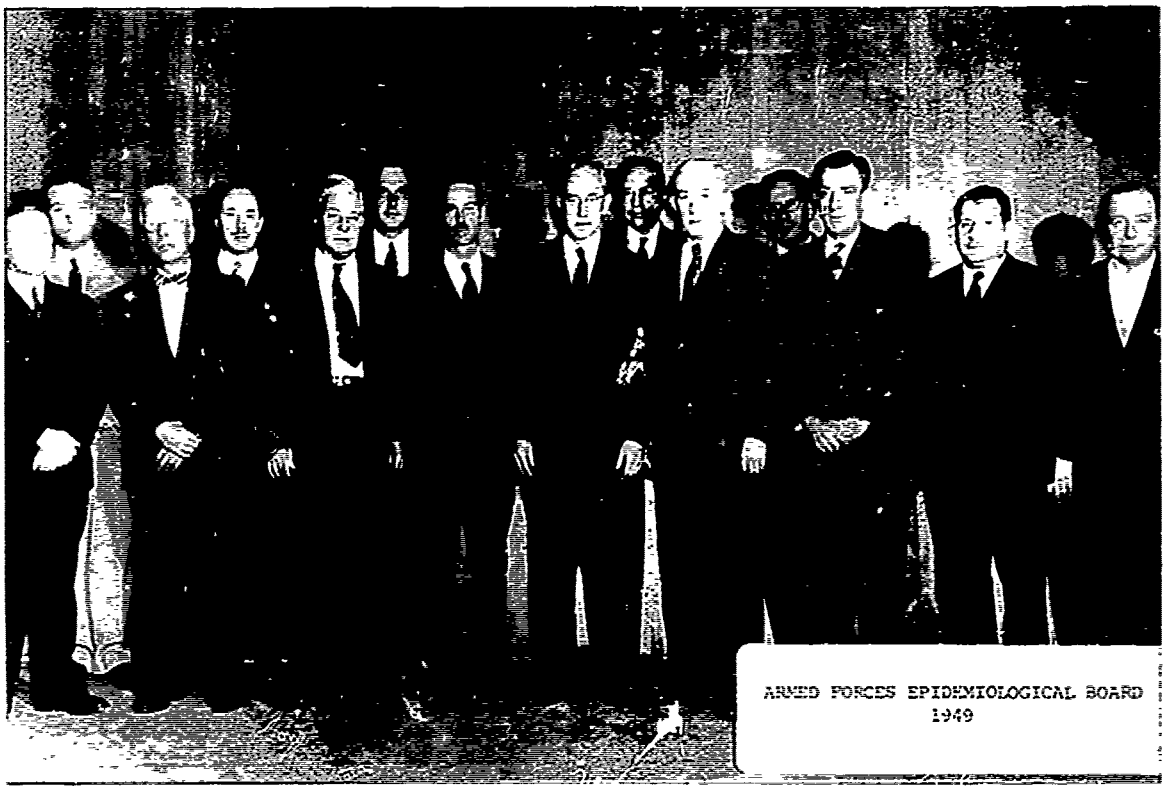


1948 Armed Forces Epidemiological Board and Commission Directors

Seated, left to right: Dr. Joseph T. Wearn, member; Dr. Francis G. Blake, member; Dr. Colin M. MacLeod, President of the Board; Dr. Kenneth F. Maxcy, member; and Dr. Gordon M. Fair, Director, Commission on Environmental Hygiene.

Standing, left to right: Dr. Thomas Francis, Jr , Director, Commission on Influenza; Dr. John R. Paul, Director, Commission on Virus and Rickettsial Diseases, Dr. John H. Dingle, Director, Commission on Acute Respiratory Disease; Dr. Frank L. Horsfall, Jr., Acting Director, Commission on Immunization; and Dr. Cecil J. Watson, Director, Commission on Liver Disease.

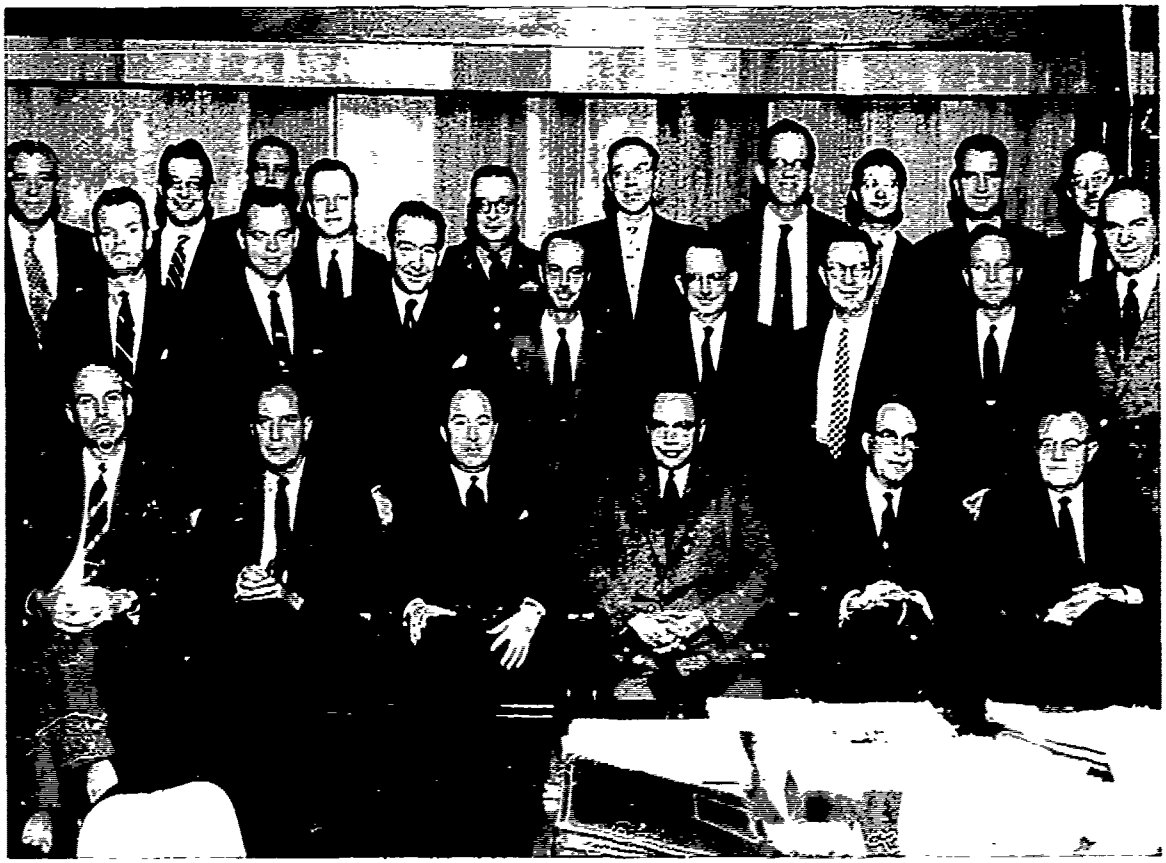
Not pictured: Dr. James S. Simmons and Dr. Karl F. Meyer, members.



1949 Armed Forces Epidemiological Board and Commission Directors

Front row, left to right: Dr. John Paul; Dr. Rolla Dyer; Dr. Thomas Rivers, Dr. Colin M. MacLeod, President of the Board; Dr. Francis G. Blake; General James S. Simmons, MC, USA; Coggeshall; Dr. Isador Ravdin; and Dr. William Tillett.

Second row, left to right: Dr. Cecil Watson; Dr. Thomas Francis, Jr.; unidentified; Dr. John H. Dingle; and Dr. Joseph Smadel.

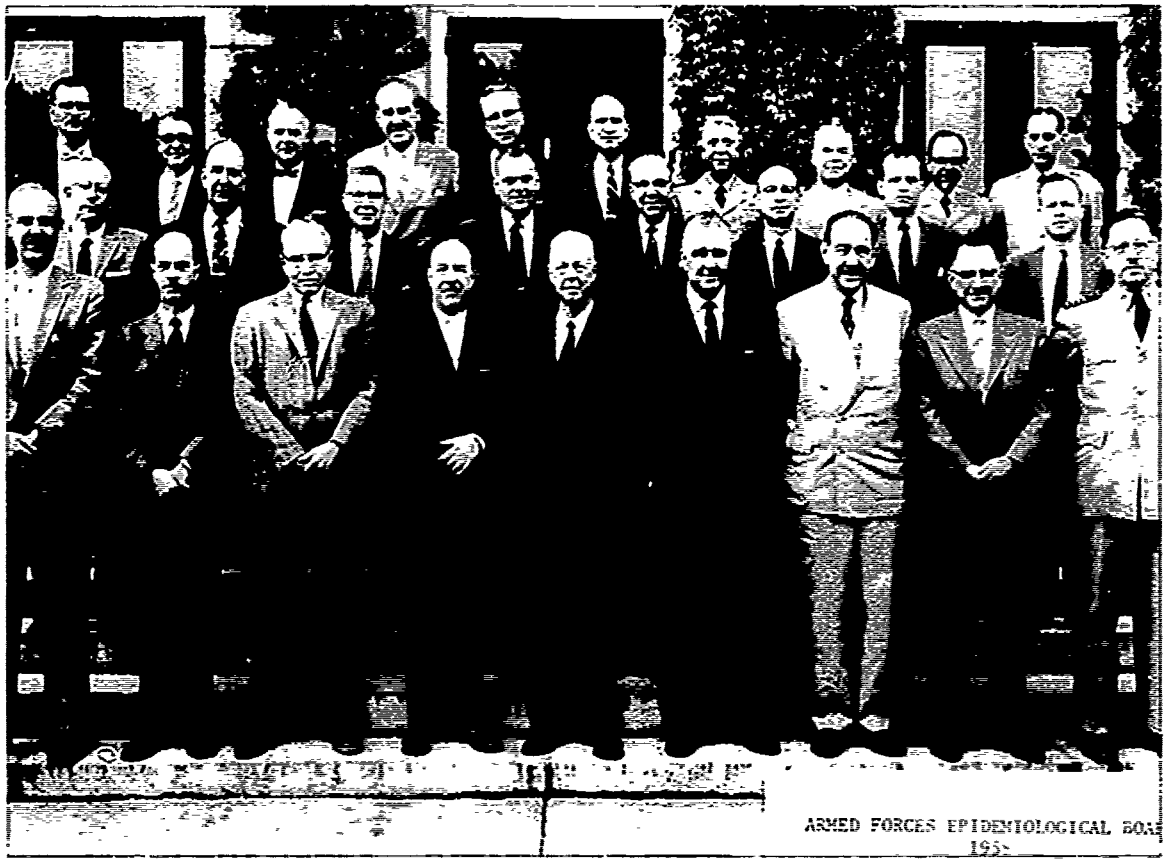


Armed Forces Epidemiological Board and Commission Directors
3 December 1956

Seated, left to right: W. Barry Wood, Jr.; Richard F. Shope; Thomas Francis, Jr.; John H. Dingle, President of the Board; William P. Shepard; and Ernest L. Stebbins.

Center row, left to right: F. Sargent Cheever, Fred M. Davenport, Richard A. Kern, Colin M. MacLeod, Charles E. Smith, Rodney R. Beard, Alto E. Feller, and Ross A. McFarland.

Back row, left to right: H. K. Sessions, Donald M. Pillsbury, unidentified, Thomas H. Weller, Colonel H. N. Eisen, William McD. Hammon, Geoffrey Edsall, Floyd W. Denny, William S. Jordan, Jr., and Captain R. W. Babione, Executive Secretary.



Armed Forces Epidemiological Board and Commission Directors 8–10 May 1958

Front row, left to right: Dr. W. Barry Wood, Jr.; Dr. Colin M. MacLeod; Dr. John H. Dingle; Dr. Thomas Francis, Jr., President of the Board; Dr. Stanhope Bayne-Jones, Dr. Clayton G. Loosli; Dr. Richard A. Kern; Dr. Charles E. Smith; and Captain W. R. Babione, MC, USN, Executive Secretary.

Center row, left to right: Dr. Joseph E. Smadel; Dr. Richard E. Shope; Dr. Rodney R. Beard; Dr. Fred M. Davenport; Dr. William McD. Hammon; Dr. A. E. Feller; Dr. Francis S. Cheever; and Dr. Thomas H. Weller.

Back row, left to right: Dr. Charles L. Wisseman, Jr.; Dr. Donald M. Pillsbury; Dr. B. G. King; Dr. Ross A. McFarland; Dr. Charles H. Rammelkamp, Jr.; Dr. William S. Jordan, Jr.; Captain H. K. Sessions, MC, USN; Dr. M. Brown; Major S. Vivona, MC, USA; and Colonel J. Rizzolo, MC, USAF, assistant Executive Secretary.



Armed Forces Epidemiological Board and Commission Directors
15–17 May 1961

Front row, left to right: Dr. Thomas Francis, Jr.; Dr. Richard A. Kern; Dr. Richard E. Shope; Dr. Gustave J. Dammin, President of the Board; Dr. Stanhope Bayne-Jones; Dr. Charles E. Smith; and Dr. Colin M. MacLeod.

Center row, left to right: Colonel Charles H. Moseley; Dr. Donald M. Pillsbury; Dr. Francis S. Cheever; Dr. William S. Jordan, Jr.; Dr. George S. Mirick; Dr. Charles L. Wisseman, Jr.; and Dr. Charles H. Rammelkamp, Jr.

Back row, left to right: Colonel John Rizzolo, MC, USAF, Executive Secretary; Dr. Harry Most; Dr. Albert V. Hennessy; and Dr. Ross McFarland.

Not pictured: Board members Dr. John H. Dingle and Dr. Clayton G. Loosli. Commission Directors Dr. R. R. Beard, Dr. Theodore E. Woodward, Dr. Geoffrey Edsall, Dr. Fred M. Davenport, and Dr. William McD. Hammon.



Armed Forces Epidemiological Board, Commission Directors, and Military Representatives to the Board
20–22 May 1963

Front row, left to right: Board members Dr. C. E. Smith; Dr. S. Bayne-Jones; Dr. T. Francis, Jr.; Dr. G. J. Dammin, President of the Board; Dr. J. Dingle; Dr. C. M. MacLeod; and Dr. J. C. Snyder.

Back row, left to right: Commission Directors and Military Representatives Dr. R. D. Stoner; Colonel F. L. Bowling, MC, USAF; Dr. R. A. McFarland; Colonel A. J. Rapalinski, MC, USA; Dr. W. McD. Hammon; Dr. F. S. Cheever; Dr. C. H. Rammelkamp, Jr.; Dr. R. R. Beard; Dr. G. Edsall; Dr. H. Blank; Dr. W. S. Jordan, Jr.; Dr. H. Most; Dr. T. E. Woodward; Colonel C. H. Moseley, MC, USA, Executive Secretary of the Board; Dr. C. L. Wisseman, Jr.; General R. E. Blount, MC, USA; and Dr. F. M. Davenport.

Not pictured: Dr. R. Kern and Dr. C. G. Loosli, members, and Dr. V. P. Bond, Commission Director.



Military Representatives to the Armed Forces Epidemiological Board
6–7 December 1965

Front row, left to right: Major Robert T. Cutting, MC, USA; Lt. Colonel Eugene A. Rosenberger, MC, USA; Colonel Claude M. Eberhart, MC, USA; Brig. General Joe Blumberg, MC, USA; Colonel Adam Rapalski, MC, USA; Dr. Carl Lamanna; Colonel Joseph W. Cooch, MC, USA; Captain James R. Kingston, MC, USN, Colonel Harold W. Whitcher, MC, (British liaison officer).

Back row, left to right: Lt. Colonel A. M. P. Ives, RCAMC (Canadian medical liaison officer), Captain Sidney A. Britten, MC, USN, Executive Secretary of the Board; Captain Jack W. Millar, MC, USN; Colonel John Rizzolo, MC, USAF; Colonel William D. Tigertt, MC, USA, Brig. General Colin F. Vorder Gruegge, MC, USA, Colonel Franklin L. Bowling, MC, USAF; Colonel Dan Crozier, MC, USA.



Commission Directors of the Armed Forces Epidemiological Board
6–7 December 1965

Left to right Dr Richard D. Stoner, deputy director, Dr William R Scherer, Dr. William S Jordan, Jr , Dr Charles H. Rammelkamp, Jr , Dr. Harvey Blank, Dr. Charles L Wisseman, Jr., Dr Irwin H. Lepow , Dr Wilbur C Downs, Dr Rodney R Beard, Dr. Horace M Gezon, Dr Harry Most, Dr Theodore E. Woodward, and Dr Fred M. Davenport

Not pictured Dr I H Schmidt, Dr Ross A. McFarland, Dr Victor P Bond, and Dr William McD. Hammon

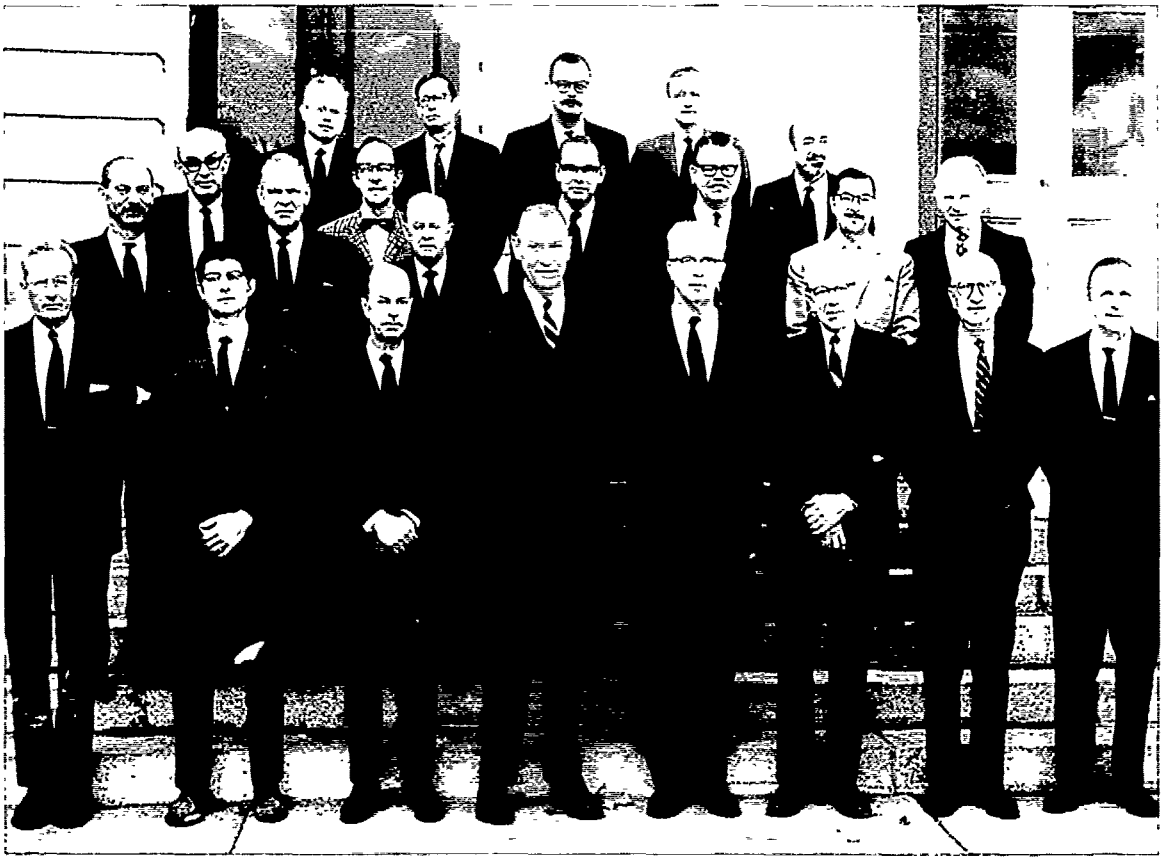
Members of the Armed Forces Epidemiological Board in 1965, not pictured Dr Gustave J. Dammin, President of the Board, and Dr Stanhope Bayne-Jones, Dr Francis S. Cheever, Dr. John H. Dingle, Dr. Thomas Francis, Jr , Dr Richard A. Kern, Dr. Albert B Sabin, Dr Charles E Smith, and Dr. John C. Snyder



Armed Forces Epidemiological Board and Commission Directors
2 March 1968

Seated, left to right: Dr John C Snyder; Dr Richard A. Kern, Dr Albert B. Sabin, Dr. Gustave J. Dammin, President of the Board; Dr Colin M. MacLeod, and Dr. Francis S. Cheever.

Standing, left to right Dr Ross A. McFarland, Dr. Theodore E. Woodward, Captain S. A Britten, MC, USN, Executive Secretary; Dr. Charles H. Rammelkamp, Jr , Dr. William McD. Hammon, Dr. Abram S. Benenson, Dr Staney J. Weidenkopf, Dr Horace J. Gezon, Dr William S. Jordan, Jr , Dr. Victor P. Bond, Dr. Floyd W Denny, Jr ; Colonel William D Tigertt, MC, USA, Dr. Fred M. Davenport, Dr. Lewis W. Wannamaker, Dr. Paul C. Beaver, Dr Charles L Wisseman, Jr.; Dr. William F. Scherer; and Dr. Harvey Blank.



Armed Forces Epidemiological Board and Commission Directors
20 February 1970

Front row, left to right, members of the Board: Dr John C. Snyder; Dr. Floyd W. Denny, Jr.; Dr. Colin M. MacLeod, Dr. Gustave J. Dammin, President of the Board, Dr. Charles H. Rammelkamp, Jr., Dr. William McD. Hammon; Dr. William S. Jordan, Jr.; and Dr Theodore E. Woodward.
Not pictured: Dr. Francis S Cheever.

Center row, left to right, Directors of the Commissions Dr. Abram S. Benenson; Dr. Goron Meiklejohn, Dr. Fred M. Davenport; Dr. Bennett L. Elisberg; Dr. Paul C. Beaver; Dr Saul Krugman; Dr. Lewis W. Wannamaker; Colonel Bradley W. Prior, MC, USAF, Executive Secretary; and Dr. Harvey Blank.

Back row, left to right: Dr. Robin D. Powell, Dr. Robert L. Kaiser; Dr. Charles L. Wisseman, Jr.; Dr. William F. Scherer; and Dr. Elvio H. Sadun.



Armed Forces Epidemiological Board, 30th Anniversary Celebration
Walter Reed Army Institute of Research
17–19 February 1971

Seated, left to right: Dr. Joseph Stokes, former member; Dr. Colin M. MacLeod; Dr. Gustave J. Dammin, President of the Board; Dr. Francis S. Cheever; and Dr. Charles H. Rammelkamp, Jr.

Center row, left to right: Dr. Theodore E. Woodward; Dr. John S. Strauss; Dr. Lewis W. Wannamaker; Dr. Abram S. Benenson; Dr. Harvey Blank; Dr. Paul C. Beaver; Dr. Bennett L. Elisberg; Dr. Richard M. Krause; Dr Gordon Meiklejohn; Dr Fred M Davenport; Dr. Saul Krugman, Dr. Robert L. Kaiser; and Colonel Bradley W. Prior, MC, USAF, Executive Secretary.

Back row, left to right: Dr. David Minard; Dr. Thomas R. Hendrix; Dr. George G. Jackson; Dr. Charles L. Wisseman, Jr.; Dr. William S. Jordan, Jr.; and Colonel Dan Crozier, MC, USA.

Not pictured: members Dr. Floyd W. Denny, Jr.; Dr. William McD. Hammon; and Dr. Edwin H. Lennette; Commission Directors Dr. Robin D. Powell and Dr. William F. Scherer, and deputy directors Dr. Elvio Sadun and Dr. Jonathan Uhr.



RICHARD A. KERN, M.D.

Distinguished as a Professor of Medicine at Temple University School of Medicine in Philadelphia, Dr. Richard Kern served many societies as a member and was President of the American College of Physicians 1957-58. During World War II, he was a senior officer in the U.S. Navy Medical Services; after the war, he was active in the affairs of the Department of the Navy and its Reserves. The Association of Military Surgeons of the United States established a memorial lecture honoring Dr. Kern as a public servant.

As an early member of the AFEB, Dr. Kern gave the Board insight into the practical relationships between the practice of medicine and the prevention of disease. He, like other Board members, served as a vital bridge between the laboratory bench and the application of those basic principles to health care.



RICHARD E. SHOPE, M.D.

Dick Shope accomplished much during his relatively short (64-year) life. After qualifying in medicine at the University of Iowa College of Medicine in 1924, he trained in pharmacology there, where he worked on the chemotherapy of tuberculosis. Later he joined the Rockefeller Institute at Princeton (later called the Rockefeller Foundation). Always an outdoorsman with a fondness for animals, his interests shifted to hog cholera and the field of virology. This interest continued for the next thirty-eight years.

A key observation (with Dr. Paul Lewis) showed that a mixture of *Haemophilus influenzae suis* and swine flu virus produced typical influenza and severe pneumonia in swine. This clarified the complementary viral-bacterial role in producing disease, and led to his unique contribution. that swine flu virus might cycle through lung worms, with ova passed through feces, then to earthworms, and back to hogs via earthworms. This novel and controversial idea helped explain the cyclic nature of influenza. His most brilliant contribution was his demonstration that two viruses that affected wild cottontail rabbits could produce either a fibroma or a papilloma. The viruses carry his name, and have had very important implications in understanding the pathogenesis of cancer.

Dick had a distinguished war record, and worked with Dr. Thomas Rivers at the U.S. Navy Medical Research Unit on Guam. He was Director of the AFEB's Commission on Epidemiological Survey from the time it was reorganized in 1951 until 1959. A productive scientist, he had the objectivity to monitor the Scientific Defensive Biological Warfare Program at Fort Detrick (later USAMRIID), which was one of the roles of the Commission on Epidemiological Survey. New concepts of pathogenesis and control were elucidated under his direction. Members of the Commission and others enjoyed working with him, his sense of humor was infectious.



JOSEPH E. SMADEL, M.D.

For thirty-two years, Joe Smadel was a physician and investigator whose contributions to medical science either saved or prolonged the lives of thousands of people. At the time of his death in 1963, Joe was recognized as one of the outstanding scientists of the mid-twentieth century. Expecting no reward, he performed research because he liked it, and his labors provided the essential bridge between the laboratory and the physician who cares for infected patients. One of his most satisfying experiences was the therapeutic triumph with chloramphenicol in the treatment of typhus and typhoid fevers, and the successful field trials that showed that this antibiotic effectively suppressed scrub typhus infection.

A major contributor to the Armed Forces Epidemiological Board, he organized and directed three of its Commissions—those on Immunization, Rickettsial Diseases,and Epidemic Hemorrhagic Fever, each of these Commissions bears the indelible Smadel mark. He was also a member of the Commissions on Epidemiological Survey, Virus Diseases, and Influenza, and his stabilizing influence during the developmental phases of the poliomyelitis vaccine trials contributed significantly to that success.

Joe had little patience for armchair philosophy, and he crusaded against shallow thinking. He demanded unswerving performance from his associates, who were expected to exercise good judgment and to adhere to his personal brand of integrity. He never allowed his personal burdens to interfere with his dedication to his work, and his enthusiasm sparked the enthusiasm of his associates. He worked intently and set an example for others.



ROSS GAULD, M.D.

Ross Gauld, a Canadian by birth, provided much "behind the scenes" help for the AFEB and several of its Commissions. He served as a faculty member in epidemiology at The Johns Hopkins School of Public Health, which was followed by his appointment to the scientific professional staff at WRAIR, where he directed the Division of Preventive Medicine.

The Commission on Immunization was one of the largest commissions of the Board, and was responsible for a broad and active program. Ross served as Deputy Director of this Commission. Many leaned upon him for help, and had great confidence in his practical approach to problem-solving. Joe Smadel, for example, placed great confidence in his advice. Other commissions, including that on Hemorrhagic Fever, profited from his epidemiological knowledge. Ross was reserved and effective, and often had at hand knowledge of those historical events that helped solve a problem.



GEOFFREY EDSALL, M.D.

Geoff Edsall graduated from Harvard Medical School in 1934 and served his house officership at the Massachusetts General Hospital from 1934 to 1936. Research fellowships at Harvard and instructorships in bacteriology and immunology at the Harvard Schools of Medicine and Public Health followed. From 1940 until 1942, he was Assistant Director of the Division of the Biologic Laboratories of the Massachusetts Department of Public Health, and was its Director until 1949. For several years, he was Professor and Chairman of the Department of Microbiology at Boston University School of Medicine, which was followed by his appointment as Director of the Division of Immunology at WRAIR in 1951.

Geoff served the AFEB in many ways, particularly as the Director of its Commission on Immunization from 1952 to 1963. This Commission was graced by the membership of some of the leaders in American medicine in the fields of biology and immunology, and it accomplished, under Geoff's direction and in collaboration with other commissions, a vast amount of work. The three-day meetings that this Commission held at WRAIR were actually reviews of the contemporary work in immunology and vaccine development. Goeff also served as a member of the Commission on Epidemiological Survey, where his advice was put to good use. His research interests were broadly distributed throughout immunology, and his special contributions were in the purification of toxoids, particularly those of tetanus and diphtheria.



JOHN C. SNYDER, M.D.

During and after World War II, Jack Snyder ranked among the top rickettsiologists in the world. As a member of the U.S.A. Typhus Fever Commission, he made distinguished contributions, and he was a senior member of the small team that arrested the epidemic of louse-borne typhus in Naples, Italy. He did the pioneering work that showed that control of the Madrid strain of epidemic typhus (Strain E) is crucial if this dread disease is to be controlled.

Soon after the war, Jack was appointed to the position of Dean of the Harvard School of Public Health and Hygiene, during which time he also chaired the Commission on Rickettsial Diseases of the AFEB and served as a member of the Board. The public health menace of the rickettsioses diminished with the passage of time, and a portion of the credit for this advance is due to Jack Snyder.



ROSS A. McFARLAND, Ph.D.

Ross McFarland graduated from the University of Michigan in 1901, and was awarded his doctorate in Science at Harvard in 1928. He joined the Harvard faculty in 1939, and, beginning in 1962, he held the position of Guggenheim Professor of Aerospace Health and Safety there.

Dr. McFarland was a member of the Commission on Accidental Trauma from 1958 to 1959, and was its Director from 1959 to 1969. During meetings of the Board, he carefully explained the ramifications of accidents in the military, including time lost from work, mortality, and prolonged convalescence. Among the many contributions that this Commission made under his leadership were the demonstrations of both the significance of whiplash injury and the protection provided by the wearing of seatbelts. These two major contributions helped to reduce the morbidity of vehicular accidents.



FRED DAVENPORT, M.D.

No one connected with a Commission of the Board was more persistent in his effort to reach the right conclusion than was Fred Davenport. His former chief, Thomas Francis, passed the influenza baton on to Fred. The control of influenza by vaccine was then being intensively researched, as were also the pathogenesis and epidemiology of influenza. He collaborated with the Influenza Commission as a member and directed its activities from 1955 to 1971.



WILLIAM McD. HAMMON, M.D.

Bill Hammon was a working member of the AFEB system practically from its beginning. As a protége and associate of K. F. Meyer, Bill was actively involved in the initial isolation of the western equine encephalitis virus in California in the 1930s. Later, he directed the development of the Department of Epidemiology at the University of Pittsburgh School of Public Health. He developed the data there that showed, in a large field trial, that immune serum prevented poliomyelitis. This major contribution to the understanding of poliomyelitis was an essential forerunner to its control, first by inactivated (Salk) and later by attenuated (Sabin) poliomyelitis vaccines.

Bill was straightforward, meticulous, and thorough. He was able to use historical information to single out leads that were likely to uncover new data. He made long, productive field trips to the Far East for epidemiological and laboratory studies of the encephalitides and the hemorrhagic fevers, including dengue. Dr. John Paul, director of the Commission on Virus Diseases until 1956, leaned heavily on him for help. Bill was Director of that Commission from 1956 to 1965, and was appointed to the Board in 1965.



CHARLES L. WISSEMAN, JR., M.D.

At the University of Texas Southwestern Medical School at Dallas, Charlie Wisseman was a top student, and throughout his life he was a scholarly and productive scientist. He was Chairman of the Department of Microbiology at the University of Maryland for 38 years.

Following World War II, he worked with Joe Smadel at WRAIR. He pursued the mysteries of typhus, encephalitis, leptospirosis, and other diseases of military importance both at the bench and in the fields of Malaya, Borneo, Pakistan, and Africa. He was Director of the Commission on Rickettsial Diseases from 1959 to 1973, when the Commission system of the AFEB ceased Since then, he has been a consultant to many governmental and international agencies, including the World Health Organization.



KENNETH GOODNER, Ph.D.

Known as K. G. by his students of microbiology at Jefferson Medical College for more than two decades, Kenneth Goodner was one of the most effective medical school teachers of those in medical scientists who contributed to the AFEB and its Commissions. He was born in McCune, Kansas. After his initial schooling, he became a doctoral candidate at Harvard under Hans Zinsser. K. G. was a contributing member and silent supporter of the cadre of brilliant young men at the Rockefeller Institute for Medical Research during his sixteen years there. His special legacy was his contact with and personal interest in young scientists. He wanted young men and women to achieve their potential as fine physicians and scientists and he never ceased to impart the glow of his enthusiasm. This desire to cultivate the new generation was fed by the rich tradition of medical history, which was one of his chief interests

His knowledge was broad and he served the AFEB as the conscience of the Commission on Immunization. K. G. was recognized internationally for his scientific contributions to immunology. He helped to develop the yellow fever vaccine and studied pneumococcal pneumonia, plague, and cholera. He was a charter member of the group that decided, in 1958, to locate the Cholera Research Laboratory in Dacca, Pakistan. He perceptively observed the significance of *Escherichia coli* as a causative agent of human diarrheas when interest in the cholera *vibrio* was reborn. K. G. simply said to a group of experimental physiologists and clinical microbiologists in 1960: "Don't forget to put *E. coli* into the intestinal loop."

Thanks are due Kenneth Goodner for his tireless search for medical knowledge and his devoted contribution to the public interest

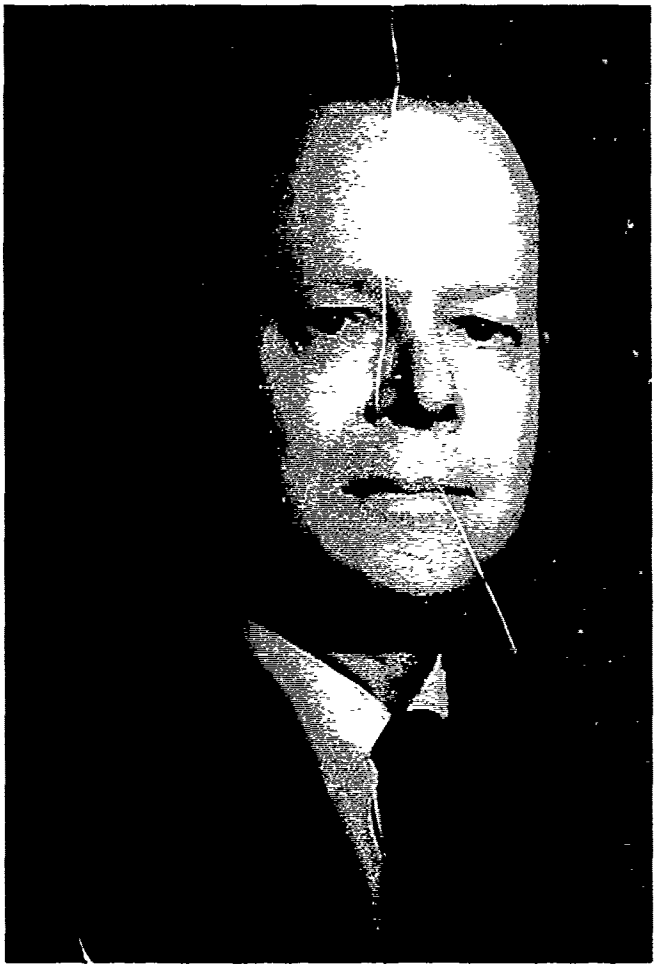


WILLIAM FRANKLIN SCHERER, M.D.

Bill Scherer graduated from the University of Rochester School of Medicine and Dentistry in 1947; he interned in medicine at Barnes Hospital in St. Louis, and also served an internship in pathology at the Strong Memorial Hospital in Rochester. Bill was a resident in medicine at the Vanderbilt Hospital from 1949 to 1950. At the University of Minnesota School of Medicine, from 1950 to 1962, he progressed from Instructor to Professor of Microbiology. In 1962, he was appointed Professor and Chairman of the Department of Microbiology at Cornell Medical College, where he made scientific contributions of lasting importance.

Bill chaired the Board of Scientific Counselors at the National Institute of Allergy and Infectious Diseases and was the Theobold Smith Awardee of the American Association for the Advancement of Science During his early years, he was a National Research Council Fellow and a Markle Scholar. Bill is credited with having been the first to cultivate polio virus in human Hela cancer cells.

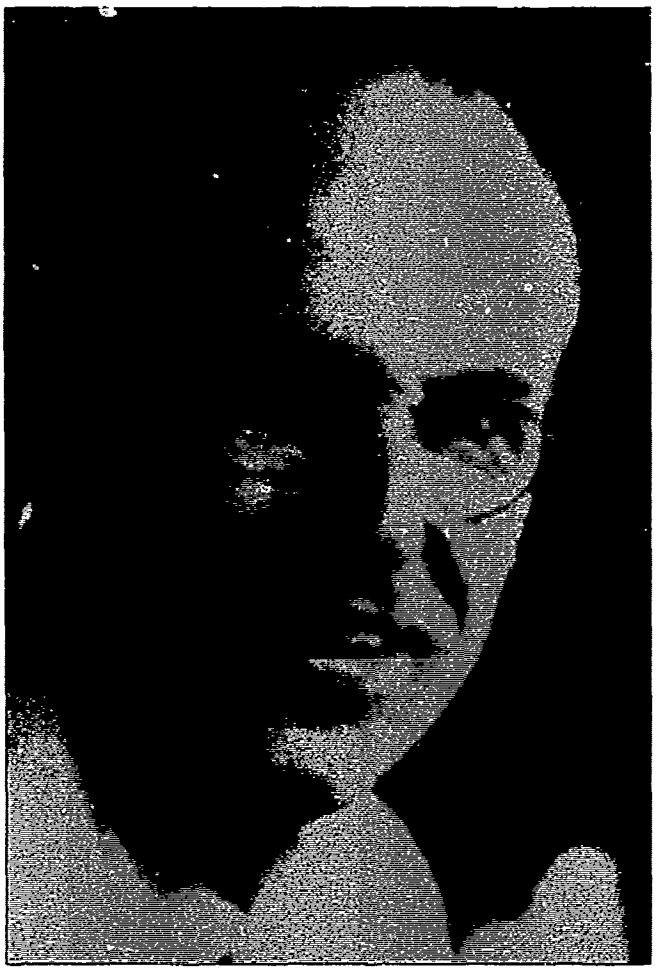
The AFEB was privileged to have Bill Scherer direct its Commission on Viral Infections from 1965 to 1973.



THOMAS H. WELLER, M.D.

Tom Weller always conducted himself as a meticulous student of medicine, thoroughly schooled in the fundamentals of the scientific method. Trained as a clinical and laboratory-oriented pediatrician, he extended his capabilities into the fields of virology and parasitology. With his mentor John Enders and his associate Fred Robbins, he received the Nobel Prize for the cultivation of poliomyelitis virus in tissue cultures.

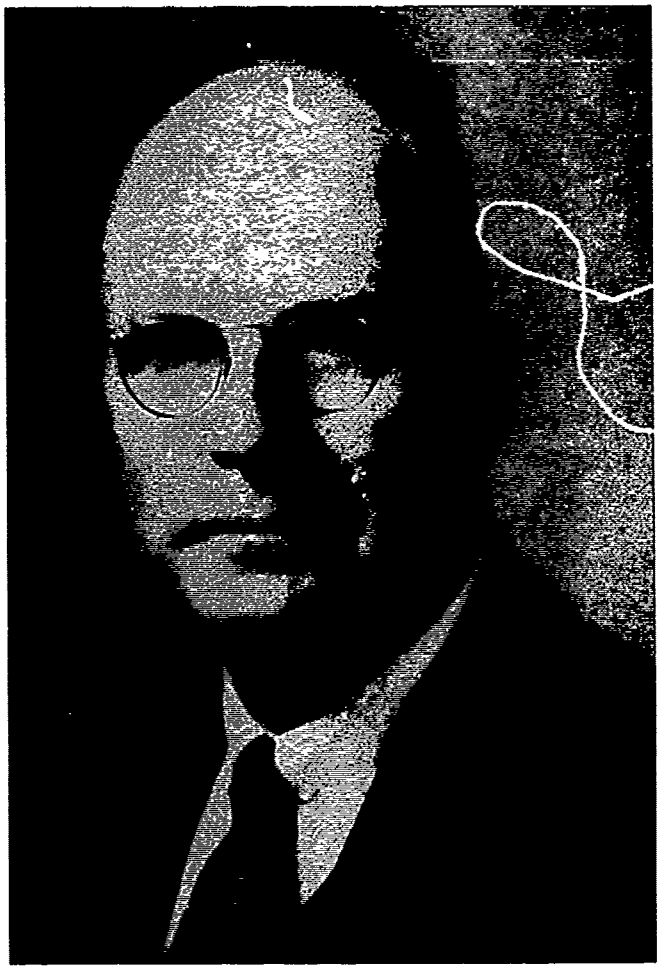
Tom willingly responded to military medical problems; he served with distinction on the Commission on Parasitology and directed its activities from 1953 to 1959, while concurrently engaged at the Harvard School of Public Health. The AFEB Commissions on Malaria and Virus Diseases profited greatly from Tom Weller's wise counsel, teaching ability, and scientific contributions.



W. BARRY WOOD, JR., M.D.

Barry Wood was a proud alumnus of Harvard College and The Johns Hopkins University School of Medicine He excelled as an academician, and was Chairman of the Department of Medicine at Washington University School of Medicine in St. Louis. One of his major contributions to the field of biology was his demonstration of the phenomenon of surface phagocytosis.

Barry was an early member of the AFEB and one of the charter members of its Commission on Epidemiological Survey. His presence and stature enhanced the Board and its Commissions.



FRANK BROWN BERRY, M.D.

Dr. Berry was the second physician to be appointed Assistant Secretary of Defense for Health. He took the oath of office on 28 January 1954 in a ceremony at the Pentagon, in the office of Secretary of Defense Charles E. Wilson.

Dr. Berry graduated from Harvard Medical School. He served as a medical officer in both world wars and held the rank of Brigadier General in the Army Medical Corps. For many years, Dr. Berry was a professor of clinical surgery at Columbia University College of Physicians and Surgeons. He was a founding member of both the American Board of Surgery and the Board of Thoracic Surgery. Beginning in 1946, he served as a national consultant in surgery to the Surgeon General of the Army and, in 1948, he became a member of the Committee on Medical Sciences of the Research and Development Board.

Dr. Berry always interacted enthusiastically with the Armed Forces Epidemiological Board. His help and contributions made it possible for the Board and its Commissions to relate effectively to the various military services through the offices of the respective Surgeons General. Whenever possible, he attended meetings of the Board and made helpful contributions. During his tenure, the Berry Plan for the recruitment of young physicians into the military services was implemented. It was in this area that the AFEB was able to assist the Office of the Assistant Secretary of Defense for Health Affairs, under Dr. Berry's guidance.

PART V

The Series of Events that Culminated in the Transformation of the Armed Forces Epidemiological Board From an Operational and Research Function to an Advisory One

There was considerable unrest in Washington during the early 1970s. The press, preoccupied with conflict-of-interest issues, scrutinized the activities of government officials almost daily, which led to a general bureaucratic housecleaning. In July 1970, President Richard M. Nixon appointed a blue-ribbon panel to study the Department of Defense. Responsible military medical officers were concerned that the AFEB and its Commissions might appear to be in violation of conflict-of-interest laws.

One of the strengths of the Commission system was that the leaders in the investigation of any given epidemiological problem were also members of the relevant Commissions; they, or their parent institutions, were the recipients of the AFEB's contracts to carry out the necessary research. Under this system, the country benefited from having the most knowledgeable people working on the problems that most urgently needed their expert attention. The civilian physicians and medical scientists that comprised the AFEB and its Commissions hardly considered themselves likely targets of any scrutiny, but nothing could have been further from the truth.

The first inkling that the Board was involved in the housecleaning came in a letter from Brig. General Richard Taylor dated 11 December 1970, which was transmitted to AFEB members on 30 December. General Taylor, who was the Deputy Assistant Surgeon General, indicated that there would be a tertiary review of the Board and its Commissions by "appropriate representatives of the U.S. Army Medical Research and Development Command." There have always been reviews of government-sponsored agencies, and properly so. The Army's Medical Research and Development Command is responsible for the expenditure of funds appropriated by the Congress, and is accountable for such monies. A number of Board and Commission members feared that the AFEB might be prevented from developing a scientific program relevant to military needs—the function which had been so effective for three decades. The members believed that the directive for bureaucratic scrutiny had come from sources higher up, and not from General Taylor's office.

At its thirtieth anniversary meeting on 18 February 1971, Dr. Colin MacLeod, a charter member who had been President of the AFEB from 1947 to 1955, addressed the Board and its military representatives on the issue of conflict of interest. His speech follows:

I do not intend to spend my time in empty accolades because we have important business at hand that must be addressed.

I suppose one of the reasons I get called upon to talk on occasions such as the present is my long association with the AFEB and its Commissions as well as with its predecessor organization, the Army Epidemiological Board, which began to be organized in late 1940 and 1941 under the awesome title of Board for the Investigation and Control of

Influenza and other Epidemic Diseases in the United States Army. It was not by chance that some of the moving figures in the organization of the original Board had served on a variety of Commissions organized by the Army during World War I, such as Francis Blake, A. R. Dochez and Fess Avery, stimulated by Steve Simmons. The idea of Commissions in the medical department of the Army is of course considerably older than World War I and goes back, if my memory serves, to General Sternberg himself and perhaps even before. They have a long and important history in American military medicine.

I was Director of the Commission on Pneumonia, which was established in 1941. It was one of the original Commissions of the Board and functioned throughout World War II. At the end of the War, in a general reorganization, some of the Commissions were discontinued or combined, presumably because they had accomplished their task well—or possibly because they had not done so. In any case, the Pneumonia Commission was discontinued and I was kicked upstairs to be a member of the Board, and shortly thereafter succeeded Dr. Bayne-Jones as President of AEB in the spring of 1946. He had been President for one year when Dr. Blake retired at the end of the war.

I am impressed with the recurrent patterns that have appeared over this 30-year period. At times, especially when cuts in funds are imminent or actual, there appear reactions that border on the paranoid, both from the side of the civilians on the Commissions and the Board and the military medical services—but I do not intend to dwell on this point, except to indicate that both are engaged in a common purpose and that each has much to offer military medicine. I would hate to see us get so smug that this statement of fact does not burn itself into our consciousness every day. I believe everyone on the Board and Commissions is aware that while they devise and carry out programs and make recommendations of both scientific and fiscal nature, the Congress places the ultimate responsibility for the expenditures of our tax funds on the military services and holds them accountable. This fact, from time to time, has caused a good deal of uncertainty about who does what and may lead to strained relations between the Surgeon General's office and civilian investigators as to the present time.

The Commission structure of AFEB antedates the Study Section system of NIH. I don't know how much the Commission structure influenced the Study Section development, but I should point out that Dr. Rollo E. Dyer, the then Director of NIH, was close to AFEB during World II and also [was] a very important member of the Typhus Commission, which also operated out of the Preventive Medicine Division of the Surgeon General's office. Actually, how do the Commissions differ from the NIH Study Sections? The differences are very great in actuality since the Commissions are entrusted with the responsibility of devising programs, and, in collaboration with the medical departments of the three military services, seeing to it that the programs are carried out. The Commissions are made up of experts in their area of concern, which is generally a well-circumscribed, disease-oriented area. To use a bit of modern government jargon, they are goal-oriented. Members of Commissions commonly derive a good deal of their support from Army Medical R & D funds, but this in no way disqualifies them from being members of the Commissions—in fact it is in their favor. The question is: can they be dispassionate about who else gets his work supported since they are in competition for the same funds? I will come back to that question in a moment.

Study Sections of NIH, on the other hand, are not goal-oriented and usually do not have any responsibility for the development of programs, although it is true from time to time that they may make recommendations about programs to NIH, but the Study Section as such will not carry that program out. They are passive, judicious bodies; [their] function is to review applications sent to them. Because of the very broad areas of biomedical science they must cover, it is not uncommon, at least in the wide area of medical microbiology and infectious diseases, that a Study Section may not have on its membership people who are intimately aware of the significance of the work proposed by particular applicants for funds. Possibly this happens infrequently but one knows of instances of sufficient number and seriousness to make one realize that the Study Section system leaves something to be desired. It is not covered by holiness as some would aver. Errors in judgment may be made on both sides: Work that has high scientific merit may be turned down or given a low priority, or on the other hand, pedestrian studies may be given a high priority and be funded because no one on the Study Section is sufficiently expert to make the appropriate judgment.

Study Sections are presided over by a Chairman who is relatively inactive in the intervals between meetings, whereas the Director of a Commission is continually involved in Commission affairs, and as everyone in this room knows, who is now or who has been a Commission Director, this involves a great deal of work the year round which is literally taken out of his own hide and that of the University where he works. The military services get a great deal of work, which is gladly done, but for which they do not have to pay.

It has been said by people who should know better that the Commissions consist of groups of people who hand

out money to each other—that they are on the inside track for Army research funds and prevent anyone else from breaking into their charmed circle. This is manifestly unfair, but all here have heard these uninformed and unfair criticisms more than once.

Actually, what does prevent the Commission members from being in conflict of interest, since it is true that members usually have a portion of their work that deals with Commission program supported by Medical R & D funds? There are a number of factors which historically have prevented this from happening. The first of these is personal morality and Commission morality. I realize a statement of this kind won't satisfy the green-eyed legal critics who see evil everywhere, but nonetheless personal morality is the strongest force in preventing conflict of interest not only in AFEB Commissions but everywhere else in human affairs. I am impressed by the concern the Commissions have had to avoid conflict of interest and I don't know of instances in AFEB where it has been a problem. As Dr. Bayne-Jones once remarked in another context, "You have to be like Caesar's wife and fall over backwards." I should also note that you cannot legislate morality nor can the Judge Advocate General or the General Accounting Office set down a prescription for it. But there are other factors that are somewhat more tangible and which minimize the possibility of conflict of interest. In the first place, the Commissions do not make the final judgment based on quality, relevance and cost. They recommend to AFEB which in turn deliberates on the recommendation and then makes its own recommendation to Army Medical R & D. It is of course uncommon for the Board to alter the recommendations of Commissions related to scientific judgment. This is not in the least surprising because after all, the Commissions are made up of the real experts in the field and are mature, responsible scientists who have remarkable dedication to their important tasks.

AFEB's recommendations are then acted upon by Army Medical R & D so that two echelons of review are imposed between the actions of the Commission and the awarding of a contract.

This three-layered formal mechanism of review obviously provides safeguards which I consider ample by themselves to prevent any hanky-panky were it to arise through any inadvertence.

There has also been built into the system from its beginning a very interesting set of controls imposed by the review for both scientific merit and relevance or pertinence to the mission of the medical departments of the three services. You will recall that NIH Study Sections pass on scientific merit alone. AFEB and its Commissions not only determine the scientific merit of a proposal but also make a judgment of its military relevance and whether the cost of carrying it out is reasonable because cost considerations influence both other judgments. Army R & D then takes these twin judgments and if it disagrees with the estimate of military relevance or cost, it can take appropriate final action—either pushing the ratings down or up. I suspect it to be rare that R & D disagrees with the judgment of scientific merit made by the Commissions and the Board, but we always have had recurrent discussions—sometimes sharp—with the military representatives to the Commissions and the Board concerning the relevance of proposed research. This is as it should be since the scientist through ignorance may overlook important military considerations, and the scientific administrators may overlook the relevance of a particular piece of work because they are not fully cognizant of the implications for military medicine of the research proposed. They can't be experts on everything. So there have to be discussions of the merits of the case before arriving at the final decision and intelligent men can differ in this judgment.

Let me emphasize, however, that the determination of relevance at all three levels of judgment is an extremely important factor in minimizing conflict of interest on the part of the Commissions and Board. We have excellent proposals submitted which are turned down because judgment of relevance gives a low priority. If scientific merit is given a one rating and relevance a five, a proposal has no chance. By the same token, if the science is weak or off the mark and the relevance is great, it suffers the same fate—that is to say, poor science is never relevant. I should also emphasize that how much a project costs is extremely important in determining both its scientific merit and its relevance and cost cannot be dissociated as has been proposed. This idea is both shocking and alarming because of its naiveté.

Because of these multiple sets of controls, the Board and its Commissions, I believe, have been able to function in an atmosphere singularly devoid of conflict of interest. I hope we will continue to function in this way for many years to come in our joint mission of preserving the health of our troops. This is our primary mission and let us not forget it. Sometime yesterday I thought, 'The mission is about to play second fiddle to bureaucratic neuroses.'

The subject of relevance has other implications as well as that of being an index of the [worth] of a proposal. And this gets involved in that old struggle about basic and applied research. This has been going on since the first Commission was established and I dare say will take up a large part of the obituary of the Board. When I was

President of the Board (9 years), there was one Commission whose meetings I made sure never to miss, because one influential and highly articulate member, himself an outstanding scientist as recent events have once again confirmed, invariably gave an emotional speech at the beginning of the meeting and at intervals thereafter to the proposition that AFEB should support practical research only—it seemed at times that anything that wasn't involved in the direct production of a viral vaccine should be out of bounds!

Despite the eminence of this critic and his record of high performance, I must make the point that if his advice had been followed, many of the most significant contributions of the Board would never have come about. I believe that our failures have been due to our inadequate appreciation of the lack of fundamental knowledge in a particular area and not because of failure to apply what was already known.

Lack of foresight is a crippling factor too. For example, we should have gone to work on meningococcal immunization immediately after World War II even though the effectiveness of the sulfonamides was undoubted. Mass chemotherapy or prophylaxis is just not good military medicine, although as a stopgap we may have to use it. Furthermore, there was enough experience then of sulfonamide resistance in other bacteria to make it almost a sure prediction that it would happen with meningococci also, especially under conditions of mass prophylactic use.

May I remind you of the sad story of malaria and the pickle we are in now because we did not use our wits after World War II and [did not] realize that resistance to chemotherapy on the part of the malarial parasite was inevitable and that the mosquitoes were not going to take DDT lying down either. I hope we will remember this tragic lesson in designing our future course of action because malaria is certainly going to be with us in the indefinite future and chemotherapy is probably not going to handle it unless some truly miraculous drugs are discovered.

Another crucial point about the support of the more basic relevant research is that you just cannot attract the best scientific minds—and we need them beyond all else—if their activities are going to be circumscribed by what is already known and by its application to military situations. As I have said, there never has been much of a problem applying what is known but the art of research consists of picking the significant things that need to be discovered—and then discovering them.

I have talked too long. Let me close by saluting the Board and Commissions on this 30th Anniversary—and also by saluting the perspicacity and deep scientific insights of so many extraordinary officers in the three military services who have been so strong in support of the best in science. I could only wish that the latter did not turn over so fast that the process of self-education has usually been completed about the time they are due to move on to another assignment. In actuality the real continuity in military preventive medicine resides in this Board, unpalatable as that statement may be to some of you. The trend that seems to be developing is to break that thread of continuity through the introduction of procedures so onerous and so unintelligent that the functioning of the Commissions and this Board will be virtually impossible. It seems that nebulous fears about a conflict of interest, [which] does not exist and never has, have caused the military medical services to run so scared that they are by way of forgetting their mission. Gentlemen, may I suggest that you revive your actions from that point of view and not from the point of view that there may be a staff man in some subcommittee of the House who fancies himself as a giant killer and really has little concern for the welfare of science—nor, I dare say, for the mission of the medical departments of the three services which is intimately tied to good science. Excellent science at the least cost has always been the hallmark of this organization, the AFEB. It looks as though we are in for an era in which both quality and economy are going to be sacrificed because we are afraid to stand up for what we know is true. As one who has spent a great deal of his time over the past thirty years working to improve the health of our troops, this saddens me deeply. As a taxpayer, it makes me simply angry.

Nevertheless, a management study of the AFEB was in progress. The three-member management study team included Elliott J. Williams, Lt. Colonel Phillip E. Winter, MC, (both from the Office of the Surgeon General of the Army), and Lt. Colonel Frank F. Jordan, MSC, from the Army's Medical Research and Development Command. The study team consulted with a number of Board members and Commission Directors and scrutinized records dating back to 1941, when the AEB was organized. Board members received a copy of the detailed management report on 11 May 1972, and it was formally presented to the Board at its meeting on 18 May 1971. Internally, the report was submitted to Dr. Richard S. Wilbur, Assistant Secretary of Defense for Health Affairs, and the three Surgeons General for their review.

RICHARD S. WILBUR, M.D.
Assistant Secretary of Defense for Health Affairs



The report attempted to review the accomplishments of the Board and its Commissions since their inception in 1941. A number of important contributions were highlighted, but there were many gaps. Special visits by individual Board members, Commission members, or small research groups, who had contributed to many important field operation problems, were left unreported. This unique program had had vast experience during the preceding thirty years; it is understandable that the management survey failed to grasp its magnitude.

Everyone concerned might have been more comfortable if the initial statements had simply said that the bureaucratic climate in Washington, and particularly in the Department of Defense, now required a reevaluation of many government-sponsored civilian agencies, including the AFEB. The management survey group could have set this tone in its study and presentation.

But a different tone was set from the beginning, which placed the AFEB in a defensive position. Disbelief, anger, and resentment were expressed during the discussions that occurred after the limited distribution of the AFEB management report. The Board and Commission members had always understood the concept that changes in government-sponsored agencies occur. The original influenza board, the AEB, and the AFEB had all accepted new charters that had been adapted to current trends. But the management report described "an obsolete bulky system" that was "too large" and "inflexible," "repetitious in its programs," and "uninformed of the reality of military medical problems."

One wonders what Stevens Simmons and Stanhope Bayne-Jones would have thought had they been

present. The men and women who had served the Board and its Commissions during the previous thirty years had served their country and served it well, without compensation, simply because they desired to contribute. The report's historical account of the Board's and its Commissions' activities was totally inadequate and inaccurate. This, combined with a "verbal spanking," bruised feelings. At this point, the AFEB could well have ceased to exist.

The report spoke of "problems of the AFEB" that included "financial conflict of interest." It stated: "There is no question that the present system violates the spirit if not indeed the letter of the law. It is improper to hold a government contract and be an official member of the review group that technically approves one's research proposal even if the advisor leaves the conference room during the discussion." It referred to the practice of reappointing scientists to key assignments, but it specified that there was a good reason for this practice: The AFEB was the repository of the military's "institutional memory" for infectious diseases and other medical problems.

The report commented that the AFEB was not responsive to "the changes in missions and priorities of the military medical departments." There were certain exceptions to this statement on the AFEB's limited organizational flexibility. For example, the Commission on Epidemiological Survey, which I directed, had Colonel Dan Crozier as its executive officer. The report commended this arrangement. When the report noted the overlapping responsibilities between the Commissions, it was critical that members of the AFEB system and those of the in-service laboratories had no functional means of communication and coordination. (This criticism was valid, and the situation had been partially corrected when, beginning in 1960, the Preventive Medicine Division of the Army Surgeon General's office had referred its problem to USAMRDC. They, in turn, had consulted with AFEB and non-AFEB contractors to address the problem. Operational questions for the Preventive Medicine Division traditionally had been transmitted to the Board.) The study group foresaw "a requirement for joint operational advisory groups in such areas as the medical aspects of environmental pollution and securing and retaining scarce health professionals in a zero-draft force."

The following two options were recommended in the management report:

Option I: Keep the AFEB intact, with administrative options to eliminate conflicts of interest; fix a tenure policy; and appoint younger members. At a minimum, it would be necessary to *(a)* prohibit members of the AFEB from holding research contracts, *(b)* limit tenure to four years, *(c)* reduce the number of Commission members by one-third to one-half, and *(d)* restrict the size of the Commissions to no more than five to seven members.

Option II: Separate the operational and research advisory missions of the AFEB. The Board could be retained as a joint advisory group for advice on operational problems on preventive medicine. The Army Surgeon General could establish advisory groups tailored to the requirements of the medical research and development program. The Board would remain as a joint agency to provide the three Surgeons General scientific and technical advice and assistance in developing and executing preventive medicine programs, policies, and procedures as required. Board members were to be selected on the basis of their scientific and academic standing in fields related to the Board's function, including, but not limited to, communicable and chronic disease epidemiology and control, environmental health, data collection and analysis, health-care delivery, and health maintenance. The management agent for the Board would be the Surgeon General of the Army.

The study group concluded that:

- The AFEB and its Commissions have been of inestimable value to the Armed Forces for over thirty years in providing expert medical advice in the control of infectious diseases
- The availability of trained preventive medicine officers, the emergence of a military medical research

and development community, and the growing effectiveness of the organization for the prevention of disease has materially lessened the need for AFEB assistance in both field investigations and contract research

- There is a viable requirement for an AFEB, especially one that has interests extending beyond the confines of classic disease control, and that can provide scientific and technical advice on priorities, policies, and procedures in applying new technological and epidemiological principles to chronic disease control, environmental pollution control, and the design of new systems of health maintenance
- The organization of the Commissions should be revised so that they *(a)* are severed from the Board's control, *(b)* function as consultants in the research and development structure, and *(c)* are effectively removed from the onus of a conflict of interest
- The Surgeon General of the Army should remain the executive agent, but the members of the Board should also be appointed as consultants to the Assistant Secretary of Defense for Health and Environment
- A separate medical research advisory system should be established for the Surgeon General of the Army
- The Army's Director of Health and Environment should be given sole staff responsibility for supervising the Board, including its operation and maintenance, with funding through the Army's Office of Maintenance for proper administrative support
- There is no requirement that the executive secretary of the AFEB be a physician qualified as a preventive medicine officer

The Board Considers the Management Survey Report

The Board and the Commission Directors met on 12–13 July 1972 at WRAIR, and the discussion was devoted almost entirely to the management survey report. As requested, most Board members and Commission Directors had previously submitted letters to Executive Secretary Colonel Bradley W. Prior, offering their comments. General Richard Taylor of the Research and Development Command, who was the Surgeon General of the Army from 1973 until 1977, and senior staff members of the three services attended this meeting. Dr. Dammin and Colonel Prior prepared detailed minutes of the discussions, which had been taped during the two-day meeting; the minutes were transmitted to each member and Commission Director. (That document, which comprises 109 double-spaced typewritten pages, is on record in the AFEB office.)

The discussions, which were often heated but always under control, focused on *(a)* why change was necessary, *(b)* why the management report did not more accurately portray the Board and its Commissions' activities during their thirty years of creditable performance, *(c)* which of the options, *I* or *II*, was best suited to satisfy the current bureaucratic climate, and *(d)* did the respective Surgeons General really want to have a board like the AFEB? Colonels Edward L. Buescher, MC, Jerome Greenberg, MC, and Robert J. T. Joy, MC, all of whom were familiar with AFEB activities, were positive that a change in scope and function was indicated. They stressed the improved and expanded intramural scientific capability to deal with problems of military medical significance, and the improved recruitment of qualified personnel to key positions in preventive medicine. The participants left the meeting exhausted and with an element of unease, but finally understanding why the Research and Development Command was required to make basic changes in this long-standing and effective organization.

The 12–13 July meetings and events during the coming several months helped to smooth frayed sentiments. The worst did not occur because rational minds on each side of the issue had the same thought: "What is best for our country and our military services?" During this critical period, Dr. Gus Dammin, General Hal Jennings, and General Richard Taylor led the AFEB toward a much happier outcome than had earlier appeared possible.



Armed Forces Epidemiological Board and Directors and Deputy Directors of the Commissions
18–19 May 1972

Seated, left to right. Dr. William McD. Hammon, Dr Edwin H Lennette, Dr. Gustave J. Dammin, President of the Board, Dr. Francis S. Cheever, and Dr Charles H. Rammelkamp, Jr.

Standing, left to right, front: Dr. Gordon Meiklejohn, Dr. David Minard, Dr. David Taplin, Dr. Bennett L. Elisberg, Dr Richard M. Krause, Dr. Paul C. Beaver, Colonel Bradley W. Prior, MC, USAF, Executive Secretary, Dr Robert L Kaiser, and Dr. Floyd W. Denny, Jr

Standing, left to right, rear: Dr. Lewis W. Wannamaker, Dr. William F. Scherer, Dr. Saul Krugman, Dr. Theodore E. Woodward, Dr. Charles L Wisseman, Jr., Dr. Abram S. Benenson, Dr. George G. Jackson, Dr. William S Jordan, Jr., and Dr Thomas R. Hendrix.



LIEUTENANT GENERAL
HAL B. JENNINGS, MC, USA
The Surgeon General



BRIGADIER GENERAL
KENNETH DIRKS, MC, USA



GUSTAVE J. DAMMIN, M.D.

There are few among us who possess the competence, commitment, wisdom, and equanimity that Gus Dammin displayed. His productive war record was followed by a stellar career as an experimental pathologist at Washington University School of Medicine in St. Louis and at Harvard Medical School The AFEB was fortunate to have him as a contributor to several of its Commissions, a member of the Board, and its President from 1960 to 1972.

During this twelve-year period, the Board and its Commissions dealt with substance abuse in the military, immunization practices, and changes in the organization of the AFEB Gus steered a steady ship. He saw issues and problems through to their best solutions by his appointments of consultants, the Board and its Commissions flourished under his guiding hand. A careful and dedicated scientist, Gus Dammin not only advised other investigators, but he also made major contributions of his own. His leadership of the AFEB was of unquestioned historical significance.

At the July meeting, General Taylor appointed Colonel Richard Barquist, (chairman), and Colonels Dan Crozier, Edwin Buescher, Robert Joy, Thomas Lamson, and Kenneth Dirks to a task force and charged them to develop a workable plan for a new advisory system for the Army Medical Research and Development Command. Colonel Dirks presented the task force's report to the AFEB on 15 December 1972.

Between the July and December 1972 meetings of the Board, Dr. Dammin and Surgeon General Hal Jennings held productive discussions. Dr. Dammin's December 1972 memorandum to the Board and the Commission Directors, which follows, described this progress:

I had an extended and very encouraging telephone conversation with Gen. Jennings last Friday about the Management Survey Report, the proposed DOD Directive, the Board and Commissions. He mentioned how grateful he was for our standing offer to help in the development of an effective successor to the AFEB and then described more recent considerations by his staff of the future of the AFEB. He stated that the proposed DOD directive, as we reviewed it in July as part of the Management Survey Report, had not been released. Indeed, it was being recalled from DOD for revision. Further consideration of the proceedings of the AFEB meeting in July led Gen Jennings to inquire further about the feasibility of having Commissions support the work of the AFEB in its reorganization Gen Jennings and his staff are now undertaking a revision of the DOD Directive so that it will provide for a Board-Commission structure. It will, of course, differ from our present pattern in that its primary function would be advisory in relationship to policy, plans and operations and no longer relate to research and its funding I believe that the distinction which must be made now between preventive medicine operations and research was discussed in sufficient detail at our July meeting and so covered in the Minutes of that meeting.

Speaking for the Board and its Commissions, I assured Gen. Jennings again of our willingness to help him and his staff, and the DOD, promising to set aside sufficient time during our 15 December meeting for a review of a revised DOD Directive which would call for a Board-Commission organization. Planning and funding preventive medicine research would receive separate consideration at this meeting. Gen. Jennings is to have Gen. Taylor and Col. Greenberg confer with Lt. Col. Wilks and me on the agenda. I had begun drafting an agenda and had just spoken with Lt. Col. Wilks about it, when I received a call from Gen. Jennings on Friday.

Again in December 1972, Dr. Dammin distributed the following memorandum, which indicated further good progress, to the membership:

I returned yesterday evening from the meeting of our Commission on Rickettsial Diseases which covered two full days of reports and discussions of almost all aspects of rickettsial disease. This surely is the kind of meeting that must be in the planning of the Board that is to succeed ours. There is no other meeting under any sponsorship which brings together as many workers and as much knowledge about rickettsial disease.

At the meeting, I received the revised draft of the proposed DOD Directive (5154 8) which calls for Commissions to serve with the new Board. If promulgated as scheduled, the reconstituted Board would begin its service on 1 January 1973. Should this not proceed as planned, then the new Public Law 92–463 ends the service of our Board on 6 January 1973 Discussions which I had at the meeting hinted that the new Board and its Commissions may not be organized soon enough to avoid a discontinuity in AFEB activity I mention "AFEB" because I understand that the Army intends to continue the use of the present name of the Board.

The 15 December 1972 meeting of the AFEB and its Commission Directors was most productive and served to clarify many of the issues; that meeting's agenda appears on page 131.

During the meeting, General Hal Jennings reaffirmed his views that *(a)* the AFEB was greatly desired and needed by the military services, *(b)* the name AFEB be retained, and *(c)* the AFEB could establish ad hoc task groups (formerly called Commissions, and in the future to be called Subcommittees of the AFEB), provided that there were a limited number of members, that the AFEB and its Subcommittees comply with the new Public Law 92–463, and that they avoid any semblance of a conflict of interest. General Jennings stressed the need for the AFEB to work closely with the new panels (or advisory groups), which would be discussed by Colonel Dirks, although the AFEB could not advise on the awarding of a contract,

The Agenda of the 15 December 1972 AFEB Meeting

0900 Introduction and Announcements: *Dr Dammin, President*
Lt Col. Wilks
Lt. Gen. Jennings
R. Adm. Geib
Maj Gen Steel

0915 The Future AFEB. *Lt. Gen Jennings*
The Research Advisory Structure: *Col Dicks*
Discussion

1000 Recess and Coffee

1015 Military Reports
Chronic Diseases: *Col. Cutting*
Medical Fitness (Physical Standards): *Maj. Friedlander*
Venereal Diseases–1972. *Col Cutting*
Discussion
Navy *Capt. Alexander*
Air Force: *Col. Nugent*

1100 Reports of Commissions
Streptococcal and Staphylococcal Diseases *Dr Wannamaker*
Acute Respiratory Diseases: *Dr. Denny*
Influenza: *Dr. Meiklejohn*
Viral Infections: *Dr Scherer*
Epidemiological Survey. *Dr. Woodward*

1215 Recess and Lunch
Executive Session –*Board Members, Commission Directors, and Deputy Directors*
Group Photograph

1330 The AFEB Archives
A Moving Portrait of Dr Joseph E. Smadel: *Dr Woodward*

1345 Reports of Commissions
Malaria: *Dr. Powell*
Parasitic Diseases: *Dr Beaver*
Environmental Health: *Dr. Minard*
Cutaneous Diseases: *Dr. Blank (Dr Strauss)*
Immunization *Dr Benenson*
Enteric Infections: *Dr Hendrix*
Rickettsial Diseases *Dr. Wisseman*
Discussion

1530 Recess and Coffee

1545 Executive Session—*Board Members*

1630 Adjournment

it could render advice on the proposal. General Jennings asked the board to study the new AFEB charter and to make comments and suggestions. He suggested that the AFEB plan its next meeting in conjunction with the meeting of Preventive Medicine Officers in April 1973, and that no further meetings of the AFEB Commissions should be held until their charters had been approved.

Colonel Dirks then presented the task force report and delineated the ground rules, compatible with Public Law 92–463, for government-sponsored boards and committees. These regulations were deemed to apply to the AFEB, or to subsequent commissions or advisory groups, that would serve the Army Medical Research and Development Command. The law specified that *(a)* advisory meetings be public, *(b)* there must be a timely announcement of each meeting in the *Federal Register*, *(c)* records must be available for public inspection and copying, [NOTE. The military recognized that there must be special exemptions for privileged or confidential information. EDITOR.] *(d)* detailed minutes of each meeting must be kept, *(e)* an officer of the federal government must be present at each meeting, *(f)* meetings will be called only by that responsible federal officer or with his prior approval of the date, time, place, and agenda, and *(g)* Committee tenure will be for two years, and will be subject to renewal only by the approval of the head of the responsible agency.

Colonel Dirks concluded his presentation by stating that those now establishing the advisory system for USAMRDC should maintain their previous vigorous effort to recruit highly qualified consultants in infectious diseases, and that the members would not be eligible to hold contracts with USAMRDC during their period of service.

The newly recommended system embraced the establishment of research-proposal review committees (entirely separate from the AFEB) that complied with the new public law on advisory committees, conflict of interest, and other statutes closely related to in-house laboratory professional expertise, and would facilitate the coordination of in-house and extramural military research.

The Board Is Reorganized Under Its New Charter

General Jennings's and Colonel Dirks's presentations and their comments during the ensuing discussion were favorably received by the Board and Commission Directors. Then Colonel Dirks presented the AFEB's proposed new charter. The Board met in executive session, and after making a few minor revisions, recommended that the document be adopted. (See Appendix 4 for the text of that charter, which was adopted on 15 December 1972.)

During this time, the entire Army structure was being reorganized. For example, the Surgeon General's Office in Washington would now be concerned primarily with policy, a new Health Services Command in San Antonio would handle operations. The new organization, which was to become effective in July 1973, might well place new demands upon the Board and its newly formed Subcommittees. General Jennings suggested that the AFEB might wish to assume responsibility in the four following categories:

Communicable Disease Control, which would include *(a)* formulating an immunization policy, *(b)* using chemoprophylaxis for contingencies, *(c)* evaluating of the monitoring and surveillance procedures, *(d)* advising on immediate and anticipated needs in infectious disease control, such as meningococcal meningitis and gonococcal urethritis, and *(e)* analyzing the infectious disease problems that might emerge and affect women as their numbers in the military increase.

Health Maintenance, which would encompass *(a)* establishing an advisory service on community public health, *(b)* serving the healthy, in activities such as health education and nutrition, *(c)* giving advice regarding the risks in exposure to unusual environments, *(d)* developing and evaluating procedures designed to detect disease early, and *(e)* designing the optimum procedure for and frequency of periodic health examinations.

Environmental Quality, which would include two major areas of concern. *(a)* those environmental

hazards posed by military activities, such as noise generation and chemical pollution, and *(b)* that of the soldier dislocated from his immediate environment.

Physical Standards, which would be concerned with *(a)* the bases for acceptance for and rejection from military service, *(b)* the study of the examination methodology on which these major decisions are based, *(c)* the development of age- and job-adjusted standards for men and women, and *(d)* the design of the health-maintenance physical examination, the examination for retention in the service, and similar examinations.

These areas of need for the armed forces clearly embraced many of the activities with which the AFEB and its Commissions had previously been concerned. Additionally, in its new advisory capacity, the AFEB's field of responsibility would be broadened. The way was now clear for further progress, major misunderstandings had virtually faded, and the stage was set for the Board's spring meeting on 18 April 1973. The agenda for that meeting appears below.

This meeting ended the original AFEB and its Commissions, which had worked so productively and effectively for over thirty years. It ended the wise and inspired leadership of Gus Dammin's thirteen-year presidency of the Board. General Jennings said. "This meeting signals the end of a glorious era, which, I want to assure you, isn't going to cease [just] because the Department of Defense has made a new charter for this organization, [as required by] new laws that have been enacted and other factors." He then presented the Army's Outstanding Civilian Service medal to Francis S. Cheever, Floyd W. Denny, William McD. Hammon, William S. Jordan, Jr., Edwin H. Lennette, Charles H. Rammelkamp, Jr., and me. General Jennings announced that Gustave J. Dammin would receive the Distinguished Public Service award, which would be presented to him by Assistant Secretary of Defense Richard S. Wilbur at a separate ceremony.

Edwin H. Lennette, M.D., Ph.D., took the chair and succeeded Dr. Dammin as President of the Armed Forces Epidemiological Board on 18 April 1973.

The Agenda of the 18 April 1973 AFEB Meeting

Chairman: G. J. Dammin, President

1200 Luncheon Meeting: *Executive Session, Board Members*

1330 Introduction and Announcements
G. J Dammin
Lt Col. N E Wilks, Executive Secretary

1345 Guidelines for the New AFEB
The Surgeon General, Dept. of the Army, *Lt. Gen. H. B. Jennings*
The Surgeon General, Dept of the Navy, *V Adm. D. A. Custis*
The Surgeon General, Dept. of the Air Force, *Lt Gen. R. A. Patterson*
Discussion

Chairman, E. H Lennette, President-Elect

1500 Documentary Film and Report on the AFEB Archives: *T E Woodward*
Discussion

1530 Recess and Coffee

1545 Executive Session: *Preventive Medicine Officers and Board Members*
1630 Executive Session: *Board Members*

1700 Adjournment



FRANCIS SARGENT CHEEVER, M.D.

Sarge Cheever graduated from Harvard College, and from Harvard Medical School in 1936, then served his internship and medical residency at Presbyterian Hospital in New York. He held faculty teaching and research positions in microbiology at Harvard from 1938 to 1950, when he accepted an appointment as Professor of Microbiology and Medicine at the University of Pittsburgh School of Medicine. In 1958, Sarge was appointed Dean of that medical school. A sensible, practical approach to problems was his trademark.

Sarge brought these attributes to the Commission on Enteric Infections of the AFEB, which he directed from 1955 to 1963. He served as a member of the Board from 1965 to 1973, and could always be depended upon for help. In the early 1970s, Sarge joined Horace Gezon as a field consultant for the Army in surveying the problems of infectious diarrhea in Vietnam. Their field studies and recommendations proved to be of inestimable value and greatly aided the chief surgeon in implementing control measures.



FLOYD W. DENNY, M.D.

Floyd Denny was an honor graduate in medicine from Vanderbilt University School of Medicine, where he trained in pediatrics. His interest in infectious diseases led to his appointment as a research fellow, and later as the Assistant Director, of the Streptococcal Diseases Laboratory at Case Western Reserve University School of Medicine. His association and friendships with John Dingle, Charles Rammelkamp, Bill Jordan, and others was kindled there. He played an important role in the pioneering studies on streptococcal diseases and their relationship to rheumatic fever at Warren Air Force Base. In 1960, Floyd was appointed Chairman of the Department of Pediatrics at the University of North Carolina School of Medicine. He has made major contributions to our knowledge of infections caused by mycoplasma.

Floyd served as Deputy Chairman of the AFEB from 1955 until 1957 under his mentor, Dr. John Dingle. His long experience with Board activities included serving as the Director of the Commission on Acute Respiratory Diseases from 1967 until 1973, and as a member of the Commission on Streptococcal Diseases from 1954 until 1973. As a full Board member, he was committed to doing his share and much more. His AFEB commitments were taken in stride with his heavy academic responsibilities at Chapel Hill.



WILLIAM S. JORDAN, JR., M.D.

After he graduated from Harvard Medical School in 1943, Bill Jordan trained in medicine at Boston City Hospital, which provided him the opportunity to learn from Dr. Maxwell Finland. Bill then served for two years as a medical officer in the U.S. Navy, in 1947, he joined Dr. John Dingle's group in preventive medicine at Case Western Reserve University School of Medicine. He developed his talents as a virologist and immunologist and played an important role in the Cleveland Family Study, a classic in epidemiologic analysis. This work, sponsored by the Commission on Acute Respiratory Diseases of the AFEB, sparked his interest in military medicine, since he regularly reported the results of investigations on influenza, adenovirus infections, and atypical pneumonia. A major contribution of this work was the report that two separate filterable agents were responsible for acute gastroenteritis.

In 1956, Bill Jordan became Deputy Director of the Commission on Acute Respiratory Diseases and, in 1959, he began an eight-year period as its Director. Under his leadership, members of various Commissions made great strides in defining the etiology and epidemiology of various respiratory infections. This information helped improve methods of prevention and control of these infections in military personnel.

Because of his special talents and interest in the role of preventive medicine in the military, Bill Jordan was appointed a member of the AFEB in 1967. He contributed to all activities of the Board, without his wise counsel, some of the difficult problems faced by the Board the would not have been resolved so effectively.

In 1976, Bill was appointed Director of the Microbiology and Infectious Disease Programs of the National Institute of Allergy and Infectious Diseases. In this position, he has coordinated our national effort in the prevention of infectious diseases in civilian populations, and he has brought this expertise to the deliberations of the AFEB. Bill Jordan, with his experience and intelligence, is a national resource.



GORDON N. MEIKLEJOHN, M.D.

After graduating in medicine from McGill University in 1937, Gordon served his internship and residency in medicine at the Montreal General Hospital, Canada. This was followed by a fellowship in medicine at the Rockefeller Foundation. From 1944 to 1946, he served as a lieutenant in the U.S. Navy. He joined the faculty of the University of California, where he was appointed Professor of Medicine in 1951. From 1951 to 1975, Gordon served as the Distinguished Professor of Medicine and Chairman of the Deparment of Medicine at the University of Colorado in Denver.

Gordon is one of the most longstanding and devoted contributors to AFEB activities. He served as a member of the Commission on Influenza from 1948 to 1973, and directed that Commission from 1971 to 1973. He has been a pillar of support in conducting the year-to-year surveillance studies on the incidence of and the antigenic changes related to influenza. These continuing serological observations, many of which are conducted at Lackland Air Force Base and other key laboratories, are closely correlated with those of the Centers for Disease Control in Atlanta, the World Health Organization, and the AFEB. These painstaking observations are of great importance in helping select the particular influenza viruses that are incorporated in new vaccines from year to year.



DAVID MINARD, Ph.D., M.D.

David Minard was awarded his doctorates in both physiology (1937) and medicine (1943) by the University of Chicago. He served with the U.S. Navy and, beginning in 1943, was assigned to amphibious forces in both the Atlantic and the Pacific fleets. Later in his Navy career, he was head of the Physiology Department of the Naval Research Institute, where he directed the Thermal Stress Division from 1961 to 1963. In 1954 he earned his M.P.H. at the Harvard School of Public Health.

He published numerous papers on subjects as varied as histamine metabolism, cerebral and renal circulation, thermal radiation, air blast effects, the effects of metabolism and water balance on survival, combat stress, heat stress, high-altitude effects, body-temperature regulation, human calorimetry, ionizing radiation, work physiology, and occupational health. The Board profited greatly from his contributions as a member of the Commission on Environmental Health beginning in 1963, and he directed this Commission from 1970 to 1972.



Harvey Blank, M.D.
Commission on Cutaneous Diseases
Member 1950–1973
Director 1962–1973



Paul C. Beaver, Ph.D.
Commission on Parasitic Diseases
Member 1953–1973
Director 1967–1973



Rodney R. Beard, M.D.
Commission on Environmental Hygiene
Member 1942–1944, 1951–1973
Director 1956–1963



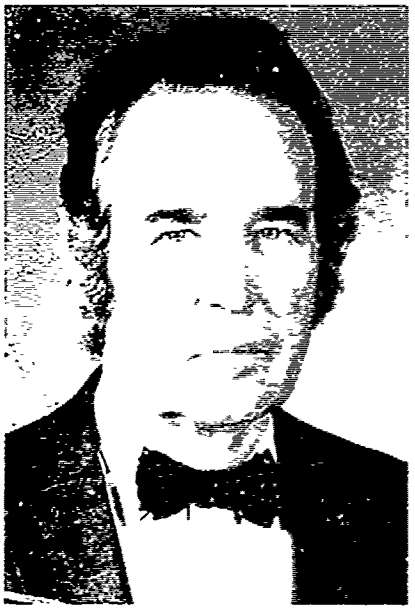
Victor P. Bond, M.D.
Commission on Radiation and Infection
Director 1965–1968
Commission on Epidemiological Survey
Member 1968–1973



Wilbur G. Downs, M.D.
Commission on Malaria
Member 1962–1973
Director 1965–1969



Alto E. Feller, M.D.
Commission on Acute Respiratory Diseases
Member 1941–1946, 1947–1948; 1951–1967
Director 1955–1959



Thomas R. Hendrix, M.D.
Commission on Enteric Infections
Member 1965–1972
Director 1970–1972



George G. Jackson, M.D.
Commission on Acute Respiratory Diseases
Member 1954–1973
Acting Director 1971–1972



Irvine H. Lepow, M.D.
Commission on Immunization
Member 1960–1971
Director 1964–1965



Harry Most, M.D.
Commission on Parasitic Diseases
Member 1953–1973
Director 1961–1967



Donald M. Pillsbury, M.D.
Commission on Cutaneous Diseases
Member 1954–1968
Director 1954–1962



Robin D. Powell, M.D.
Commission on Malaria
Member 1964–1973
Director 1969–1973



William S. Tillett, M.D.
Commission on Pneumonia
Member 1941–1944
Commission on Streptococcal Infections
Member 1948–1967
Director 1949



Stanley J. Weidenkopf, M.P.H., Ed.D.
Commission on Environmental Health
Member 1965–1973
Director 1966–1970

SECTION 2

The Ad Hoc Committee System

1973–1990

PART I

The Decade of the 1970s

Reassessment and Reorganization after the Commission System was Abolished

When the bold new organizational plan for the AFEB was approved, it was unclear to many Board members just how the new role and advisory responsibilities would be fulfilled. Abolishing the commission system had considerably shifted the Board's philosophy, operation, and mission. Nevertheless, the Board and Commission members who had provided advice and recommendations, and who had contributed specific research for the betterment of health care and preventive medicine for the military, accepted the new charge with objectivity and grace. This is to their great credit. With the change, the Board and its Commissions would no longer directly sponsor specific research aimed at helping to solve medical problems in the military. Rather, the Board and its new ad hoc Committees would now function solely as advisors when specific problems arose.

It was not possible to foretell if the Board would continue to be as useful to the military as it had been during the first thirty years of its existence. How would the Board and its ad hoc Committees fit into the overall structure of the Department of Defense? In 1984, when I was President of the Board, Colonel Robert F. Nikolewski, the Executive Secretary, prepared a White Paper at my request that described the AFEB's function and activities since its reorganization.

The White Paper was written in response to both Department of Defense Directive Number 5154.8, dated November 6, 1978, and Directive Number 5105.18, dated March 20, 1984. The AFEB had received new charters on those dates. Throughout the Board's history, new charters, guidelines, and statements of mission had been prepared to better define the role of the AFEB within the Department of Defense structure. Because personnel are frequently reassigned in the key administrative positions within both the military and the Office of Health Affairs, the Board itself has repeatedly needed to provide the evidence that its function is necessary to the Department of Defense. (After all, the AFEB's institutional memory dates back fifty years, to 1940!)

Colonel Nikolewski's report, which follows, serves both as a retrospective overview of and an introduction to the activities that occupied the Board during the 1970s and 1980s. A list of the recommendations that the Board made from 1955 until 1985, which Nikolewski appended to his report, appears in Appendix 3 of this volume.

DASG-AFEB
1 October 1984

SUBJECT. Armed Forces Epidemiological Board, Department of Defense Directive Number: 5154.8, November 6, 1978 and DOD Directive Number: 5105.18, March 20, 1984

Statement of Function. The Armed Forces Epidemiological Board (AFEB) provides to the three military Departments, through the respective Surgeons General, timely scientific and uniquely professional medical advice and specific recommendations concerning operational programs, policy and research concerning new technological and epidemiological principles (i.e., distribution and causation of disease in a specified population) in the control of acute and chronic diseases, environmental protection, occupational health and health maintenance systems for all the uniformed military services. Recommendations that have been formulated by the Board for implementation by the respective military medical services [appear in Appendix 3].

1. Recommendations by the AFEB within the past sixty days have included Board oversight of the most comprehensive review of the Navy Asbestos Medical Surveillance Program ever undertaken. Coincident with this study, the Board has been charged by the Assistant Secretary of Defense, Health Affairs, in an initial and ongoing oversight review of total epidemiologic reporting systems, specifically addressing the availability and quality of data in potential areas of international conflict worldwide. In addition, the Secretary has requested that the Board begin a continuing review of the medical consequences of and constraints created by the essential and increasing participation of women in the Armed Forces. Further and recent recommendations by the AFEB have resulted in changing, within the past three years, the policies and directives of the Tri-Service Regulations AR 40-562, BUMEDINST 6230.1H, AFR 161-13 and CG COMDTINST 6230.4C relative to Immunization, Requirements and Procedures of the Uniformed Medical Services. Specifically, the qualitative and quantitative applications of smallpox, tetanus, polio, meningococcal, typhoid and hepatitis B vaccines have been substantially and beneficially changed, thus offering increased protection of our military population with concomitant and significant cost reductions. Policy changes have occurred in all three services regarding the variety and quantity of stockpiled antibiotics to be utilized in answer to the complex problems associated with the elimination of diarrheal and rickettsial disease for combat servicemen. The AFEB is singularly responsible for developing each year the formulary and administrative schedule of the current influenza immunization program for the military which, as an aside, mitigates potential civilian application nationally. This Board, in support of DOD, was instrumental within the past eighteen months in justifying the maintenance of crucial overseas laboratories which are dedicated to epidemiologic disease control and research unique to these theaters of operation. Through the office of the Executive Secretary, AFEB, the Board was instrumental in organizing and coordinating the establishment of a United States Navy cohort collection and study of serologic specimens which validated the efficacy of the 1982–1983 influenza vaccine, which resulted in a savings of $500,000 in stockpiled vaccines.

2. Policy changes through recommendations by the AFEB, relative to changes in the immunization schedules for the Armed Forces, have resulted in an incalculable benefit to the military services by reducing the impact of preventable infectious diseases through decreased morbidity and in minimizing periods of lost training time. For example, there were only 14 cases of measles reported in the entire military service during calendar year 1981, as compared to 425 cases during 1980. Recent recommendations dealing with the administration of the hepatitis B vaccine are realistically expected to be as dramatic in the control of this devastating disease with its variety of medical sequelae. These actions were solely the responsibility of the Armed Forces Epidemiological Board whose effectiveness in both scientific applicability and timeliness benefited the *commonality of purpose* of the three military medical services.

3. Historically, all meetings, with rare exceptions, are open meetings attended by physicians and scientists both from within the federal government and the civilian community. This forum, because of the signal competence of the Armed Forces Epidemiological Board (AFEB) members, consistently serves as the premier sounding board for the preventive medicine officers of the three uniformed services. This necessary interface, between these experienced

medical officers and recognized and reasoned development of scientific ideas[, results] in major significant changes in military medicine *common to all three services*. Examples of this uniformity of scientific endeavor, between military medical personnel and these national civilian authorities, have included, but have not been limited to, the risk analysis, discussion and assessment of the Herbicide Orange problem, potential environmental and occupational hazard analysis associated with cancer as well as comprehensive policies regarding immunizations of the military community. These latter recommendations in themselves have consistently set the benchmark for public health immunization programs for the private civilian sector. The existence of a *single board* of renowned physicians and epidemiological scientists, serving the *common* problems of the uniformed medical services, has effectively avoided unnecessary "triplication" of efforts by the three services as they address the problems and solutions in epidemiologic disease control, risk management and occupational environmental threats to the military population.

4. The AFEB operates, to a significant degree, through three chartered Subcommittees: Disease Control, Environmental Quality, and Health Maintenance Systems. An ad hoc committee is presently investigating aspects of the military medical health care delivery systems to effect compatible data bases and interchange between the three services relative to the incidence of disease within the United States military population. Prompt identification of disease threats and recommendations for disease control, which are accomplished through this committee, are additionally designed to correlate and promptly interface with the civilian medical authorities. Expertise brought to the Board by the designated members offers effective [representation] in the medical scientific disciplines of infectious disease, internal medicine, occupational medicine, pediatrics, human engineering, toxicology, and biostatistics. [The membership of the Board represents] the wide geographic, professional and ethnic diversity of the Board. Such scientific diversity offers substantial reasoned scientific input to the immediate and pressing needs of the military in, for example, illegal substance abuse (*Cannabis spp.* testing) along with the potential and varied threats to the military and civilian populations regarding overt and covert biological/chemical warfare and nuclear radiation exposure.

5. The Board formally convenes approximately three times per year based on written problem areas identified to the Board by the respective Surgeons General. Task force operations occur between meetings as a data gathering forum for formal presentation to the entire Board and representatives of the military Surgeons General and their equivalent civilian counterparts. Relevance to continuing this committee function is tied inexplicably to current epidemiologic investigations concerning disease control, environmental and occupational medicine threats to the military population worldwide—particularly with the varied and complex geopolitical considerations facing the United States government at this time.

6. Elimination of this single board of civilian medical authorities would create the necessity of requiring each of the three military services to solicit such essential medical-scientific expertise independently. None of the three services possess the depth of competence within these disciplines that this Board singularly and uniquely offers. "Triplication" of efforts would result in costs far in excess of the nominal expenses associated with the present Board's operation. In addition, "triplication" would of necessity result in a significant divergence and a lack of a standardized approach essential to military readiness and a uniformity of required medical goals and objectives. In addition, parochial military efforts would eliminate the open civilian forum and lack of public scrutiny inherent in the charter of the Board as mandated by the DOD directives. This civilian board of recognized authorities offers a significant and meaningful entré to medical academia which contributes to unprecedented exchange of information exceeding the collective expertise of the Board.

7. There are no other committees within the Department of Defense, or in federal or civilian agencies which offer an established epidemiologic forum in the biomedical sciences. This Board has effectively achieved, through essential scientific advice and consent, an extremely effective method of recommending appropriate solutions to the commonality of pressing problems unique to the three military medical services.

Robert F. Nikolewski
Colonel, USAF, BSC
Executive Secretary
Armed Forces Epidemiological Board

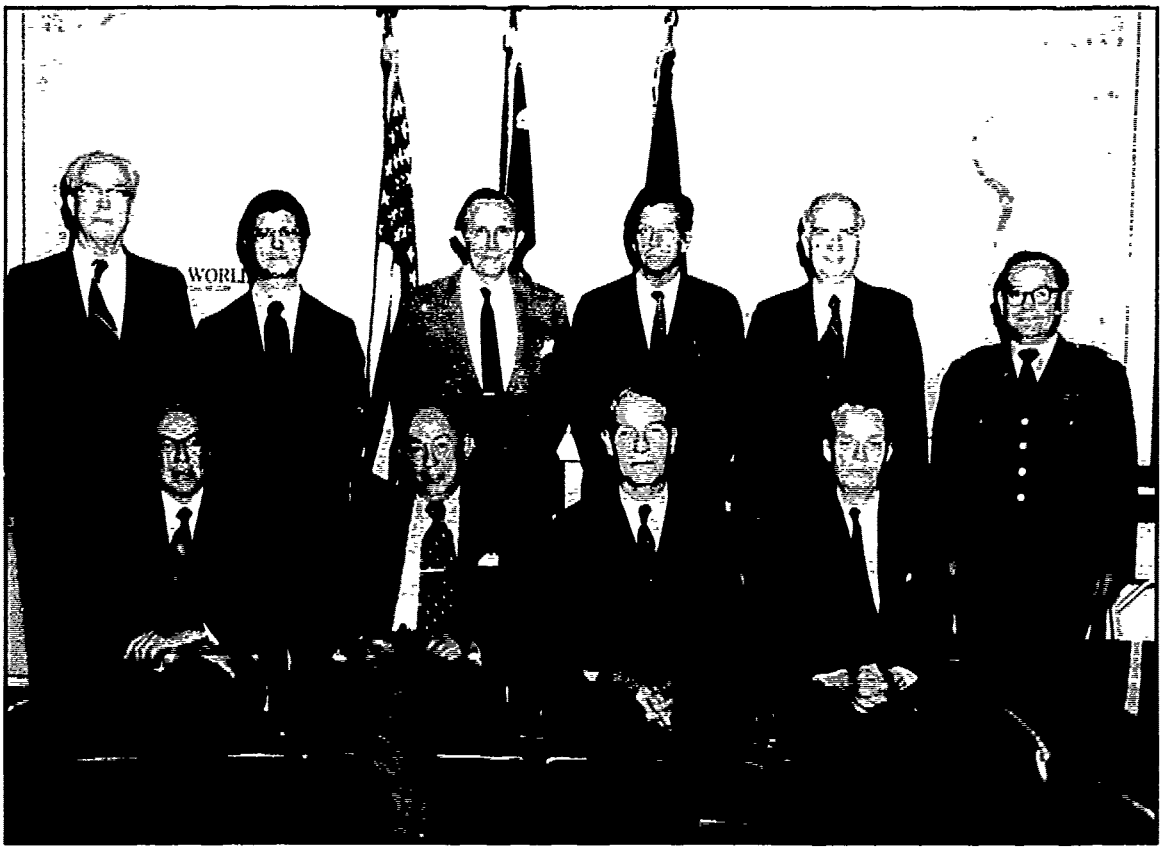


EDWIN H. LENNETTE, M.D., Ph.D.

Ed Lennette, with both medical and doctoral degrees, was well prepared to carry out his role as a member of that large group of microbiologists, virologists, and rickettsiologists who helped make the AFEB and its Commissions so effective. In 1939, he was appointed to the staff of the International Health Division of the Rockefeller Foundation, where he worked on influenza, yellow fever, and other viral diseases from 1939 to 1946. He directed the Medical Veterinary Division at Fort Detrick from 1946 to 1947.

Because of his background and qualifications, Dr. Lennette was appointed Chief of the Viral and Rickettsial Disease Laboratories of the California State Department of Public Health, where he contributed important new knowledge to our understanding of many viral and rickettsial diseases. His pioneering work on Q fever was fundamental to clarifying its pathogenic and epidemiological features.

During this entire period, Dr. Lennette was a member of the AFEB and several of its Commissions, particularly those dealing with influenza, viral, and rickettsial diseases. He was elected President of the AFEB in 1973 and served until 1976. Serious scientific and fiscal considerations arose during this critical time for the Board: it operated under a new charter, the Commission system was abolished, and the Board assumed a strictly advisory role to the military.



1973 Armed Forces Epidemiological Board and Committee Directors

Seated, left to right: Dr. William McD. Hammon; Dr. Edwin H. Lennette, President-elect; Dr. Gustave J. Dammin, President of the Board; and Dr. Francis S. Cheever.

Standing, left to right: Dr. Charles H. Rammelkamp, Jr.; Dr. Floyd W. Denny, Jr.; Dr. Theodore E. Woodward; Dr. Reuel A. Stallones; Dr. William S. Jordan, Jr.; and Lt. Colonel Norman E. Wilks, MSC, USA, Executive Secretary.

The Permanent Committees and Ad Hoc Study Teams Are Formed

On 12 September 1973, the Board held its fall meeting at the Academy of Health Sciences, Fort Sam Houston, Texas. Dr. Edwin H. Lennnette presided. This meeting, which served to inform the Board members of the medical programs under way at Fort Sam, was accomplished through briefings and inspection tours of facilities. Considerable information was given on the health environment training programs at this military medical center.

Dr. Lennette presided at the regular spring meeting of the Board held at WRAIR on 16–17 April 1974. Important plans were made for new Board members during this meeting. Designated Subcommittees that could help the Board fulfill its new role were formed There was a discussion of how ad hoc task forces might help in the military's implementation of and response to difficult health problems as they arose. The agenda for that meeting follows:

The Agenda of the April 1974 AFEB Meeting
Edwin H. Lennette, M.D., President

16 April	
0800–1200	Preventive Medicine Symposium, Sternberg Auditorium
1300	AFEB Executive Session (Board Members) Announcements: *Dr. Lennette*
1300	Administrative Actions and Discussion Approval of Minutes Fall Meeting Plans 1974 Spring Meeting 1975
1400	Discussion of Board Membership New Members Chairmen of the ad hoc Study Teams
1430	Establishment of Permanent Committees
1500	Establishment of Other ad hoc Study Teams
1500–1515	Break
1515	AFEB Archives, The Bayne-Jones Room: *Dr. Woodward*
1540–1600	Discussion of the Mission of the Board
1630	Adjournment
17 April	
0800–1200	Preventive Medicine Symposium
1300–1400	Reports from the Military: OTSG, Army; OTSG, Navy; OTSG, Air Force
1400–1415	Break
1415–1500	Special Reports Rickettsial Vaccines: *Dr. Wisseman* Smallpox Emergency Quarantine Facility: *Dr. Lennette*
1500–1545	Presentation on Tropical Medicine Instruction and Global Medicine: *Col. Taras Nowoswsky, MC,* WRAIR
1545–1615	Discussion on above reports
1630	Adjournment

HEALTH PROCUREMENT STANDARDS

One of the important problems presented to the Board during this period was that of health-procurement standards for the military services. Dr. Lennette asked Dr. Herschel Griffin, a Board member and Dean of the Graduate School of Public Health at the University of Pittsburgh, to head the ad hoc Study Team on Procurement Standards consisting of Lewis H. Kuller, M.D., D.P.H., Pittsburgh; William R. Harlan, Jr., M.D., Duke; Darwin Labarthe, M.D., Mayo Clinic; and Richard B. Shelelle, Ph.D., Illinois. This Study Team worked with designated military Preventive Medicine Officers, and they met at WRAIR on 24 May 1974, with Colonel Robert T. Cutting presiding. That agenda follows:

The Agenda of the 24 May 1974 Study Team Meeting

Ad Hoc Study Team on Procurement Standards
Armed Forces Epidemiological Board

Chairman: Colonel Robert T. Cutting

1000–1245	Announcements
	Approval of Minutes 13 March meeting
	Reports by Drs. Harlan, Kuller, Shelelle and military representatives a. Bibliography and information regarding obesity as a risk factor b. BP of AFEES rejectees for overweight and for underweight c. Weight class of AFEES rejectees for high BP d. Conversion of the AR 40–501 height-to-weight tables to wt^2/ht = body mass index (Keys' modification) e. Discussion of standards 1 Height versus weight 2. Blood pressure 3. Other indicators of body fat
1245–1345	Lunch
1345–1500	Discussion of suggestion to revise height-to-weight tables by use of height/weight index
	Where do we go from here? a. Can recommendations be made now? b. Further studies (as requested) c. Additional information and further assignments d. Is another meeting desirable? When? e. Conclusions
1500	Adjournment

After the meeting, Dr. Griffin, Lt. Colonel Erickson, and others prepared the following **recommendations**, which were then approved at the Board's fall meeting on 4 October 1974:

1. That the procurement medical fitness standards relative to blood pressure be modified as follows:

a. The use of systolic blood pressure as a standard of medical fitness should be discontinued. Those disqualifying conditions manifested by high systolic and low diastolic pressures [e.g., aortic insufficiency] would continue to be causes for rejection.)

b. Preponderant diastolic pressure over 90 mm should be maintained as a cause for rejection except as provided in (c) below.

c. Provision should be made for acceptance of persons with preponderant diastolic blood pressure over 90 mm but under 100 mm with waiver. This recommendation is based on the following considerations:

(1) The current standards were developed before the ready availability of effective antihypertensive medication

(2) There is no evidence that patients with slightly elevated blood pressure entail an increased risk of complications by participating in strenuous exercise or other physical activity.

(3) The risk of disability due to hypertensive disease and its complications among mild hypertensives within the first 10–15 or even 20 years of military service is very low, much lower than morbidity associated with excessive alcohol consumption, orthopedic problems or psychiatric disease.

(4) The risk of disability due to hypertensive disease is more closely associated with the diastolic than the systolic blood pressure. The major current studies on cardiovascular disease, e.g., the Multiple Risk Factor Intervention Trial (MRFIT), consider subjects as hypertensive on the basis of diastolic pressure alone.

2. That a representative sample of persons accepted with waiver be identified and followed as described below:

a. The blood pressure of the men should be recorded at the AFEES centers. Values for initial and repeat measurements at AFEES should be retained for future analysis.

b. During his service, the individual's blood pressure should be recorded (if possible, at 2–3 month intervals) regardless of whether visits for therapy are made to the dispensary. Weight, and if possible, adiposity should also be reported.

c. The medical records of each man should be identifiable so that his use of health services within the military can be documented.

d. Men who develop substantially elevated diastolic pressures as measured by readings above 100 mm Hg on three or more occasions should be considered for treatment.

e. At the end of one year, data on any changes in blood pressure, medication required, frequency of utilization of medical facilities and morbidity should be evaluated.

f. Blood pressure standards can be reevaluated based on the results of this one year's experience.

Implementation of these changes would increase the pool of available manpower and yield information on the costs/risks of changing standards relative to manpower requirements. During 1971, approximately 22,000 applicants were in this category. It is noted that about 40% of them would also be rejected for overweight. Thus, any waiver program must provide for this factor, too.



HERSCHEL E. GRIFFIN, M.D.

After he graduated from medical school, Herschel Griffin had a private medical practice in California for several years. He entered the Medical Corps in 1950 and was soon appointed Regimental Surgeon; later, in Korea, he was promoted to Division Surgeon. His record in the Department of the Army was distinguished, and from 1966 to 1969 he was Chief of the Preventive Medicine Division in the Office of the Surgeon General. After he retired from the military, Dr. Griffin served not only as Dean of the Graduate School of Public Health but also as a professor of epidemiology and microbiology at the University of Pittsburgh.

While in the military, Dr. Griffin participated actively in the activities of the AFEB and its Commissions. Dr. Edwin H. Lennette, who was the Board President at that time, appointed him Chairman of the ad hoc Study Team on Procurement Standards, which was charged to review and make recommendations regarding the military services' physical standards. From 1978 to 1980, while he was also Dean at the University of Pittsburgh, Dr. Griffin was President of the AFEB. This was a critical time for the AFEB, when it reassessed its role and responsibilities as an advisory board to the military services.

THE TWENTY-FIFTH ANNIVERSARY SYMPOSIUM OF THE STREPTOCOCCAL DISEASE LABORATORY

A symposium commemorating the twenty-fifth anniversary of the Streptococcal Disease Laboratory was held at Warren Air Force Base, Wyoming, on 3 October 1974. The symposium was presented in the form of a festschrift honoring Charles H. Rammelkamp, Jr., M.D., a long-time distinguished member of the Board.

The Board met at Warren Air Force Base immediately after the festschrift and planned further for the effective functioning of the Board and its Subcommittees under the new organization. The agenda for that meeting follows:

Symposium Agenda, 3 October 1974, Warren Air Force Base

H. B. Houser, M.D., Chairman

8:45 A.M. Welcoming Remarks
Col. Christopher S. Adams, Jr., Commander, 90th Strategic Missile Wing
Col. G. Douglas Adamson, M.D., Commander, USAF Hospital, Warren Air Force Base
Leroy R. Maki, Ph.D., President, Wyoming Heart Association

Richard M. Krause, Presiding

9:00–9:20 A Search for Better Antibody Tests for Group A and Group B Streptococcal Infections: *Lewis W. Wannamaker, M.D.*
9:25–9:55 The Evolution of the Typing System for Group A Streptococci: *W. R. Maxted, Honorary Ph.D.*
10:00–10:20 On the Ways Antibodies to Streptococcal Carbohydrates can Substitute for Myeloma Proteins: *Richard M. Krause, M.D.*
10:25–10:45 Break

Chandler A. Stetson, M.D., Presiding

10:45–11:05 Immunopathologic Studies of Rheumatic Heart Valves: *Melvin H. Kaplan, M.D.*
11:10–11:30 The Genetic Instability of Serum Opacity and Resistance to Phagocytosis of Group A Streptococci: *Paul P. Cleary, Ph.D.*
11:35–11:55 Biological Reactions to Peptidoglycan of Group A Streptococcus and Other Bacteria: *Jiri Rotta, Ph.D.*
12:00–1:30 Lunch, Officers' Open Mess

Floyd W. Denny, Jr., M.D., Presiding

1:30–2:00 Post-streptococcal Glomerulonephritis: The Pyoderma Era: *Hugh C. Dillon, M.D.*
2:05–2:25 Observations on the Epidemiology of Rheumatic Fever: *Harold B. Houser, M.D.*
2:30–2:50 The Relative Rheumatogenicity of Group A Streptococcal Strains: *Gene H. Stollerman, M.D.*
2:55–3:25 The Pattern of Acquisition and Spread of Group A Streptococci in Families: *Aziz El Kholy, M.D.*
3:30–4:00 Break

Harold B. Houser, Presiding

4:00–4:20 Recreational and Vocational Evaluation and Planning for the Young Cardiac: *Loring Brock, M.D.*
4:25–4:45 Mycoplasma Pneumoniae Disease: An Immune Paradox: *Floyd W. Denny, Jr., M.D.*
4:50–5:10 Crystal Gazing: *Chandler A. Stetson, M.D.*
6:00–7:30 Reception, Officers' Open Mess
7:30 Dinner, Officers' Open Mess
Lewis W. Wannamaker, M.D., Presiding
Edward A. Mortimer, M.D., Frederick C. Robbins, M.D., Lewis A. Thomas, M.D.

At the 13 January 1975 meeting of the Board, discussions were held on the reorganization of the AFEB, when the new charter for 1975–77 was placed in operation. (See Appendix 4 for the 1975–77 charter.) Colonel Robert T. Cutting, MC, Chief of the Health and Environmental Division, representing the Surgeon General of the Army, convened the meeting. Vice Admiral Donald L. Custis, the Surgeon General of the Navy, attended the meeting and addressed the Board. An additional action item of this meeting was to continue E. H. Lennette as President of the Board.



1975 Armed Forces Epidemiological Board

Seated, left to right: Colonel Robert T. Cu ting, MC, USA; Dr edwin H Lennette, President of the Board; Dr. Floyd W. Denny, Jr. and Dr. Vaun A Ne vill.

Standing, left to right: Dr. Theodore E. Woodward, Dr. E. Russell Alexander Dr. Paul M. Densen; Dr. William S. Jordan, Jr., Captain Charles E. Alexander, MC, USN; and Lt. Colonel Duane G. Erickson, MSC, USA, Executive Secretary.



CHARLES H. RAMMELKAMP, JR., M.D.

Charles Rammelkamp's interest in military medicine began in 1943, when he joined the Commission on Acute Respiratory Diseases under the direction of Dr. John H. Dingle. At Fort Bragg during World War II, Rammelkamp contributed important new knowledge related to non-streptococcal tonsillitis, acute respiratory disease of recruits, and the induction of atypical pneumonia and acute respiratory disease in volunteers. After the war, with Dingle's group and a new Department of Preventive Medicine at Case Western Reserve University, Rammelkamp participated in the AFEB-supported research that detected the prevalence of Type 12-D streptococcal infection in acute nephritis in families. In 1948, he established a laboratory at Warren Air Force Base as a member of the newly formed Commission on Streptococcal Disease of the AFEB. The pioneering studies done there established that intimate contact is the major transmitting mechanism of streptococcal infections, and that epidemics are prevented by chemoprophylaxis with penicillin. They also showed that proper use of antibiotics in treatment of streptococcal pharyngitis will prevent attacks of rheumatic fever.

Rammelkamp worked unceasingly and made major contributions to medicine and preventive medicine. Although his major interest was streptococcal infections, he contributed equally to the knowledge of staphylococcal infections. There is no question that Charles Rammelkamp was devoted to the AFEB, in both its military and civilian roles, and was a major contributor to its success in solving medical problems.



LEWIS W. WANNAMAKER, M.D.

Lewis Wannamaker received his formal education in medicine at the University of Minnesota. After he completed his training in pediatrics, he returned to the University of Minnesota School of Medicine, where he eventually became a professor and Chairman of the Department of Pediatrics. During World War II, Dr. Wannamaker was a member of that remarkable team of medical scientists who worked on streptococcal diseases and the prevention of rheumatic fever at Warren Air Force Base, Wyoming. He was a major contributor to the work of this team of investigators, which included John Dingle, Charles Rammelkamp, and Floyd Denny. At Minnesota, Lewis Wannamaker developed the Center for the Study of Streptococci, a worldwide reference bank, where many scientists trained under his leadership.

The AHEB profited greatly from Dr. Wannamaker's service. He was a member of the Commission on Streptococcal and Staphylococcal Diseases from 1955 to 1973, and its director from 1967 to 1973. He served as a member of the Commission on Cutaneous Diseases from 1968 to 1972.

CHOLINESTERASE INHIBITION AND THE GERMAN NERVE GAS KNOWN AS GB

At its 10 July 1975 meeting, the Board heard of a problem caused by methyl phosphorofluoridate, a German World War II nerve gas that was called GB in this country. Some of the workers at the Rocky Mountain Arsenal had manifested symptoms of organic depression (not to be confused with emotional depression) after they had participated in the demilitarization of GB, which is a cholinesterase inhibitor. In order to assess the difficulties pertaining to cholinesterase inhibition and the depression that it caused in these people, an ad hoc Study Team on Cholinesterase Inhibitors was formed. It convened at the Forrestal Building in Washington, D.C., on 13 August 1975. The agenda and roster of participants follows.

Agenda, 13 August 1975
Ad Hoc Study Team on Cholinesterase Inhibitors

0900–0910	Opening Remarks: *Dr. Newill*
0910–0920	Problem Definition: *Col. Cutting*
0920–0950	Demilitarization Program
	GB Operation at RMA *Lt Col Hanson*
0950–1000	Break
1000–1030	Occupational Health Policy
	Background
	Practice and Procedure of RMA
	Difficulties: *Lt Col Hathaway*
1030–1130	Discussion of Cholinesterase Methodology
	Reproducibility in Human Specimens
	Dr. Sidell, Col Steinberg
	Dr Michael, Dr Ellin
1130 -1230	Lunch
1230–1300	Teratogenicity: *Dr McNamara*
1300–1530	Discussion
	Conclusions
	Recommendations to the Board

Roster of Participants

AFEB members. Dr. Vaun Newill, Chairman of the ad hoc Study Team, Division of Environmental Health, Exxon Corp, Dr. Wayland Hayes, Vanderbilt University School of Medicine, Dr. J. Henry Wills, Albany Medical College, Dr. David Grob, Maimonides Medical Center.

Representatives from the Army: Col. L. J Legters, MC, Col. Robert T. Cutting, MC;, Col. John E. Ward, MC, Col. Marshall Steinberg, MC, Lt Col. George E T Stebbing, MC, Lt. Col. Robert L. Hanson, MSC, Lt. Col. Donald M. Rosenberg, MC.

Representing the Air Force: Lt. Col. Frank L. Corker, MC.

Civilian Representatives from Edgewood Arsenal.
AFEB Staff. Lt. Col. Duane G. Erickson, MSC, Executive Secretary, Miss Betty L. Gilbert, Executive Assistant

The ad hoc Study Team met at the Rocky Mountain Arsenal on January 28–29 1976 to further study the cholinesterase inhibitor problem. The agenda for that meeting follows:

Agenda, Rocky Mountain Arsenal Meeting, January 1976

28 January 1976

0830	Arrive at Rocky Mountain Arsenal: *Dr Gaon*
0830–0850	Welcome and Opening Remarks: *Col Burne*
0850–0920	GB Demilitarization Briefing. *Mr Glassman*
0920–0950	Installation Restoration: *Lt Col Williams*
0950–1000	Coffee Break
1000–1020	Work Environment Monitoring and Quality Control *Dr Boyle*
1020–1035	Protective Garment Status and Issue of Safety Equipment. *Mr Rock*
1030–1130	Escorted Tour of GB Demilitarization Facilities *Mr Ursillo and staff*
1130–1230	Lunch in the Officers' Open Mess
1230–1330	Investigative and Quality Control Studies *Mr Ursillo*
1330–1350	Quality Control of RBC ChE: *Col. Glenn*
1350–1430	Employee RBC ChE Determination and Evaluation *Dr Gaon*
1445–1630	Discussion

29 January 1976

0830–1130	Discussion and Executive Session

After the various meetings and discussions, the Board made the following report on the problem of cholinesterase inhibition and its consequent organic depression:

During its meeting of February 13, 1976, the AFEB approved the report and thirteen recommendations of the ad hoc Study Team on Cholinesterase Inhibitors The report and recommendations which follow were transmitted to the Surgeon General, DA, on 23 March 1976.

In response to a request for assistance from the Chief, Health and Environment Division, OTSG-DA, an ad hoc Study Team was organized to consider occupational health problems associated with the GB demilitarization project Dr Vaun A. Newill was appointed Chairman. The first meeting was held in Washington, D. C. on 13 Aug 75, and a second, on 28–29 Jan 76 at Rocky Mountain Arsenal at Denver. The following report is hereby submitted for consideration by the Board.

1 The Study Team wishes to commend the Demilitarization Project for the marked improvement in occupational health procedures which have been implemented at Rocky Mountain Arsenal since early in 1975 and which is manifest in the significant decrease in instances of cholinesterase depressions in their workers since June 1975

2. The problem of establishing baseline cholinesterase activity levels in each individual is recognized, particularly when there exists a possibility for exposure within the first 48 to 72 hours after employment. However, the importance of this baseline value cannot be overemphasized, since it will serve as a reference point for all future

determinations. Thus, a specific study should be conducted to determine the best least-cost procedure for accomplishing this task. Until such time as results of this study are in hand, baseline cholinesterase activity values should be based on three determinations performed on blood specimens collected on three nonconsecutive days. In addition, whenever there is a change in the method of determination of the cholinesterase activity, there should be a reevaluation of the baseline for each employee. In this reevaluation, blood collected for determination of cholinesterase activity should be analyzed by both methods for a period of time to obtain data necessary for the reevaluation procedure.

Recommendations:

a. That a study be performed to determine the best least-cost procedure for establishing the RBC cholinesterase activity baseline for a newly hired individual. Until the results of this study are available, the baseline activity of an individual should be determined on specimens collected on three non-consecutive days.

b. That individual baseline data be reevaluated each time that there is change in the method used for RBC cholinesterase activity measurement. Parallel determinations by both methods on the same blood sample should be made for a period of time to aid in this reevaluation.

3. The current practice at RMA is to determine RBC cholinesterase activity only once every two weeks on personnel who have a high risk of exposure two or more times a week. While this practice, in conjunction with recent improvements in protective measures, has been associated with no instance of serious intoxication by GB, it is desirable to detect evidence of absorption of GB earlier than is currently possible. In the 75 instances in which RBC cholinesterase activity was depressed below 75 percent of baseline in 57 individuals at RMA during the past year, the mean percent reduction of cholinesterase activity reported at the time of detection was 45 percent This resulted in a 56-day mean time lost from the job because of restriction from further exposure until the cholinesterase activity returned to at least 90 percent of the baseline level. On the average, weekly, instead of biweekly, determinations on employees who are subjected to a high risk of exposure one or more times a week would detect evidence of GB absorption closer to the time of exposure. Earlier detection of depressions in cholinesterase activity has the following advantages:

a. There would be less opportunity for re-exposure while blood, and presumably tissue, cholinesterase activity was depressed, and therefore, less likelihood of cumulative toxicity.

b. Since it should be easier to relate the depression of cholinesterase activity to one or two episodes of possible exposure than to three or more episodes, it might be more feasible to identify contributory factors

c. When the depression of cholinesterase activity is the result of more than one exposure, it should be possible to detect the depression at levels closer to 75 percent of baseline rather than at the current mean level of 55 percent of baseline. This in turn should result in reduction in the time lost from that job because of restriction from further exposure.

d. Weekly, instead of biweekly, determinations of cholinesterase activity during the recovery period after removal from the job because of a depressed ChE activity should provide a more accurate indication of recovery of normal activity, and should enable half of the employees to return to full duty a week earlier. There would be some advantage in determining cholinesterase activity within a day after a potential exposure, if logistically possible. The employee union should recognize this requirement for more frequent sampling as an advantage for the protection of the health of the employees, and it also should decrease time lost from duty. Employees who are not subjected to a high risk of exposure should continue to have their cholinesterase activity determined at intervals of several weeks to several months, depending on the degree of exposure.

Recommendation:

That employees subjected to a high risk of exposure to GB one or more times a week have their RBC cholinesterase activity level determined at least once a week.

4 The reproducibility of values for RBC cholinesterase activity determined daily in any non-exposed normal individual is between 10 and 20 percent in the best laboratories Therefore, a determination of 75 percent of baseline should represent a significant reduction of cholinesterase activity, evidence of systemic absorption of an anti-cholinesterase compound, and a valid reason for avoiding re-exposure until sufficient recovery of cholinesterase



Armed Forces Epidemiological Board and Committee Directors
Army Environmental Hygiene Agency, Edgewood, Maryland
11–12 November 1976

Seated, left to right Dr Paul M. Densen; Dr William S. Jordan, Jr., Dr. Floyd W. Denny, Jr.; Dr. Theodore E. Woodward, President of the Board; Dr. Charles H. Rammelkamp, Jr ; and Dr. Norton Nelson.

Standing, left to right Captain Dennis F. Hoeffler, MC, USN, Colonel Llewellyn J. Legters, MC, USA; Dr. Mildred A Morehead, Dr Herschel E Griffin, Dr. Vaun A. Newill, Colonel Frank T. Corker, MC, USAF; Betty Gilbert, secretary; and Lt Colonel Duane G. Erickson, MSC, USA, Executive Secretary.



VAUN A. NEWILL, M.D.

After he graduated from the University of Pittsburgh School of Medicine, Vaun Newill trained in medicine in Cleveland and joined the faculty of Case Western Reserve University School of Medicine there. Subsequently, he held faculty teaching appointments at the schools of public health at Harvard and at the University of North Carolina. From 1968 to 1970, he directed the Division of Health Effects Research at the National Air Pollution Control Administration, Durham, North Carolina. In 1974, Dr. Newill joined the Medical Research Division of the Exxon Research and Engineering Company, Linden, New Jersey.

The AFEB was particularly fortunate to have Dr. Newill as a member. In 1975 and 1976, he chaired its ad hoc Study Team on Cholinesterase Inhibitors. Workers at a military chemical plant had experienced depressions following their exposure to the nerve gas isopropyl methyl phosphorofluoridate (known as GB). The Study Team's thorough report helped provide the guidelines on the occupational health problems associated with the demilitarization of this toxic chemical.

activity has occurred. However, the requirement for recovery of cholinesterase activity to 90 percent of baseline before permitting return to work having a potential for re-exposure is regarded as too stringent in view of the 10 to 20 percent variation in the technical reproducibility of the determination, this has resulted in longer periods of employee absence from full duty (mean, 56 days) than would appear to be necessary.

Recommendations:

a. That the RMA continue the current criterion of removing employees from potential exposure to GB when their RBC cholinesterase activity is depressed to 75 percent of their baseline level, or less.

b. That the criterion for permitting workers to return to duties which entail a potential risk of exposure to GB be changed from 90 percent to 80 percent, or higher, of their baseline ChE activity provided that they have had no exposure to anticholinesterase compounds for at least one week, and provided than an 80 percent, or higher, of baseline cholinesterase activity level has been obtained on at least two separate blood samples.

5. In order to assure maximum protection of the health of employees throughout the demilitarization program, standardization of procedures for cholinesterase activity determinations and for surveillance of employees should be achieved. If it is feasible to do so, a single method for determination of ChE activity should be used by all facilities. At the least, different methods used by various facilities all should be standardized by use of two reference preparations of cholinesterase derived from human erythrocytes, one to be a normal control preparation, the other, a partially inhibited (by GB) preparation. The extent of inhibition of the latter reference preparation should be known to the coordinator only, and preparations should be labeled in a nonrevelatory manner.

Recommendations:

a. That some appropriate individual be designated to be responsible for assuring that acceptable standardized techniques for employee health surveillance are used at all installations involved in the demilitarization program.

b. That a single central laboratory, or two or more regional laboratories, be designated to process blood samples from installations operating under the demilitarization program and to perform routine determinations of the RBC cholinesterase activity therein. The various operating installations should maintain competence to perform accurate determinations of RBC cholinesterase activity for nonroutine use in the event of an accident or a possible significant exposure of one or more workers. A quality control surveillance system should be established to assure that this competence is maintained.

6. There is a trend toward the more general use of pharmacological measurements to supplement environmental measurements in controlling occupational exposure to chemicals. In this connection, it has been customary for decades to monitor the plasma and/or RBC cholinesterase activity of workers exposed to anticholinesterase organic phosphorus compounds. This offers an indirect indication of absorption through measurement of a biochemical effect. It long has been practical to obtain a direct indication of exposure through measurement of urinary excretion of metabolites of a few compounds, such as parathion and malathion. However, only since the work of M. T. Shafik has it become practical to measure the urinary metabolites of all organic phosphorus insecticides. [Ref. Shafik, M. T.; Broadway, D. E.; Enos, H. F.; and Yobs, A. R. 1973. *Agr. Food Chem.* 21: 625–629. review.] The direct analytical approach should not replace the measurement of cholinesterase activity, but the analysis of metabolites does have the advantage of better quantitative correlation with exposure, and, if repeated, it can reflect discrete/recent exposures rather than a summation of exposures over a period of weeks or even months. The Shafik method of measuring urinary organic phosphorus metabolites is now standard in several laboratories. Analysis of a few samples of urine from persons recently exposed to GB under the most severe operational conditions would reveal whether a practical measurement of absorption of GB is now possible without modification of the method. If such a trial were unsuccessful, the method still might be adapted through study of the organophosphorous metabolites characteristic of GB, and, perhaps, through increasing the sensitivity of the method to detect the small concentrations expected in the urine of exposed workers.

Recommendations:
a. That the practicality of using the standard Shafik test be explored by sending suitable samples of urine to any laboratory skilled in using the test.
b. If this test is not immediately successful, that arrangements be made to have Dr. Shafik determine the possibility of adapting this test for measuring metabolites of GB in the urine of individuals occupationally exposed to the compound.

7. No scientific opinion with regard to restrictions on employment of women can be rendered before further data are available. In general, restrictions on work for women might best be applied to the risks of exposure involved in a particular job rather than to impose a blanket exclusion from the entire project. However, it must be kept in mind that any woman who works in an area where she could be exposed, and who subsequently delivers a child with a birth defect, might claim that an exposure caused the defect. There is at present no scientific data which could refute such a claim. The government could therefore be held liable for damages.

Recommendation:
That women employees of child-bearing age and capability should be assigned only to jobs with an extremely small possibility of exposure to GB.

8. The ad hoc Study Team believes that the analysis of data from work exposure records and health records by epidemiological techniques could provide much valuable information for the GB demilitarization project management. Further, a sociological-psychological study of workers in the high-risk category might be useful in determining why some employees experience less exposure to GB than others performing the same work.

Recommendation:
That the Commander, RMA, request through command channels of the U.S. Army Matériel Development and Readiness Command that the services of an epidemiologist be provided for analysis of occupational health data from GB Demilitarization Project.

9. The ad hoc Study Team believes that whenever feasible every opportunity for clinical studies on individuals exposed to GB should be pursued using a comprehensive and well-defined protocol. This information could be of significant value in occupational health programs for pesticide operations. Because of the potential value of this information with regard to the public health implications of the broad use of pesticides and their potential effects in the general population, provision should be made for long-term retention of this data to include periodic analyses.

Recommendation:
That employees who have experienced an exposure to GB, and who have signs or symptoms attributable to GB, have measurements made, whenever feasible, to record local and systemic signs including pupil size, vital capacity, maximum breathing capacity, movement of expired air and localized or generalized sweating measured by skin resistance technique.

10. The accumulation of water, hydraulic fluid and other liquids on the floors within cubicles increases the risk of accidents and the possibility for exposure to GB. Mechanical failure of the sump pumps has been described as the cause of this accumulation of fluids. Increased effort should be made to eliminate this unsafe condition.

Recommendation:
That each cubicle be provided with a back-up pumping system which will become operational automatically if the existing sump pump fails to prevent accumulation of fluid on the cubicle floor.

SUBMITTED BY:

Vann A. Newill, M.D.
Chairman, ad hoc Study Team

Duane G. Erickson
Lt. Colonel, MSC, USA, Executive Secretary

THE LIAISON BETWEEN THE ARMED FORCES EPIDEMIOLOGICAL BOARD AND THE U.S. ARMY MEDICAL RESEARCH INSTITUTE OF INFECTIOUS DISEASES

From the time that the Army's medical research activities began at Fort Detrick, the AFEB, and particularly its Commission on Epidemiological Survey, maintained a close relationship and responded for advice and assistance whenever requested. The Board's Commission on Epidemiological Survey served in a direct advisory role for the investigative programs at Fort Detrick, which later became known as the U.S. Army Medical Research Institute of Infectious Diseases (USAMRIID). That program of activities is described in the history of that Commission being prepared by Colonel Dan Crozier, MC, former Director of the Commission on Epidemiological Survey and former Commander of USAMRIID.

On 20–21 November 1975, the AFEB's ad hoc Subcommittee for Infectious Disease Problems met at USAMRIID for discussions and to plan work sessions. This productive meeting informed the Board of the various fundamental research activities underway at Fort Detrick. (Similar sessions of this type were held in ensuing years; when these meetings were held, a Board member gave a full report to the AFEB at its next meeting.) The agenda for the 20–21 November 1975 meeting, showing the topics of discussion and participants, appears on page 166.

THE COURSE IN GLOBAL (TROPICAL) MEDICINE AT WALTER REED ARMY INSTITUTE OF RESEARCH

In February, 1974, I suggested in a letter to Brig. General Kenneth Dirks, MC, Commander of the United States Army Research and Development Command, that, if feasible, civilian participants, including selected medical students and interested faculty members, be enrolled in the Global (Tropical) Medicine Course at Walter Reed Army Institute of Research (WRAIR). I pointed out that curricula in most American medical schools are grossly deficient in their training in parasitology and tropical medicine. General Dirks kindly expressed his ready assent to the suggestion. However, because of the military requirements and the practical considerations of class size, limited laboratory facilities, and fiscal constraints, he felt it was unlikely that the course could be extended significantly, or that a second course could be presented. Edwin H. Lennette, Board President, supported my suggestion in the following letter, dated 19 February 1974:

Dear General Dirks:

I should like to second the comments of Dr. Ted Woodward in his letter to you of 11 February 1974 with general reference to global medicine and specific reference to the course in Tropical Medicine at the Walter Reed Army Institute of Medical Research. Dr Woodward has pinpointed an area in which medicine in this country is woefully deficient and, since medical schools are no longer involved in the teaching of global medicine (or, as it is sometimes designated, tropical medicine), I truly believe that the Department of the Army could play a major role in this important area of medicine and medical education.

Indeed, I feel that the subject is of such importance that I have asked Col. Wilks, executive secretary of the Armed Forces Epidemiological Board, to place it on the agenda of the next meeting of the Board, viz., 16–17 April 1974.

Sincerely yours,

Edwin H. Lennette, M.D., Ph.D.

The course was expanded somewhat, in keeping with available resources and the normal constraints of WRAIR staff members. A few Peace Corps physicians have taken the course and non-military

The Agenda of the November 1975 Meeting of the Subcommittee for Infectious Diseases

0900 Opening Session
Introduction and Remarks: *Col Joseph F Metzger, MC, Brig Gen. Kenneth R Dirks, MC*

20 November

Coffee Break

Scientific Presentations

I. Subpopulation of actively rosetting T-lymphocytes as an index of CMI in man. *Lt. Col. Robert Edelman, MC*

II. Multiple leukocyte factors that induce reactions characteristic of the inflammatory response. *Carol A. Mapes, Ph D.*

III. Directions of Arenavirus Research

Arenavirus studies at USAMRIID: *Lt. Col. Gerald A. Eddy, VC*

The African green monkey as an alternative primate host for studying Machupo virus infections: Clinical aspects: *Capt. Franklin S. Wagner, VC*

Pathogenic studies of Bolivian hemorrhagic fever: *Maj. Charles G McLeod, Jr., VC*

1215 Lunch at Fort Detrick Officers' Open Mess

1330 Scientific Presentations (continued)

IV. Directions of Rickettsiology Research

Overview of Rickettsiology Division research: *Maj. Carl E Pedersen, Jr., MSC*

Immunological aspects of spotted fever vaccines *Richard H. Kenyon, Ph.D.*

Diagnosis of Rocky Mountain spotted fever using radioimmunoassay techniques *Maj Charles N Oster, MC*

Specific *in vitro* lymphocyte transformation to Rocky Mountain spotted fever rickettsial antigen: *Maj. Michael S Ascher, MC*

Immunological potential of the soluble antigen of *Coxiella burnetii*: *Maj. Richard A. Kishimoto*

Coffee Break

V. Directions of therapeutic studies

Effects of poly (ICLC) on yellow fever, Machupo, and Venezuelan equine encephalomyelitis virus diseases in monkeys: *Maj. Edward L. Stephen, VC*

Mouse models for evaluating potential antiviral compounds: A new "indirect" evaluation model: *Ralph W. Kuehne, M.S.*

The use of small-particle aerosols of antiviral compounds for the treatment of type A influenza pneumonia in animal models: *Maj. Jerry S. Walker, VC*

Pharmacokinetic aspects of aerosols of kanamycin in normal and respiratory *Klebsiella pneumoniae*-infected rats: *Richard F. Berendt, Ph.D.*

1715 Cocktails and Buffet Supper: Fort Detrick Officers' Open Mess

21 November

0800 Scientific Presentations (continued)

VI. Bacterial Exotoxins

Overview of toxin research: *Leonard Spero, Ph.D.*

Pseudomonas exotoxin—Properties and role in pathogenesis *Stephen H. Leppla, Ph.D.*

The response of mammalian cells to the exotoxins of *Corynebacterium diphtheriae* and *Pseudomonas aeruginosa*: Differential cytotoxicity: *John L. Middlebrook, Ph.D.*

Staphylococcal exfoliative toxin: *Ms. Anna D. Johnson*

Coffee Break

Consultation Sessions Each Division Chief will serve as host for meetings with consultants assigned according to the following list:

Division	Consultant
Aerobiology	William S. Jordan, Jr., M D., and Herschel E. Griffin, M D.
Animal Assessment	Reuel Arthur Stallones, M.D.
Bacteriology	William D. Sawyer, M.D., and Charles H. Rammelkamp, Jr., M D.
Pathology	A. M Pappenheimer, Jr., Ph.D , and Abram S. Benenson, M.D.
Physical Sciences	Ralph D Feigin, M.D., and Jay P. Sanford, M D
Rickettsiology	Bennett L. Elisberg, M D., and Theodore E. Woodward, M.D
Virology	Edwin H Lennette, M D., and Neal Nathanson, M.D

1215 Lunch at Fort Detrick Officers' Open Mess

1330 Executive Session

LIEUTENANT GENERAL
RICHARD TAYLOR, MC, USA
The Surgeon General



candidates have either enrolled or audited the lecture series. Available laboratory space has been a limiting factor. The AFEB has always shown great interest in educational programs for all of the military services, and Board members have contributed to various of the courses, particularly the one at WRAIR.

The period of fiscal austerity continued. In 1976, Colonel Richard Miller, MC, Chief of Preventive Medicine at WRAIR, and Director of the excellent global medicine course there, reported a problem and asked for a little help. He had been informed by the Surgeon General's Office that financial limitations had necessitated canceling the course. In a telephone call, I commented to General Taylor that closing the global medicine course at WRAIR would have far-reaching implications. After all, the course had served to indoctrinate the medical officers of all three services to the field and practical problems faced in the tropics. General Taylor, during his entire career, had closely identified himself with the Board, and the spirit of cooperation between him and the Board had always been a two-way street. He pinched a little more and found the financing to continue this excellent instructional course, and it remains one of the best of its kind anywhere. This is a fitting tribute to the excellence of military-sponsored educational programs, which keep medical officers informed of unusual but important global medical problems.

THE AFEB MEETING AT THE CENTERS FOR DISEASE CONTROL

Because the Board desired to keep abreast of relevant national problems related to infectious disease control, it held its winter 1977 meeting at the Centers for Disease Control (CDC) in Atlanta, Georgia. Several important developments during this period had prompted this change of venue. Dr. William Foege, Director of the CDC, briefed Board members on the scope of their activities. Legionnaire's Disease had posed a considerable threat that summer, and Board members were able to hear, first hand, of the new developments in this field. Furthermore, the African-derived hemorrhagic fevers caused by the Lassa and Ebola viruses were occurring with increasing frequency and had the potential to pose considerable challenges for the military.

This collaborative meeting among the AFEB and staff members of the CDC, WRAIR, and USAMRIID provided a unique forum. Discussion arose regarding the optimal site for the hospitalization of patients who were either en route to, or already in, the United States, and who were possibly infected with either virus. It was concluded that the best plan should include upgrading the security laboratories (Class IV) at USAMRIID. And it was considered appropriate that patients thought to be in the incubation period of any of these hemorrhagic fevers should be hospitalized at Fort Detrick.

This meeting was very useful, and it demonstrated the benefits that accrue from holding meetings at the site where a subject disease is under investigation. The agenda for the AFEB meeting in Atlanta follows:

Agenda for the 14 November 1977 AFEB Meeting at the Centers for Disease Control

0830–0840	Opening Remarks *Dr. Herschel E. Griffin*, President, AFEB
0840–1910	Overview of CDC Operations: *Dr. Wm. Foege*, Director, CDC
0910–1010	Epidemiologic Surveillance and Disease Reporting Systems *Dr. Philip S. Brachman*, Director, Bureau of Epidemiology
1010–1025	Coffee Break
1025–1125	Legionnaire's Disease *Dr. David W. Fraser*, Chief, Special Pathogens Branch, Bureau of Epidemiology
1125–1225	Lassa and Ebola Viruses—Investigations and Management of Imported and Indigenous Cases. *Dr. Karl Johnson*, Chief, Special Pathogens Branch, Virology Division, Bureau of Laboratories
1225–1315	Lunch
1315–1400	National Preparedness for Defense against Biological Warfare Agents and for National Health Emergencies Discussion of Separate and Joint Responsibilities and Capabilities for a Coordinated Response by All Agencies Involved Stockpiles of Vaccines, Antitoxins and Immune Globulins
1400–1430	Report from Subcommittee on Disease Control and Discussion: *Dr. Abram Benenson*, Subcommittee Director
1430–1500	Report from ad hoc Subcommittee on Asbestos Related Health Problems and Discussion: *Dr. Anna Baetjer*, Subcommittee Member
1500–1515	Coffee Break
1515–1545	Report from Subcommittee on Health Maintenance Systems and Discussion *Dr. Mildred Morehead*, Subcommittee Member
1545–1600	Report on 1977 USAMRIID Planning Session: *Dr. Charles H. RammelKamp, Jr.*
1600–1630	Programs of the Uniformed Services University of the Health Sciences *Capt. Dirk Van Peenen, USN*, Chairman, Department of Preventive Medicine and Biometrics, USUHS.
1630 -1650	Army Preventive Medicine Report *Col. Taras Nowosielsky, MC*, Chief, Health and Environment Division, Office of the Surgeon General
1650–1710	Navy Preventive Medicine Report: *Capt. W J Brownlow, MC, USN*, Head, Disease Analysis and Control Branch Occupational and Preventive Medicine Division, BUMED, DN
1715	Adjournment



1978 Armed Forces Epidemiological Board and Committee Directors

Back row, left to right. Paul V. Densen, D.Sc., Anna M. Baetjer, M.D., Paul Kotin, M.D., Vaun M. Newill, M.D., Abram S. Benenson, M.D., James Chin, M.D., and Lt. Colonel Duane G. Erickson, Ph.D., MSC, USA, Executive Secretary.

Front row, left to right. Theodore E. Woodward, M.D., Gustave J. Dammin, M.D., Herschel E. Griffin, M.D., President of the Board; Charles H. Rammelkamp, Jr., M.D.; and William S. Jordan, Jr., M.D.

THE PROBLEM OF THE HERBICIDE AGENT ORANGE

For more than a decade, the AFEB had heard reports and entered into discussions regarding the medical effects of exposure to the herbicide Agent Orange in Vietnam. The Board's role had been to render advice pertaining to the techniques and methods for evaluating the problem. On 30 August 1979, a special ad hoc Subcommittee met to review a plan to study the possible adverse health effects on Air Force personnel following their exposure to Agent Orange in Vietnam (Project Ranch Hand). The attendance roster for that meeting follows:

AFEB: Floyd W. Denny, M.D., Anna M. Baetjer,M.D., and Paul M. Densen, D.Sc., members, and Captain Charles W. Halverson, USN, Executive Secretary.

Consultants and Technical Experts. Major Alvin L. Young, USAF; Joel Michalek, Ph.D.; Lt. Colonel William H. Wolfe, USAF; Colonel George D. Lathrop, USAF; Major Phil G. Brown, USAF; Robert W. Miller, M.D., Abraham Lilienfeld; Lt Colonel Ronald D. Burnett, USAF, Colonel J. W. Thiessen, USAF; Commander R. B. Peterson, USN; and Bartlett M. Rhoades.

Dr. Paul Kotin, a Board member who was active in the Board's assessment of the Agent Orange problem, was unable to attend this meeting. The ad hoc Subcommittee carefully considered comments and recommendations regarding the Ranch Hand protocol, and their recommendations were approved by the Board. The recommendations pertained to the need to formulate an ideal control group with provision of adequate sampling flexibility and replacement under the proposed best-match variable concept. It was proposed that only one best-match-available control be used in the analysis. It was further recommended that a classic retrospective-prospective mortality study be considered (in conjunction with the proposed study), comparing the Ranch Hand personnel with the nonexposed C-123 air crew members. Other suggestions pertained to *(a)* the type of statistical testing, *(b)* whether a positive dose-response finding would be required, *(c)* dose-latency analysis, *(d)* the type of bias corrections, and *(e)* the criteria for rejections.

During the 18 September 1979 meeting of the Board, Colonel William Wolfe, USAF, and Dr. Patterson, an analytical chemist, reported on data that evaluated the immune systems of the Ranch Hand group that had been exposed to Agent Orange. Isotope dilution spectrophotometry techniques measured dioxin and its analogues in adipose tissue and serum; concentrations were higher in serum. With an overnight run, it was possible to perform five sample specimens at a one-time cost of $1,000 per specimen. Two million dollars would be required for a two-year project. The half-life of dioxin is assumed to be 7.08 years. Studies showed that the Ranch Hand Group, which comprised 2,250 in the study, were exposed to Agent Orange, based on the isotope findings. Interestingly, no difference in serum levels was detected for Vietnam and non-Vietnam test samples.

The Board continues to be involved in this important longitudinal study.

THE ASSISTANT SECRETARY OF DEFENSE REQUESTS THAT THE BOARD CONSIDER NEW ISSUES OF GREAT IMPORTANCE

The Board usually held its fall meeting at a facility known as Parson's Island at Kent Island, Maryland. McCormick and Company of Baltimore kindly allowed the AFEB and its guests to meet there. This particular meeting was of considerable interest since a number of senior military officers and others in authority attended the meeting. These included. John Moxley, M.D., Assistant Secretary of Defense for Health Affairs; Lt. General Charles C. Pixley, MC; and Brig. General Garrison Rapmund. One of the



THEODORE E. WOODWARD, M.D.

Ted Woodward was raised in Westminster, Maryland; he graduated from Franklin and Marshall College in 1934 and the University of Maryland School of Medicine in 1938. He entered the Army in 1941, interrupting his internship and residency in medicine. During the war, he served at Fort Meade, Maryland, for a short time, and with the U.S. Army Corps of Engineers in Jamaica, B.W.I. This was followed by research training at the Army Medical School in Washington, D.C., where he attended a course in tropical medicine. He was temporarily assigned to a field laboratory with the initial landing forces in northern Africa. His work, primarily on the typhus fevers, involved research at the various Pasteur Institutes in northern Africa, and he was a member of the U.S A. Typhus Fever Commission. He served in Naples, Cairo, the Aden Protetorate, the European theater (in England and Normandy and elsewhere in France), and the Pacific theater (in northern New Guinea and the Philippine Islands).

After World War II, Woodward practiced medicine privately in Baltimore for several years. In 1948, he joined Joseph E. Smadel in studying the clinical efficacy of Chloromycetin in the treatment of scrub typhus and the typhoid fevers in Kuala Lumpur, Malaya (now Malaysia). After this valuable experience, he joined the faculty of the University of Maryland School of Medicine, where he organized the Division of Infectious Diseases. From 1954 to 1981, he was Chairman of the Department of Medicine there.

He contributed to AFEB activities, first as a member of the Commission on Epidemiological Survey from 1952 to 1973, and as its Director from 1959 to 1973. He was a member of the Commission on Rickettsial Diseases from 1955 to 1973, and an associate member of the Commission on Immunization from 1950 to 1973. He served as President of the AFEB from 1976 to 1978, and from 1980 to 1990.

prominent guests was Wolf Szmuness, M.D., Director of the Laboratory for Epidemiology at the Kimball Research Institute of the New York Blood Center. The agenda for that September 1980 meeting and a summary of its minutes, which provide ir ight into the manner in which the Board functioned and recorded its discussions, follow:

Agenda for the Fall 1980 Meeting of the AFEB

19 September

0830–0840	Opening Remarks: *Theodore E. Woodward, M.D.*, President, AFEB
0840–0850	Greetings *John Moxley, M.D.*, Asst Secretary of Defense for Health Affairs
0850–0930	Infectious Disease Research Funding: *Brig General Garrison Rapmund,* Assistant Surgeon General for Research and Development
0930–1000	TBA
1000–1015	Coffee Break
1015–1100	Navy Overseas Medical Research Laboratories. *Capt. S. W. Joseph, MSC, USN,* Naval Medical Research and Development Command, NNMC
1100–1145	Commentary on a Paper by Dr. E K Gunderson Concerning Epidemiological Models for Management and Clinical Services in Health Care Systems: *Paul Densen, D.Sc.*
1145–1300	Lunch
1300–1330	Tri-Service Experience with Hepatitis B Virus: *Army, Navy, and Air Force Preventive Medicine Officers*
1330–1430	Hepatitis B Vaccine Trials in a New York City Homosexual Male Population: *Wolf Szmuness, M.D.*, Director, Laboratory for Epidemiology, Kimball Research Institute of the New York Blood Center
1430–1445	Coffee Break
1445–1530	Army Preventive Medicine Report: *Col. George E. T. Stebbing, MC*, Chief, Preventive Medicine, Consultants Division, Office of The Surgeon General, DA
	Navy Preventive Medicine Report: *Capt. R. L. Marlor, MC*, Director, Occupational and Preventive Medicine Division, Bureau of Medicine and Surgery, DN
	Air Force Preventive Medicine Report: *Col. Alfred K. Cheng, MC*, Chief, Preventive Medicine, AFMSC/FGTA

20 September

0830–0840	Opening Remarks: *Theodore E. Woodward, M.D.*, President, AFEB
0840–0900	Reassessment of AFEB Recommendation Concerning Typhoid Immunization for Dependents Overseas
0900	AFEB Working Session

Summary of the Minutes

Dr. Woodward, President, opened the meeting at approximately 0830 on 19 September 1980 by welcoming all present with special recognition given to Dr. Moxley, the Assistant Secretary of Defense for Health Affairs, Lt. General Pixley, the Surgeon General of the Army, and Brig. General Rapmund, the Commander of the U.S. Army Medical Research and Development Command After a few introductory and administrative remarks, he called upon Dr. Moxley as the first speaker.

Dr. Moxley began with the statement that the problem with which the AFEB had been involved concerning overseas laboratories had been settled and that all of the labs would stay open and all of the personnel positions reinstated. He stated that due to changes which have been experienced over a period of time within the DOD medical fields he would like to ask the Board to give thought and consideration to the following areas in the future.

1. Focus research on neurobiological or chemical warfare issues.

2. The vulnerability of human organisms in handling certain types of weaponry, an example of the problem is the severe hearing impairment from close proximity to the firing of certain heavy artillery.

3. Epidemiological research into alcoholism and substance abuse.

4. A realistic, sharply defined set of physical standards, such as weight, vision, and sickle cell trait carriers, that would eliminate frequent waivers is needed.

5. Research on effects of individual and group isolation, and its effect on combat readiness and on interpersonal relations.

6 The importance and expanding area of computerized management information systems (DEERS, TRIMIS, UCA).

Dr. Moxley, in concluding, asked that consideration be given to the composition of the Board itself in filling vacant positions with the expertise, interest and dedication to address the types of issues described above. He stated that previously the AFEB had focused on infectious diseases but now is diversifying to include other areas and that he feels the above areas will be very challenging areas within the DOD over the next few years.

A question and answer session followed in which Dr. Moxley stated that it would be very difficult to justify a Board as large as the AFEB in the future if the Board was focused entirely on infectious diseases and that the Board's expansion in the future was desirable. It was stated that two-thirds of all casualties during past wars were due to disease, not hostile action, and that disease has been critically important to manpower during wartime, however, it may have less impact on manpower effectiveness at this time, and it is not known how much time should be given to various other areas. The information system will address this.

Dr. Woodward called on General Rapmund as the next speaker.

General Rapmund stated that he would like to place into perspective the status of the Army's research programs. He stated that the Army has nine laboratories which are headquartered at Frederick, Maryland, that there is currently a staff of 2,800 and a budget of about $85 million, and that by the end of 1980 all nine labs should be involved in chemical research. Some of the current research programs include. disease, environmental hazards, casualty care, dental, chemical, drug abuse, and tank gas masks.

General Rapmund stated that some members of Congress [and] Hill committee staffers are convinced that R & D and NIH do duplicate work. They feel that Army R & D should concentrate on lasers, microwaves, [and] chemical and biological warfare defense. General Rapmund stated that the Board may be able to help with programs for typhus research and anti-malarial research. He said Congress says that there is duplication of research efforts among Services, the military medical school and NIH. He stated that the Board may help to influence decisions concerning research of military medical importance and national defense. Better visible documented coordination between NIH and the Services is needed to avoid cuts in funds. He stated that there is a necessity to demonstrate to Congress that DOD is seriously coordinating research efforts in order to avoid fund cuts. Help is needed from the Board for independent verification of the nature and validity of the problems. General Rapmund then said some priority areas of interest include, in the order of priority. chemical agents, performance in hazardous military environments, and infectious disease.

General Rapmund then listed some of the advisory bodies they may call upon if needed. Included are. the Army Scientific Board, clinical Consultants to the Army Surgeon General, the Defense Science Board, and the National Academy of Sciences National Research Council and also a number of contract sources.

General Rapmund stated that research for occupational health is needed particularly in the areas of the dangers of new weapon systems. The principal emphasis should be on fire-power and sustainability of troops in the field. He said, as it stands, the medical consideration is not an integral part of the weapons system development. But, if the Army would view and allow human factors as part of the systems development, then resources could be returned to support this. The major weapons system decision-making body is chaired by very senior people and medicine is not represented. The Board might be able to help on this issue. There are currently a lot of weapon systems that are not ready to be fielded and have not been tested for human factors.

Dr. Woodward called on Dr. Densen to comment on Dr. Gunderson's paper Epidemiological Models of Value for Clinical Service and Management of Navy Health Care Systems. Inpatient and Outpatient Data at the Naval Health Research Center at San Diego.



Meeting of the Armed Forces Epidemiological Board
Parson's Island, Maryland
September 1982



Rear Admiral James Zimble and
Brigadier General Monte Miller



Left to right: Captain Hauler, Admiral James Zimble, Colonel Al Cheng, Dr. Dwight Culver, and Dr. Abram Benenson.

Dr Densen stated that first, he would like more preciseness in the language of the [conceptual] framework when dealing with incidence of disease, and second, a little more thought to the use of sampling procedures would greatly reduce costs and allow more factors to be examined. The mechanism for identifying which groups are high risk groups for morbidity or hospitalization and identifying problems that go with certain kinds of environments were discussed The methods for coordinating general health maintenance programs and occupational health programs, with thought given to placing people in jobs, i e , matching physical capacities of individuals against physical requirements of the jobs, need further study

Dr Densen suggested the organization of a task force consisting of the three Preventive Medicine Officers of the services, the San Diego group, the statistical units of the Services, a clinical group and someone who represents the actual clinical problems of delivering health services get together for more meaningful data collection. Dr. Densen also suggested that research be directed at testing ways of indicating beneficial life styles in the Armed Forces should be developed Dr. Densen stated that a form is being put in health records of Air Force and Navy civilian and military personnel indicating what exposures exist in the workplace. The physician should indicate at the time of the exam whether it is an occupational illness. This data collection system must have the proper questions asked and the proper data collected in order to be of value.

Dr Woodward then called upon Captain Joseph, USN, to speak on the Navy's Overseas Medical Research Laboratories.

Captain Joseph began by stating that the matter of the Overseas Medical Laboratories has been resolved and expressed thanks for the efforts of a number of persons, including the AFEB. He stated that the Navy Medical Research and Development faces a cut of approximately $3-12 million and that added to last year's cut plus additional years cuts, that soon the decision of whether the Navy can continue to maintain certain projects will exist. Captain Joseph then briefed the Board on the locations of the Navy medical laboratories and the projects with which they were involved He briefly justified the necessity of having laboratories at these various locations. He stated that in the Navy Overseas Laboratories, the infectious disease programs are primarily involved in the following four areas epidemiology, improved diagnostic methodology evaluation and use of chemotherapeutic and chemoprophylactic drugs and vaccines. He stated that it was important to recognize that a disease is not always the same in various areas, thus they are looking at risk of exposure to various infectious diseases, their prevalence, severity and resistance to therapy in these various locations.

Dr Moxley stated that one of the very significant factors in saving the laboratories was the strong support for retention of the labs expressed by the host nation governments. Dr. Moxley also said that universal respect for U.S. biomedical capabilities is held throughout the world, which is an important factor when approaching nations to develop relationships to have sites where bases can be developed.

Lt Colonel Erdtmann then provided information concerning the viral hepatitis morbidity in U.S. Army active duty forces He pointed out that most individuals that have clinically apparent hepatitis, i.e , having jaundice, significantly elevated liver function tests, or typical symptoms, are admitted to the hospital and given a diagnosis of acute viral hepatitis as long as other conditions associated with jaundice and abnormal liver function are ruled out. It is then routinely determined whether the individual's blood contains HBsAG, a marker for type B hepatitis. Other hepatitis B markers are not usually performed. Lt. Colonel Erdtmann went on to present data which showed hepatitis rates almost ten times higher in the Army than for the U S. population at large. However, due to different reporting mechanisms in the civilian community, the real differences in rates are probably not that great. But Lt Colonel Erdtmann said the data suggest that there is probably a higher occurrence of hepatitis among military forces than among the U.S. civilian population. From 1976 to 1979, the Army worldwide case rates were generally stable with approximately three cases per thousand per year (for all types combined) and one case per thousand per year for type B. There were approximately 2,200 cases of all types per year and 800 cases per year of HBV with an overall decline in acute viral hepatitis in 1979 Lt Colonel Erdtmann cautioned the Board that the true number of cases of hepatitis B was probably understated The HBV cases as presented represented only those in which a HBsAg test was performed, was positive, and was recorded within the medical record at the time the discharge summary was dictated. Those individuals with acute viral hepatitis in whom an HBsAg test was not done or whose test result was not available at the time of discharge were not counted as cases of hepatitis B. Additionally, those individuals whose HBsAg test was negative were discounted as cases of hepatitis B even though other serologic markers might have been positive for hepatitis B had they been done. Thus, the data represented only a "least case" analysis of hepatitis B morbidity. He reported that during the period 1976 through 1979 most of the HBV cases occurred in Europe (53%)



GARRISON RAPMUND, M.D.

Following his graduation from Harvard College in 1949, and from the Columbia University College of Physicians and Surgeons in 1953, Garrison Rapmund trained as a house officer at Bellevue Hospital in New York, and in pediatrics at the Babies' Hospital, Columbia Presbyterian Medical Center, New York.

Gary Rapmund joined the Department of Virus Diseases at WRAIR and later served at the U.S. Army Medical Research Unit in Kuala Lumpur, Malaysia. He developed an interest in rickettsial diseases, particularly mite-borne typhus fever, and made important contributions to their diagnosis and prevention. He was Commandant of the unit in Malaysia from 1965 to 1969, and was Director of WRAIR from 1976 to 1979. Dr. Rapmund was promoted to Major General in 1981, and he commanded the U.S. Army Medical Research and Development Command until 1986. In 1983, the Infectious Diseases Society of America awarded him their Joseph E. Smadel Medal. During his tenure with the Medical Research and Development Command, Dr. Rapmund kept the AFEB informed of the research developments in the medical services and maintained a good working relationship with the Board.

while 37 percent occurred in the U.S. Eighty-five percent (85%) of the HBV cases occurred among individuals less than 25 years of age. Over 90 percent of these individuals were enlisted males. He further presented data which showed that the incidence of acute viral hepatitis among active duty Army personnel worldwide by viral type was higher in Europe and Korea than elsewhere. With respect to the incidence of hepatitis B worldwide by race and sex, there was slight suggestion that the disease rate in males was higher than females and that the rate among blacks was slightly higher for both sexes. In summary, military groups found it to be the highest risk of developing clinically apparent hepatitis B infections were young enlisted members assigned overseas to Korea or Europe.

Colonel Cheng commented briefly on the acute hepatitis experience in the Air Force. He indicated that presently they had insufficient data to determine rates, but had only total numbers of cases based upon Air Force hospital inpatient information which, in addition to Air Force personnel, included some Army, Navy and dependent personnel. Colonel Cheng said that approximately one-third of the cases were hepatitis B. He reported, however, that beginning this year, on certain bases, it will be possible to obtain more accurate denominator information. He then commented briefly on five recent outbreaks of hepatitis A, four of which were related to child care centers.

Captain Marlor reported that the Navy, based on data from disease alert reports, in 1979, had a total of 387 reported cases of type A hepatitis and 284 cases of type B, 77 of which were in active duty personnel. In January through June of 1980, there were 152 cases of A and 80 cases of B. Of the active duty B cases in the Navy identified in January through June 1980, the majority were young sailors and in the lower pay grades. The cases seemed evenly distributed throughout the rating groups. Captain Marlor further stated that people assigned to ships in the continental U.S. had about the same number of cases as those assigned to shore. Also, it was noted that those shipboard in the Atlantic and Pacific areas had exactly the same number of cases reported and those ashore in those areas were about the same. Captain Marlor concluded that in view of the present available data it would be difficult to identify any specific populations that would be candidates for hepatitis B vaccine.

Dr. Wolf Szmuness, of the Lindsley F. Kimball Research Institute of the New York Blood Center, next presented the results of a study with a hepatitis B vaccine in a placebo-controlled, randomized, double-blind trial in 1,083 homosexual men known to be at high risk for hepatitis B infection. The study showed the vaccine to be safe and the incidence of side effects was low. He said that within two months, 77 percent of the vaccinated persons had high levels of antibody against hepatitis B surface antigen. This rate increased to 96 percent after a booster dose and remained essentially unchanged for the remainder of the study. For the first eighteen months of follow-up, hepatitis B or subclinical infection developed in only 1.4 to 3.4 percent of the vaccine recipients while the placebo recipients experienced an 18 to 27 percent incidence ($P < 0.0001$). The reduction of incidence in the vaccinees was as high as 92.3 percent. No one with a detectable immune response had hepatitis B or subclinical infection. Dr. Szmuness also stated that they noted a significant reduction of incidence within 75 days after randomization. This observation, he said, suggests that the vaccine may be efficacious even when given after exposure. In the ensuing discussion, it was pointed out that the vaccine would probably be available for use by mid- or late 1981, but that a number of other types of studies would follow. Other populations suggested for testing the vaccine include dialysis patients, babies, children and endemic carriers.

Dr. Culver then presented some of his views concerning occupational health. He pointed out that the province of occupational health is the worker and the work environment. The work environment should be safe and manipulated within limits in order to produce the desired degree of safety and health. He emphasized that people in occupational health, however, cannot make the decisions determining how safe or healthy the work environment is to be, those determinations are the responsibility of the organization concerned. Likewise, how healthy and productive the worker should be are determinations for the employing agency. Dr. Culver said that the functions of those involved in occupational health do include, in the case of people, the measurement of the environmental effects on individuals, i.e., medical surveillance and clinical assessment. He said the work environment should be measured in terms of its physical, chemical and psychological parameters. He also pointed out the need for more research programs to develop important methods of making various measurements and applying the accumulated data epidemiologically so appropriate control measures can be established.

Dr. Culver concluded by emphasizing that an effective occupational health program cannot exist without the coordinated interaction of diagnosis, treatment, medical evaluation and environment analysis. Additionally, those involved in diagnosis and treatment must have some responsibility in prevention, in control of the environment and in the selection of people who are going to work in that environment.

Colonel Stebbing proceeded with the Preventive Medicine Report for the Army. He indicated that the Army had experienced a very significant increase in cases of heat injury during 1980, approximately 100 more than a year ago.

Most of this increase was due to cases of heat exhaustion rather than heat stroke. Fifty-two percent of heat injury cases were among basic trainees and the remainder were in seasoned troops. The reason for this is not clearly understood.

With regard to the Army influenza program, Colonel Stebbing indicated they would soon be immunizing with the A Brazil, A Bangkok, and B Singapore vaccine. He said they had already seen some cases of Adeno 4 and have started immunizing with Adeno 4 vaccine.

Colonel Stebbing reported on eight cases of meningococcal meningitis, two of which were serogroup Y. One Y was a fatal case. The remaining six cases were not serogrouped. Colonel Stebbing went on to describe the Army occupational health organization and some of the inherent internal problems. He said there was a great need for research into finding effective applications of epidemiology to problems in occupational medicine and environmental hygiene as it relates to the work environment, i.e., medical surveillance, identification of environmental hazards and control measures. He also briefly described the occupational health and industrial hygiene training programs provided in the Army.

Captain Marlor then gave the preventive medicine report for the Navy. He described some problems caused by certain lining materials or the improper application thereof in potable water tanks aboard ships. This has resulted in difficulty in maintaining adequate chlorine residuals. These ships will most likely have to return to a shipyard and have the tanks relined. This will be very costly in time and money and there is limited yard space. He reported a related problem which concerns the conversion of an oil tanker to a water barge which is to be deployed to Diego Garcia for an extended period. Again, [there is] a problem in maintaining the potability of the water.

Captain Marlor stated that the Navy still did not have an occupational health group. He said they have been working to develop a viable occupational health program. In this endeavor, they have been attempting to make some organizational changes. He said they are building into the Navy Environmental Health Agency. NEHC will be staffed with occupational medicine physicians, industrial hygienists, radiation specialists, occupational health nurses, etc. in order to improve data gathering and analysis to identify problems for further study and research. This unit will also have a preventive medicine element for epidemiological support.

Colonel Cheng reported on problems similar to those experienced by the other services. Their hearing conservation program was very good at this time. Measurement and control of exposure to toxic gases and chemicals continue to present problems, this requiring more research for improved technology. Colonel Cheng said there is currently an effort being made to expand their training program in occupational health to include family practice physicians. Colonel Cheng further commented on the increasing problems associated with child care centers as a result of the increasing numbers of single parents in the Air Force.

Dr. Woodward called the meeting to order at 0805 on 20 September 1980. He stated that he thought the AFEB should write letters to Dr. Moxley and General Rapmund thanking them for their presentations and asking them to define those areas, in the order of their priorities, in which the Board might be of assistance. He stated that the Board could then devote time of the AFEB meetings to the key issues.

Dr. Woodward stated that Dr. Moxley had said that he would very much appreciate meeting with a small group of the AFEB after the Board has had time to consider his suggestions and to discuss further the proposed issues.

There was a general discussion of the Gunderson paper concerning how the suggestions made by Dr. Densen could best be carried out, the objective being to develop a better delivery and statistical analysis system, with the three services working together to maintain and establish better credibility and focus on methods for identifying high risk groups. It was decided that a task force should be organized to meet in San Diego. The task force would be made up of the Preventive Medicine Officers, the group from San Diego, a statistical group and a clinical group, plus any other persons who might be helpful to the mission of this task force.

It was suggested that at the next Board meeting, the Services expand on what the highest priority items should be as identified by Dr. Moxley and General Rapmund and when the priorities are established that consultants with the appropriate expertise be solicited to assist the Board in responding to these priorities.

There was a general discussion concerning the Board making a resolution stating that it is desirable that each of the three Services have a well organized, integrated occupational health service and that resources should be made available. After discussing the matter, it was decided that more information was needed from the three Services. There was a request that the OSHA Study, which produced a report of the occupational programs, be made available if possible.

There was a general discussion on the problems of funding cuts for the Army and Navy Medical Research and Development programs. The Board indicated that it will be very supportive and coordinate very closely with Dr.

Moxley and General Pixley on this matter when their wishes are known.

Captain Marlor was asked to bring the Board up to date on the asbestos situation at the next Board meeting and each of the three subcommittees were asked to put together lists of names for review for possible Board membership.

Dr. Woodward stated that he would form a resolution in the name of Dr. Geoffrey Edsall, who died recently, place it in the Minutes, and mail it to Dr. Edsall's wife.

After a general discussion, it was decided that the next AFEB meeting would be set for 5–6 February 1981.

The meeting adjourned at 1015 a.m. on 20 September 1980.

After this meeting, I requested that Dr. Moxley indicate those issues that he considered to be of the greatest importance. He responded with the following letter, dated 11 December 1980:

Dear Ted:

This is a somewhat belated reply to your request that I reduce to writing a prioritized list of the issues which I presented to the Board at the Kent Island meeting two months ago. I have waited to get the transcript of that portion of the meeting so that I might more accurately reflect my comments.

I realize what I am proposing is, in many ways, quite a departure from the sorts of topics and issues that the AFEB has wrestled with in the past. But the simple fact is that medicine is changing, and we in the military health care system aren't immune to that change. Further, we must make a particular effort to address and, hopefully, resolve some of the less traditional medical problems we face. I don't intend to demean the past important contributions the AFEB has made in traditional epidemiological areas, but we must move on to meet new challenges. This was the major purpose in enlarging the size of the AFEB and of seeking broadened expertise.

I suggest the following issues for AFEB consideration:

- Chemical warfare is an area in which I would like to ask for the assistance of the AFEB. The civilian sector has made enormous investments in neurobiology research, which will be of value in any investigation of chemical warfare issues. I see one major function of the AFEB to be a catalyst in the interaction of the Department of Defense and the civilian community in areas of medical research. Although a decade ago there was significant reluctance on the part of many scientists to work with DOD, attitudes toward national security and the availability of research funds have changed so that now we are able to benefit from civilian-based research to a greater extent. The military medical departments, my office and the AFEB should cooperate in focusing research on neurobiological or chemical warfare issues.
- Another important issue to be addressed is that of the human organism's vulnerability in handling certain types of weaponry. One example of this problem is the severe hearing impairment that can result from proximity to the firing of certain heavy artillery. Weapons are developed without the early involvement of the medical community, who later may point out that for health reasons the weapon is usable only with certain sacrifice of operator capability.
- Epidemiological research into alcoholism and substance abuse is needed, since these are problems of great magnitude in the military. Expert guidance from the AFEB would be welcomed by the Office on Drug and Alcohol Abuse Prevention in Health Affairs.
- The three Surgeons General have all expressed concern about the validity of the existing physical standards. They are increasingly requested to grant waivers to permit the acquisition of otherwise qualified personnel. Weight and visual standards, as well as sickle cell trait carriers, are targets of particular interest in the matter of waivers. I would like to see a realistic, sharply defined set of standards that would not necessitate frequent waivers.
- Fascinating research on the efforts of individual and group isolation, on combat readiness and on interpersonal relations has begun at the Letterman Army Institute of Research. This could be a basis for further investigations in this area.
- Expertise could possibly be provided by the AFEB to Health Affairs in the important and expanding area of computerized management information systems (DEERS, TRIMIS, UCA). I feel that there is a need for periodic evaluation of these efforts to guarantee the development of useful products.
- The success of the cooperative efforts on behalf of the continued support for the overseas labs demonstrates the potential effectiveness of this group when called upon in a controversial area. Medical research and development is facing a critical period, which compels us to maintain an active interface with the civilian community and to ensure

efficient management of R & D efforts within the Department.

In conclusion, I want to shift the focus of this letter from the issues which confront us and the Board to the composition of the Board itself. I know that several positions on the AFEB will become vacant in 1981. It is my sincere hope that in filling these positions, you will seek vigorous members with the expertise, interest and dedication to address the sorts of issues described above. The military health care system counts heavily on your advice and counsel.

I appreciate your willingness to hear and consider these new issues. Once you have had a chance to digest the foregoing, I and my staff would be pleased to meet with you to discuss the proposed issues further.
Sincerely,

John H. Moxley III, M.D.
Assistant Secretary of Defense for Health Affairs

Soon thereafter, on 16 February 1981, I wrote to Dr Moxley, and described the Board's prior experience, its recommendations, and the steps to be taken on the issues raised. All of these issues were thought by the respective military services to be of great importance.

Dear Dr. Moxley:

We missed having you attend our recent meeting of the Armed Forces Epidemiological Board, which proved to be quite productive. It is our hope that you will be able to attend the meetings this year which are scheduled for June 11–12, 1981, at WRAIR; [and on] September 16–17–18, 1981, [at] Parson's Island. The latter site seemed to be a nice site for a meeting; it was relatively cheap and the surroundings served the purpose to promote good communication.

Undoubtedly, General Augerson has conveyed some of the features of the recent meeting to you. He attended the executive portion on Friday morning, at which time I spoke to the various points which you introduced at the Parson's Island meeting in 1980, and elaborated upon in your letter to me of December 11, 1980.

Permit me to address these points in order.

1. The Board does consider **chemical warfare** a very important matter, particularly with respect to the needs of neurobiological research. General Rapmund directed some of his comments to the chemical warfare problem. During one of the meetings in 1981, we will arrange to have the Board informed of the current status of things including the viewpoints of experts regarding future indicated research.

2. The issue of **injury of humans in handling modern types of weapons** is an equally important matter. Several years ago, there was a partial briefing on the problem to the Board. Again, this issue will be discussed with more thoroughness in either the June or September meeting of 1981. There is the important matter of security clearance which takes time to arrange.

3. The matter of the problem of **alcohol and drug abuse** is not new to the Board. About six years ago, the Board established an ad hoc Committee on Drug Abuse in which a small group of high level and well-qualified persons participated. Some very positive recommendations were made. I am instructing Captain Halverson to exhume this information for the AFEB office which should provide useful data. A copy will be sent to you. Also, we will seek to have a full status report presented to the Board by the respective Services and convene a small special study group in keeping with the indicated needs. This is a major problem which was succinctly made clear during recent meetings. The problem or its solution is not uniquely medical.

4. **Physical standards.** You have first-hand evidence of the Board's important in-put regarding the Board's recommendations pertaining to health standards. The Densen Report was excellent. You raised the matter of weight and visual standards and the issue of sickle cell trait. I have asked Dr. Densen to consider this matter and to let us have his views and those of his subcommittee. Clear recommendations should be forthcoming.

5. **Individual and group isolation in relation to combat readiness and interpersonal relations.** During the last meeting, we were impressed with the data on morbidity and mortality statistics which Captain D. F. Hoffler presented from the Navy Department. It was very apparent that suicide ranks high as a cause of death, albeit lower than in the civilian population. I have contacted several members of the three Services and will arrange to have the Board informed by well qualified senior officers regarding their evaluation of the issues. Captain Hoffler informs me of an outstanding expert in the Navy Department and I am sure that there are others. Since you mention that studies have been initiated at the Letterman Army Institute of Research, we will have the appropriate qualified

person speak for that group.

6. **Computerized management and informational systems.** The AFEB has established a Task Force to pursue the important matter of epidemiological approaches to health care and management. The Navy program in San Diego is an excellent example. The Task Force met once and we are now planning working sessions which will include members of the Task Force, indicated invited experts and the preventive medicine officers of the three services. It is our view that small working groups of this type can accomplish a great deal for each service. If genuinely interested, they can concentrate on those approaches which seem particularly appropriate for their specific service. Some good progress has been made. Dr. Herschel Griffin heads this Task Force and when he steps down as a member of the Board later in the year, Dr. Remington has kindly consented to lead this group. We are fortunate to have Drs. Griffin and Remington involved and you will be pleased to know that Bill Spicer has made important contributions.

7. **Overseas service-oriented research programs** is a matter with which the Board fully concurs. You are aware that the Board interfaced in this issue and is fully cognizant of the importance to encourage academic institutions to relate to overseas service-oriented research programs. This has happened before and if there are proper resources, it will happen again. Already, there is progress of this type at NAMRU-2 in Jakarta, there are other examples.

Let me thank you for your interest and objective comments. By way of additional interest, the Board has decided to invite three persons to join the Board. Two infectious disease types are now stepping down (Rammelkamp and Jordan) and only one will be replaced, i.e., Saul Krugman. The two other members whom we hope to recruit are Seymour Jablon, who is an expert in systems programs, and Sheldon Murphy, who is capable in toxicology. Your comments will be appreciated.

Sincerely yours.

Theodore E. Woodward, M.D.

The AFEB's Prior Action on Substance Abuse

I responded to Dr. Moxley's comments pertaining to AFEB interaction on substance abuse among military service personnel, and informed him that the Board's ad hoc Committee on Drug Abuse had been formed and had met at WRAIR ten years earlier, on 13 April 1971. Members of the Committee who were not affiliated with the Board included: Dr. Vincent Dole, Chairman of the Rockefeller University; Dr. Robert L. DuPont, Director of the Narcotics Treatment Administration; Dr. Gilbert Beebe of the National Research Council; and Mr. Brian LeBert-Francis of the Special Action Office for Drug Abuse Prevention. Dr. Colin MacLeod represented the AFEB. This ad hoc Committee had formulated a series of recommendations, which the Board had approved. My letter to Dr. Moxley on this subject, dated 4 March 1981, and the AFEB's previous recommendations, dated 24 April 1972, follow:

Dear Dr. Moxley:

During our recent discussions and correspondence, you raised the important problem of the practice of drug abuse in members of the Armed Services. As President of the Armed Forces Epidemiological Board, I assured you that the Board would respond to this matter, and attempt to be of assistance in keeping with its limitations.

As a first step I have retrieved the proceedings of the AFEB's ad hoc Committee on Drug Abuse, which rendered a report on April 24, 1972. The composition of the special ad hoc Committee, appropriate memoranda and letters, and the recommendation of the AFEB are enclosed. They are submitted to you for informational purposes.

As was indicated previously, the Board will assign this important problem to some of its future meetings since it considers the issue extremely significant.

Sincerely yours,

Theodore E. Woodward, M.D.



JOHN H. MOXLEY III, M.D.

John Moxley received his A.B. degree from Williams College in 1957, and graduated from the University of Colorado School of Medicine in 1961. He was a house officer at Peter Bent Brigham Hospital in Boston; from 1963 to 1965, he was a clinical associate and attending physician at the National Cancer Institute in Bethesda; and he was the senior resident physician at the Brigham Hospital. Dr. Moxley's specialties are oncology and hematology.

Dr. Moxley was appointed Assistant Secretary of Defense for Health Affairs in 1980; during his tenure, he maintained a close and enthusiastic relationship with the AFEB. Despite his busy schedule, he attended many of our meetings. At the Board's fall 1980 meeting, he raised a number of issues regarding important national military problems, including chemical warfare, health problems related to weapons systems, epidemiological research into alcohol and drug abuse, health standards for the military services, computerized management information systems, and the structure and function of the DoD Overseas Laboratories. The Board addressed these matters effectively and in considerable detail, and is grateful to Dr. Moxley for his constructive suggestions.



Armed Forces Epidemiological Board Meeting on the Medical Education of Drug-Abuse Control Programs of the Military Departments
30 September 1971

Seated, left to right: Dr. William McD. Hammon, Dr. Gustave J. Dammin, President of the Board, and Dr. Colin M. MacLeod.

Standing, left to right: Dr. Theodore E. Woodward, Dr. Edwin H. Lennette, Dr. Francis S. Cheever, Dr. William S. Jordan, Jr., Dr. Charles H. Rammelkamp, Jr., Dr. Floyd W. Denny, Jr., and Colonel Bradley W. Prior, MC, USAF, Executive Secretary.



Left to right: Dr. Charles H. Rammelkamp, Major General Richard Taylor, Dr. William S. Jordan, Jr., Lieutenant General Hal Jennings, The Surgeon General.

MEMORANDUM FOR:

The Assistant Secretary of Defense for Health and Environment
The Surgeon General, Department of the Army
The Surgeon General, Department of the Navy
The Surgeon General, Department of the Air Force

SUBJECT: Recommendation of the AFEB ad hoc Committee on Drug Abuse

The Armed Forces Epidemiological Board by mail vote unanimously concurs in, and accepts, the statement and recommendation formulated by its ad hoc Committee on Drug Abuse as follows:

1. The acute problem of heroin addiction in the Armed Forces appears to be coming under control. With the continued withdrawal of troops from Vietnam (the area with the highest rate of heroin addiction) the incidence of heroin use can be expected to decrease even without specific medical intervention.

2. The measures that have been instituted by the Army, Navy and Air Force for identification and short-term treatment of heroin users in the services appear to be appropriate and intelligently directed. The data systems of the three services also may have sufficient compatibility to support epidemiological and follow-up studies of the addict groups, such as the evaluation of rehabilitation programs.

3. The Committee is, however, disturbed by a deficiency in facilities for continued care of heroin addicts who have failed to respond to the short-term rehabilitation programs within the services, and are discharged still addicted. It appears that only a small (and undetermined) percentage of addicts leaving the services have been brought into effective treatment by Veterans Administration or civilian agencies. The remainder, presumably, are continuing to live as addicts, supporting their dependency by criminal means. If this impression is correct, then either there is inadequate liaison between the armed forces and the agencies to which the veteran has been referred (non-Federal civilian, Veterans Administration, etc.) or the treatment programs that have been offered to addicted veterans are ineffective.

> It is **recommended** that joint meetings be held between the Department of Defense and Veteran's Administration to review the apparent deficiency for continued care of heroin addicts who have failed to respond to the short-term rehabilitation programs within the services, and are discharged still addicted. If the deficiency resides in the processes of transfer of addicts from the services to treatment program, the problem should be easy to resolve at this level. If, on the other hand, the problem is one of failure of therapy and rehabilitation of the addicted veterans, then a searching study of the causes of this failure should be formulated and implemented. There is an obligation to the veteran which cannot be regarded as discharged until every effort has been made to return him or her to useful civilian life. The AFEB's ad hoc Committee on Drug Abuse would be available to advise on how to evaluate the efficacy of rehabilitation programs in the Veterans Administration and elsewhere in the civilian sector.

4. It would also be desirable to follow the long-range outcome of those who have been identified as addicts while in service. The logical agency to conduct such a study would be the White House Special Action Office, since it would have access to data from all sources. Indeed, a comprehensive follow-up study would appear to be feasible only if undertaken by this agency. Alternatively, if such a study is not possible, then limited surveys should be considered (e.g., incidence of continued addiction in sample of persons identified as addicts in Vietnam in 1971–72, and later returned to New York City). Such a limited survey could be conducted by the Department of Defense under contract with data registries in the area (New York City Narcotics Registry, Methadone Data Registry, Policy Department listings, etc.).

FOR THE ARMED FORCES EPIDEMIOLOGICAL BOARD:

Bradley W. Prior
Colonel, USAF, MC
Executive Secretary

PART II

The Decade of the 1980s

Peacetime Activities Essential for the Maintenance of a Balanced Health Program in the Military Services

During the years 1979–1989, the military services and the Department of Defense's Office of Health Affairs utilized the Board's advisory capabilities for a number of critical medical issues that were of paramount importance to the military. Some of the most important problems ever encountered by the AFEB were discussed during this decade, including:

- Asbestosis
- Worldwide diseases and the rapid deployment force (RDF)
- Population-based forecasting models in health-care delivery systems
- Health standards for military personnel
- Health problems related to women in the armed forces
- Malaria
- Acquired immune deficiency syndrome (AIDS)
- Asplenia
- Health problems associated with the M2 Bradley Fighting Vehicle (BFV)
- Korean hemorrhagic fever
- Cardiovascular screening for military personnel age 40 and over

THE AFEB'S ROLE IN SETTING POLICY ON ASBESTOS-RELATED HEALTH PROBLEMS

Beginning in 1977, Preventive Medical Officers at the Department of the Navy consulted with the Board in determining policy for asbestos-related health problems. During several Board meetings that year, exposure risk levels, the specificity of demographic factors, diagnostic criteria, possible contributing factors, prognosis, incidence, prevalence, and mortality were discussed.

Dr. Herschel Griffin, President of the Board, organized an ad hoc Subcommittee in 1977, in response to a request from the Deputy Assistant Secretary of Defense for Energy, Environment, and Safety, that the Board evaluate and coordinate all ongoing and proposed epidemiological studies of asbestos-related health problems. The Board was asked to advise on which other studies were needed, and on a subsequent statement of interest from the Chief of the Bureau of Medicine and Surgery, Department of the Navy, on the Board's evaluation of the potential health hazards associated with the industrial uses

of asbestos. AFEB members Dr. Paul Kotin (Chairman), Dr. Anna Baetjer, and Dr. Norton Nelson served on the Subcommittee. Expert consultants to the Subcommittee were: Dr. George Jacobson, Chairman of the Department of Radiology, University of Southern California School of Medicine; Dr. Marvin Kuschner, Dean of the School of Medicine, State University of New York at Stony Brook; Dr. Marvin Schneiderman, Associate Director, Field Studies and Analysis, National Cancer Institute; and Dr. Irving Selikoff, Professor of Medicine, Mount Sinai School of Medicine.

Meetings were held on 29 September 1977 and 6 January 1978, in accordance with provisions of the Federal Advisory Committee Act and implementing directives, and were attended by a broad representation from the Department of Defense, the Veterans Administration, the Government Accounting Office, the National Institute of Occupational Safety and Health, the National Cancer Institute, the United States Public Health Service, organized labor, and other groups. During these meetings, representatives of the medical departments of the armed forces described their control programs and the potential for exposure to asbestos in the environment. The consultants to the Subcommittee presented briefings covering their areas of individual expertise, and the representatives of other groups were given the opportunity to comment.

The report, which was presented on 13 April 1978, with subsequent discussions on 13–14 April, showed that the consideration of asbestos-related health problems involves many issues besides those related to preventive medicine and occupational health. Engineering controls, contractual agreements, indemnifications, operational management, and command policies and prerogatives, all matters beyond the purview of the AFEB, were not addressed by the Subcommittee, although they do at times affect health policy.

The Subcommittee learned that Army and Air Force personnel have some potential for exposure to airborne asbestos fibers while repairing the brakes of vehicles, while replacing insulation and fire retardant materials, and during dental laboratory and clinic procedures. But the greatest potential exposure exists in the Navy, both from the standpoint of the numbers of personnel involved and from the high concentration of airborne asbestos fibers that may occur during insulation-handling operations in confined spaces aboard ships. The Navy's policy was to confine the use of asbestos to an absolute minimum, and, in those situations in which substitute materials were inadequate, to impose strict handling procedures on its use. The report stated that compliance with Occupational Safety and Health Administration (OSHA) regulations would effectively control personnel exposure to asbestos, and that all three services have regulations implementing comprehensive industrial hygiene programs for this purpose. However, a serious breakdown in these controls can occur when work, such as asbestos "rip-out" operations aboard ships undergoing shipyard overhauls, is contracted out for completion by commercial firms. These outside contractors may operate with untrained laborers and fail to comply with federal regulations for protecting either their own employees or those who may work in that area later. The report stated that it is essential that these contractor-operations be brought under the authority of line officers to mandate compliance with the regulations for protecting the contractors' personnel. This might be accomplished by writing compliance standards for personnel protection and industrial hygiene controls into contracts for this type of work.

Because of the serious impact of this matter on disease prevention, it was considered appropriate that the Subcommittee make an exception in this case and comment directly upon a management operational policy issue. The report stated that environmental exposure to asbestos is a national health hazard, and is not unique to the armed forces. The magnitude of the asbestos-related disease problem merits the establishment of a national program for *(a)* preventing exposure, *(b)* education and research, and *(c)* providing medical care for those afflicted with asbestos-associated diseases. It has been well established that exposure to this material entails increased risk of developing chest diseases and various cancers. However, many aspects of this risk remain poorly defined, such as those in the areas of temporal and

dose-response relationships, and further epidemiological and clinical assessments are needed to increase our understanding of these diseases.

The report further stated that the armed forces population could provide a useful arena for collecting needed data, as well as for developing practices and programs applicable to the population at large. Joint Department of Defense–Department of Health, Education, and Welfare research efforts are needed to provide information that may contribute to *(a)* better methods for preventing further exposures to personnel, *(b)* reducing the risk of developing asbestos-related diseases in those personnel who were exposed in the past, and *(c)* improving the medical care for those already afflicted with asbestos-associated disease. Current pilot studies being conducted at selected Naval shipyards are expected to establish feasible standards for medical and environmental surveillance programs, which will be applicable elsewhere. However, the primary emphasis has been placed upon improving the controls for preventing personnel exposure and minimizing the adverse effects of exposures to asbestos in the past, without awaiting the results of further research.

The Subcommittee also learned that the Naval Environmental Health Center is developing a comprehensive registry of asbestos workers, in order to maintain the continuity of its medical surveillance program while it follows individuals for long time periods. In addition, a Naval Harmful Exposures Analysis Panel has been working to identify all job-related hazards, the populations at risk, and their geographic locations. This information is being used to target current medical and environmental surveillance resources toward specific environments and occupations and to justify the expansion of resources devoted to occupational health programs.

The Navy has taken measures to standardize their preemployment, periodic, and termination-of-employment medical examinations. This has helped to evaluate the effectiveness of environmental hygiene measures and to identify environmentally-associated diseases early, so that appropriate health care can be obtained. Similar routine medical surveillance programs are needed for all DoD personnel with occupational exposure to asbestos and other potentially harmful materials.

The Subcommittee report further stressed that rapid expansion of the knowledge of asbestos-related health problems is needed among health-care personnel, and that management, supervisors, and workers must be educated regarding the importance of complying with environmental control measures for preventing asbestos-associated diseases. The National Cancer Institute has developed programs for the education of health professionals and for alerting the public regarding the possible health effects associated with past exposure to asbestos.

After thoroughly discussing the information provided by the Subcommittee and the data derived from related commentaries, on 7 July 1978 the Board **recommended** the following to the three Surgeons General and the Assistant Secretary of Defense for Health Affairs:

> a. That for all tasks having a potential for airborne distribution of asbestos fibers, the Department of Defense make immediate provisions to assure the mandatory, immediate, and continued compliance with measures for the protection of the environment and all personnel, whether DoD- or contractor-employed, from exposure to hazardous concentrations of airborne asbestos fibers.
>
> b. That in contracts with commercial firms for tasks involving the fabrication, installation, repair, or removal of asbestos-containing insulation or fire-retardant materials or the repair [and the] relining [or both] of brakes, the Department of Defense make provisions which will assure the mandatory compliance with regulations for the protection of personnel and the environment from exposure to hazardous concentrations of airborne asbestos fibers.
>
> c. That educational activities be implemented to make health-care professions cognizant of asbestos-related health problems, that regional consultation centers be established for assistance in clinical diagnosis, pathology, and reading of X rays, and that education

programs be established to inform project managers, supervisors and workers regarding the importance of compliance with all environmental control measures for prevention of asbestos-related disease. It is particularly important to inform employees who may have been exposed to hazardous levels of airborne asbestos fibers in the past that it is extremely hazardous for them to smoke.

d. That an asbestos-related disease registry be developed through consultation with existing disease registries; capabilities should be developed in conjunction with the guidelines developed by the American College of Radiology and the existing U.S. Mesothelioma Panel.

e. That the Navy appoint an officer and office, which will be administratively located in the existing Occupational Health Program, to be charged with overall responsibility for supervision of the Navy Asbestos Control Program and liaison with other involved federal agencies.

f. That sufficient information be provided to applicants for employment in areas having a potential for exposure to hazardous concentrations of airborne asbestos fibers to assure that they understand that cigarette smokers exposed to asbestos fibers experience a greatly increased risk (7–30 times greater) of developing lung cancer over that of asbestos workers who do not smoke. A special effort should be made to discourage smokers from accepting employment which may involve exposure to asbestos fibers.

g. That a continuing consultative advisory committee to the DoD be established, which will be composed of experts, both from within government and outside, in the fields of clinical diagnosis and therapy, epidemiology, biostatistics, environmental and occupational health, and industrial hygiene. This group could function as a Subcommittee of this Board until such time that it is considered operationally more appropriate to establish it as an independent advisory committee.

h. That the DoD coordinate with the DHEW and other involved agencies in promotion or research needed to provide information needed for improved occupational health capabilities.

The Board Assists the Navy Environmental Health Center in Norfolk

Not until November 1983 did Colonel Robert Nikowlewski, who was then the Board's Executive Secretary, receive a request from the Commanding Officer of the Navy Environmental Health Center (NEHC) for members of the Navy Asbestos Medical Surveillance Program (AMSP) to present a report on the progress of their endeavor, which had begun in 1977–78. The AMSP had specifically requested that the Board's Subcommittee provide recommendations not only for data analysis but also to consider disability criteria, research priorities, and a review of major program changes. Members of the AFEB review subcommittee were Drs. Culver, Densen, Jablon, Kurland, Legters, Nelson, Thompson, and me.

The Navy's program, which described the identification of civilian and military personnel who were possibly exposed to asbestos, and the forms of data collection in histories, physical findings, and chest X rays, was presented by Lt. Commander P. G. Bray, MC, USNR, with comments from Captain J. Edwards, Captain J. Calcane, and others. The areas that the Subcommittee raised for consideration included:

- Specification of asbestos-exposure risk levels
- Specification of demographic factors
- Possible contributing and confounding factors

- Diagnostic criteria for asbestos-related diseases
- Measurement of the frequency of such diseases, including their *(a)* incidence, *(b)* prevalence, and *(c)* mortality
- Prognostic factors
- Future modification of the data-collection instruments, based on the reliability of each item in the data-collection questionnaire

In the interim before the next meeting of the AFEB, Dr. Kurland, Colonel Nikolewski, and I (who was President of the Board) visited NEHC in Norfolk, Virginia, for further discussion. Dr. Nelson, a member of this small ad hoc group, was unable to make this trip. At its meeting on 28 February 1984, the AFEB accepted the findings of the Subcommittee and **recommended** the following:

> 1. A panel of experts should be selected by the Navy, either as full-time employees or by contract, to develop skeleton tables designed to provide essential data on prevalence, incidence, prognosis, and data reliability. Priorities should be assigned to these tables, in relation to their relevance to such a design, so as to provide a more effective future program. Modification of the data collection instruments may be necessary.
> 2. The Board would, if requested, be willing to identify for the Navy suggested names for this panel of experts and would participate with the advisory panel as a consultant group to effect timely solutions to this multifaceted program.

On 23 April 1984, the Commanding Officer of NEHC requested that the AFEB assist them in identifying a group of experts from which an advisory panel for NEHC might be selected. The Board was also asked to define the minimal and optimal numbers of panel members by speciality, such as clinical medicine, epidemiology, biostatistics, occupational health, and industrial hygiene.

Dr. Leonard Kurland chaired the AFEB Subcommittee and solicited the names of experts who might serve on the advisory board for the Navy. In addition to the medical disciplines reflected in the list of potential nominees, the Board agreed unanimously at its meeting on 24 August 1984 to also consider including recognized authorities in the medical specialties of industrial hygiene, pulmonology, and occupational medicine. It was further suggested that the Navy's selection of panel members preferably reflect only those individuals who had not been involved in pending or recently completed, medically related, federally funded asbestos contract studies. At this same meeting, the AFEB **recommended**:

> that, upon selection and activation of the Asbestos Surveillance Panel by the Navy Medical Service, the Board would, if requested, serve as the scientific oversight review for proposed plans, policies, and programs outlined by the panel in keeping with the overall goals and objectives of the United States Navy Occupational and Environmental Medicine Programs.

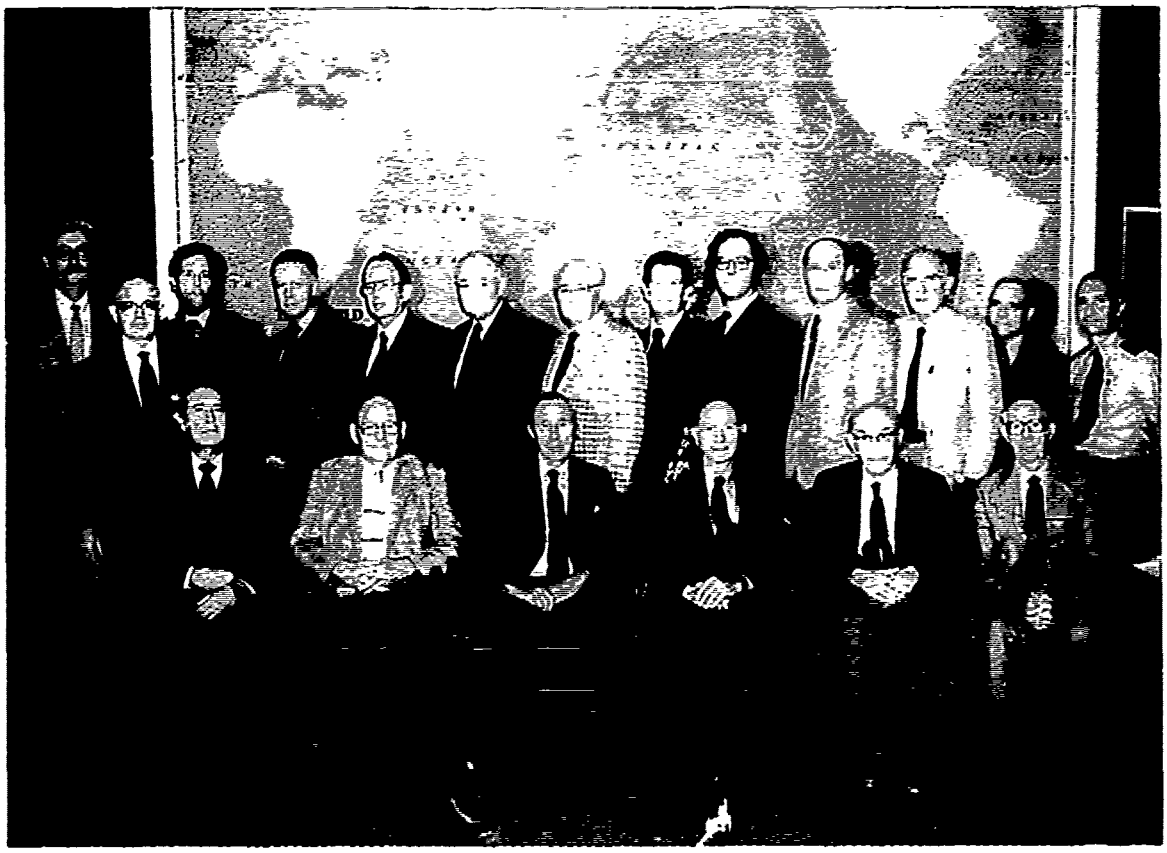
The NEHC Advisory Panel met in Norfolk, Virginia, in January 1986. Members Frank Townsend and William Harlan, and Colonel Robert A. Wells attended this meeting. (By this time, Dr. Townsend had succeeded Dr. Kurland as Chairman of the ad hoc Committee, and Colonel Wells had succeeded Colonel Nikolewski as the Board's Executive Secretary.) During the meeting, a number of questions related to asbestos and its associated health problems were discussed. These involved detailed scientific issues and required responses by capable authorities. The questions were presented to the President of the AFEB for the Board's consideration. I commented that these types of questions should be presented to the Navy's Panel of Experts on Asbestosis, since Board members were not sufficiently informed on



LEONARD T. KURLAND, M.D., M.P.H.

An honor graduate of the University of Maryland School of Medicine and the Harvard School of Public Health, Len Kurland first distinguished himself in the clinical, pathogenical, and epidemiological aspects of neurology. He did the pioneering work on motor neurone diseases, in particular on amyotrophic lateral sclerosis. He is now Professor of Epidemiology at the Mayo Graduate School of Medicine, which has developed a model system on records, medical data collection, and statistical analysis.

Len is a hardworking and dedicated Board member who has assisted in developing ambulatory and hospital data-collection systems for the military services. He has also helped devise guidelines for population forecasting and statistical evaluation of such difficult problems as the Guillain-Barré syndrome. On several occasions, he has invited the Board's ad hoc Subcommittees to meet in Rochester.



Armed Forces Epidemiological Board and Committee Directors
Walter Reed Army Institute of Research
8–9 September 1983

Seated, left to right: B. Dwight Culver, M.D.; Paul M. Densen, D.Sc.; Theodore E. Woodward, President of the Board; Abram S. Benenson, M.D.; Gordon N. Meiklejohn, M.D.; and Herschel E. Griffin, M.D.

Standing, left to right: Richard D. Remington, Ph.D.; Leonard T. Kurland, M.D.; William R. Harlan, M.D.; William S. Spicer, Jr., M.D.; Frank B. Engley, Jr., Ph.D.; Frank M. Townsend, M.D.; Seymour Jablon; Samuel D. Thompson, Ph.D.; Ronald C. Shank, Ph.D.; Richard H. Hornick, M.D.; William S. Jordan, Jr., M.D.; Llewellyn J. Legters, M.D.; and Colonel Robert F. Nikolewski, BSC, USAF, Executive Secretary.



Armed Forced Epidemiological Board and Committee Directors
21–22 June 1984

Seated, left to right: Benjamin D. Culver, M.D.; Norton Nelson, Ph.D.; Theodore E. Woodward, M.D., President of the Board; Paul M. Densen, D. Sc.; William S. Jordan, Jr., M.D.; Herschel E. Griffin, M.D.; and Gordon N. Meiklejohn, M.D.

Standing, left to right: Llewellyn J. Legters, M.D.; Samuel D. Thompson, Ph.D.; William R. Harlan, M.D.; Richard B. Hornick, M.D.; Ronald C. Shank, Ph.D.; Leonard T. Kurland, M.D.; Frank M. Townsend, M.D.; Abram S. Benenson, M.D.; Saul Krugman, M.D.; and Colonel Robert F. Nikolewski, BSC, USAF, Executive Secretary.



FRANK M. TOWNSEND, M.D.

Frank Townsend graduated from Tulane University School of Medicine, and trained for several years in clinical medicine. He took his graduate training in pathology at Washington University School of Medicine in St. Louis. Dr. Townsend has been one of the pillars of the University of Texas Medical School at San Antonio. He has contributed to various fields of pathology; a major contribution of lasting importance was his extensive evaluation of wounds following airplane accidents.

Frank Townsend brought a mature judgment to the Board in the fields of medicine and pathology. He was particularly helpful in developing the Board's recommendation to the Department of the Navy regarding the asbestosis problem, as well as in the formulation of sensible guidelines for the control of HIV infections.

such issues to render an authoritative response. The Board reaffirmed that it would always provide scientific oversight for proposed plans, policies, and programs as outlined by the expert panel.

On 7 February 1986, J. J. Bellanca, Commanding Officer of NEHC, transmitted the following letter of appreciation to the AFEB:

1. This is to express my appreciation for the helpful support of the Armed Forces Epidemiology Board (AFEB). This distinguished group has provided my command and the Naval Medical Command welcome support for our Asbestos Medical Surveillance Program.

2. I would especially like to recognize the contributions of two AFEB Board Members, first Dr. Kurland, and later Dr. Townsend, in helping us to form an expert advisory panel. This advisory panel, presently consisting of Dr. Phil Enterline, Dr. Ed Gaensler, Dr. Marcus Key, and Dr. Jerome Wiot, has analyzed our efforts and made detailed suggestions concerning data and procedures. These will be of significant value to protected Navy personnel, the medical community, and the Navy.

3. Finally, I wish to thank Colonel R. A. Wells, Executive Secretary of the Armed Forces Epidemiologic Board and all who have cooperated with him to provide us with an excellent and expert forum for solving critical epidemiologic problems regarding asbestos medical surveillance. (It should be added that Colonel Nikolewski merits equal appreciation.)

4. Please convey my sincere thanks to all concerned. We move on with increased confidence in our mission as a result of the support rendered by the Armed Force Epidemiologic Board.

During this decade of discussion of the problems related to asbestosis, the AFEB kept abreast of current developments. Preventive Medicine Officers and others in authority informed the Board of new developments, such as the relationship between mesothelioma and lung cancer, from data provided by the Armed Forces Institute of Pathology (AFIP). Demographic data including the incidence, prognosis, and mortality of asbestosis, and better means of its roentgen detection, were also presented to the Board.

THE AFEB'S ROLE IN ASSISTING THE MILITARY ON PROBLEMS RELATED TO INFECTIOUS DISEASES IN THE EVENT OF RAPID DEPLOYMENT

Periodically and without fail, the Board entered into discussions with the three military services (through their Preventive Medicine Officers and intramural military investigators) regarding combat readiness, rapid deployment, and infectious diseases. Drs. Abram Benenson and Charles Rammelkamp represented the AFEB at a workshop on the preventive strategy regarding the threat of infectious diseases to rapid deployment. The report of that workshop and subsequent pertinent correspondence follows:

This workshop, held at WRAIR on 14-15 July [1981], was attended by representatives of all the services involved in the Rapid Deployment Force (RDF), the Preventive Medicine Officers of all three services, and experts on the various diseases that had been selected for discussion.

The purpose of the workshop was to *(a)* define infectious disease threats to the RDF given the projected scenarios for its deployment; *(b)* obtain an update on the epidemiology, preventive strategies and needed research and intelligence for each disease; and *(c)* identify policy requirements to effectively protect the RDF from these disease threats.

The area of concern was Southwest Asia; each disease was considered from the point of view of the threat to military operations in that area. Specific diseases and items considered were:

Hepatitis. Maj. Stanley M. Lemon, MC, WRAIR, reviewed the potential problem of hepatitis. He discounted hepatitis B as a problem unless there is sustained deployment and sexual contacts are affected. While only 22% of our troops have antibodies against hepatitis A, non-A non-B hepatitis is seen as the major threat in view of several

water-borne outbreaks which had occurred in India in 1955, 1977 and 1979 without development of antibodies against HAV. Based on these antibody studies, Dr. Lemon feels that outbreaks previously considered to have been due to hepatitis A were really due to non-A non-B infections. In 1978, French Forces [deployed to] Chad had non-A non-B hepatitis; those given IG were protected.

Research requirements include: definition of the characteristics of hepatitis in the region concerned, agent identification and characterization, the effectiveness of IG in preventing hepatitis, and, long-term, development of a vaccine against hepatitis A.

Malaria. Col. Craig J. Canfield, MC, WRAIR, presented malaria as a serious and severe threat. Problems are related to vector control inadequacies and the lack of a drug in the TO&E for chloroquine-resistant falciparum malaria. Resistance is anticipated to be a potential problem in view of the westward spread across Asia of resistant strains; half the cases in the area could be expected to be due to *Plasmodium falciparum*. Malaria vaccine, when available, would be strongly indicated for small independently operating units. The question was raised why to give chloroquine/primaquine combination in chemoprophylaxis in view of concern of G6-PD deficient individuals. No rationale was elicited from any of the participants for including primaquine in the field chemoprophylactic.

Leishmaniasis. Lt. Col. Charles N. Oster, MC, WRAIR, discussed leishmaniasis. *Leishmania tropica*, with dogs as the reservoir, is the urban problem; *Le. major*, with a rodent reservoir, is the rural problem. The latter can be controlled by eliminating rat burrows by deep (half meter) plowing of camp site areas and creating a ten-meter concrete barrier. [This hardly sounds practical. A.S.E.] DEET hopefully would be an effective repellent (but see below under sandfly fevers). USSR and Israel use a vaccine made of living *Le. major* organisms, based on experiences in which 50% of Israeli soldiers developed lesions in a six-month period at Jericho and 50% of Germans in Saudi Arabia developed the disease. *Le. donovani*, the cause of visceral leishmaniasis, has a rodent and canine reservoir, and can be a serious problem with high mortality without lengthy therapy. Research requirements are to determine the local epidemiology and potential attack rates, the effectiveness of the control measures on the specific vectors involved, the need for an effective therapy (only pentostam, a pentovalent antimonial, is now available in the United States on an IND) and the question of development of a vaccine.

Dengue. Col. William H. Bancroft, MC, WRAIR, discussed the potentially serious threat to military operations should dengue appear. This is related inversely to the effectiveness of anti-mosquito measures. Research requirements are to establish whether vector mosquitoes are present in the area and their habitat. The need for vaccination against dengue was discussed since vaccines against at least two of the four types are now potentially available. The value of carefully monitoring fevers of unknown origin for the initial appearance of dengue among troops was discussed, as well as serum surveys of the indigenous population to assess their past experience with this group of viruses.

Sandfly Fever, Rift Valley Fevers, and Congo/Crimean Hemorrhagic Fever. Lt. Col. Clarence J. Peters, MC, USAMRIID, felt that the problem in sandfly fever lies in the unknown effectiveness of standard repellents against local sandflies, as well as whether insecticide resistance has appeared. Research requirements include the determination of the effectiveness of antiviral drugs against this particular virus. As far as vaccines are concerned, the multiple types of sandfly fevers complicate this potential long range solution. Rift Valley Fever—the potential effect of this virus was manifested in the recent 1977 epidemic in Egypt. While an effective vaccine has been developed, only sufficient material for 100,000 individuals is now available; this was prepared at the Swiftwater plant. Considerable discussion followed on policies for selecting vaccine recipients, particularly since the RDF contemplates staging areas in East Africa. Congo/Crimean Hemorrhagic Fever, a tick-borne disease, is expected to be prevalent throughout the entire area. Very little precise information is available concerning this disease entity in the potential area of operations.

Diarrheal Disease. Myron M. Levine, M.D., University of Maryland, presented the very serious problem of diarrheal disease. He reviewed the transmission through food and water of the various agents; by person-to-person spread of shigellae and 27-millimicron viruses; possibly by respiratory droplets of the rotavirus and the 27 millimicron agent; and by flies as the vector of shigellae. Chemoprophylaxis was discounted as inappropriate or inadvisable; immunogenic protection provides the greatest hope.

Active work is underway with a pilus vaccine which would protect against colonization factor 1 and colonization factor 2; these are found in one-third of LT+/ST+ *Escherichia coli* infections but unfortunately are present in only 8–15% of LT-/ST+. Promising results are coming from work with oral vaccines with attenuated non-toxigenic strains such as E 1292/75 (2A). From the therapy point of view, early treatment with trimethopim-sulfasoxasole is

recommended; antibiotic resistance, especially against tetracycline, is as frequent as 40% in some areas. Research requirements include definition of the incidence and etiology of diarrheal diseases which might affect military personnel operating in the area; evaluation of the use of new oral vaccines versus enterotoxigenic *E. coli* and shigellae. An effective live vaccine against *Shigella flexneri 2a* is now produced by Yugoslav laboratories in Belgrade and Zagreb, this requires several doses and produces immunity lasting for twelve months at which time a single booster dose is required; three percent vomit after the first dose.

Rickettsial Diseases. Joseph V. Osterman, M.D., WRAIR, discussed Q fever and Boutonneuse fever (caused by *R. conorii)* as actual problems; epidemic and possibly murine typhus are expected to occur at a low incidence. Prevention would be based on avoiding the vector. Lice are resistant to DDT and lindane but Abate is still effective. For tick control, there is a question of the effectiveness of DEET as a repellent. For immunization against epidemic typhus, 1,000,000 doses of strain E and 400,000 doses of an inactivated vaccine are available. There is no vaccine for Boutonneuse fever. For Q fever, only 1,000 doses of phase-2 and 18,000 doses of phase-1 vaccine are available. Chemoprophylaxis was discussed with concern that weekly Doxacycline dosage would result in persistent rickettsial infections. Research requirements include definition of the frequency and types of rickettsial infections occurring in the area, the clearance by human testing of phase-1 Q fever vaccine, the determination of antigenic variation and vaccine development against *R. conorii;* the evaluation of appropriate antibiotic regimens for chemoprophylaxis, and entomological study for *R. conorii* vectors.

Schistosomiasis. Maj. John Boslego, MC, USUHS, focused on prevention by avoidance of contaminated vectors, locating foci of contamination, appropriate water treatment and protective clothing. The effectiveness of hexachlorophene as an anti-penetrant versus its neurotoxicity hazard was discussed. Col. David E. Davidson, VC, WRAIR, discussed potential immunization with irradiated cercariae which is many years off. He reviewed the drugs available for the specific schistosomal types and their adverse reactions. Of concern is the development of drug resistance against some of these agents by *Schistosoma mansoni* in Brazil. Several potentially available agents are not licensed in the USA. Among anti-penetrants, hexachlorophene using a 0.1–0.3% alcoholic solution was 90–100% effective on mice; the anti-penetrant activity lasted for five days and resisted water soaking for four hours. Other drugs are under evaluation as anti-penetrants, including 4-aminoquinolines and amoscanate.

Rabies. William G. Winkler, DVM, Centers for Disease Control, stressed the importance of animal bites in this disease, despite four documented cases acquired by aerosol transmission, two cases from tissue (corneal) transplants, and a potential for infection by ingesting the virus. The human diploid cell vaccine has proven to be stable; pre-exposure immunization with three doses given at days 0, 7, and 21, or 28 should seriously be considered. The limiting factor is the price of $42 50 per dose and the only licensed vaccine at the moment is French-made (Merieux); this has a low incidence of systemic reactions with 1 in 625 developing fever and headache. Research problems involved are those related to the demonstration of the carrier state in dogs in Ethiopia; the demonstration by monoclonal antibody studies that strains of virus differ immunologically raises the question whether the vaccine is uniformly effective; and the limited availability of rabies immune globulin which is only supplied by Cutter Laboratories and only 12,000 doses are presently available.

Respiratory Diseases. Lt. Col. R. M. Scott, MC, WRAIR, felt that the greatest potential respiratory disease problem would be an antigenic shift in Influenza A and he reminded the group of the potential value of amantadine should such an event occur.

Vector Control. Col. M. Moussa, MSC, OTSG, pointed out that we have inadequate information on the identity and characteristics of the vectors in the area, of their repellent and insecticide sensitivities, and inadequate resources with which to control vectors. The Russians have reported that the anophelines in northern Iran are not repelled by DEET nor are the ticks. Studies of acceptability of repellents have shown that 60% of troops prefer to use a commercial preparation rather than the standard item, and 30% of those exposed prefer to use none. The equipment available to the RDF for area control of vectors is either non-functional, or obsolete with no replacement parts. He painted a very grim picture.

Rapid Viral Diagnosis. Karl M. Johnson, M.D., USAMRIID, discussed the techniques available for rapid viral diagnosis of specific pertinent agents, and the need for the development of appropriate technology to give operating units the ability to rapidly identify viral agents to permit appropriate preventive measures.

Practical Consideration of Airborne Corps Preventive Medicine. Col. D. C. Tsoulos, MC, Surgeon XVIII Airborne Corps, discussed his problems as operational senior medical officer, with inadequate preventive medicine



PHILIP K. RUSSELL, M.D.

Phil Russell received his B.A. in Biology from The Johns Hopkins University in 1954, and his degree in Medicine from the University of Rochester School of Medicine in 1958. He trained in medicine at North Carolina Memorial Hospital in 1959, and at the University of Maryland Hospital from 1961 to 1964. At Maryland, he excelled as a house officer; he gained experience in infectious diseases in Baltimore and at Maryland's Tropical Disease Medical Center in Lahore, Pakistan.

Phil Russell had an exemplary record in Bangkok, Thailand, where he served as Chief of Virology at the U.S. Army component of the South East Asia Treaty Organization. He was Director of the Virology Department at WRAIR; from 1979 to 1983, he was Commandant of WRAIR, which was followed by his appointment as Commanding General of Fitzsimmons Army Medical Center. In August 1986, he assumed command of the United States Army Medical Research and Development Command.

Phil Russell has distinguished himself as a virologist with notable contributions in the field of arbovirus infections, particularly those of dengue fever and the encephalitides. He maintained a close association with the Armed Forces Epidemiological Board and its Commissions prior to 1972. It was appropriate that Phil Russell was elected President of the American Society of Tropical Medicine and Hygiene. In 1979, he was the Joseph E. Smadel Lecturer and the awardee of the Infectious Diseases Society of America.



ABRAM S. BENENSON, M.D.

After he graduated from Cornell University Medical College in 1937, Bud Benenson trained at Bellevue Hospital, New York, and entered the U.S. Army Medical Corps in 1940. From then until 1962, he progressed through the ranks to Colonel, and served at Tripler General Hospital, the Medical Field Service School at Carlisle, Pennsylvania, the Fourteenth Field Hospital, Korea, the Army Medical Service Graduate School, the Second Army Area Medical Laboratory at Fort George G. Meade, the Tropical Research Medical Laboratory at San Juan, Puerto Rico; USAMRIID at Fort Detrick, Maryland, and WRAIR at Walter Reed. His medical service embraced the fields of microbiology, virology, immunology, epidemiology, and tropical medicine. He made important contributions to cholera research in Dacca, Pakistan. The Jefferson Medical College of Thomas Jefferson University, the University of Kentucky College of Medicine, and the Gorgas Memorial Laboratory and the School of Public Health in San Diego have all had the advantage of his academic contributions.

Bud Benenson has served the Board and many of its Commissions, and he directed the AFEB's Commission on Immunization for a number of years He is an infectious-disease authority whose fundamental background is excellent, whose memory of historical findings is uncanny, and whose ability to correlate the old with the new is impressive. Bud now heads the Board's Subcommittee on Infections, a public service which merely highlights his long list of contributions to the AFEB.

personnel, supply and logistics problems, obsolete equipment, and no diagnostic capabilities within Corps. Food supply is based on 90 days C-rations which probably will result in eating from unauthorized sources. In the Bright Star exercise (Egyptian desert) 75% of the officers developed diarrhea. Education on personal protective measures is essential and must be simple, field sanitation now depends on non-medical personnel, with no Disease Surveillance and Control Teams, which are essential. Vaccines will be needed for unconventional troops who might operate where no medical support could be provided.

Research Requirements. Col. Philip K. Russell, MC, WRAIR, reviewed and summarized the research requirements which include the need for field research to define the epidemiology of major threats including the incidence and distribution of the diseases, the antigenicity and drug sensitivity of agents involved, the biology, distribution and insecticide sensitivity of vectors. Present efforts are underway at NAMRU-3 on schistosomiasis, Rift Valley fever, [and] Crimean/Congo hemorrhagic fever vectors. In the Army laboratory in Kenya, leishmaniasis, trypanosomiasis, [and] vector taxonomy and biology are under investigation. Under rapid diagnosis, the methods, reagents and equipment must be designed, doctrine for deployment and field use in disease control and treatment need definition, [and] selected agents, such as arboviral, rickettsial and BW threat agents, [must be] defined. Specific research requirements under hepatitis include the development of a vaccine against HAV and basic knowledge of non-A non-B, under malaria, drug development and vaccine development; under schistosomiasis, increased information on anti-penetrants, under leishmaniasis, agent and vector taxonomy, immunology, chemotherapy, under dengue, quadravalent vaccine, under Rift Valley fever, ecology, vaccine improvement and development, under diarrheal disease, shigella vaccine, *E. coli* pilus vaccine; under rabies, validation of intradermal vaccination.

Preventive Medicine Policy and the RDF. Col. George E. T. Stebbing, MC, OTSG, summarized the present status and future needs of the preventive medicine policy and the RDF. Major stress must be placed on the personal responsibility for health, and area sanitation. Preventive medicine units must be defined into segments which constitute C-130 plane local units. Policy decisions must be made on the use of IG against hepatitis, the use of vaccine against HBV; chemoprophylaxis against malaria and the change from the emergence of resistant plasmodia; determination of where Rift Valley fever exists and to whom vaccine should be given, the use of pHisohex as an anti-penetrant for schistosomiasis; chemoprophylaxis for diarrheas; and to whom should pre-exposure rabies vaccination be given. Decisions on actions will be limited by what the command will permit; the type and amount of equipment will be dependent on transport facilities.

Concluding Remarks. Col. Philip E. Winter, MC, who chaired the meeting, pointed out the need to establish priorities and at the moment he ranked in order: diarrhea, leishmania, and the need to define procurement, acquisition, and R & D requirements. To monitor priorities, a committee was appointed consisting of Col. Winter, Col. Russell, Col. Stebbing, Col. Tsoulos, Maj. Prier, (Chief, Department of Epidemiology, Division of Preventive Medicine at WRAIR) and the Director of the U.S. Army Military Intelligence Information Agency.

It is anticipated that the AFEB will be involved in developing some policy decisions. It is advantageous that Dr. Rammelkamp and I had the opportunity to understand the background.

Abram S. Benenson, M.D.
Director, Gorgas Memorial Laboratory

Dear Bud:

First, I wish to thank Rammel and you for having attended the ad hoc meeting on rapid deployment in relation to infectious disease threats. Your report was comprehensive and the Board profited by receiving this important information. During the recent meeting, the question of simplification of vaccine schedule for the Armed Forces was a topic of discussion. Apparently, this is now the time for an objective review of this important matter. To this end, I wish to appoint an ad hoc committee of the Board to cope with this matter. You are the logical one to chair this group and I hope that you will take it on. The persons whom I suggest for membership are to receive copies of this letter with the hope that they will serve. If you wish to have other persons meet with you, this can certainly be arranged. Bill Tigertt comes to mind as one who might be very helpful.

If you concur, I believe that the group might meet on February 3, the day before the full meeting of the Board. As you know, this meeting will be held at WRAIR and I see no reason why the preventive medicine officers of the three services could not attend.

Also, Bud, I am going to ask you to serve on the ad hoc committee to consider the long-term effects of multiple immunizations. On this one, I will expect Bill Beisel to do a lot of the leg work. He has a long-term memory of the problem since he has been stationed at USAMRIID and has access to numerous important details. Let me thank you for all that you have accomplished for the good of the AFEB. Indeed, I feel the same way about everyone who takes time from [their] very busy schedules to assist the Board in its various activities.
Sincerely yours,

Theodore E. Woodward, M.D.
President, AFEB

Colonel Philip K. Russell
Commandant
Walter Reed Army Institute of Research
Washington, D. C. 20012

Dear Phil,

You are well familiar with the workshop on Infectious Disease Threats and its relation to Rapid Deployment which was held at WRAIR on July 14–15, 1981. Bud Benenson and Charles Rammelkamp kindly participated in this conference as representatives of the AFEB. Based on the character of the brief minutes which Bud Benenson prepared, I gather that the workshop was productive and also open to various important questions. Thank you for allowing the Board to be represented, and be assured that we wish to be of service whenever possible. Do you think it appropriate and possible for you or a designated person to inform the Board of certain important matters which pertain to Infectious Diseases and their Prevention? The specific items of consideration are briefly mentioned below, and I am asking Bill Jordan if he will cover these matters as far as the NIH is concerned. Bill and Rammel have raised these points with which I fully concur. They are:

1. What aspects of early diagnosis of Infectious Diseases and control measures are being pursued by WRAIR or USAMRIID?
2. What information can be provided regarding the stockpile of essential drugs and vaccines?
3. What are the names of the civilian agencies or University-oriented laboratories that are working in the field of early diagnosis of Infectious Diseases and their prevention? In this regard, it would be useful to learn of the sources of support for the specific studies.

It would be very useful if Bill Jordan, as well as you, could provide us information regarding these matters at the time of the next meeting of the Board. Time can be found in the agenda for this important information. It is essential that the Board be so informed so that its advice, when solicited, can be oriented in the right direction. Hopefully, this is not too much to ask.

Sincerely,

Theodore E. Woodward, M.D.

cc: William S. Jordan, Jr., M.D.
Charles H. Rammelkamp, Jr , M.D.
Abram S. Benenson, M.D.
Captain Charles W. Halverson

THE AFEB SUPPORTS THE OVERSEAS RESEARCH LABORATORIES

During World War II, laboratories for special research were established at various geographic sites. The U.S. Navy established its Naval Medical Research Unit Number 2 (NAMRU-2) on the island of Guam. Later, the Department of the Navy inaugurated similar units in Cairo, Manila, Jakarta, and elsewhere. Special laboratories sponsored by WRAIR were established in Kuala Lumpur in 1948, and in Bangkok in 1959. These and other Overseas Laboratories enjoyed a record of excellence in medical research that was of vital importance to the Department of Defense.

Congress questioned the need for the Overseas Laboratories and discussed placing their research programs, which were located in foreign countries, under civilian sponsorship using contractual agreements. Another possibility was to eliminate them. When the Board heard this, it devoted several meetings in 1979 and 1980 to this critical issue. Dr. Reuel A. Stallones, Dean of the University of Texas School of Public Health and a former AFEB member, served as a consultant to a special Defense Department committee charged to pursue the matter. On 6 May 1980, Dr. Stallones sent me the following letter:

Dear Ted:

While serving as consultant to the Department of Defense on the proposed closure or change of sponsorship of the military overseas medical research laboratories, a number of issues emerged which were of special interest to me personally, and which do not fit well into a formal report. Since the suggestions involve the Armed Forces Epidemiological Board, I thought a submission directly to the Board would be the most useful step. The suggestions presuppose that the laboratories will continue to function under their present sponsorship, which is by no means assured.

1. Oversight. Significant value would accrue if a formal advisory board were established to provide continuing consultation on the mission and performance of the laboratories. The Armed Forces Epidemiological Board is an obvious locus for such a function. Evidently the commitment should be more than casual, and should entail frequent visits to the laboratories.

2. Integration. The report entitled "New Directions in International Health Cooperation," submitted to President Carter in 1978 by Dr. Peter Bourne, noted that the military laboratories could be expanded to become centers for regional training in clinical tropical medicine. This leads to the need for serious consideration of regional organization of military research, generally. Presently NAMRU-2 (Manila and Jakarta), AFRIMS (Bangkok), and USAMRU (Kuala Lumpur) represent a very strong base for coordinated research and training efforts in Southeast Asia and the Western Pacific. NAMRU-3 (Cairo) and USAMRU (Kenya) could serve as the foci for regional programs in North Africa and the Middle East, and in Central Africa. Notably lacking is a strong research base in Latin America, for the U.S. Army presence in Brazil is modest. Perhaps the Armed Forces Epidemiological Board could take the lead in proposing expansion and integration of the DOD overseas medical research programs, with a view to achieving a globally balanced strategy. These notions were not originated by me, but arose in a number of conversations of different groups. However, I have not had an opportunity to review these suggestions with anyone else, and therefore I am sending them to you without presuming to represent others' views.

I am sending copies of this letter to Dr. John Moxley and Dr. Phillip Winter, since their responsibilities relate to the subject. Thank you for listening.

Yours sincerely,

Reuel A. Stallones, M.D., M.P.H.

The Board's reaction and the action that it took in regard to this important matter are described in the following letter, dated 3 June 1980, which I sent to the Secretary of Defense. The response, dated 30 June 1980, is from Walter B. LaBerge, the Principal Deputy Undersecretary of Defense.



REUEL ARTHUR STALLONES, M.D., M.P.H.

Stony accomplished many things following his internship, service as a battalion surgeon, and service as as a Preventive Medicine Officer and epidemiologist in the military. He taught preventive medicine at the University of California at Berkeley. At the University of Texas School of Public Health in Houston,where he was Professor of Epidemiology, Stony also assumed the duties of that school's first Dean in 1968. Under his leadership, master's and doctoral degrees in science, public health, and a wide range of fields related to public health were inaugurated and awarded.

Despite his heavy academic responsibilities during this period, Stony contributed in full measure as a member of the AFEB, never swaying from [illegible] belief that military and civilian medicine were comparable in certain of their objectives. His wisdom [illegible] helped the Board in its relationships with the military, and his role in maintaining the security [illegible] epartment of Defense's Overseas Research Laboratories was appreciable.

SUBJECT: Department of Defense Overseas Medical Research Laboratories

The Honorable Harold Brown
Secretary of Defense
Room 3E880 Pentagon
Washington, D. C. 20301

Dear Mr. Secretary:

The Armed Forces Epidemiological P[illegible]FEB) expresses its concern over the proposal that military medical research laboratories in foreign countri[illegible]d in their scope, eliminated or placed under civilian management by contractual arrangements. The [illegible] portions of its last two meetings to discussion of this important matter. Its considered judgement is [illegible]uld lead to an unacceptable reduction in military operational and research capability. Any savings[illegible]ent in terms of expenditures for personnel and operational costs would be trivial in comparison with the [illegible]

Board members feel obligated to voice [illegible]eir concern in view of the AFEB mission "to provide timely advice and recommendations concerning operational [illegible]rams, policy development and research needs for the prevention of disease and injury and the promotion of [illegible] its competence to do so lies not only in its forty years of institutional involvement with military medical rese[illegible]rams, but also in the long personal and productive experience of several of its current members who have [illegible]n active either in the direct operation of, or as consultants to, military medical research in supporting laboratorie[illegible] either in the United States or abroad.

These scientists are recognized authorities in various health fields.

The requirement for maintaining the overseas laboratories is unquestioned. It is essential that the Department of Defense maintain them in order to meet its known and anticipated military operational requirements pertinent to diseases and other adverse health risks peculiar to foreign environments. The United States must keep abreast of all indigenous disease or health threats such as malaria, scrub typhus, encephalitis, hemorrhagic fever, environmental changes and others wherever and whenever they may directly affect the ability of U.S. forces to function effectively. Certain of the essential functions of overseas military medical research laboratories are:

a. Research. Development of new knowledge and the resultant technologic and control programs depend directly on the long-term commitment of scientific investigation directed to problems which occur naturally in a particular country. American forces encountered malaria, scrub typhus, dengue and other disorders throughout the Southwest Pacific Islands, Indochina and Asia when troops functioned in the field. Many of these threats are unsolved and remain military problems.

b. Training. To maintain a cadre of experts and develop new competence in medical conditions to which military forces are exposed overseas, it is essential to maintain, improve and develop both facilities and scientific personnel before there is an operational necessity. Examples of the importance of medical research and our abysmal lack of capability occurred when American troops encountered scrub typhus, malaria and dengue fever in the Pacific Islands, drug-resistant falciparum malaria in Vietnam or highly fatal hemorrhagic fever in Korea. These are glaring examples. The threat of Rift Valley fever in the Middle East and virus infections, such as Lassa Fever or Marburg, and Ebola virus infections in Africa are current major threats to military security. Much progress has been made through research conducted in overseas military laboratories, and there is now a coordinated program directed to development of means of control throughout the military system. It is unlikely that any civilian institution would direct its interest to these unsolved problems simply because they are peculiar to the military mission.

c. Surveillance. There is no question of the value of foreign military medical laboratories and their ability to collect and cull the type of important epidemiologic information which is essential for long-term planning and determination of predictability. Military necessity makes it essential that experts be informed of military needs through their strategic placement throughout the world. They must be constantly involved in collection and interpretation of relevant data. The first isolation of the Asian strain of influenza virus in 1957 was in a military installation located in Asia. It is fundamental to the security of the United States that military medical laboratories be broadly conceived and developed world-wide. It is true that these laboratories would profit from better integration, it is quite unlikely that any civilian agency would have the interest, enthusiasm and broad capability to conceive, develop and integrate such programs. There is a lack of military research presence in Latin America which merits early and serious consideration. The question may be logically raised why the military services should direct the overseas research programs. Experience through decades makes it abundantly clear that the required

capability and interest exists only in the military system. In no way does this derogate the outstanding contributions made by career civilian DOD scientists who have worked productively in these laboratories. These scientists have contributed to the planned and relevant military research problems designs and programmed for these laboratories.

Factors which forcefully favor military sponsorship are:

*a. **Continuity.*** To insure continuity of capability it is essential to have management by, and involvement of, career military personnel who can alternate their tours of duty between domestic and foreign laboratories that are engaged in research on common mission oriented problems. These are problems unique to the military.

*b. **Responsiveness to Problems.*** The ability to respond to military demands is more direct and flexible when scientific facilities are under military command responsibility. Sponsorship by the contract mechanism is so awkward and clumsy as to preclude rapid change in response to military needs. The result can be costly delays.

*c. **Availability of Key Scientific Personnel.*** There is a serious limit to the availability of highly qualified civilian scientists who would work in a civilian controlled laboratory overseas. There are striking examples of gross failure of civilian agencies to recruit personnel and to develop and maintain health care systems when placed in strategic overseas areas. This cannot be said of those established medical laboratories which continue to be productive and viable in Asia and the Middle East.

*d. **United States Presence.*** The presence of medical military laboratories in allied foreign countries has favored our national policy particularly when there has been a long-term experience in that country. In spite of political pressures and diplomatic strains, the host governments have maintained their favor in our medical laboratories. It is doubtful that civilian managed laboratories on a short-term basis could develop or enjoy this relationship.

*e. **Lasting Power.*** The record is conspicuously clear that the grant or contract mechanism has been devoid of lasting effect when civilian laboratories have been established in foreign countries. Centers have been sponsored by the USPHS, the Center for Disease Control, and NIH. USAID has sponsored other programs. The International Centers for Medical Research and Training were established in 1960 in five foreign countries by five civilian institutions. All but one of these have been phased out. The emergence of nationalism and increased anti-colonialism have shifted from free study U.S. programs to collaborative partnerships with visiting and local scientists who work on problems of mutual interest. Projects such as the NIH- and AID-sponsored Cholera Research Laboratory have been internationalized with an independent Board of Directors.

Attention must be paid to this historical record. It is unlikely and unrealistic to expect any civilian U.S. contractor to maintain any installation comparable to the current overseas military laboratories. The contracting agency would lack the welcome which is extended to the military by a friendly government. A private contractor, whether a University or institutional group, would encounter difficulties in maintaining proper relationships with civilian and governmental agencies in host countries. At times, the civilian agencies are considered competitive in contrast to relationships established by Department of Defense activity.

The AFEB concludes and makes the following recommendation with strong conviction. That the United States military continue to operate laboratories in selected foreign countries for. (1) the development of new knowledge relative to the military mission; (2) the maintenance and development of a corps of military personnel with appropriate scientific capability and expertise, and (3) the surveillance of medical problems as they relate to military needs.

These objectives require maintenance of medical laboratories that are promptly responsive to Department of Defense coordination and mission requirements, some of which can change without warning. These needs cannot be met satisfactorily by contracting such functions and responsibilities to a civilian agency, nor is it reasonable to assume that continuity or reliability of performance can be assured under such sponsorship.

Not only does the AFEB urge the maintenance of the currently existing programs, but it recommends that the military mission be better planned and programmed on a more logical and comprehensive world-wide system, i.e., [that] DOD overseas medical research programs be designed to achieve a globally balanced strategy. For example, there is no strong research base in Central or Latin America, a hemisphere which is most important to the United States.

The Board is willing and enthusiastic in its desire to assume an advisory role.

Sincerely,

Theodore E. Woodward, M.D.
President, Armed Forces Epidemiological Board

Dear Dr. Woodward:

This is in reply to your letter of 3 June to the Secretary of Defense concerning the overseas medical research laboratories.

The proposal to close or contract for the operation of these laboratories did not arise within the Department of Defense. We have been afforded an opportunity to raise further arguments in rebuttal.

To this end we have recently concluded a study of the laboratories, their value to the Department of Defense and the feasibility of contracting-out their operation. I understand that the Board has been briefed by my staff on the progress of this study.

The study report concludes that the laboratories are a valuable and productive resource and that contracting for their operation would be infeasible and, in any case, counter-productive.

Unless you object, we will include the Board's views with the study report, so they may be considered by those who will make the final decision on the issue.

Thank you for your thoughtful and constructive comments.

Sincerely,

Walter B. LaBerge
Principal Deputy [Undersecretary of Defense]

The Board responded that it would be pleased to have its views used to support the issue at hand. Ultimately, the Overseas Laboratories were maintained under the administrative responsibilities of their sponsoring military service. Hence, the Board was able to render counsel and advice that helped lead to a favorable decision.

Later, in 1980, a fortuitous opportunity permitted the Board to interact directly in investigative activities with an Overseas Laboratory. Dr. Stephen L. Hoffman, of the U.S. Naval Medical Research Unit No. 2 (NAMRU-2), Jakarta Detachment, informed me in a letter that a particularly severe form of typhoid fever, with associated shock and high fatality despite specific chemotherapy, prevailed in Jakarta. The mortality rate was said to far exceed that in other areas where typhoid fever was known to be endemic. It was clear from his letter that Dr. Hoffman was well-informed regarding the various pathophysiological abnormalities associated with typhoid, and he asked for suggestions for any indicated therapeutic approach. Corticosteroids had first been used in typhoid patients as early as 1950, under AFEB sponsorship, but I told Dr. Hoffman that proof of their efficacy had never been established, in spite of the fact that steroid treatment in severely ill typhoid patients was generally used. Excerpts from this 1980 correspondence follow:

7 July 1980

Dear Dr. Woodward:

As a consultant and investigator at the infectious diseases hospital in Jakarta, Indonesia, I see 5 to 10 new patients per week with bacteriologically confirmed typhoid fever (our lab). Of particular interest to me is the fact that many of these generally young (15–35 years), relatively well nourished patients with no underlying diseases present with severely abnormal states of consciousness. While appropriately 80% of the patients are apathetic on admission, 40% of the total number of patients have disorders ranging from delirium, which is often agitated, to obtundation, stupor, and coma. Most of them have fever outside the hospital for 7 to 10 days treated with oral antibiotics (often chloramphenicol) Although several patients have been in shock, most of them have adequate blood pressures, systemic perfusion and urinary output as well as no evidence other than abnormal mental states to suggest inadequate oxygenation, and no evidence clinically of DIC. Laboratory testing in this setting has thus far been inadequate but most patients tested have had normal electrolytes as well as uniformly negative cerebrospinal fluid examinations. The mortality rate in this group is approximately 10%, with those presenting in coma or with convulsions faring the worst. However, most recover slowly, but completely, with mental status returning to normal

approximately seven days after temperatures have returned to normal. . . .

Enclosed is a tentative outline of how we will be approaching this group as well as a control group with typhoid and normal mental status. This is a fairly standard approach and I would appreciate hearing from you as to your ideas on the pathogenesis of this disorder as well as ways that we might approach the study of it. . . .

Sincerely yours,

Stephen L. Hoffman, M.D.
Head, Department of Clinical Investigation and Epidemiology
NAMRU-2

24 July 1980

Stephen L. Hoffman, M.D.
Head, Department of Clinical Investigation and Epidemiology
U.S. Naval Medical Research Unit No. 2 Detachment
APO San Francisco 96356

Dear Dr. Hoffman:

Thank you for your letter of 7 July 1980 in which you bring out some of the opportunities which you have in connection with problems relating to patients with typhoid fever. I gather that your experience is voluminous to say the least.

There are some important problems which relate to pathogenesis of typhoid fever and its management which are unsettled. Some of these issues can only be settled or only partially settled in an area where there is a heavy influx of patients. It sounds to me as if you are experiencing some good old-fashioned virulent typhoid fever.

Would it be possible to obtain skin biopsy sections of the rose spot of typhoid?

Would it be possible to pass a cantor (gastric duodenal tube) tube in some patients, collect bile and/or perform a biopsy of the upper small intestine? We have found these procedures harmless but informative, particularly when immune-fluorescence techniques are used.

Do you think the number of patients is sufficient for a careful alternative study of two effective therapeutic regimens? Would this type of treatment be acceptable on the condition that the two forms of treatment are regarded as comparable? One of these techniques would probably involve the use of corticosteroids along with an antibiotic, etc.

It is presumed that specimens of serum could be collected for special blood studies such as fractionation of amino acids and endotoxin assay, etc. Also, studies of lymphocyte transformation are important.

Let me hear from you about the above. Actually, you stimulated my interest when you raised the question of developing a collaborative study.

Sincerely yours,

Theodore E. Woodward, M.D.

Dr. Hoffman and his associate, Dr. Narain Punjabi, with advice from Dr. Sheldon E. Greisman of the University of Maryland faculty, developed a plan of study on recommended high doses of dexamethasone. The protocol was approved through the usual channels. Funds to conduct the study, beyond those available to NAMRU-2, were raised from Parke Davis and Company. The clinical study was completed in Jakarta with highly successful results, which Dr. Hoffman and his associates reported and published. (Hoffman, SL; Punjabi, NH; Kumala, S; Moechtar, A; Pulungsih, SP; Rivai, A; Rockhill, RC; Woodward, TE; and Loedin, AA. Reduction of mortality in chloramphenicol-treated severe typhoid fever by high-dose dexamethasone. *New Eng. J. Med.* 310: 82–88, 1984.)

The AFEB and the Annual Meetings of the Overseas Commanders

This clinical investigative activity prompted me to visit NAMRU-2 in Jakarta several times during my visits to other DoD Overseas Laboratories in Bangkok and Kuala Lumpur. The Overseas Commanders in 1982 were: Commander Patrick Carney, in Jakarta; Lt. Colonel Michael Gross, in Kuala Lumpur; and Colonel Michael Benenson at AFRIMS, in Bangkok. I also visited the NAMRU facility in Cairo, where Captain Ray Watten was Commander.

During these visits, it was obvious to me that relevant research, very important for the military mission, was being conducted in all units. Furthermore, in several of the units, Army and Navy Department scientists were working collaboratively with civilian scientists. After my discussions with the investigators overseas, it became clear to me that better collaboration and communication between individual Overseas Laboratories and the base laboratories in the United States would serve a useful function.

To this end, in 1982, I transmitted this concept to Maj. General Garrison Rapmund, Commander of the Army's Research and Development Command, and to Captain James F. Kelly, Commander of the Navy's Research and Development Command. Colonel Philip Russell, Commandant of WRAIR, was also consulted. A suggestion was made to hold workshop meetings at WRAIR, or other appropriate sites, in the early winter when the Commanders of the Overseas Laboratories and other laboratory personnel regularly attended the meetings of the American Society of Tropical Medicine. These meetings would provide a forum for the Overseas Laboratory personnel to meet and discuss scientific matters and to determine, whenever possible, how joint efforts, the avoidance of duplication, and suggestions for new leads might better promote relevant military research in the overseas sites.

Meetings of the Overseas Commanders have been held annually since 1982. Much progress has been made in coordinating their research and in developing better understanding of their mutual problems. Steps have been taken to allow working personnel at all levels to discuss both scientific matters and administrative difficulties during workshop conferences. Maj. General Rapmund; Maj. General Philip Russell; Captain Kelly, USN; Colonel Frank Top; and Colonel Fred Tyner, as well as the Overseas Commanders, have contributed to the success of these meetings.

A comprehensive meeting of the Overseas Laboratory Commanders was held at WRAIR on 1 December 1988. The programs of the various laboratories were thoroughly described by each Overseas Commander or associated staff personnel. Discussions were directed at coordinating and expanding specific research projects, with the aims of avoiding duplication and expanding new knowledge. The agenda for that meeting appears on page 208.

On 2 December, the Commanders and other overseas personnel visited the WRAIR and NAMRI laboratories. Maj. General Philip Russell, Commander of the U.S. Army Medical Research and Development Command, sent me the following letter, dated 30 December 1988:

Dear Dr. Woodward:

Thank you for your participation in this year's Overseas Laboratory Commanders Conference. Your presence at these gatherings is always welcomed by both Army and Navy field commanders. It did not escape my notice that this was the seventh in a series of these conference since they were begun at your suggestion in 1981. These meetings are another tangible benefit resulting from the involvement of the Armed Forces Epidemiological Board in the infectious disease research program of the three Services. The interaction between the Board and our researchers in the field has been extremely valuable to us, both in terms of program direction and in terms of stimulating and guiding our young research scientists. Several of our young officers have remarked to me how much they have valued your visits to the overseas laboratories. Your continued involvement in our program, and the involvement of other members of the Board, is always welcome. Best regards.

Sincerely yours,

Philip K. Russell, Major General, Medical Corps, Commander

The Agenda of the 1 December 1988 Meeting Overseas Laboratory Commanders

Walter Reed Army Institute of Research

0800	Registration
0830	Welcome: *Col. C. Fred Tyner,* Director, WRAIR
0840	Introduction: *Capt. J. Woody,* CO, Navy MRDC
0850	Introduction: *Maj. Gen. P. Russell,* CDR, USAMRDC
0900	Army Infectious Disease Program: *Col. D. Robinson*
0930	Navy Infectious Disease Program: *Capt. L. Laughlin*
1000	Break
1020	AFRIMS (Thailand): *Col. F. Soldez*
1050	USAMRU-M (Malaysia): *Col. G. Lewis*
1110	NAMRU-2 (Philippines): *Capt. J. Coolbaugh*
1130	NAMRU-2 DET (Indonesia): *Cdr. F. Paleologo*
1150	USAMRU-ROK (Korea): *Col. K. Dixon*
1210	Lunch
1330	NAMRU-3 (Egypt): *Capt. M. Kilpatrick*
1400	USAMRU-K (Kenya): *Col. C. Roberts*
1420	Break
1440	NAMRI-DET (Peru): *Cdr. R. Buck*
1500	USAMRU-B (Brazil): *Maj. (P) McGreevy*
1520	Break
1540	HIV: *Col. E. Tramont*
1600	HIV Discussion
1610	General Discussion
1630	Cash Bar, Officers' Club (WRAMC)
1800	Catered Dinner (Barbecue) WRAIR

The fortieth anniversary meeting of USAMRU (Malaysia) was held at WRAIR on 24 February 1988. Members of the AFEB, WRAIR, USAMRIID, NIH, and invited guests attended. The meeting's agenda illustrates not only the important military medical research that has been conducted at USAMRU during the past forty years, but also the close collaboration between the AFEB and the DoD Overseas Laboratories. That agenda follows:

The Agenda of the 24 February 1988 Meeting
USAMRU (Malaysia)

0900 Welcome: *Col. F. Tyner*
0905 40th Anniversary Celebration—Introduction: *Maj. Gen. P. K. Russell*

I. Scientific Achievements—The University of Maryland Period 1948–1962
Chairman: Dr. C. L. Wisseman, Jr.

0915 First Specific Treatment for Scrub Typhus and Other Infections: *Dr. T. E. Woodward*
0945 Typhoid Fever and Chemoprophylaxis of Scrub Typhus: *Dr. H. L. Ley, Jr.*
1015 Fevers of Unknown Origin: *Dr. P. A. Webb*
1035 Break
1050 Medical Ecology: *Dr. R. Traub*
1140 Encephalitis: *Dr. P. Paterson*
1150 Discussion
1200 Lunch

II. Scientific Achievements—The Post-Maryland Period
Chairman: Col. D. Robinson

1300 The Ecology of Scrub Typhus: *Maj. Gen. G. Rapmund*
1320 Forest Ecology: *Dr. I. Maul*
1340 Doxycline Prophylaxis: *Col. M. Groves*
1400 Current Studies: *Lt. Col. G. Lewis*
1420 Discussion

III. International Cooperation
Chairman: Brig. Gen. W. D. Tigertt

1430 Collaborative Studies with the Institute for Medical Research: *Dr. R. Traub*
1440 Collaborative Studies with The Commonwealth Force: *Dr. C. Dulake*
1500 Volunteers, Then and Now Discussion: *Dr. B. Elisberg*
1520 Break

IV. The Joseph E. Smadel Lecture

1530 Introduction of Dr. C. L. Wisseman, Jr.: *Dr. B. Elisberg*
1535 Epidemic Typhus: *Dr. C. L. Wisseman, Jr.*
1630 Adjourn

V. Evening Program

1700 Gather for Dinner
1800 Dinner
1900 Introduction of Speaker: *Maj. Gen. P. K. Russell*
1915 Collaborative Efforts between the University of Maryland and the U.S. Army: *Dr. T.E. Woodward*

In fulfilling its advisory role, the AFEB has helped support and coordinate the activities of the Department of Defense's Overseas Laboratories. This help has often taken the form of establishing an informal working relationship with a qualified academic center whenever that was appropriate to the program's mission. Not the least of this support has been the AFEB's assistance in recruiting key personnel.



WILLIAM D. TIGERTT, M.D.

Bill Tigertt was closely affiliated with the AFEB and several of its Commissions during his distinguished military career. With the advantages of his remarkable experiences in laboratory medicine and his accurate bibliographic memory, Bill applied his capability in pursuit of those infectious-disease problems that he confronted. He gained broad experience in tropical diseases in New Guinea and the Philippines as Director of the 26th Army Laboratory and at the 406th General Laboratory in Tokyo. Malaria, other parasitic diseases, and enteric infections were rampant Later, under his guidance as Commander of the U S Army Medical Unit at Fort Detrick (later USAMRIID), many of the problems of pathogenesis, pathophysiology, and control of viral and rickettsial diseases were clarified He held the rank of Brigadier General when he retired from the Army Medical Corps.

Bill was the principle force behind the thrust to find better prophylactic and chemotherapeutic controls of malaria. He collaborated closely with the Commission on Epidemiological Survey, and was a member of the AFEB's Commissions on Malaria, Virus Diseases, and Parasitic Diseases.

THE DENSEN REPORT

The Board has always responded to requests by the respective Surgeons General and the Office of Health Affairs in the Department of Defense on standards and procedures related to health care, health standards, and data-collection systems. Several ad hoc committees and task forces addressed these health issues for the Board. Dr. Paul Densen, a leader in this field and a dedicated Board member, kindly responded to my request that he prepare a chronology of these proceedings and an historical commentary. The document that he produced, which is of significant historical importance, follows. It deals with the AFEB's activities related to physical standards, frequency of examinations, population-based forecasting, epidemiological methods in the health-care delivery system, the ambulatory care data base, readiness-related issues, and the health care of women in the armed forces.

The AFEB, The Setting of Health Standards, and the Application of Epidemiological Concepts to the Study of the Health of the Armed Forces: A Chronology and Commentary

Background

Late in 1978 the Armed Forces Epidemiological Board was formally reorganized into three subcommittees:[1]

a. The Subcommittee on Disease Control

b. The Subcommittee on Environmental Health

c. The Subcommittee on Health Maintenance Systems

The establishment of the Subcommittee on Health Maintenance Systems constituted an expanded area of activity for the Board. While its concerns inevitably overlap those of the other two subcommittees, the designation of a separate subcommittee represented specific recognition of the importance of dealing with individual disease entities and environmental hazards. At the same time, it was recognized that central to the concern of all three subcommittees must be the development of an appropriate data base to aid in the early detection of departures from health, provide management with the tools for resource analysis, and furnish epidemiological information on the distribution of health and disease in the Armed Forces which could serve as a point of departure for more detailed research efforts In brief, the Subcommittee was to provide "scientific evaluations and recommendations concerning:

a. The assessment of those physical, nutritional, behavioral, hereditary and other characteristics of individuals and populations which are associated with chronic disease and disability.

b. Those programs which can be implemented to prevent or decrease lost time duty for Armed Forces personnel, and

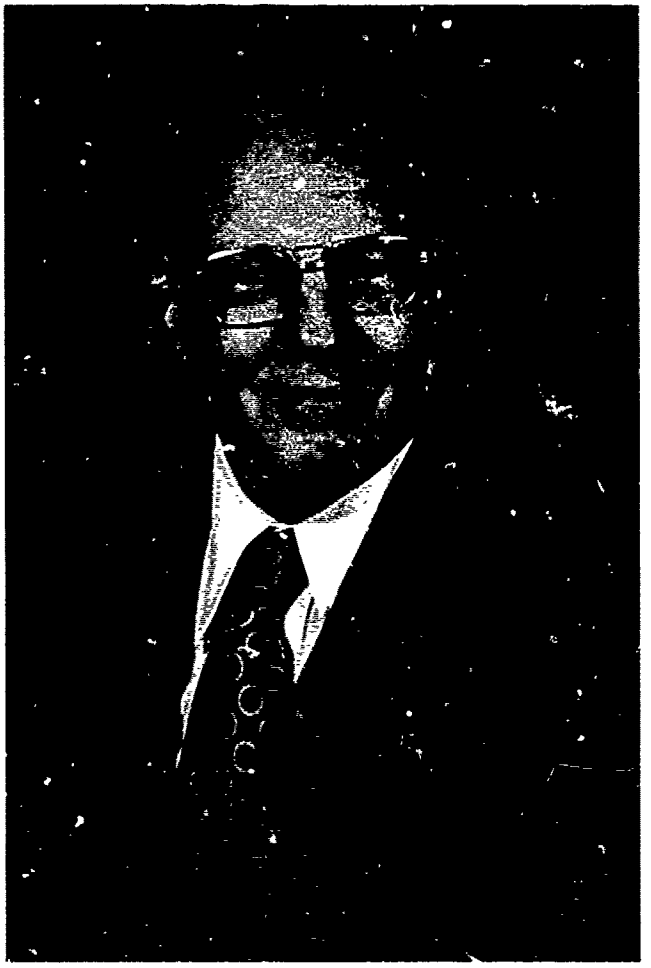
c. Those epidemiological and management techniques applicable to the design of more efficient health service programs, particularly with regard to preparations for varied operational contingencies.

The activities under this charge follow:

Activities

Periodic Medical Examinations. In March of 1975, Col. Robert T. Cutting, M.D., Chief, Health and Environmental Division, DOD, requested the AFEB to review the scope of the periodic medical examination [(PME)] in the Armed Forces The usefulness of the examination was in question and the shortage of medical manpower dictated that the entire policy be reviewed.

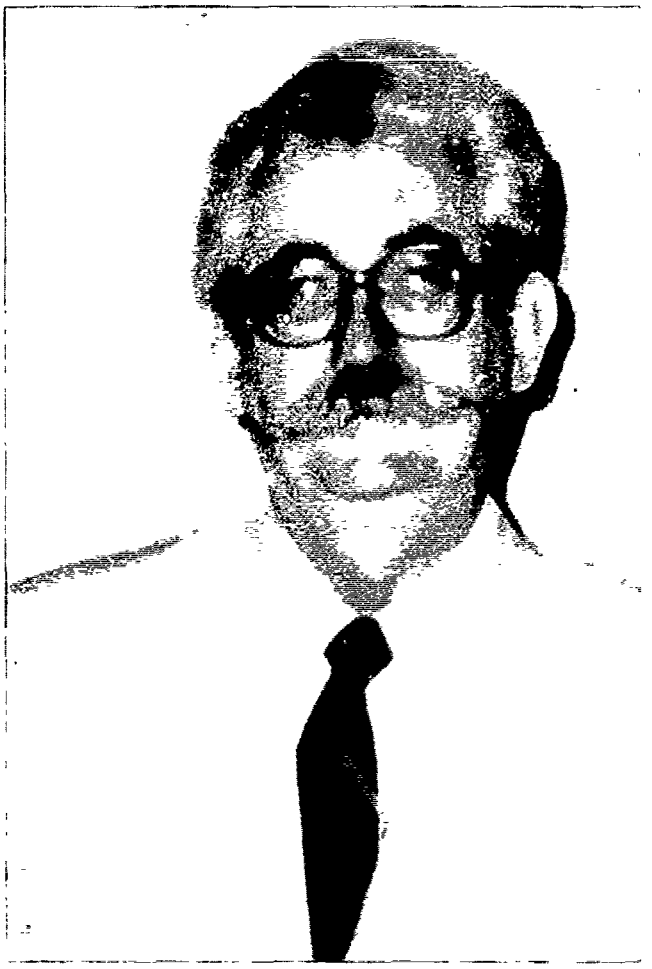
In response to Dr. Cutting's request, Dr. Lennette, President of the Board at the time, appointed an ad hoc study team which made its report in March of 1976.[2] The report included a suggested procedure for review of the PME and resulted in the appointment of a Subcommittee with Dr. Paul Densen as chairman to review the subject in detail. The Subcommittee held its first meeting in January, 1977 and submitted its report to the Board at its February meeting



PAUL M. DENSEN, D.Sc.

Paul Densen has had a distinguished career as a counselor and administrator of health services, particularly as they relate to health care, community health planning, and health needs. He is the doyen of health-care consultants in the United States and is called upon by national groups with problems in this field.

The AFEB was fortunate to have attracted Paul Densen as a member in 1975. At that time, shortly before the Board broadened its interests in the field of infectious diseases, Paul Densen brought a sorely needed brand of expertise, and chaired the Board's Subcommittee on Health Maintenance. Urgent, longstanding problems were frequently presented to the Board by the Surgeons General of the three services and the Office of Health Affairs. Paul assisted the military services in their planning for health care, health standards, and population forecasting, and particularly the special problems associated with the delivery of health care to large groups. Members of the Subcommittee performed in-depth studies, visited many military installations, and made exhaustive, objective recommendations regarding health care and statistical analysis. These were of inestimable value to the Department of Defense, and Paul Densen deserves the lion's share of the credit. Always responsive, he never failed to accept a request and carry the problem through to its solution.



RICHARD D. REMINGTON, Ph.D.

Dick Remington is a product of the University of Montana and the University of Michigan. After receiving his doctorate at Michigan, he served with Dr Thomas Francis as an epidemiologist in that outstanding School of Public Health. Later he served as the Dean of the School of Public Health at Michigan.

The Board was fortunate to attract Dick Remington as a member A practical and wise epidemiologist, he has helped solve various problems that were posed by the three medical services His contributions have included recommendations pertaining both to data collection for ambulatory medical care systems and to population forecasting of the need for current and future procedures pertinent to inpatient and outpatient services He has also worked on problems associated with acquired immune deficiency syndrome, particularly in developing practical guidelines for disease control.

in 1979.[3] The Board approved the report and forwarded its recommendations to the Assistant Secretary of Defense (Health Affairs) and the Surgeons General in March of the same year.[4]

A number of detailed recommendations were made, the gist of which was that the PME, as then constituted, be abandoned. In its place it was proposed that a minimal health examination be integrated into the general medical program, the content and frequency of which were specified in the report. The report emphasized that the minimal health examination should serve to place examinees into risk groups and that the frequency and content of subsequent examinations should be governed by the nature of the risk. Manpower considerations were discussed and recommendations made as were recommendations for improving the management and monitoring of the program.

Subsequent to the Board's report, a number of changes were made in the medical examination standards which move the procedure in the direction recommended by the Board.

In 1973, regulations required medical examinations every four years for Army personnel aged 19 through 39, every two years from ages 39 through 49, and annually thereafter. Since 1980, following the Board's report, examinations are required every five years from ages 20 through 60, and annually thereafter. General officers are examined annually regardless of age.

The principle that the examination should serve to place individuals into risk groups and that subsequent examinations should be dictated by the nature of the risk has been adopted. For personnel over forty, procedures such as rectal examinations, cardiovascular screening, mammography and Pap smears have been instituted. Recently, the Army has initiated health risk appraisals which place the individual into risk groups based upon replies to a check list. A computer scans the check list and calls for further examination if the individual is identified as having a high risk life style.

The original stimulus for review of the PME was its low yield as then constituted with resultant inefficient use of scarce manpower. The extent to which the changes described have improved the situation should be examined periodically and the findings made available to the Board.

The risk-correlated approach to health maintenance has been particularly evident in a long-standing collaboration between the Air Force and the Army. The Navy, while not formally involved, has expressed keen interest. However, as far as is known at this writing, a coordinated, tri-service approach to a health examination program is still in the future.

Population-Based Forecasting. In 1973, at the direction of the President, a Military Health Care Study (MHCS)[5] was undertaken charged with, among other things, making "appropriate recommendations for modifications to improve the Military Health Services Systems." The 1975 report of this study called particular attention to the lack of reliable information on the size and characteristics of the population eligible to receive benefits from the system and on the patterns of utilization of the system by the eligible population. The report "recommended that DOD adopt a planning process for CONUS which is based primarily on the demographics of the population to be served."

In response to this recommendation, the Office of Program Planning and Policy Analysis (OPPA) was established in 1980 in the Office of the Assistant Secretary of Defense, Health Affairs. One of the tasks assigned to OPPA was to develop population-based forecasting models designed to permit appraisal of the impact of policy changes on the Military Health Care System both in the direct care of service personnel and in the care of dependents. In November of 1980 Dr. John H. Moxley, III, then ASDA(HA), requested the AFEB to assess the "structure, accuracy and potential usage" of the population-based forecasting models being developed by the OPPA and asked that Dr. Densen participate in this assessment.[6]

Dr. Densen submitted his report to the Board in September of 1981. The Board approved the report and forwarded the recommendations to the ASD(HA) and the Surgeons General in the following month.[7] There were three overall **recommendations**:

> 1. The population-based forecasting activities of the OPPA should continue to be supported.
> 2. The activities of the OPPA in this area should be integrated with the medical statistics activities of the three services.
> 3. The ASD(HA) should request the AFEB to conduct and report on annual review of the population-based forecasting activities of the OPPA.

The last of these recommendations warrants some elaboration. The report dealt at some length with the potential uses of the information being developed by OPPA, pointing out that the need to know the population exposed to risk

pervades almost every management, policy and research activity undertaken by the Armed Services. Over the years the AFEB has repeatedly had occasion to comment upon the lack of such information, as indeed did the Military Health Care Study and as have outside consultants such as the Rand Corporation. The recommendation for an annual review was designed to ensure that the issue receive the attention its importance warrants. The recommendation also sought to provide an educational device for all parties concerned.

So far as is known no action on this recommendation has been taken to date.

In 1984 the functions of the Office of Program Planning and Policy Analysis were assumed by Dr. Mestrovich and his staff at the Defense Medical Systems Support Center (DMSSC). Population data by age, sex, beneficiary and geographical regions continue to be collected through the DEERS program. Responsibility for analyses and distribution of the data have been assigned to Norma St. Clair in Dr. Mestrovich's office.

Although the availability of such population estimates represents a considerable advance over the previous situation, bringing these data together with numerator data in a systematic manner to form prevalence and/or incidence rates for the three Services is still sporadic. In view of the numerous recommendations in this regard which have been made over the years, this is deplorable and deserving of greater attention. One approach to developing such rates is embodied in the interim recommendation of the Ambulatory Care Data Requirements Work Group discussed below.

Epidemiological Methods in the Health Care Delivery System. At a meeting of the Board in September of 1980, Dr. Eric Gunderson presented a report on the Navy program on epidemiological models and management and clinical services in health care systems. Dr. Woodward placed discussion of this report on the agenda for the meeting of the Board in September of that year.

The Gunderson report provoked lively discussion which emphasized the need to bring together numerator and denominator information as a basis for epidemiological examination of the health of the Armed Forces and to provide the tools necessary for more effective management of the health care programs of the three services.

Following this meeting, Dr. Woodward appointed a Task Force with the charge "to better define and develop a program aimed at formulating epidemiological methods in the clinical health delivery system which will utilize all services and benefit all services in a manner which is peculiar to their needs."[7] This initial Task Force was chaired by Dr. Herschel Griffin who was later succeeded by Dr. Richard Remington when the former's term on the Board ended. In April of 1982, the Task Force submitted two resolutions to the Board which were forwarded to the ASD(HA) and the Surgeons General. One of these recommended "that as soon as possible (reports on health service utilization, occurrence of disease and other health indicators) include, in addition to counts, rates based on denominator data reflecting populations at risk." The other resolution expressed the Board's willingness to assist in a planned annual review of the Office of Health Policy, Planning and Systems.

Subsequent to the April 1982 report, the Task Force received on-site briefings on the Navy Occupational Health Information System (San Diego), the Army Outpatient Information Test System (Brook Army Medical Center) and the Air Force's Outpatient Computerized Occupational Health Program (Brooks AFB, Texas). These briefings culminated in a report to the Board at its March 1982 meeting containing several recommendations which were approved and forwarded in the usual manner.[8]

After noting that the development of health care related information by the three Services was [impressive] and deserving of support, it was further recommended that "expansion of the informal dialogue occurring among the three services should be encouraged with each service developing its own phased implementation plan to provide a longitudinal health record on military personnel and their dependents." Referring to the information systems being developed by the Services another recommendation stressed that a "minimum requirement of these systems should be a capability to compare populations at risk with populations receiving care (matching numerator and denominator data)." Again, it was indicated that "the AFEB would like to be a contributing participant in the evolution of health care information systems. . . ."

Following the Remington report there appears to have been organized in the Office of the Assistant Secretary of Defense (Health Affairs) a Health Studies Task Force with Colonel Redman as its chief. The Task Force undertook a study whose objectives were to:

1. Assess the utility and
2. The feasibility of transferring individual inpatient data to the Health Affairs Data Management Information System [DMIS] and then
3. To develop a mechanism to interface this data with other data modules in DMIS.

In June of 1984, the Task Force issued a draft report in which it was concluded it was both useful and feasible to transfer "archive copies of the Services individual inpatient data systems to the Data Management Information System of the OASD(HA)."

[The] June 1984 draft report of the Task Force may be considered a follow-up on the Remington report designed to provide DOD with the kind of information needed for the effective management of its health care program

The Task Force continues to function on a contingency basis (see the discussion below on readiness) under the direction of Lt Colonel Antoinette Hagey. Contemporary issues have included smoking, nutrition, cardiovascular screening and cholesterol testing.

Ambulatory Care Data Base. A major part of the resources of the Military Health Care System (MHCS) is devoted to providing ambulatory care services to military personnel and their dependents Yet, as pointed out in the Health Studies Task Force draft report "complete individual ambulatory utilization experience among the population is not now (1984) being collected by the services."[10]

The lack of ambulatory care information is not due to failure to recognize the problem. Almost every review of the health care programs of the three services for the past twenty years or so has noted the advantages to be gained from the availability of such information from the clinical, epidemiological and administrative points of view. Indeed, as noted in the Remington report, individual installations in each of the Services have striven to address the issue and at its 1985 Fall meeting, the Board heard a presentation on the development of an Ambulatory Care Data Base at Fort Sam Houston This effort was begun as an Army initiative in 1982 by LTCs Terry Misener and John Coventry

The search for a practical approach to the development of ambulatory care data continues. In September of 1966 an Ambulatory Care Data Requirements Work Group with Norma St. Clair as coordinator was organized as part of the Composite Health Care Systems, which in turn is part of the Defense Support Systems reporting directly to the ASD(HA) on data base issues Ms St. Clair presented the plans of the Work Group to the AFEB in October of the same year and subsequently Dr Densen attended one of the meetings of the Group and received Minutes of other meetings

This effort received a setback in May of 1987, when Surgeon General Becker indicated that the Army was "preparing to discontinue testing the Ambulatory Care Data Base" because it could not "afford the cost (about $400,000 per year) nor manpower spaces (17) to continue ACDB collection efforts."[11] The Surgeon General did indicate that apart from cost considerations the system was judged to be a success.

In its report at the end of May 1987, the Work Group made a number of recommendations.[12] After stressing that the recommendations were designed so as not to place additional reporting burdens on the personnel of the individual installations and that they should not be implemented until a fully automated support system is available, the report urged that the ambulatory care data set developed by the Work Group should be "incorporated in the Composite Health Care System (CHCS) as the ambulatory care reporting requirement." The "Work Group focused on the facility level requirements for data that enhance the delivery of quality health care." It noted, however, that the "data requirements of the facility level are of a different nature from the requirements of the higher levels of management."

The Work Group was asked to recommend an interim solution for system-wide data collection until the CHCS capability became available. It noted that a system now exists that "records patient encounters without a data collection burden on facility personnel. This system provides support to clinic administrative personnel. An interface with DEERS could provide demographic data that could be combined with encounter information. This capability would provide basic data on encounters by clinical area and patient demographics "

The availability of such information would provide management with information on the variation in patterns of utilization among the individual installations which could serve as a basis for further inquiry as to the reasons for the variation. Unusually high or low utilization patterns may indicate more efficient deployment of resources or more effective ways of providing care or the opposite. In any case, management would have a powerful but too infrequently used tool available based on already existing data collection procedures.

In view of the many recommendations over the years to develop ambulatory care information, the AFEB should vigorously support the Work Group's recommendation that certain existing procedures for collecting encounter information "be proliferated (and) combined with a DEERS interface" to establish an interim data collection system.

This interim data collection procedure would be in accord with the recommendations of the Remington report referred to above and [consistent] with a suggestion made by Dr. Densen to Norma St. Clair that the development

of administrative data not wait entirely upon the clinical information desired at the facility level.

Readiness-Related Issues. The ability of the Armed Forces to combat disease in the field has always been a matter of major concern to the medical staffs of the three Services. It was not until World War II that battle casualties exceeded losses from disease. The worldwide deployment of Armed Forces personnel, even in the absence of overt armed conflicts, makes the issue of continuing concern to the DOD.

In March of 1984 the ASD(HA), Dr Mayer, requested the Board to examine the quantity and quality of the existing worldwide reporting systems for epidemiological data with particular attention to the information on the incidence and prevalence of disease. He also asked that the Board review the availability and quality of epidemiological data for various potential trouble spots in the world and recommend the preventive measures best suited to prepared the Armed Forces to deal with health problems in these areas.[13]

Dr Woodward asked Dr. Densen to form an ad hoc subcommittee to prepare a reply to Dr. Mayer's request. With considerable help from representatives of the three Services, a draft report was presented at the September 1984 meeting of the Board. Lively discussion ensued and a number of constructive suggestions were made. The final report was sent to Dr. Mayer in the following month.[14]

After pointing out that information on the health problems likely to be encountered by Armed Forces personnel outside CONUS was available from a number of sources, but that this information was not collated and disseminated to the field in the most useful fashion, the Board **recommended** that:

> 1. The disease reporting systems of the three Services be reviewed with the objective of providing relevant medical intelligence information to the Armed Forces Medical Intelligence Center (AFMIC).
> 2. A physician-epidemiologist be assigned to AFMIC who, among other duties, should rank the diseases present in order of military importance with concomitant preventive measures to deal with them.
> 3 The physician-epidemiologist should be a regular contributing participant at all Board meetings.

Following this report, a non-medical epidemiologist was added to the staff of AFMIC and he attended Board meetings. More recently an Air Force Colonel, who is a physician with training in epidemiology, has been assigned to AFMIC. He attended his first AFEB meeting in February of 1988 as the AFMIC representative.

At the September 1987 meeting of the Board, the AFMIC Executive Officer, Lt. Colonel John Weske, discussed the problems encountered in rank ordering the reportable diseases according to military importance. He reported that a meeting on the subject was planned within the next ninety days with the object of clearly delineating the goals of the effort and possible options and solutions, as well as a time table for achieving the goals. This topic is on the agenda for the Fall of 1988 AFEB meeting.

With regard to preparing Armed Forces personnel to deal with health problems in troubled areas, the Board stressed that unless information "reaches the field commander in a manner which clearly provides an assessment of risk and indication of action to be taken, its usefulness is limited It is in this area of interpretation and translation into practical recommendations that the Armed Services appear to be somewhat deficient. To remedy this deficiency, the Board made recommendations designed to prepare medical personnel to maintain the readiness of troops under combat conditions and to facilitate large area surveillance in order to identify potential hazards as well as to aid in diagnoses. Among these were the following [**recommendations**].

> 1. The combat casualty course be expanded to include aspects of preventive medicine and expansion of the Army Course in Tropical Medicine at Walter Reed to provide practical field and laboratory experience in tropical medicine.
> 2. A continuing medical education course be required for all military physicians. Physicians with appropriate preventive medicine training be assigned to units deployed to existing trouble spots.
> 3 In the preparatory phase for troop deployment provision should be made for field laboratories in the operational area early in the deployment schedule.

As of this writing, training in preventive medicine is conducted on a contingency basis as is related pre-deployment planning. Operations plans are previewed for infectious diseases in accordance with guidelines developed in the Academy of Health Sciences Preventive Medicine Officer's short course. Whether this includes provision for field laboratories is not known at this point.

Upon receiving the recommendations in these two reports, Dr. Mayer prepared a memorandum[15] to the Assistant Secretaries of the Army, Navy and Air Force (M&RA and MRA&D) and to the Assistant to the Chairman, Joint Chiefs of Staff stating that he intended to implement the recommendations of the Board and soliciting comments. If the actions proposed by Dr. Mayer are indeed implemented a good start will have been made toward overcoming the deficiencies noted in the Board's report. In any event, the Board should follow developments in this area closely

Women in the Armed Forces. Dr. Mayer, in the memorandum of March 27, 1984, asked the Board to examine the constraints and likely consequences of the increasing participation of women in the Armed Forces.

It proved impossible to answer Dr. Mayer's question directly because of the lack of high quality data on the health problems of women in the Armed Forces. This problem had been noted previously in another context by the Office of the Assistant Secretary of Defense (Manpower, Reserve Affairs and Logistics) In a review of women in the military published in October 1981,[16] it was stated that "a complete understanding of the relative costs and productivities of military men and women is hampered by missing, outdated or inconsistent data." This conclusion was found to apply as well in the area of health affairs.

Given this lack of adequate and reliable data, the Board's recommendations were directed at remedying this deficiency, so that in the future the nature and size of the health problems of women in the military would be more precisely understood and therefore more effectively addressed.

Particularly lacking were measures on childbirth and pregnancy-related conditions presented in such a form as to make possible comparisons with the civilian sector and to permit meaningful interpretation of trends. An eloquent presentation of the problem was made by a service obstetrician (Col Sa'adah) at the Fall meeting of the Board In its report the Board **recommended** that:

> the statistical data on childbirth and pregnancy-related conditions be revised so as to be directly comparable to reports of the National Center for Health Statistics.

The data should present trends in annual birth rates, with and without complications of pregnancy, details as to pregnancy outcomes in terms of parity, trimester of pregnancy first seen, etc., in order to provide information on the health of both mother and child and lay a better foundation for the estimates of resource requirements.

The discussion at the Fall meeting of the Board emphasized the need for a much broader base of information about the health status and utilization patterns of women in the Armed Services than existed at the time. After again noting the absence of out-of-hospital utilization data and reiterating its prior recommendations to develop such data, the Board **recommended** that:

> the Office of the ASD(HA) consider developing a prospective five-year cohort study of women, beginning when they are inducted, to determine their utilization of health services, [to] examine the relation[ship] between health status and occupation, and [to] evaluate the factors contributing to separation from the Armed Services.

This recommendation is in accord with the general recommendation of the Remington report that a longitudinal health record be established on military personnel and their dependents.

Following the transmission of these recommendations to Dr. Mayer's office, Col. Redman of that office was asked to examine their feasibility. He concluded that "it is feasible to have the Services maternal and natal statistics be collected, completed and reported in a manner comparable to current national and state guidelines" and recommended that the services be directed to "to incorporate all elements of birth certificate information not now collected through their medical records coding into the Individual Patient Data Systems."[17]

So far as can be determined at this writing, little or nothing has been done to develop the needed data though as Col. Redman noted, it is feasible to do so. This is a shameful state of affairs and the Board should exert its influence whenever and wherever it can to remedy the situation

Col. Redman also reported the cohort study to be feasible and recommended that it be undertaken.[18]

In Retrospect

In carrying out its assignment as defined in the original charge to the Subcommittee on Health Maintenance, the Board has followed the basic epidemiological principle of endeavoring to define the population exposed to risk and relating events of interest to that population (relating the numerator to the denominator).

Considerable progress has been made by the Services in the understanding of this principle and its application to the health care program. The Board's recommendations in this area have been considerably advanced by the revitalization of the Office of the Assistant Secretary of Defense, Health Affairs, under Dr John Moxley, III, and his successor, Dr. William E. Mayer. Both of these individuals fully appreciate the principle and they have endeavored to make the Office the focal point for the "population-based health information system" envisioned in the Remington report. As noted in the foregoing, there is much yet to be done but the will to do it is there.

To insure continued programs, it would be desirable to improve communication between the Board and the Services in two respects:

1. The Board is most effective in helping to improve the health maintenance efforts of the Services when it is in a position to bring its expertise to bear in the "gleam in the eye" stage of a proposal. It is at this stage that epidemiological and statistical concepts are most efficiently woven into the design of a proposed project or program. As early as possible the Board's comments should be solicited when proposals are put forward to the ASD(HA) officer or to the respective Offices of the Surgeons General.

2. More systematic follow-up of the Board's recommendations should be instituted. The Executive Secretary should be asked to determine what action has been taken on the recommendations and to report to the Board at periodic intervals.

Paul M. Densen

June 1988

Footnotes

1. Reorganization memorandum of 11/6/78.
2. Report of ad hoc Study Team for Review of Scope of PME in the Army. AFEB 76-3, March 15, 1976.
3. Report of the Subcommittee on Health Maintenance of the AFEB, Feb 16, 1979.
4. Recommendations on the Scope of the PME in the Armed Forces, DASG-AFEB 79-3, 27 Mar 1979
5. U.S Dept of Defense, Dept. of Health, Education & Welfare, Office of Management & Budget. Report on the Military Health Care Study, Washington, D.C. US GPO, Dec 1975
6. Memo from Dr. Moxley to Executive Secretary AFEB regarding Review of Population-Based Forecasting Models, 5 Nov 80.
7. Memo to ASD(HA) and Surgeons General. Recommendation Regarding an Assessment of Population-Based Forecasting Models of the Office of Planning and Policy Analysis 26 Oct 1981 and Report to Board by PMO dated September 2, 1981.
8. Letter of 9/25/80 from Dr. Woodward to Dr. Griffin requesting that the latter serve as Chairman of the Task Force.
9. Memo to ASD(HA) and the Surgeons General, 21 April 1983, DASG-AFEB 83-3. Recommendations on Epidemiological Methods in the Military Health Care Delivery System.
10. Draft Report Diagnostic Data for Health Planning and Policy Development Health Studies Task Force OASD(HA) Burgess and Redman, June 1987.
11. Memo from General Becker to ASD(HA) re: Ambulatory Care Data Base, 1 May 87.
12. Recommendations of the Ambulatory Care Data Requirements Work Group, 29 May 1987. Ms. Norma St. Clair (Chair).
13. Memo from Dr. Mayer to AFEB regarding Readiness Related Topics for AFEB examination.
14. Board memos to Dr. Mayer on Readiness. DASG-AFEB 85-1, 85-2, 85-3, 29 October 1984.
15. Memo from Dr. Mayer to Assistant Secretary (M&RA) to Assistant to Chairman, Joint Chiefs of Staff, 14 May 1985.
16. Background Review—Women in the Military, Office Assistant Secretary of Defense. (*Manpower, Reserve Affairs and Logistics*, Chapter VII, p. 97, Oct 1981).

17 Feasibility of Upgrading the Services' Maternal and Natal Statistics Reporting Systems, Col. R. A. Redman, Health Studies Task Force OASD(HA) 10 May, 1985. (Vol III).

18 Feasibility of a Cohort Study on the Health Needs of Women in the Services, Col. Redman, Health Studies Task Force OASD(HA), 15 May 1985. (Vol III).

THE CONTINUING PROBLEM OF MALARIA

In their regular reviews to the Board on the incidence of specific illnesses among military personnel, the Preventive Medicine Officers of the three services regularly reported on the prevalence of malaria in troops deployed to tropical areas. On 16 May 1985, Colonel Manmohan V. Ranadive, Chief of Preventive Medicine in the Office of the Surgeon General of the Army, presented the following memorandum and questions to the AFEB:

MEMORANDUM FOR
EXECUTIVE SECRETARY, ARMED FORCES EPIDEMIOLOGICAL BOARD

SUBJECT Chemoprophylaxis Against Chloroquine-Resistant Malaria. Question to the Armed Forces Epidemiological Board

BACKGROUND

1 In January, 1985, the U.S.P.H.S. recommended that travelers to Chloroquine-resistant *P. falciparum* (CRPF) regions in Asia or South America take Fansidar in addition to Chloroquine ONLY if they remained overnight in rural areas (reference 1) Travelers to east and central Africa were recommended to take Fansidar and Chloroquine due to the intense transmission of malaria.

2 Since Fansidar became available in the U. S. in 1982, 20 cases (six fatal) of severe adverse reactions including erythema multiforme, Stevens-Johnson syndrome and toxic epidermal necrolysis have been reported, 19 of these cases were also taking Chloroquine weekly. In April 1985, U.S.P.H.S. revised their earlier recommendations (reference 2) For short-term travel (3 weeks or less) to CRPF-areas in Africa, only Chloroquine was recommended, and Fansidar was to be taken ONLY if a febrile illness consistent with malaria developed while on the trip. Long-term travel would require a careful assessment of the need for both medications prophylactically, taking into account the degree of exposure and the likelihood of contracting infection.

3 Malaria chemoprophylaxis was not routinely recommended for visitors to urban centers of Asia (to include China, Indonesia, Malaysia, the Philippines and Thailand), or for those who would have only daylight exposure to rural areas. Individuals having considerable outdoor exposure to rural areas of Thailand, where widespread resistance to both Chloroquine and Fansidar has been reported, would require special evaluation. Since [the] malaria risk in South America was primarily in rural areas and in specific urban areas only, routine prophylaxis was not recommended Chloroquine prophylaxis was also recommended for travelers to the Indian subcontinent, Papua New Guinea, Irian, Java, the Solomon Islands, and Vanatu.

4 Due to the large numbers involved in a military deployment, reliability in taking medications at the appropriate time, and limited medical care in isolated areas, the U.S.P.H.S. guidelines are not necessarily applicable in the military setting.

QUESTIONS

1 In view of recent U.S.P.H.S. guidelines and the fact that military personnel on overseas deployments will often be at greater risk of contracting malaria than tourists, is Chloroquine and Fansidar prophylaxis in combination indicated for military members deployed in CFPF areas?

2 Since many CFPF areas are so highly endemic for vivax malaria, terminal Primaquine prophylaxis will also be indicated What is the best prophylaxis schedule using the three drugs that will be associated with the least serious adverse effects?

3 What precautions or medical procedures should be followed to minimize the occurrence of serious adverse effects from prophylactic medications?

REFERENCES
1 Adverse reactions to Fansidar and updated recommendations for its use in prevention of malaria. *MMWR* 33 (51). 713-714. 4 January 1985.
2 Revised recommendations for preventing malaria in travelers to areas with chloroquine-resistant *Plasmodium falciparum*. *MMWR* 34 (14): 185-190, 195. 12 April 1985.

During the spring meeting of the AFEB on 6–7 June 1985 the Subcommittee on Infections and the Board discussed the malaria problem again and formulated the following recommendations.

MEMORANDUM FOR
THE ASSISTANT SECRETARY OF DEFENSE (HEALTH AFFAIRS)
THE SURGEON GENERAL, DEPARTMENT OF THE ARMY
THE SURGEON GENERAL, DEPARTMENT OF THE NAVY
THE SURGEON GENERAL, DEPARTMENT OF THE AIR FORCE

SUBJECT Interim Recommendations Concerning Chemoprophylaxis of Chloroquine Resistant *Plasmodium falciparum* (CRPF) Malaria

1 The Chief, Preventive Medicine, Directorate of Professional Services, Office of the Army Surgeon General, prepared the attached background information report and specific questions to the Armed Forces Epidemiological Board (AFEB) as a result of reported adverse reactions to Fansidar (*MMWR* 33 (51). 713-714, 4 January, 1985) and concomitant revision of the United States Public Health Service (USPHS) earlier recommendations (*MMWR* 34 (14). 185-190, 195, 12 April 1985 Centers for Disease Control, DQ-CPS, Advisory Memorandum no. 80, 24 April 1985).

2. In answer to the first question, regarding whether or not Chloroquine and Fansidar in combination is indicated for military members deployed to CRPF areas, the AFEB recognizes the differences in intensity of military and civilian exposures and the multiple variables that might be associated with such possible military exposure. For these reasons, the Board believes it is inappropriate at this time to recommend a *single* course of action that would be applicable to all possible deployment scenarios. Therefore, the Board would propose that decisions concerning malaria chemoprophylactic regimens for deployed individuals and groups be based on consideration of falciparum malaria endemicity, present knowledge regarding patterns of drug resistance of falciparum parasites in the regions, military mission, size of forces and medical support available to these forces. Therefore, within this general framework, the Board offers the following *interim* recommended guidance predicated mainly on the size of the forces.

a. For individuals and small groups of *up to twelve* personnel, (i.e., special military detachments), the Centers for Disease Control guidelines, as published in the *Morbidity and Mortality Weekly Report*, Vol. 34, No. 14, April 12, 1985, should be followed.
b. For sizeable deployments of *more than twelve personnel* (including units of battalion size or larger) to Chloroquine resistant *Plasmodium falciparum* (CRPF) areas, a development of a blanket policy applicable to the entire force should be made, predicated on all available information. Regimens that might be considered, depending on the respective circumstances, should include:
(1) Standard Chloroquine prophylaxis plus Fansidar and terminal Chloroquine and Primaquine.
(2) Standard Chloroquine prophylaxis plus Mefloquine and terminal Chloroquine and Primaquine.

3 With regards to the best prophylaxis schedule in CRPF areas which are highly endemic for vivax malaria, the Board makes the following observations:

Fansidar prophylaxis, in a regimen with Chloroquine and Primaquine, will be associated with hemolytic reactions in those persons with Glucose-6-Phosphate Dehydrogenase (G6PD) enzyme deficiency. This risk,

however, must be viewed in the context that vivax malaria continues to be the most common form of malaria acquired by military personnel. The disease, although mild, relatively speaking, may remove the individual from duty for up to five to seven days. Thus, the expense of hospitalization of these individuals, coupled with the important risk that the disease potentially may not be recognized by civilian or military physicians, adds to the disease morbidity. Therefore, viewed in the context of benefit and associated risk, the Board **recommends** that.

a. Based on recognized epidemiological factors, Fansidar should be continued for one week after leaving the country. The combination of Chloroquine (300 mg) and Primaquine (45 mg) should be combined for a total of eight weeks, one tablet per week.
b. Mefloquine appears to show great promise as a therapeutic and prophylactic agent in the treatment of malaria, particularly in CRPF areas. Additional valuable experimental data can be obtained by using it in combination with Chloroquine in regions where CRPF and Fansidar-resistance are present. Recommended experimental dosage should be 180 mg weekly, so as to obtain adequate perspective data. This drug should be highly prioritized in its approval and certification by the Food and Drug Administration (FDA). Further, the FDA needs to be made aware of its identification as an important alternative drug for civilian personnel presently receiving Fansidar.

4. With regards to precautions and medical procedures to be followed so as to minimize the occurrence of serious adverse effects from prophylactic antimalarial medications, the Board provides the following guidance and **recommendations:**

a. Adverse effects utilizing Fansidar prophylaxis can be minimized through dissemination of information to *all* medical personnel as to the significance of a generalized rash and the danger of continuing this drug if the rash is considered to be drug-induced. Commanders of all units under Fansidar prophylaxis should be advised as to the importance of having any members of their command exhibiting generalized rash seen by medical personnel.
b. Individuals receiving terminal Primaquine therapy should be advised as to the possible side effects of the medication (i.e., dark urine suggesting hemolysis) and the need to promptly seek medical attention. G6PD testing would be [highly] desirable so as to provide the opportunity to give necessary warning to those who are at highest risk of Primaquine-induced hemolysis.
c. Data collection concerning attack rates after termination of Chloroquine chemoprophylaxis and the severity of illness among those who develop the disease would be helpful in deciding whether Primaquine treatment is necessary. The United States Public Health Service could obtain this data from civilian travelers.

FOR THE ARMED FORCES EPIDEMIOLOGICAL BOARD

Theodore E. Woodward, M.D., President, AFEB

Robert F. Nikolewski, Colonel, USAF, BSC, Executive Secretary

REFERENCES

1. Pearlman, E. J., et al.. Chemosuppressive field trials in Thailand. IV. The suppression of *Plasmodium falciparum* and *Plasmodium vivax* parasitemias by Mefloquine. (WR 142, 490, A 4-Quinoline Methanol). *Am. J. Trop. Med. Hyg.* 29: 1131-1137, 1980.
2. Dixon, K. E., Pitaktong, U., Phintuyothin, A.. Clinical trial of Mefloquine in the treatment of *Plasmodium vivax* malaria. *Am. J. Trop. Med. Hyg.* 34: 435-437, 1985.
3. World Health Organization. Advances in Malaria Chemotherapy. *Tech. Rep. Ser.* 1984, 711, WHO Geneva.

THE BOARD'S ROLE IN ASSISTING THE MILITARY TO DEFINE ITS POLICY REGARDING ACQUIRED IMMUNODEFICIENCY SYNDROME AND EXPOSURE TO HUMAN T-LYMPHOTROPIC VIRUS TYPE III

During his tenure as Executive Secretary, Colonel Robert Nikolewski often reminded me that the Board needed an important new issue to enhance its image. The problems of acquired immunodeficiency syndrome (AIDS) and human T-lymphotropic virus type III (HTLV-III) filled that need. At the end of the Board's 6 June 1985 meeting, when new business was discussed, Lt. Colonel John Herbold, USAF, then in the Office of Health Affairs, asked, out of the blue, "What does the Board have to recommend for the military regarding AIDS?" What a question! We thought that we had escaped any difficult or controversial problems to consider as action items at this meeting! I was the President of the Board at that time, and I advised Dr. Herbold that the Board did not respond to verbal requests, and that all such queries should be submitted in writing through the proper channels. That was on 6 June 1985. Never has the system witnessed such rapid transit of a set of provocative questions, they reached the AFEB office from the Office of Health Affairs on 10 June 1985—a record. The memorandum for the Board, dated 10 June 1985, from J. Jarrett Clinton, M.D., Deputy Assistant Secretary of Defense, follows:

SUBJECT: HTLV-III Antibody Positivity

As introduced at the June 6 meeting of the Subcommittee on Disease Control, request the Board address the issue of the public health significance of HTLV-III antibody positivity.

Specifically, what guidance can the Board provide regarding the appropriate implementation of public health surveillance and control measures? Given the spread of HTLV-III infection outside previously identified high-risk groups, what studies should the services conduct and what data should be gathered to better define the natural history of and potential military importance of this infectious agent in active-duty populations? Given the comprehensive health care system of the Armed Forces, a closed system, how might our concerns and approaches differ from those of the civilian sector?

Your considered deliberation of this critical issue is requested.

The AFEB has traditionally responded expeditiously when major health problems involve both the military and the public. Accordingly, a special meeting of the Board's Subcommittee on Infectious Diseases was convened at WRAIR on 9 August 1985. The offices of Health Affairs and the respective Surgeons General were bombarded with comments and questions from all sources. These offices were soon spared the nuisance of so many inquiries when the word got out that the AFEB was to direct its attention to AIDS. Neither Colonel Nikolewski nor I nor our secretaries logged the number of calls, but they were numerous. Heads of various lay groups, gay rights groups, and the press called. The Board received demands for allocations of speaking times and placement on the agenda of the pending August meeting. The Board's meetings are, by law, open sessions. I assured the head of the gay rights movement that he would receive agenda time, I asked him to limit his discussion to one-half hour, and to limit the number of persons who would attend the meeting with him because space was limited. We gave no specific answers to questions, and the calls were finally diverted to the proper public relations officer at the Department of Defense. There were many disruptions, but 9 August soon arrived.

I awakened with the chickens that morning, got an early start from Baltimore in order to beat the beltway traffic, and arrived at WRAIR at 0730, well ahead of the meeting. Outside the meeting room were two large and impressive military guards. Unaware as to why they were there, I had them relocated to another floor. I thought that those attending the meeting, particularly the press, might have adverse reactions to seeing armed guards. It was not clear in advance whether the meeting would be orderly and informative or disorderly and controversial, since the public, through the press, was polarized at this time. Soon Conference Room 3092 was packed—a record—with extra chairs and standing room only.

The agenda for that meeting follows, and the roster of Board members, military personnel, invited guests, and press representation is on page 225. (To my knowledge, this was the first time that the press had ever attended a meeting of the AFEB.)

AGENDA

ARMED FORCES EPIDEMIOLOGICAL BOARD
TASK FORCE ON HTLV-III ANTIBODY POSITIVITY
WALTER REED ARMY INSTITUTE OF RESEARCH

9 August 1985

0900–0915 Welcome, Introduction of Members and Visiting Consultants
Dr. Theodore Woodward

0915–1000 Military Medical Issues Regarding HTLV-III-LAV Disease
Col. Edward Tramont, USA, MC

1000–1030 Presentation, National Gay Task Force
Jeffrey Levi
Mathilde Krim

1030–1045 Department of Defense Blood Bank Program
Lt. Col. Tony Polk, USA, MSC

1045–1145 Preventive Medicine Officers' Report

Col Manmohan Ranadive, USA, MC
Lt. Col (P) Ernest Takafuji, USA, MC
Capt. William B Mahaffey, MC, USN
Col. Alfred K. Cheng, USAF, MC
Comments
Lt Col Herbold

1145 Discussion
Dr. Theodore E. Woodward

The meeting was orderly. Colonel Edmund Tramont reviewed the current knowledge regarding AIDS. Mr. Jeffrey Levi, Director of the National Gay Task Force, raised the human rights issues of confidentiality and ethical practices. I informed Mr. Levi that the AFEB comprised some of the most ethical and well-informed scientists, epidemiologists, and clinicians in this country, and that questions and recommendations would be directed toward protecting the individual. He was assured that the Board's recommendations would be in the best interests of both the military and the public

The meeting's main purpose was fulfilled by providing important information on the effectiveness and limits of HTLV-III antibody testing and clarifications of problems relating to the protection of the

blood supply. Clinical descriptions of the disease syndrome, the means of classifying phases of the AIDS spectrum, the incidence of the disease, the known methods of spread of the virus, and the current and anticipated incidences were also elucidated.

Another principal function of the meeting was to allay the suspicion, misinformation, and incrimination which seemed to have polarized the public. The stage was set for the Board to gather its data, to crystallize its understanding of the problem, and to fulfill its mission at its fall meeting, planned for 11–13 September 1985. At this meeting, various other age items would be discussed, and the Board's final recommendations regarding the AIDS problem would be formulated.

Roster of Participants

9 August

AFEB Members:	
Theodore E. Woodward, M.D	Board President
William S Jordan, Jr, M D	Board Member
William R. Harlan, M D	Board Member
Frank M. Townsend, M.D	Board Member
Samuel D. Thompson, Ph.D	Board Consultant
Robert F. Nikolewski, COL, USAF, BSC	Executive Secretary
Robert A. Wells, COL, USA, MSC	Executive Secretary (Designate)
Invited Consultants:	
Abram S. Benenson, M.D	San Diego State University
Saul Krugman, M.D	New York University Medical Center
Also Attending:	
Thomas M. Geer, GB, USA, MC	Director, Professional Services, DASG
Philip K. Russell, BG, USA, MC	Commander, Fitzsimmons Army Medical Center
Harold Jaffe, M D.	Centers for Disease Control AIDS Section, Epidemiology and Treatment
Roger Dodd, M.D.	American Red Cross Laboratory, Bethesda
Harry W Haverkos, M D.	National Institutes of Health
Jim Hill, Ph.D.	National Institutes of Health (representing Dr Fauci)
Alfred J Saah, M.D	National Institutes of Health
Manmohan Ranadive, COL, USA, MC	Preventive Medicine Officer, USA
Ernest Takafuji, LTC(P), USA, MC	Disease Control Consultant (DASG)
William B. Mahaffey, CAPT, MC, USN	Preventive Medicine Officer, USN
Alfred K Cheng, COL, USAF, MC	Preventive Medicine Officer, USAF
Edmund C Tramont, COL, USA, MC	Chief of Microbiology, WRAIR
A J Pole, LTC, USA, MSC	Department of Defense Blood Program
T R Cuthbert, COL, USA	Office Secretary of Defense (MRA&L)
John R Herbold, LTC, USAF, BSC	Health Affairs
Michael Murphy, LTC, USA	Public Relations, Department of Army
Dave Russell, MAJ, USA	Public Relations Office, Chief of Public Affairs, Department of the Army
Tansill Johnson	Public Relations, DASG
Jeffrey Levi	National Gay Task Force
Mathilde Krim	National Gay Task Force

Reporters Representing the Following:

Army Times, The New York Times Chronicle Broadcasting, Pentagram, The Washington Times, The Advocate, Washington Stripe, The Washington Post, U S. Medicine, and *The Washington Blade.*

Prior to the September meeting, the Department of the Army, on 15 August 1985, and the Department of Defense's Office of Health Affairs, on 9 September 1985, had presented specific memoranda and questions for the Board's consideration. These questions provided a structure for the Board's response,

particularly after the current knowledge of AIDS had been been clarified and discussed. These new memoranda, and the agenda and attendance roster for the 11–13 September meeting, follow:

MEMORANDUM FOR THE ARMED FORCES EPIDEMIOLOGICAL BOARD

SUBJECT. Questions for the Armed Forces Epidemiological Board on HTLV-III Infections in the Military

1. At the recent meeting of the Armed Forces Epidemiological Board (AFEB) Subcommittee on Infectious Diseases held on 9 August 1985, the respective services were requested by Dr. Theodore Woodward, Chairman of the AFEB, to submit specific questions pertaining to HTLV III infections and AIDS to the Board that could be addressed at its September meeting.

2. In response to that request, the following questions are provided:

a. Based on current level of understanding, what is the significance of a positive Western blot-confirmed antibody test for HTLV-III infection?

b. Are individuals who are antibody-positive at increased risk of having more severe reactions to live virus vaccines? What would their immunological response be to live and killed vaccines?

c. With the requirement to continue vaccinating military members against smallpox, is routine HTLV-III antibody screening of basic trainees (and other new entrants into the military) prior to receiving smallpox vaccine medically justified? Should prior screening be performed before administration of any other live virus vaccines?

d. Should the Army be involved in the collection of medical data and the conduct of epidemiological studies on HTLV-III infections?

3. Your assistance with these difficult questions is greatly appreciated.

FOR THE SURGEON GENERAL:

Ernest T. Takafuji, M.D., Lt Colonel, MC
for:
Manmohan V. Ranadive, M.D.
Colonel, MC, Chief, Preventive Medicine Consultants Division

MEMORANDUM FOR THE ARMED FORCES EPIDEMIOLOGICAL BOARD

SUBJECT: HTLV-III Antibody Positivity

In our June 10, 1985 memorandum to the Armed Forces Epidemiological Board, we requested advice on broad public health issues of HTLV-III antibody positivity in the military. Your specific attention to the following questions in the context of the original request will assist this office in the development of policy guidelines.

1. Should personnel on active duty be screened for HTLV-III antibody?

2. What steps should be taken with respect to active duty personnel who screen confirmed positive for HTLV-III antibody?

3. Should confirmed HTLV-III antibody positive individuals, identified through screening of potential active duty accessions, be permitted to join the military services?

4. What public health risk does a confirmed HTLV-III antibody positive individual pose in the military operational setting?

5. What public health risk does a confirmed HTLV-III antibody positive individual pose in the military community setting?

Edward Charton, M.D.
Deputy Assistant Secretary [of Defense] (Professional Affairs & Quality Assurance)

AGENDA

ARMED FORCES EPIDEMIOLOGICAL BOARD
(CLOSED MEETING)
McCORMICK FACILITY, PARSON'S ISLAND, MARYLAND

Wednesday, 11 September 1985

1300–1700 Select Immunodeficiency Diseases
Letter Questions OSD(HA)
Acquired Immunodeficiency Syndrome
Letter Question: Preventive Medicine Consultants Division (DA-OTSG)
Acquired Immunodeficiency Syndrome
Letter Question: Commander, Naval Medical Command
Asplenic Individuals

Thursday, 12 September 1985

0830–0845 Armed Forces Medical Intelligence Center Current Update
Capt Finnegan, USA, MSC

0845–1200 Select Immunodeficiency Diseases (Continued)

1300–1345 Germ Cell Tumors of the Testicle Among Aircraft Repairmen
Lt Cmdr A M Ducatman, MC, USNR

1345–1400 Questions

1400–1445 Review of the U. S Army Ambulatory Care Data Base
Lt. Col Fred Cecere, USA, MC
Lt Col Terry Misener, USN, MC

1445–1500 Questions

1500–1600 Preventive Medicine Officer Reports
Col Ranadive, USA, MC
Col Cheng, USAF MC
Capt Mahaffey, USN, MC
Cmdr Stockwell, USCG
Special Award to Colonel Robert Nikolewski

Friday, 13 September 1985

0800–1100 Overview and Summary
Dr Theodore Woodward
Presentation to Dr William E Mayer and Dr. J Jarrett Clinton

Roster of Participants

12 September

AFEB Members:
Paul M. Densen, D.Sc.
Carol J. Johns, M.D
William S. Jordan, Jr., M.D.
Richard Hornick, M D.
Samuel Thompson, Ph.D
Saul Krugman, M.D.
Theodore E. Woodward, M.D.
Abram S Benenson, M.D.

AFEB Staff
Lt. Col Robert A. Wells, Ph.D., MSC, USA
Col. Robert F Nikolewski, BSC, USAF
Jean P Ward, DAC

Military Preventive Medicine Officers and DoD Staff
Col. Alfred K. Cheng, MC, USAF
Col Robert G Self, MC, USAF
Lt. Col. John Herbold, BSC, USAF
Capt William B. Mahaffey, MC, USN
Col Manmohan Ranadive, MC, USA
Capt. Vernon D. Schinshi, MSC, USN
Cdr. John R Stockwell, USPHS

Attendees:
Lt. Col. Fred A. Cecere, MC, USA
Col Richard N. Miller, MC, USA
Lt. Col Terry R Misener, ANC, USA
Capt. Kenneth F. Wagner, MC, USN
Lt. Col George E. Crawford, MC, USAF
Col. William H. Bancroft, MC, USA
Lt. Col. Ernest Takafuji, MC, USA
Col. Thomas E. Bowen, MC, USA
Lt. Cdr. Alan M. Ducatman, MC, USN
Lt. Col. Donald Burk
Capt. john McNeil, MC, USA
Capt. Mark S Davis, MC, USN
Maj. John F. Brundage, MC, USA
Maj. Benedict M Dimega, MC, USA
Capt. Jeffrey. D Gunzenhauser, MC, USN
Maj. Robert R Redfield; MC, USA
Col William H Wolfe, MC, USAF
Lt. Col. James W Kirkpatrick, MC, USA
Capt. Douglas M. Stetson, MC,USMC
Col Edmund C Tramont, MC, USA
James R Allen, M D

13 September

AFEB Members:
Theodore E Woodward, M D.
Frank Townsend, M.D
Abram S. Benenson, M.D
Samuel Thompson, Ph D
Richard Hornick, M D
William S. Jordan, Jr., M.D
Carol J. Johns, M D
Leonard Kurland, M.D.
William R. Harlan, M.D

Senior DoD Staff and Representative of the Surgeon General
William Mayer, M.D.
Jarrett Clinton, M.D
Maj Gen Monte B Miller, MC, USAF

AFEB Staff.
Lt. Col. Robert A. Wells, MSC, USA
Col. Robert Nikolewski, BSC, USAF
Jean P. Ward, DAC

Military Preventive Medicine Officers and DoD Staff:
Col. Alfred K Cheng, MC, USAF
Col. Manmohan Ranadive, MC, USA
Capt William Mahaffee, MC, USN
Lt Col. John R. Herbold, BSC, USAF
Col. Robert G. Self, MC, USAF
Cdr. John R. Stockwell, USPHS

Attendees:
Cdr. Mark L. Dembert, MC, USN
Lt. Cdr. Alan M. Ducatman, MC, USNR
Cdr. Mark S. Davis, MC, USN
Lt. Col. James W. Kirkpatrick, MC, USA
Lt. Col. Terry R. Misener, ANC, USA
Lt. Col. Fred A. Cecere, MC, USA
James R. Allen, M.D.
Lt. Col. George Crawford, UC, USAF
Col. William H Wolfe, MC, USAF

The Board Formulates Its Resolutions on AIDS

Further discussions were held during evening sessions. Specific answers and recommendations to the questions relating to AIDS were formulated. On the morning of 13 September, Dr. William E. Mayer, Assistant Secretary of Defense for Health Affairs, and his Deputy, Dr. J. Jarrett Clinton, arrived at Parson's Island by helicopter. I presented the Board's answers to their specific questions and our recommendations to Dr. Mayer. He commented, after expressing his thanks, "We can live with that." The final report was presented to the Office of Health Affairs and the respective Surgeons General on 17 September 1985, and follows:

MEMORANDUM FOR

THE ASSISTANT SECRETARY OF DEFENSE (HEALTH AFFAIRS)
THE SURGEON GENERAL, DEPARTMENT OF THE ARMY
THE SURGEON GENERAL, DEPARTMENT OF THE NAVY
THE SURGEON GENERAL, DEPARTMENT OF THE AIR FORCE

SUBJECT: Human T-Lymphotrophic Virus Type III (HTLV-III) Antibody Positivity

1 At the request of the Assistant Secretary of Defense, Health Affairs, the Armed Forces Epidemiological Board (AFEB) members, consultants and respective military medical service representatives met 11 through 13 September 1985 to consider a set of questions on the above subject (Enclosures 1 and 2).

2 The AFEB traditionally has conceived its mission to be that of rendering advice to the end of ensuring the maintenance of a healthy, effective military service which is ready at all times for rapid deployment. It believes that HTLV-III infections should be addressed in the military services as any other infectious or contagious disease. In this regard it is noteworthy that its similarities to hepatitis B are striking in many respects. The primary objective of the Board must be to protect the health of the individual and simultaneously to prevent the spread of infection to other personnel within the Armed Forces.

3 The Board makes its recommendations relevant to HTLV-III antibody positivity in the light of its evaluation of the current state of knowledge of this complex disease. The Board is well aware of the present threat and of the potential for greater threat based on the comprehensive assessment of several factors to include. *(a)* the risks to the infected individual incident to military service, *(b)* the risk of transmission of illness to non-infected personnel, *(c)* the impact of infected individuals on the function of their unit, and *(d)* the safety of the blood supply.

4 The recommendations of the Board may be subject to change at such time as the natural history of HTLV-III infection becomes more clear Under these conditions, pertinent and longitudinal studies would be appropriate. Under ideal circumstances the screening of all active duty military personnel for HTLV-III antibody and hepatitis B antigen could be advisable However, such screening is unnecessary based on information currently available relative to the threat of illness to others or the limitations of personnel to perform their duties. Moreover, the prospect of screening all active military members for HTLV-III antibody at this time is not envisioned as feasible—not only because of the logistical and economical requirements, but especially because of the limited availability of trained personnel and medical resources. The qualifying criterion is simply that it is unknown whether an individual with HTLV-III will progress to active illness. Future studies of the natural history of the syndrome should help clarify this important matter.

5 Based on a thorough review of available information and subsequent discussion, the Board makes the following **recommendations:**

a All active duty personnel pending reassignment to overseas permanent duty stations should be screened for the presence of HTLV-III antibody. If these individuals are found to be positive by ELISA and by an appropriate confirmatory test, the service member should be medically evaluated to determine the status of his or her infection
This is appropriate to allow identification of those at high risk for progression of infection and at high risk from exotic diseases before an extended overseas tour.

b. Individuals who are antibody positive but manifest no evidence of progressive clinical illness or immunological deficiency may be considered for worldwide duty. All antibody positive persons should receive a comprehensive and immunological evaluation at least annually. They should be counseled on risks of transmission and be designated as blood-donor ineligible. Military personnel with progressive clinical illness or immunological compromise should be referred to a medical evaluation board for a determination of fitness for worldwide duty.

c New candidates for active duty identified as HTLV-III antibody positive (two ELISA and confirmatory tests) at the time of induction will be rejected from military service. The candidate will be advised to consult his or her personal physician.

This judgment is based on the possibility that such antibody positive persons may have an increased potential to develop the Acquired Immune Deficiency Syndrome—particularly when they are given required live biologic vaccines, when they are exposed to or are infected with agents such as the *Plasmodium* of malaria or are subjected to other biological or physical stresses. It is conceivable that future testing and medical evaluation may show that individuals with positive antibody alone may be healthy and therefore should not be ultimately precluded from consideration for military service.

6. Current evidence indicates that HTLV-III is transmitted to others by blood transfusion from an infected person by the injection of infected blood products or by intimate contact with an infected person. The risk of transmission of HTLV-III is not completely understood and requires further evaluation However, day-to-day association with infected persons by close household contacts does not pose a threat to the uninfected individuals There are hundreds of instances where adults or children living with persons with AIDS or positive for HTLV-III antibody have themselves failed to become infected or antibody positive. The same situation has been observed regarding medical contacts with known patients. Moreover, health professionals who have experienced needle puncture with needles contaminated with materials from AIDS patients have very rarely developed illness or serologic evidence of infection. Specifically, only one such case has been reported at present. The Board, therefore, makes the following **recommendation** relative to military operational settings:

> Environmental contacts in military operational settings such as tanks, submarines, and aircraft are not regarded as significant risks for infection by HTLV-III. In accordance with United States Public Health Service recommendations, personnel who are HBGa and/or HTLV-III antibody positive should be designated as unsuitable as blood donors.

7. Although generally there is no perceptible risk of transmission by non-sexual person-to-person contact, there are other concerns which are relevant within the military/community setting. The following **recommendations** by the Board are intended to address these issues:

> a. Service planning on contingency blood samples should take the potential for HTLV-III infection into account. The periodic screening of all military personnel is not recommended due to excessive screening costs weighed against low risk and the inability to ensure the absence of infectivity by random testing However, the Board recommends that donated blood be screened to detect HTLV-III antibody and Hepatitis-B antigen wherever a significant number of blood units are to be processed.
>
> b Although personnel pending overseas assignment are recommended for the highest screening priority, those currently serving at an overseas duty station may also be candidates for screening. Such screening should be accomplished in a prioritized fashion, with the highest priority to those assigned at locations with a high risk of endemic disease or with minimal medical capability.
>
> c. The Board recommends that additional education be provided on techniques to minimize the transmission of this infection in order to reduce unfounded fears regarding the etiology and epidemiology of the disease.

FOR THE ARMED FORCES EPIDEMIOLOGICAL BOARD

Theodore E. Woodward, M.D
President, AFEB

Robert A Wells, Ph.D.
Lt. Colonel (P), USA, MSC
Executive Secretary

The Secretary of Defense Establishes Policy

Acting without delay, Secretary of Defense Caspar W. Weinberger transmitted the following memorandum and policy procedures, dated 24 October 1985:

MEMORANDUM FOR
SECRETARIES OF THE MILITARY DEPARTMENTS
CHAIRMAN, JOINT CHIEFS OF STAFF
ASSISTANT SECRETARY OF DEFENSE (FM&P)
ASSISTANT SECRETARY OF DEFENSE (RA)
ASSISTANT SECRETARY OF DEFENSE (PA)
ASSISTANT SECRETARY OF DEFENSE (HA)
ASSISTANT SECRETARY OF DEFENSE (LA)
GENERAL COUNSEL

SUBJECT Policy on Identification, Surveillance, and Disposition of Military Personnel Infected with Human T-Lymphotropic Virus Type III (HTLV-III)

The following policy is established relative to infection of military members with Human T-Lymphotropic Virus Type III (HTLV-III) This initial policy is intended to reflect current knowledge regarding the natural history of this disease, the risks to the infected individual incident to military service, the risk of transmission of disease to noninfected personnel, the effect of infected individuals on the function of the unit, and the safety of the blood supply. These policies are adopted as interim guidance which shall be reviewed within one year. This review shall assess developments in the medical management of HTLV-III infections, information obtained through longitudinal epidemiologic studies of the natural history of HTLV-III infection, and the effects of this interim guidance on force management. Appropriate changes to DOD directives shall be promulgated within 30 days of the conclusion of this review.

A. Accession

Applicants for enlisted service shall be screened for exposure to HTLV-III at the Military Entrance Processing Station or the initial points of entry to military service Candidates for officer service shall be screened for exposure to HTLV-III during their pre-appointment of pre-contracting physical examinations. Individuals confirmed as HTLV III antibody positive (Food and Drug Administration-approved enzyme immunoassay (EIA) serologic test and, if positive, a positive immunoelectrophoresis test (Western blot) are not eligible for military service. The rationale for this policy is [that.]

- the condition existed prior to service,
- the Department avoids potential medical costs and the possibility that the individual shall not complete his or her service commitment,
- clinical evidence indicates that pre-AIDS patients may suffer adverse and potentially life-threatening reactions to some live virus immunizations administered at basic training,
- an antibody positive individual is not able to participate in battlefield blood donor activities or other blood donation programs, and
- presently, there is no way to differentiate between antibody positive individuals who will progress to clinical disease and antibody positive individuals who will remain healthy.

B. Disease Surveillance

1 Active duty and reserve component military personnel shall be screened for the presence of HTLV-III antibody. Generally, implementation should be in the following priority order:

- individuals serving in, or subject to deployment on short notice to areas of the world with a high risk of endemic disease or with minimal existing medical capability,

- individuals serving in, or pending assignment to, all other overseas permanent duty stations,
- individuals serving in units subject to deployment overseas,
- other individuals or units deemed appropriate by the respective military department such as medical personnel involved in the care of HTLV-III infectious patients, all remaining individuals in conjunction with routinely scheduled periodic physical examinations

2. Individuals who are confirmed to be antibody positive shall be medically evaluated to determine the status of their infection and the potential adverse consequences to the individual of serving in a particular geographic region. The Assistant Secretary (Health Affairs) shall convene a Tri-Service medical working group to develop a standardized clinical protocol to ensure consistent evaluation and staging of each patient at all military medical treatment facilities.

3. The medical assessment of each exposure to and/or case of HTLV-III infection shall include an epidemiological assessment of the potential transmission of HTLV-III to close personal contacts and family of the patient. This information is vital to provide appropriate preventive medicine counseling and to the continued development of scientifically based information regarding the natural history and transmission pattern of HTLV-III. Therefore, the occurrence of HTLV-III infection shall not be used as a basis for punitive action against an individual.

4. Each military medical service shall conduct ongoing clinical evaluations of each antibody positive individual's health status at least annually, provide appropriate preventive medicine counseling to individual patients, provide public health education materials to the beneficiary population, conduct longitudinal [studies], and prepare internal reports to facilitate timely review and reassessment of current policy guidelines.

C. Retention

1. Individuals who are antibody positive but manifest no evidence of progressive clinical illness or immunological deficiency ([based on] physical and laboratory assessment, demonstration of ability to respond to immunizations, and ability to mount a protective immune response to immunizations or exposure to naturally occurring pathogens) shall be retained. The Service Secretaries, in order to protect the health and safety of infected individuals and of other military persons, may limit assignment of such individuals with respect to the nature and location of the duties performed in accordance with operational requirements.

2. All antibody positive persons shall receive a comprehensive clinical and immunological evaluation at least annually. Each individual shall be counseled on the risks of disease transmission, methods of prevention, and informed that they are ineligible to donate blood.

D. Separation

1. Individuals who are infected with HTLV-III and demonstrate progressive clinical illness shall be referred for medical evaluation for a determination of fitness for continued service in accordance with Title 10 United States Code Section 1201, et seq.

2. Individuals who are infected with HTLV-III and are found not to have complied with preventive medicine counseling for individual patients may be separated for the convenience of the Government.

3. Separation for the convenience of the Government or for misconduct based upon evidence other than HTLV-III infection is unaffected by this policy memorandum.

E. Safety of the Blood Supply

DOD Military Blood Program Office policies and Food and Drug Administration guidelines shall be followed by the Military Departments' Blood Programs and by civilian blood agencies collecting blood on military installations. In the event that units of blood shall not be screened for infectious agents prior to transfusion (contingency or battlefield situations), the DOD Military Blood Program Office in coordination with the Military Departments shall provide guidance to operational units to ensure that potential donors have been screened.

F. Limitations on the Use of Information

1. Results obtained from laboratory tests for HTLV-III performed under this memorandum and information concerning personal drug use or consensual sexual activity disclosed by a Service member as part of an epidemiological assessment under this memorandum may not be used against the Service member in actions under the Uniform Code of Military Justice, in a Line of Duty determination, or on the issue of characterization in separation

proceedings. Such information may not be used as the basis for separation of the service member except for (a) separation based upon physical disability, or (b) separation for the convenience of the Government after a hearing before a board of officers and approval by the Secretary or an Assistant Secretary of the Service concerned.

2. The limitations in paragraph F.1. do not apply to:

(a) The introduction of evidence for impeachment or rebuttal purposes in any proceeding in which the evidence of drug abuse or relevant sexual activity (or lack thereof) has been first introduced by the Service member,

(b) Disciplinary or other action based on independently derived evidence.

Caspar W. Weinberger
The Secretary of Defense

Enclosure (References)

References

(a) Armed Forces Epidemiological Board Memorandum, 17 September 1985, Human T-Lymphotropic Virus type III (HTLV-III) Antibody Positivity.

(b) Deputy Secretary of Defense Memorandum, 30 August 1985, HTLV-III Testing.

(c) Assistant Secretary of Defense (Health Affairs) Memorandum, 14 August 1985, Standardization of Reporting Requirements for Blood Collection Agencies on Military Installations.

(d) Assistant Secretary of Defense (Health Affairs) Memorandum, 17 July 1985, Military Implementation of Public Health Service Provisional [*sic*].

(e) DoD Military Blood Program Office Memorandum, 13 March 1985, Military Implementation of Public Health Service Provisional Recommendations.

(f) Department of Defense Directive 6200.1, April 27 1973, Policy Concerning the Venereal Disease Control Program of the Armed Forces.

(g) Department of Defense Directive 1332.18, September 9, 1968, Separation from the Military Service by Reason of Physical Disability.

(h) Title 10 United States Code Section 1201, *et seq.*

Despite the difficult logistical adjustments, the three military services persevered, collaborated, and applied their personnel and resources to effect the Board's recommendations. The Assistant Secretary of Defense for Health Affairs expressed his appreciation to the Board in the following letter, dated 5 December 1985:

Dear Dr. Woodward:

I wish to commend and thank the Board for its assistance in addressing issues of critical importance regarding the emergence of Human T-lymphotropic Virus Type III infections among military personnel. To assist the Department of Defense in maintaining a current and balanced approach on this issue, I request that the AFEB establish a standing committee on HTLV-III infection that would evaluate and comment on current DOD initiatives and programs from the perspective of prevention, epidemiologic assessment, and risk management. Your continued support and valuable insight are greatly appreciated. I look forward to meeting personally with you and whomever you appoint to discuss the details of the AFEB's continuing work on this disease.

Sincerely yours,

William Mayer, M.D.

The AFEB Responds to Requests from the Department of Defense

In keeping with Dr. Mayer's request, a standing AFEB Subcommittee on HTLV-III Infections was appointed, with the following membership. Abram S. Benson, Chairman, and William S. Jordan, Jr., Frank M. Townsend, and me. Later, Walter H. Dowdle, Richard B. Hornick, and Llewellyn J. Legters also



WILLIAM E. MAYER, M.D.

Dr. Mayer, a psychiatrist, became the Pentagon's top medical advisor in December 1983, when he was appointed Assistant Secretary of Defense for Health Affairs. He served in both the Army and the Navy Medical Corps and, following the Korean War, he conducted a special study for the Army on prisoners of war. He served as Director of the California State Department of Health while Ronald Reagan was Governor, and was head of the Alcohol, Drug Abuse, and Mental Health Administration in the Department of Health and Human Services while he was also on active duty in the Public Health Service Commissioned Corps.

Dr. Mayer and his very able Deputy, Dr. Jarrett Clinton, soon made it clear that they wished to work with the Armed Forces Epidemiological Board and the respective military services. Problems of great importance that intimately involved the Board came under intense discussion during their administration, some of which were acquired immune deficiency syndrome, asbestosis, agent orange, cardiovascular screening for military personnel age 40 and older, safety considerations of the M2 Bradley Fighting Vehicle, military health standards; and population-based epidemiological forecasting.

joined. On September 25, 1986, J. Jarrett Clinton, M.D., Deputy Assistant Secretary of Defense, addressed the following letter of request to the AFEB:

Dear Dr Woodward:

The Department of Defense has initiated a policy review of our current HTLV-III program guidance. As you recall, our initial guidance was promulgated after recommendations were provided by the AFEB. The assistance of the AFEB throughout this past year has been instrumental in our ability to maintain a steady course in addressing the myriad problems associated with this disease in a scientific and medically sound manner.

It would be most helpful if the AFEB would address the following questions at your October meeting.

(a) What is the significance of a p24 band alone? Should DoD maintain a dichotomized, positive, negative standard or should laboratory results be reported as positive, negative, or indeterminate? Should laboratory results report the band patterns and explanation of results to the attending physician?

(b) Is periodic testing of the total force medically indicated? If so, how frequently? Does the current DoD recommended order of priority for cohort screening of military personnel for HTLV-III infection maximize the dual objectives of protecting individual health and minimizing transfusion associated transmission in contingencies? Could the total force screening effort currently being undertaken by the Military Services be effectively integrated into existing procedures such as pre-enlistment physical examinations, medical qualification for overseas assignment or assignment to rapid deployment units, and in conjunction with scheduled periodic physical examinations?

(c) For which high risk patient populations, if any, should military medical facilities offer or require HTLV-III screening (for example STD clinics, prenatal clinics, surgical or all hospital inpatients)?

(d) Given the rationale for HTLV-III screening of military personnel, should we require population-based screening of DoD civilian employees, either within the United States or overseas?

(e) What restrictions, if any, should be placed on health care workers who are HTLV-III antibody positive? If an HTLV-III infected health care worker continues to work, does the patient have a right to know about the health care worker's status, even if the risk of transmission is negligible?

We appreciate your attention to these difficult issues.

Additionally, any guidance regarding other aspects of this disease that you deem appropriate would be most welcome. I am looking forward to joining you at the meeting.

Sincerely,

J. Jarrett Clinton, M.D.
Deputy Assistant Secretary
(Professional Affairs & Quality Assurance)

cc: Surgeons General
Executive Secretary, AFEB

The Subcommittee on AIDS and the Board discussed these questions at its fall 1986 meeting, and transmitted the following recommendations on Human Immunodeficiency Virus (HIV) infections—note that the policy on the name of the virus has been changed to HIV from HTLV-III—to DoD's Office of Health Affairs on 10 November 1986.

SUBJECT: Recommendations on Human Immunodeficiency Virus (HIV) Infection

1. At the request of the Assistant Secretary of Defense, Health Affairs, the Armed Forces Epidemiological Board (AFEB), military medical service representatives and appropriate members of the civilian medical community met 16–17 October 1986 to consider a set of questions on the above subject (Enclosure 1).



WALTER R. DOWDLE, Ph.D.

Walter Dowdle received his B.S. degree from the University of Alabama in 1955, his M.S. degree from Alabama in 1957, and his doctorate in Microbiology from the University of Maryland in 1960. Most of Dr. Dowdle's experience has been at the Center for Disease Control in Atlanta, where he has served as Director of the Center for Infectious Diseases. He has published broadly in the field of infectious diseases on pneumonia, herpetic infections, influenza, and HIV infections.

Dr. Dowdle joined the AFEB in 1986, bringing his considerable epidemiological experience to help unravel the complicated relationship between HIV infection and its impact on health care in the military.



LLEWELLYN J. LEGTERS, M.D.

Lew Legters graduated from the State University of New York at Buffalo School of Medicine, and served as a house officer in general medicine before he joined the Army Medical Department, where he developed his capabilities in epidemiology and preventive medicine. He maintained close contact with the AFEB during his tenure as the Army's Chief of Preventive Medicine from 1975 to 1977. During his service years, Lew was always well-informed on the incidence of diseases, and could easily separate out matters of consequence. His reports to the Board were always concise and informative.

Lew became Chairman of the Department of Preventive Medicine at the Uniformed Services University of the Health Sciences School of Medicine, where he developed an effective epidemiological unit that applies its expert services in geographic sites of medical and military importance. Lew has served the Board as an actively participating member, his advice greatly assists the Subcommittee on Infectious Diseases. He is one of the few career officers who has maintained a close association with the Board after his retirement from the service.



RICHARD B. HORNICK, M.D.

After he trained at The Johns Hopkins School of Medicine, Dick Hornick worked as a medical officer in infectious diseases at USAMRIID. Then, for two decades, he conducted innovative research on the development and application of viral, rickettsial, and bacterial vaccines at the University of Maryland School of Medicine. He helped develop the strong Division of Infectious Diseases there, which he directed until 1979, when he was named Chairman of the Department of Medicine at the University of Rochester School of Medicine.

Dick served as a member of the AFEB's Commissions on Epidemiological Survey and Enteric Diseases. Later he was appointed to the Board, where he provided support for the Subcommittee on Infectious Diseases. Dick's contributions to our knowledge of typhoid fever, other enteric infections, tularemia, and rickettsial diseases, and in particular to their control by vaccines and the development of a better understanding of their pathogenesis, have benefited our whole society.

2 a. With regard to the question of the significance of a solitary p24 band of the bands in the Western blot test which are characteristic of AIDS infection, and the preferred contents of the laboratory report, the Board recognized that Western blot preparations vary in sensitivity and may produce false positive reactions. A solitary p24 band in a Western blot test cannot be regarded as definitive. While it may indicate an early stage of infection with HIV, it may be a false positive reaction; i.e. a true negative. Thus the Board **recommends** that

> A solitary p24 band should be regarded as neither positive nor negative, but as an intermediate result requiring further testing of the serum sample by more definitive procedures such as testing by the solid phase ELISA with recombinant antigen or by the radio-immunoprecipitation assay. This testing should permit a report of a positive or negative test for antibodies against HIV; rarely the testing might result in indeterminate findings requiring a new serum specimen for repeating testing.

b. To answer the question whether periodic screening of the total force is medically indicated, the Board considered the issues involved in the problem of AIDS among military personnel. The current program of mass screening will identify those in the Armed Forces who are presently infected with the human immunodeficiency virus (HIV), the exclusion of recruits who are serologically positive assures that no infected individuals are added to the active duty pool. The periodic medical evaluation of those active duty personnel who were found to be seropositive will assure that the military population is fully fit for duty insofar as AIDS is concerned except that these individuals, and the much larger number of carriers of the hepatitis B virus, must be appropriately identified by "dog-tag" or other device as disqualified from serving as blood donors.

Repeating total force screening would detect those active duty personnel who have developed new infections, and would provide important epidemiological information. The latter can be more economically obtained by testing appropriate numbers of active duty personnel selected randomly from various segments, geographic and otherwise. Findings of the current screening may suggest groups of epidemiological importance.

For detection of new cases, screening would best be integrated into existing medical encounters such as medical qualification for overseas assignment, assignment to rapid deployment units, and periodic physical examinations. The transmission of AIDS is very similar to that of syphilis, it is primarily transmitted sexually and also by exchange of blood (by needles shared among intravenous drug users and, before the tests became available, by blood transfusion), control of AIDS would be best effected by using the methods successful in controling syphilis. These methods were based on identifying infected individuals and tracing the contacts from whom they may have acquired or to whom they may have transmitted their infections, and appropriately managing all who proved to be infected.

While there is now no proven effective drug for treatment of AIDS, the epidemic can be controlled by preventing further spread. This involves counseling the seropositive individuals on the techniques and need for the practice of "safe sex". For those who were involved in intravenous drug abuse, drug rehabilitation and impressing on the infected drug addict the danger he poses to others if he persists in his drug habits and shares syringes and needles with others.

The Board **recommends** that:

> Following completion of the present total force screening, further HIV detection should be applied on a selective basis. Subsequent HIV screening for the military forces should be integrated into existing procedures such as pre enlistment examinations, medical qualification for assignment overseas or to rapid deployment units, and in conjunction with scheduled periodic examinations. Major military medical facilities should acquire the expertise to carry out the serologic tests for screening for infection. Quality control measures must be reinforced to insure the validity of results.

c. With respect to the question to which high risk patient populations should HIV screening be required or offered, it is to be noted that the four-year interval between periodic physical examinations of those in the 20–30 age group, among whom the prevalence of seropositivity has been found to be highest, is too long a period to adequately protect the health of the individual or the safety of emergency-required blood for transfusion. This interval can be shortened by serological screening for HIV when the individual is admitted to a hospital or receives other medical care, with consideration of how recently the last serological screening had been performed. Because

they fall into high risk groups, testing should be required on those who attend drug rehabilitation or STD clinics because of the likelihood that infection with HIV may have occurred concurrently, testing should be repeated 2–3 months later if a negative test is reported since serological positivity may not have developed yet. Because of the threat to the newborn child, and because infected service members may be found among the contacts of a seropositive woman, screening is advisable for those attending prenatal clinics. Serological testing should be performed in the laboratories of major medical facilities, the technology for HIV testing is much simpler than the Wassermann test which is routinely performed in larger hospitals and regional laboratories. To assure a high level of performance, quality assurance testing will be required.

The Board therefore **recommends** that:

> HIV testing should be a requirement for all military personnel admitted to a military hospital unless a test has recently been performed. It should be required of all personnel admitted to clinics for sexually transmitted diseases (STD) and drug rehabilitation; tests should be repeated in two to three months if negative on first testing. HIV screening is advisable for patients in prenatal clinics. Major medical facilities should acquire the expertise to carry out the appropriate serological tests; quality control measures must be enforced to insure the validity of results.

d. Regarding the question on the screening of DOD civilian employees either within CONUS or overseas, the Board considered the indications for screening civilian employees of the Armed Forces. Within CONUS, DOD has no medical responsibility for civilian employees, however, overseas the sick civilian becomes the responsibility of the military medical system. A seropositive individual going overseas might be assigned to duty in an isolated area with poor access to medical care, should clinical manifestations of AIDS such as pneumonia develop, the welfare of the individual would be jeopardized. From the point of view of the service, the seropositive civilian employee has an increased likelihood of becoming a burden to the medical system, and the probability of completing the contracted tour of duty is reduced. Therefore, the Board **recommends** that:

> Testing for HIV should be included in any medical clearance procedures now in use prior to assignment of civilian personnel overseas

e. With reference to the question on restrictions on HIV-infected health care workers, the Board **recommends** that:

> HIV-positive health care workers who are otherwise healthy may continue to provide health care, conducting themselves in accordance with the guidelines published by the U.S. Public Health Service in *Morbidity and Mortality Weekly Report*, Vol. 35, No. 14, dated 11 April 1986, "Recommendations for Preventing Transmission of Infection with HTLV-III/LAV during Invasive Procedures." (Enclosure)

3. The Board commends the services for developing a working staging system for AIDS. The Board also suggests that the methods of reporting data related to AIDS prevalence and incidence be presented in a standard format and that specific rates be stated to permit interservice comparisons.

FOR THE ARMED FORCES EPIDEMIOLOGICAL BOARD

Theodore E. Woodward, M.D.
President

Robert A. Wells, Ph.D.
Colonel, USA, MSC
Executive Secretary

The Neuropsychiatric and Secondary-Infection Aspects of AIDS

During each of its meetings, the Subcommittee on Infections and the Board always discussed some aspect of the HIV infection problem. On 5 February 1988, John F. Mazzuchi, Ph.D., who succeeded Dr. Clinton as Acting Deputy, Assistant Secretary of Defense for Health Affairs, presented the following memorandum to the AFEB for its consideration:

MEMORANDUM FOR ARMED FORCES EPIDEMIOLOGICAL BOARD

SUBJECT: Human Immunodeficiency Virus (HIV) and Implications for Military Service

Human Immunodeficiency Virus (HIV) infection continues to be a serious concern for the military. Preliminary information on the progression of HIV infection, the neuropsychiatric aspects of HIV infection and their potential effect on job performance, and risks of secondary infection, such as coccidiomycosis, in HIV infected soldiers raises some questions.

1. Is there sufficient epidemiological evidence to support the hypothesis that military service accelerates progression of HIV infection? In other words, is the rate of progression greater than would be expected in comparable HIV infected civilian populations?

2. Is there sufficient medical evidence to demonstrate neuropsychiatric impairment at levels great enough to warrant excluding HIV seropositive military personnel, based solely on seropositivity, from military occupations requiring a high level of alertness, correct judgement, and precise motor skills?

3. Is there sufficient epidemiological evidence to demonstrate that HIV seropositive military personnel are at increased risk of developing disseminated coccidiomycosis when assigned to, living in, or traveling to geographical areas endemic for coccidiomycosis when compared to military personnel not infected with HIV?

It is requested that the Board address these questions during its February meeting.

After discussion and consideration, the Subcommittee on HIV Infections and the Board transmitted the following memorandum to the Office of the Assistant Secretary of Defense for Health:

In response to the memorandum from the Office of the Assistant Secretary of Defense on 5 February 1988, the AFEB considered the data presently known about asymptomatic infections with the human immunodeficiency virus (HIV). Based on the excellent presentation, the AFEB states:

1. There is insufficient epidemiological evidence presently available to support the hypothesis that military service accelerates the progression of HIV infection.

2 There is insufficient medical evidence to demonstrate that individuals who are HIV antibody positive, but asymptomatic, experience neuropsychiatric impairment in excess of HIV antibody negative personnel. Until more reliable data are available, the following AFEB **recommendation** [applying] to neuropsychiatric abnormalities [that] might result from various medical illnesses, including HIV infection, is made:

> If mental depression or other neuropsychiatric states occur in any serviceman [or servicewoman] assigned to a stressful or occupationally sensitive position, that person is to have [a] full medical evaluation and [be] returned to that sensitive position only after shown to be functionally fit for duty.

3. While there is sufficient epidemiological evidence to demonstrate that patients with clinically manifest AIDS (those with depressed T4 cells, etc.) are at increased risk of developing disseminated coccidiomycosis when exposed to *Coccidiodis immitis*, there is not sufficient evidence to indicate greater susceptibility to infection or dissemination in those individuals in the WRAIR Groups 1 & 2.

I had participated in the meetings of the Subcommittee on HIV Infections and the Board, but did not fully concur with all of the recommendations. I had expressed my opinions to members of the Board, and

decided to submit a personal letter to Dr. Mayer, the Secretary of Defense for Health Affairs. Th t letter, dated 9 March 1988, follows:

Dear Dr. Mayer:

The AFEB recently held its winter meeting at WRAIR and devoted considerable time for discussion of the AIDS problem in the Military Services. This discussion culminated in a series of responses to important questions which had been presented to the Board. These responses and recommendations have been transmitted to your office under separate cover.

Often, answers to delicate medical problems are not as precise as they might be simply because there is insufficient data upon which a recommendation is based. During the recent meeting, Doctor Mazzuchi and Lt. Col. Peterson reiterated that your office wished to have the recommendations and answers based solely on scientific evidence which was to form the basis for, and conclusions reached, by the Board and its panel of experts.

These answers to the specific questions are now in your hands. It was my privilege to participate in these discussions and to help formulate the recommendations as submitted. However, my personal view is at slight variance with those recommendations, which viewpoint is not fully shared by all members of the Board.

To my mind, there are factors other than those which are directly related to medical or psychoneurological abnormalities. These factors can transcend the known facts and can well relate to functional capability. To be sure, there are currently conflicting data as to whether a person with AIDS, in its early stages, has clearly measurable abnormalities of the central nervous system which would predictably interfere with his or her functional capacity in a high risk or sensitive position. Those factors that transcend this point of reference relate to day-to-day considerations of anxiety, stress, and tension, which clearly relate to function. These human reactions may develop after any catastrophic human event, of which AIDS is a representative example. In contemporary society, the social reaction to this horrible disease influences not only the victim but some of those who are associated with that unfortunate person. Clearly, there are members of society newly placed in contact with an AIDS patient who might react inappropriately to the threat of acquiring AIDS. This is true even though there is no evidence that casual contact relates in any way to transmission of the virus. These are the weaknesses of human behavior. The threat regarding aberrant behavior may pertain to the victim as well as the one who is associated with that victim.

Any physician who has practiced medicine or psychiatry with a disturbed patient in the confidence of his sick room has witnessed abnormal behavioral traits repeatedly, which have influenced function, even though that person would test negatively to the available scientific measurements.

Until society has fully sifted out and accepted the troublesome and conflicting facets of this dread virus disease, my view is simply that those persons in the military service who are clearly identified as having HIV infection should not be assigned to high risk and sensitive positions. Examples of such high risk and sensitive positions might be the piloting of an airplane, directing the activities of an air traffic station, a high security position and similar occupations. Perhaps with the passage of time, these viewpoints may be found to be obtuse. It seems to me that with the current state of knowledge and uncertainty, better judgment favors the aforementioned consideration.

Sincerely yours,

Theodore E. Woodward, M D.
President, Armed Forces Epidemiological Board

The Resolution Concerning Confidentiality

In all of the discussions pertaining to AIDS, the Board, collaborating with the military, had continually expressed the need to maintain confidentiality to the highest degree possible. During its February 1986 meeting in San Antonio, the Board had formulated the following resolution:

> The AFEB is pleased that its recommended guidelines directed to the means of restriction of spread and control of [HIV] infection within the Armed Forces was favorably received by the Office of Health Affairs of the DoD. The Board maintains its original opinion that



CAROL J. JOHNS, M.D.

Following her graduation from The Johns Hopkins University School of Medicine and her residency in medicine at its hospital, Carol Johns joined the faculty of that institution. As an exceptionally well-qualified clinician, she chose pulmonary diseases, and in particular, Beck's sarcoid, for her research interest. Carol has contributed importantly to the clinical and basic knowledge of this strange granulomatous disease. In Baltimore, she is called upon as a consultant in many difficult medical problems.

She served her alma mater, Wellesley College, as its Acting President, and she graciously joined the AFEB as a member despite her heavy academic responsibilities. She has brought a balance to the Board in matters relating both to internal medicine and to the particular needs of women in the Armed Forces.



Armed Forces Epidemiological Board and Commission Directors
6–7 June 1985

Seated, left to right: Norton Nelson, Ph.D.; Paul M. Densen, D.Sc.; Abraham S. Benenson, M.D.; Colonel Robert F. Nikoleski, BSC, USAF, Executive Secretary; Theodore E. Woodward, M.D., President of the Board; and Frank M. Townsend, M.D.

Standing left to right: Hans O. Lobel, M.D.; Ronald C. Shank, Ph.D.; Richard B. Hornick, M D ; Samuel D Thompson, Ph.D.; Llewellyn J. Legters, M.D.; Leonard T. Kurland, M.D ; and Frank B. Engley, Jr., Ph.D.



Armed Forces Epidemiological Board and Committee Directors
San Antonio, Texas
13–14 February 1986

Seated, left to right: Dr. Frank B. Engley, Jr.; Dr. William E. Jordan, Jr.; Dr. Carol J. Johns; Dr. Theodore E. Woodward, President of the Board; Major General Floyd W. Baker, Commanding General, Health Service Command; and Dr. Paul M. Densen.

Standing, left to right: Dr. Leonard T. Kurland; Dr. Llewellyn J. Legters; Dr. Abram S. Benenson; Colonel Robert A Wells, MSC, USA, Executive Secretary; Dr. Richard B. Hornick; Dr. Frank M Townsend; and Dr. Saul Krugman.

the preservation of individual confidentiality be maintained if the program is to succeed. The Board commends the Military Services for the plan to perform a longitudinal evaluation of those persons who now show the presence of [HIV] antibody. Only in this way will it be possible to understand the natural history of this disease which, to this point, has been uniformly fatal once active signs of infection occur. The valuable data which will accrue from a long-term study will provide valuable information of inestimable importance to the Military Services and to the public at large. The governmental policy should be designed so as to insure that all types of accurate medical and epidemiologic information is obtained. In the interrelationships with [HIV-]infected persons, the data collection must allow free communication between the infected service member and the health care provider. Free interchange of reliable information must not be stifled. If there is misunderstanding, lack of confidence and the fear that an adverse policy reaction will penalize or embarrass those involved, no reliable epidemiologic data will accrue. Under such adverse conditions, service members will be motivated to deny or withhold such relevant risk factors as homosexual behavior or drug abuse. An atmosphere of trust will greatly assist in acquisition of reliable epidemiologic information; otherwise, a scientific and accurate study is not possible. Added to the need of insuring an accurate scientific evaluation is the obligation to protect the rights of the individual, an undeniable right.

THE HEALTH PROBLEMS OF ASPLENIC PERSONS

In 1985, another potentially serious medical problem was presented to the Board by the Commander of the Navy Medical Command. Specifically, the Board was requested to determine the immunization requirements for three categories of asplenic persons: congenital asplenics, those whose spleens were removed before they entered the service, and those who had undergone splenectomy following their induction into active duty. After much discussion and review of the pertinent medical literature, the Subcommittee on Infections and the Board formulated the following memorandum and recommendations, dated 25 September 1985:

MEMORANDUM FOR:
THE ASSISTANT SECRETARY OF DEFENSE (HEALTH AFFAIRS)
THE SURGEON GENERAL, DEPARTMENT OF THE ARMY
THE SURGEON GENERAL, DEPARTMENT OF THE NAVY
THE SURGEON GENERAL, DEPARTMENT OF THE AIR FORCE

SUBJECT: Immunization of Asplenic Personnel

1. At the request of the Commander, Naval Medical Command, Washington, D.C., the Armed Forces Epidemiological Board (AFEB) members and consultants considered a set of questions on asplenic military personnel during the Fall Meeting of the Board at Parson's Island, Maryland.

2. Although asplenic individuals have been shown to produce lower levels of antibody in response to some antigenic stimuli than those with intact spleens, they withstand common infectious agents including viruses as well. However, asplenic individuals may fail to control infections by encapsulated bacteria such as *Streptococcus pneumoniae, Neisseria meningitidis*, and *Haemophilus influenzae*. Vaccines for these infections are available. In addition, blood protozoal infections (malaria, babesiosis) may not be resisted as well as by the normal host. The post-splenectomy sepsis syndrome, however, is a rare event.

3. It has been reported that significantly higher antibody titers against pneumococci develop if vaccine is

administered to traumatized persons before splenectomy [rather] than afterwards. There is an antibody response in either instance.

4. The Board **recommends** [that]:

> a. All personnel known to be asplenic should receive one dose of pneumococcal polyvalent vaccine. A second dose need not be given.
> b. It should be established that all asplenic persons have received quadrivalent meningococcal vaccine upon entry into the service. If not, this vaccine should be given.
> c. Vaccine against Influenza B should be administered to all asplenic individuals.
> d. Active duty personnel who require splenectomy should be given the pneumococcal and *H. influenzae* vaccine prior to removal of the traumatized spleen, if feasible.
> e. Asplenic persons should be counselled regarding the importance for them to comply with all anti-malarial measures, especially those related to the use of prophylactic drugs.
> f. In areas where babesiosis is prevalent, anti-tick measures should be employed.
> g. No restrictions on deployment are necessary for asplenic personnel.

FOR THE ARMED FORCES EPIDEMIOLOGICAL BOARD

Theodore E. Woodward, M.D.
President, AFEB

Robert A. Wells, Ph.D.
Lt. Colonel (P), USA, MSC
Executive Secretary

The Department of the Army raised several additional questions regarding a newly recognized gram negative bacteria known as Dysgonic Fermenter Type 2 (DF-2) in splenectomized individuals. The Subcommittee on Infections and the Board, after discussion and review, submitted the following memorandum, dated 23 September 1987, in answer to the questions presented:

MEMORANDUM FOR
THE ASSISTANT SECRETARY OF DEFENSE (HEALTH AFFAIRS)
THE SURGEON GENERAL, DEPARTMENT OF THE ARMY
THE SURGEON GENERAL, DEPARTMENT OF THE NAVY
THE SURGEON GENERAL, DEPARTMENT OF THE AIR FORCE

SUBJECT: Recommendations on Infections with Dysgonic Fermenter Type 2 in Splenectomized Individuals

1. At the request of the Department of the Army Surgeon General, the Armed Forces Epidemiological Board (AFEB) considered at its 7-8 September 1987 meeting a request for recommendations for the problems posed by the serious infections by Dysgonic Fermenter-2 (DF-2) experienced by asplenic individuals following dog and cat bites.

2. Concerning restrictions to be placed on duty assignments of splenectomized individuals which involve contact with dogs and cats, the Board **recommends** that:

> Splenectomized individuals not be newly assigned to duties involving significant exposure to dogs and cats. Those presently assigned or previously trained in animal care should be informed of the risks involved in case of bite and the need for immediate appropriate wound treatment and chemoprophylaxis.

3. With regard to the request for special precautions, if any, following animal bites, the Board **recommends** that:

Appropriate cleansing of the wound be performed with debridement, if necessary, together with an appropriate antibiotic such as Amoxicillin and clauvanic acid (Erythromycin or Tetracycline if the individual is penicillin-sensitive). The need for a booster dose of tetanus must be considered.

4. Concerning guidance to be provided splenectomized pet owners, the Board **recommends** that:

Splenectomized individuals who own pets should be advised of the hazard of serious infections which may follow bites from cats and dogs. They should be informed of the necessity to seek medical care and chemoprophylaxis, even if the bite is slight.

FOR THE ARMED FORCES EPIDEMIOLOGICAL BOARD

Theodore E. Woodward, M.D.
President, AFEB

Robert A. Wells, Ph.D.
Colonel, USA, MSC
Executive Secretary

THE BOARD ASSISTS THE DEPARTMENT OF DEFENSE IN FORMULATING POLICY REGARDING THE HEALTH RISKS ASSOCIATED WITH THE M2 BRADLEY FIGHTING VEHICLE

On 6 November 1986, Maj. General Robert H. Buker, MC, the Deputy Surgeon General, in a memorandum to the President of the AFEB, requested that selected members of the Board and other appropriate authorities be convened to discuss and review health hazard issues associated with the M2 Bradley Fighting Vehicle. An ad hoc group of the Board had reviewed this subject at USAMRIID just the day before, on 5 November. Brig. General Philip Russell chaired the meeting, which I attended with AFEB members Norton Nelson and Ronald Shank, and Executive Secretary Robert A. Wells. Colonel Joel Gaydos and Lt. Colonel Hugh McAlear provided the technical information. It was decided at this meeting to convene a special group of national authorities as soon as possible.

Accordingly, a meeting was held at WRAIR on 6 January 1987. The civilian authorities who participated in this meeting were Drs. Arthur Dubois, Gareth Green, and Roger McClellan, in addition to the Board members and technical authorities aforementioned. The thorough discussions provided sufficient information and reliable data. The ad hoc Committee formulated the following memorandum and recommendations, dated 2 February 1987, which were approved by the Board and submitted to the Surgeon General of the Army:

MEMORANDUM FOR
THE SURGEON GENERAL, DEPARTMENT OF THE ARMY

SUBJECT: Recommendation on the Potential for Health Risks of the Bradley Fighting Vehicle (BFV)

1. The Armed Forces Epidemiological Board (AFEB) met to consider the enclosed set of questions pertaining to the health risks of the BFV. In order to respond to the request, Board members Dr. Norton Nelson, Dr. Ronald Shank and Dr. Theodore Woodward met with Dr. Arthur Dubois, Dr. Gareth Green and Dr. Roger McClellan. Drs. Dubois, Green and McClellan, as well as Drs. Nelson and Shank are all known, recognized authorities in the fields of toxicology and pulmonary function. Two complete briefings and meetings were held, the first at USAMRDC on 5 November 1986 and the second at WRAIR on 6 January 1987. All of the known data pertaining to the BFV were

presented and thoroughly reviewed with similar and knowledgeable officers of the Department of Defense and WRAIR with LTC Yancy Phillips as briefing officer.

2. At the outset it was recognized that the combat environment is inherently hazardous. It was likewise clear that given a potentially lethal armored-combat scenario, transient environmental exposure to agents such as fire suppressing chemicals and their pyrolysis products may well represent a reasonable preference over the obvious alternative. This professional advisory group, as any such group, faced an enormous challenge in interpreting the data provided as background to the questions being addressed. Compounding the challenge was the necessity for extrapolating from these data those segments which appeared to have meaningful relevance to the potential health risks of the crew and passengers of the BFV during combat and beyond. An additional task was that of evaluating and prioritizing numerous simultaneous variables within the BFV regarding both the supporting test data and the supposition of events occurring on the battlefield. It was in this manner that the group considered the data and their implications and rendered its recommendations. It should also be noted that these recommendations represent the best possible advice from facts and projections currently available. These recommendations are forwarded with the understanding that as advice, they will be considered for application, modification or rejection as deemed appropriate.

3. Regarding the question on the Halon fire suppression system, it is obvious that the immediate risk within the BFV is fire. Supporting hard copy and film data convincingly showed that the Halon system is an effective fire-fighting system which will serve the immediate needs of the BFV occupants. Emphasis for the group's consideration focused on the associated decomposition and oxidation by-products of this system and their potential for toxicity. The Board makes the following **recommendation**:

> The application of the Halon automatic fire suppression system poses an acceptable alternative risk to the occupants of the BFV at this point in time. Continuing efforts should be made to further reduce fire-extinguishing time. Concurrent reexamination of evacuation procedures and those related to personal protection (masking) and ventilation are highly encouraged.

4. With reference to question b—vaporific effects: It was noted that considerations regarding fuel and ammunition were not included in this issue. Following extensive deliberation, the Board feels that:

> the vaporific effect does not appear to represent an unreasonable health risk to soldiers in the BFV outside the spall zone.

5. Regarding question c—measurement end points: Extensive effort was expended in reviewing underlying BFV test data with consideration of both the underlying questions being addressed and the structuring of the tests. It was the consensus of the group that the studies currently underway will produce valuable information regarding health risks related to nonfragment hazards. In addition, the Board provides the following guidance:

> Physical and chemical measurement end points are appropriate with the exception that there should be a review of all sampling flow rates and times with reference to the analytical methods and instrumentation being used to assure they are matched to anticipate exposure constituents and concentrations. In addition, particle size distribution studies should be conducted as well as studies of gas particle interactions.

6. With reference to question d—laboratory animal research: The consensus was that the studies cited represent an excellent starting point for the generation of valuable data. The basic problem is estimating the response to complex mixtures of gases and particles rather than the response to single gases. Thus, the general impression was that these tasks should be structured to mimic the anticipated exposure scenarios as much as possible in the interest of generating useful information in a timely manner. The proposed research will not completely resolve uncertainties relating to health risks from Halon degradation products as found in actual BFV fires. However, they can considerably improve the evaluation of actual risk. Specifically, the Board **recommends** that:

> More emphasis should be placed on field and laboratory stimulation of actual conditions as defined by field studies. Both laboratory and field studies will require the use of animals. Questions to be resolved should include the extent of interaction between gases,



NORTON NELSON, Ph.D., D.Sc.

Norton Nelson directed the Institute of Environmental Medicine at New York University from 1954 to 1980. He was recognized as one of this country's authorities on environmental pollution, air quality, toxic hazards, and safety evaluation. In view of the many problems involving the environment, the AFEB would not have functioned so efficiently as an advisor to the military without Dr. Nelson's wise counsel. During the years that the Board had a commission system, Norton Nelson spearheaded our understanding of, and the guidelines needed to control, the problem of substance abuse in the military His work on asbestosis, pesticides, other pollutants, and toxic products related to housing development gave the Board help that was instrumental in saving the government significant financial sums.

the particle-effect on dose-delivery to lung tissues, and other issues related to the mode of action of Halon degradation products.

7. Regarding question e—eardrum rupture: The review suggested that ear injury can reduce immediate and future individual effectiveness, although this may be difficult to distinguish from motivational factors. Following a review of the data, the group endorsed the position that:

> By itself eardrum rupture is not likely to cause significant acute disability. Further studies should be conducted in the areas of blast-associated structural and functional disturbances to the inner ear, the shielding effects of hearing protectors, and operational liability of hearing loss for military tasks.

FOR THE ARMED FORCES EPIDEMIOLOGICAL BOARD

Theodore E. Woodward, M.D.
President, AFEB

Robert A. Wells, Ph.D.
Colonel, USA, MSC
Executive Secretary

KOREAN HEMORRHAGIC FEVER

During the summer of 1987, the Departments of the Army and Navy presented the AFEB a series of questions pertaining to the methods of preventing and managing Korean hemorrhagic fever (KHF). Various field operations, including the exercise "Bear Hunt" in the Republic of Korea, had resulted in the development of hemorrhagic fever among military personnel. Korea is highly endemic for this disease. Captain Norman A. Dean, MC, USN, Officer in Charge, Navy Environmental and Preventive Medicine Unit No. 6, Pearl Harbor, Hawaii, had previously prepared a comprehensive report of a hemorrhagic fever outbreak. Dr. Dean reported that among ten severely ill patients fever, fatigue, thrombocytopenia, proteinuria, nausea, and vomiting had occurred in all of them. Diarrhea and myalgia were present in eight patients, and conjunctival injection in five.

After careful study and discussions with the Army and Navy officers who had participated in these field exercises, the Subcommittee on Infections and the Board transmitted the following memorandum and recommendations, dated 23 September 1987:

MEMORANDUM FOR
THE ASSISTANT SECRETARY OF DEFENSE (HEALTH AFFAIRS)
THE SURGEON GENERAL, DEPARTMENT OF THE ARMY
THE SURGEON GENERAL, DEPARTMENT OF THE NAVY
THE SURGEON GENERAL, DEPARTMENT OF THE AIR FORCE

SUBJECT: Recommendations on Korean Hemorrhagic Fever

1. The Armed Forces Epidemiological Board (AFEB) considered the problems posed by Korean Hemorrhagic Fever (KHF) with renal syndrome in Korea during its meeting of 17–18 September 1987. These problems were referred to the AFEB by the Surgeons General of the Army and Navy. With respect to appropriate environmental control measures, the AFEB noted that identification of the *Apodemus* mouse as a reservoir of the etiological Hantaan virus indicates the need to minimize man-mouse contact for the control of this disease. Definitive recommendations cannot be made without additional bionomics of this animal species. The establishment of a planned research laboratory should provide the needed information. Until then, the analogies of some epidemiologic characteristics to those of scrub typhus suggest the best approach.

2. Concerning questions on semi-permanent bivouacs or camps in areas endemic for KHF, the Board **recommends** that:

> Bivouac or camps preferably should not be located at any site known to have been a focus of infection for this disease. The Corps of Engineers should prepare a site by first clearing the entire campsite by flame-burning and bulldozing, including the preparation of a wide perimeter extending beyond the bivouac area. The construction of a concrete or gravel base for each tent is advised to prevent rodent harborage. It is essential that all known rodent control measures including sanitary measures for solid waste, be continually applied. Qualified officers should make regular inspections of the campsite to ensure application of these preventive measures.

3 The environmental control measures instituted in the garrison setting in addition to maintenance of high level of rodent control activities will necessitate behavioral activities by all personnel which minimize the presence of rodents. The Board **recommends** that:

> Continual rodent control measures be strictly applied by all personnel including rodent-proofing of waste food and food scraps, and management of solid wastes (rubbish, etc.) to eliminate harborages. Continual live trapping should be performed with virus studies of the trapped *Apodemus* mice if facilities for this are available.

4 With regard to personal protective measures for individuals residing in highly endemic areas, the Board states that:

> The data presently available do not provide any evidence that there is need for decontamination of individual or unit equipment.

5 In responding to the query on medical evaluation of suspected and confirmed cases of KHF, the Board notes that:

> It is desirable that diagnostic competence for the early identification of KFH be available in readily accessible units. Medical competence to treat seriously ill patients, including the capacity for renal dialysis, should be provided. Medical professionals, including contract physicians, who understand the serious complications of this disease, are required to treat such patients. This includes the knowledge and capability to apply measures to combat hypovolemic shock and renal failure. Army and Navy hospital commanders should apply these principles with a clear understanding that transport of seriously ill patients after the first few days is ill advised. Thus, evacuation should only be carried out when the required professional competence cannot be arranged, proper handling of the patient depends on very early diagnosis, and evacuation should be accomplished at sea-level cabin pressure to the closest site where appropriate professional care can be provided.

6. As requested by the Navy Surgeon General, the AFEB reviewed field guidance on KHF made by the Navy Environmental and Preventive Medicine Unit No. 6 (NEPMU-6) on 29 June 1987. The Board states that:

> It concurs with the recommendations made in the guidance rendered by NEPMU-6. Concerning the preparation of the campsite, this would preferably be addressed more aggressively as indicated in Paragraph 2 above.

FOR THE ARMED FORCES EPIDEMIOLOGICAL BOARD

Theodore E. Woodward, M.D.
President, AFEB

Robert A. Wells, Ph.D
Colonel, USA, MSC
Executive Secretary



SCOTT B. HALSTEAD, M.D.

Scott Halstead qualified in medicine at Columbia University College of Physicians and Surgeons, and was a house officer in medicine in New York at Bellevue Hospital. He was commissioned in the U.S. Army Medical Corps in 1958, and compiled a distinguished record at the 406th General Laboratory, the U.S. Army SEATO Medical Research Laboratory in Bangkok, Thailand, and WRAIR. His work embraced the field of virology, and he made major contributions to the understanding of dengue hemorrhagic fever and the immunopathogenesis of shock in this epidemic viral disease.

Scott contributed to the Commission on Viral Diseases, specifically in arboviruses. He has been Associate Director and Acting Director of the Health Sciences Division of the Rockefeller Foundation while serving simultaneously as a member of the AFEB.



Armed Forces Epidemiological Board and Committee Directors
16–17 April 1987

Left to right: Leonard T. Kurland, M.D.; Walter R Dowdle, Ph.D.; Samuel D Thompson, Ph.D.; Frank B Engley, Jr., Ph D.; Ronald C Shank, Ph.D.; Richard B Hornick, M.D ; William R Harland, M.D.; Frank M. Townsend, M.D.; Llewellyn J. Legters, M.D.; and Colonel Robert A. Wells, Ph.D., MSC, USA, Executive Secretary.

Left to right: Carol J. Johns, M.D.; Abram S. Benenson, M.D.; Theodore E Woodward, M D., President of the Board; Paul M. Densen, D.Sc.; and William S. Jordan, Jr.; M.D.

On 26 May 1989, Lt. Colonel James Le Duc briefed the Board on the current status of Hantaan virus infection and KHF. He recalled that during 1951 and 1952, many medical scientists with capabilities in virology, epidemiology, and clinical medicine worked with military medical officers in Korea on the hemorrhagic fever-renal syndrome. The Board had formed a Hemorrhagic Fever Commission, which was directed by Dr. Joseph E. Smadel and Dr. Marshall Hertig. In spite of intensive research, the Commission did not find the viral cause of this hemorrhagic disease. Not until two decades later did a Korean scientist, Dr. Ho Huang Lee, identify the causative agent.

Dr. Le Duc described the serological results of the lyophilized serum samples that Dr. Smadel had arranged to have collected and stored at WRAIR twenty years earlier. Commission workers had taken pains to collect acute (early) and late (convalescent) serum. IgM and IgG assays were tested for Hantaan virus infection and urban-rat-associated Seoul virus with the plaque-reduction neutralization test and enzyme and antibody-capture immunoassays.

Most of the sera from the 245 patients tested showed anti-Hantaan virus antibodies; IgM titers reached their maximal levels within the first few days of illness. IgG titers rose more slowly and reached their maximal levels during the second week of illness. Measurement of IgM specific antibodies appeared to be the method of choice for early diagnosis of Hantaan virus infections.

In the United States, Dr. Le Duc has collaborated with Dr. James Childs and his associates at The Johns Hopkins School of Public Health on a surveillance of Hantaan virus infection in Baltimore rats. Adult rats taken in urban Baltimore neighborhoods showed evidence of the infection in as much as 50 percent of some populations. Attempts are being made to equate hemorrhagic fever virus infection in patients with significant proteinuria, hypertension, and a history of cerebrovascular accidents. The primary focus of the study was inner-city black patients. The thesis under consideration is whether Hantaan virus infections are responsible for a portion of the patients who have chronic renal disease and hypertension. Investigators found that persons who tested seropositive for Hantaan virus fell into the group with chronic renal disease, hypertension, and cerebrovascular accidents. Since acute infection has not been detected in such patients, it is conceivable that subacute infection could lead to chronic renal disease.

AFEB CONTRIBUTION TO CARDIOVASCULAR SCREENING OF SOLDIERS AGED 40 AND OLDER

On 26 October 1987, Brig. General James H. Rumbaugh, MC, transmitted a memorandum on behalf of the Surgeon General of the Army to the President of the AFEB. That memorandum follows:

SUBJECT: Review of the 40 and Over Cardiovascular Screening Program

1 The Army revised its Physical Fitness Program in June 1981 to require soldiers 40 years of age and older to take the semi-annual PT test, from which they had been excused since WWII. To prevent exercise-related deaths, a cardiovascular screen is administered as part of the periodic physical examination which is done every 5 years. The screen is a multiphase evaluation, a risk-factor analysis, a cardiology consult and exercise tolerance test, nuclear studies and coronary angiography, and a fourth phase of medical or surgical treatment.

2. Clearance before entrance into the Army's physical training and testing program is required of all soldiers 4 years of age and older. Clearance may occur during any phase, progressively smaller numbers enter phases II, and IV.

3 The Army has screened over 100,000 active-duty soldiers. The data are contained in a computer registry at The Armed Forces Institute of Pathology (AFIP), Washington, DC. The Chief of Staff of the Army intends to extend

this program to the 152,000 over-40 members of the Reserve Components, National Guard, and Army Reserve.

4 A Blue Ribbon Panel of Medical Experts endorsed the program design and objectives during a meeting at Walter Reed in December 1986. I also desire the AFEB to conduct its own comprehensive analysis of the Army's 40 and Over Cardiovascular Screening Program as to its scientific validity and value to the Army. If you can undertake this task, please advise me of the time and resources required to accomplish it. Members of my staff and AFIP will assist you. POC for further information is Colonel Manmohan V. Ranadive, MC.

FOR THE SURGEON GENERAL.

James H. Rumbaugh
Brigadier General, MC
Director, Professional Services

After consulting with appropriate authorities, the Board formed the ad hoc Subcommittee for the Study of Cardiovascular Screening of Soldiers Aged 40 and Over, which would review the Army's Cardiovascular Screening Program (CVSP) and provide guidance on soldiers aged 40 and older. It met on 27 January 1988 at the Mayo Clinic, in the splendid facilities of the Mayo Foundation in Rochester, Minnesota. Dr. Leonard Kurland was the host for the meeting. A delightful dinner in the Mayo Foundation Residence for Fellows, the former residence of Dr. Charles Mayo, was served. After dinner, I gave a short talk about the AFEB, emphasizing its early history, the founders, and their contributions.

The ad hoc Subcommittee comprised: William P. Castelli, Director of the Framingham Heart Studies; Roland N. Shamburek; L. Thomas Sheffield; David Ballard; and Thomas E. Kottke.

Board members who participated were: William R. Harlan, Chairman of the ad hoc Committee; Leonard Kurland, Lewellyn Legters (who was unable to attend), Robert A. Wells, Executive Secretary; and me. Military representatives who participated were: Lt. Colonel William FitzGerald, USA, MSC; Colonel James R. Hickman, Jr., USAF; Colonel Manmohan V. Ranadive, USA, MC; and Major Jerel Zoltick, USA, MC.

The questions that the Surgeon General of the Army had posed to the Board were contained in the following 1987 memorandum:

MEMORANDUM FOR THE ARMED FORCES EPIDEMIOLOGICAL BOARD

SUBJECT: Questions on Cardiovascular Screening of Soldiers Age 40 and Over

1. Does the available data collected in the 40 and over Cardiovascular Screening Program (CVSP) justify continuation of the program for active duty populations and its extension to the reserve component?
2. Has the CVSP prevented exercise-related sudden death or decreased mortality and/or morbidity from coronary artery disease?
3. If the CVSP has merit in previously sedentary populations, should it be continued in active duty populations now engaged in varying degrees of exercise just when they reach age 40?
4. Does the data justify repeating CVSP every 5 years?
5. If the CVSP should be continued, how can the screening criteria be modified to decrease the number of false positives requiring Phase II screen?
6. If the data collected since the inception of the CVSP in 1981 are not adequate to answer some of the above questions, how should the data collection be modified or what additional data can be collected to answer these questions in the future?
7. Should the existing physical fitness standards be changed? E.g., should over-50 populations be exempted from the APFT test or should these standards be relaxed to make it safer?



WILLIAM R. HARLAN, M.D.

Bill Harlan was first affiliated with the AFEB in 1974, when he served on an ad hoc Committee while he was Professor of Medicine at Duke University School of Medicine. At this time, he was actively involved as an advisor to the American Heart Association. That ad hoc group, which was appointed by Herschel Griffin when he was President of the AFEB, made key recommendations regarding the desired weight and blood pressure measurements for military personnel. Most recently, Bill chaired the ad hoc Committee on Cardiovascular Screening for Soldiers Age 40 and Older. This significant report was rendered on 7 April 1988, and for this work, the AFEB is in his debt.



COLONEL
MANMOHAN V. RANADIVE, MC, USA
Director, Health and Fitness Division



LIEUTENANT GENERAL
QUINN H. BECKER, MC, USA
The Surgeon General

8. Should the present program of screening for detection of asymptomatic significant coronary artery disease be replaced by a program of screening for coronary risk factors and risk factor modification?

9 Is there a medico-legal (or standard of practice) requirement to provide state-of-the-art cardiovascular disease screening program every five years just because an organization requires individuals to undergo mandatory physical fitness testing every six months?

10. In the present CVSP an individual with two or three risk factors (smoking, high cholesterol, etc.) can pass the treadmill test and be cleared to take the APRT. Does the program give this individual a false sense of security and would getting clearance on the treadmill test act as a disincentive for this individual to change risk factors?

FOR THE SURGEON GENERAL

Manmohan V. Ranadive
Colonel, Medical Corps
Director, Health & Fitness Division

The ad hoc Subcommittee members reviewed extensive data and experiences in the Army, Air Force, foreign military services, and the U.S. civilian sector pertinent to the questions at hand. The primary focal points for discussion were *(a)* whether CVSP has prevented exercise-related sudden death, and *(b)* whether the screening program has decreased overall morbidity and mortality from coronary disease.

Screening for occult coronary artery disease was initially developed to evaluate personnel 40 years of age and older, to reduce fatal and non-fatal coronary events as those personnel increased their physical activity for the mandated Army Physical Fitness Test (APFT). An observational study by Zoltick, et al., which analyzed 188 cardiovascular deaths in the Army since 1981, indicated that screening did not successfully identify those who had fatal episodes when coronary artery disease was the primary cause of death. (References for these studies include Zlotnick, J. M., McAllister, H. A., and Bedynek, J. L., Jr. The United States Army Cardiovascular Screening Program. *J. L. Cardiac Rehab.* 4: 530–535, 1984; Whitney, E. J. and Boswell, R. N. Cardiovascular Risk Modification: A Multidisciplinary Approach. *Military Medicine* 151: 473–477, 1986; and Hatsell, C. P. and Gaughan, D. L. USAF Health Evaluation and Risk Tabulation Program. *Military Medicine* 148: 122–126, 1983.) Although the relative risk of a fatal cardiovascular event was less for those "cleared" by CVSP, over half of the deaths occurred in those "cleared to take the APFT." Air Force studies of flight personnel over 40 years of age have found similar difficulties in identifying occult coronary heart disease without performing invasive studies. Parenthetically, a review of a British study of the physical fitness training and testing programs suggested that coronary deaths were not increased significantly during exercise. After all available data were considered, the ad hoc Subcommittee concluded that there was no evidence to suggest that cardiovascular morbidity and mortality had decreased as a result of the screening program of soldiers aged 40 and over.

At its 7 April 1988 meeting, the AFEB heard Dr. Harlan's report of the ad hoc subcommittee. After thorough discussion, the Board approved the following memorandum on cardiovascular screening, and transmitted it to the Surgeon General of the Army:

1. There is no need to screen personnel who have been previously active, have passed the Army Physical Fitness Test (APFT), and who continue to exercise regularly and vigorously without symptoms, solely because they have reached the age of 40 years.

2. The panel reviewed the requirements for expanded studies of the program in weighing options for enhanced clarification and improvement of the program. [The AFEB **recommends** that:]

> An in-depth evaluation of the effect of the Cardiovascular Screening Program (CVSP) on exercise-related death should be conducted. This should include a comparison of death rates before the initiation of the program with those during the program, and to the extent

possible, the circumstances surrounding events. A study on age-specific, cause-specific death rates (not necessarily exercise-related) before and during the program should be performed. Collection of this baseline would seem essential in determining the effectiveness and the quality control of the program.

3. The current multi-phase approach used in CVSP was reviewed to identify more efficient and effective approaches to risk screening and interventions. A concern with primary screening criteria has been the high false-positive referral rates for subsequent cardiovascular consultations. It was determined that personal and family medical history, e.g., regarding blood pressure, coronary disease, diabetes, smoking, etc., is often poorly completed and/or poorly scored and probably not sufficiently specific to be useful. [The AFEB **recommends** that:]

> Emphasis be placed on the most reliable of conventional risk factors combined with follow-up counseling and intervention and instructional guidelines for behavior modification. Appropriate coronary risk factor analysis should be continued during routine periodic medical examinations. Emphasis must be placed on improving the measurement of total serum cholesterol and HDL cholesterol with standardization using Centers for Disease Control (CDC) criteria. Other risk factors should include blood pressure measurement and a review of daily smoking status. A total cholesterol to HDL ratio of 6.0 or greater, or the presence of 3 combined risk factors, namely, cigarette smoking (10 cigarettes or greater a day), a blood pressure of 160/90 or above, and a serum cholesterol greater than 250 mg/dl suggest an individual may be at significantly greater cardiovascular risk. Based on these criteria, it was felt that the number of such soldiers requiring Phase II cardiovascular evaluation and treadmill testing should be small. Phase II screening with treadmill exercise for any other criteria is not indicated.

4. Individuals who have significantly abnormal treadmill tests, as described below, should be referred for cardiac catheterization without nuclear studies.

a. Criteria for significantly abnormal treadmill tests:

(1) = less than 2 mm ST horizontal or downslope depression at 0.08 msec at 60% or less age adjusted maximal workload (generally greater than = 8 METs or 27 ml/kg/min).

(2) ST depression remains abnormal longer than 2 minutes post exercise.

(3) = less than 1 mm ST depression accompanied by chest pain.

(4) blunted blood pressure with = less than 1 mm ST depression with early exercise at greater than 80% maximum workload.

b. Nuclear testing should be reserved only for those individuals who have treadmill tests that cannot be adequately interpreted by conventional criteria because of abnormal resting ECG; e.g., LBBB, abnormal ST or T wave changes.

c. Individuals with abnormal treadmill tests who do not fall into either of the above two categories would receive no further diagnostic cardiovascular tests. They should be given counseling for risk factor reduction and individualized exercise prescription. [The AFEB **recommends** that:]

> Asymptomatic active persons with risk factors do not need treadmill testing every five years but should be followed with counseling and intervention to correct unhealthy behavior, and, if they are already exercising, encouraged to continue a regular aerobic exercise program.

5. A review was conducted of APFT standards among soldiers of different age groups. It is understood that given current testing requirements within the Army, most soldiers should have remained relatively active under age 50, and should be able to safely participate in physical activities commensurate with the current APFT requirements. After consideration of these factors, the Board **recommends** that:

> The APFT standards be relaxed for soldiers over 50 years of age, more importantly to protect individuals excercising in this age group, an individualized exercise program

should be part of the screening program and their duties should be less physically demanding.

6. In evaluating the overall Army CVSP, it was felt that certain general parameters should be altered or eliminated. The current program does not serve as an incentive for behavioral change that would modify risk factors or increase physical activity. In fact, clearance by CFSP may falsely reassure the individual that behavioral change is not needed to be considered healthy and thus lead to continuance of unhealthy lifestyles. The Board **recommends** that:

> A medical screening program for risk-factor detection and modification be developed as the most promising means of improving health and decreasing the risk of coronary related episodes. An individually graded exercise (2–3 times weekly) with pulse monitoring is prescribed to increase the physical activity and aerobic capacity of all soldiers, particularly those over the age of 40. The current design of the 40-and-over CVSP appears not to serve as an incentive to modify life-endangering behavior into healthier lifestyles. There is no compelling rationale for continuing the current CVSP in active duty soldiers or to extend it to the reserve component.

FOR THE ARMED FORCES EPIDEMIOLOGICAL BOARD

Theodore E. Woodward, M.D.
President, AFEB

Robert Wells, Ph.D.
Colonel, MSC, USA,
Executive Secretary

When he retired as Surgeon General of the Army in June 1988, Lt. General Quinn H. Becker expressed his appreciation to the Board for its assistance in helping to solve some of the aforementioned issues:

Dear Dr. Woodward:

With the approach of my retirement, I want to thank you for your service as President of the Armed Forces Epidemiological Board (AFEB).

You have played a key role in many critical decisions of great importance to the Army and its sister services. Your contributions have involved an array of multi-billion dollar issues including Acquired Immunodeficiency Syndrome (AIDS), Asbestosis, Agent Orange, Cardiovascular Screening and the M2 Bradley Fighting Vehicle. Both your professional knowledge and your leadership are greatly revered by others including myself. I depart my post knowing that our nation is in good hands thanks to your talented and patriotic service to the Board.
Warm regards.

Sincerely yours,

Quinn H. Becker
Lt. General, U.S. Army
The Surgeon General

PART III

The End of the Decade
and
The Golden Anniversary Celebration

The activities of the AFEB continue. Some diseases have been conquered or have become less significant militarily, for example, enteric diseases such as the dysenteries, rickettsial diseases such as the typhus fevers, and the encephalitides, as well as poliomyelitis. New diseases such as AIDS appear and raise the specter of catastrophic debilitation in both the military and the civilian populations. Other diseases such as malaria have not been conquered, only partially controlled with our current best knowledge. Pathogenic microorganisms continue to plague mankind and the best minds in military and civilian medicine will continue to combat them. The section that follows summarizes some of the military and medical problems that the Board confronted and advised upon during 1989.

Streptococcal Infections

Beginning in 1983 and peaking during 1987 and 1988, the Army Medical Service and the Department of the Navy reported a significant increase in streptococcal pharyngitis, particularly among recruits. Approximately one percent of those patient shown to have pharyngitis developed acute rheumatic fever. No obvious cases of streptococcal-induced pharyngitis occurred among Air Force personnel during this time, and there were also no cases of acute rheumatic fever. The prompt use of penicillin, or Erythromycin in those persons with a history of penicillin sensitivity, led to a sharp decrease in the incidence of streptococcal pharyngitis and its sequelae in Army and Navy personnel.

The AFEB was kept informed of these developments; the problem was discussed in considerable detail at the meeting of the Subcommittee on Infections at WRAIR on 16 February 1989. The three **recommendations** that the Board formulated on penicillin prophylaxis for streptococcal diseases, which were effectively applied, were that:

> 1. A selective streptococcal monitoring program should be continued at each Navy, Marine Corps, and Army recruit facility.
> 2. Chemoprophylaxis options should be tailored to the specific areas with the options to include *(a)* continued year-round programs [in populations] with high rates, such as in the Marine Corps recruits or when data suggest Bicillin is warranted, i.e., an incidence of infection of 10 per 1,000 per week, or more, of clinically confirmed streptococcal infections; *(b)* seasonal administration from October to April if monitoring data suggest a low summer rate; and *(c)* no prophylaxis if rates have historically been low throughout the year.

3. Studies should be undertaken in areas with high rates, such as Marine Corps recruit depots, to *(a)* examine the desirability of administering a second dose of Bicillin four weeks after the first to prevent a second peak of streptococcal illness during recruit training; and *(b)* determine the occurrence of streptococcal skin infections, particularly in the summer months, as a justification for Bicillin prophylaxis.

Hepatitis Vaccines

The Board has been identified with the development and use of hepatitis vaccines for several decades. Hepatitis is a serious military medical problem with significant morbidity and loss of time from work. (The problem had become quite apparent in 1986, with a high incidence of hepatitis among military personnel stationed in Korea.) Discussions among the members of the Subcommittee on Infections and the military's Preventive Medicine Officers made it apparent that immunization of the entire military force against hepatitis B infection was advisable. Because of significant fiscal constraints, however, such a program was not feasible. A regimen other than the standard subcutaneous injection of vaccine, such as the intradermal route, was suggested as a way to reduce the costs and still provide appropriate protection. Screening trials were conducted using a two-dose intradermal injection of 0.1 ml vaccine. When it became apparent that adequate antibody protection resulted, recommendations were made for all military personnel assigned to Korea and other areas of high incidence to be so immunized. The conventional full-dose regimens were recommended whenever they were feasible.

The AFEB also recommended, in a separate action, that hepatitis B vaccine be administered to all health-care workers and to inmate personnel in U.S. disciplinary barracks.

During its meeting of 28–29 September 1989, the AFEB responded to questions relating to reduced-dose regimens for recombinant hepatitis vaccines. Recombinant hepatitis vaccines are not generic, and reduced doses of hepatitis B vaccines prepared by different manufacturers may or may not be equally immunogenic. Studies by various investigators had revealed that one-fourth (2.5 mcg) to one-half (5 mcg) of the currently recommended 10 mcg doses of Merck, Sharp and Dohme's recombinant vaccine (Recombivax-HB) are highly immunogenic for adults up to the age of 30. As of this date, reduced-dose data of the Smith, Kline, Beecham vaccine (Engerix B) are not available. Accordingly, the AFEB **recommended**:

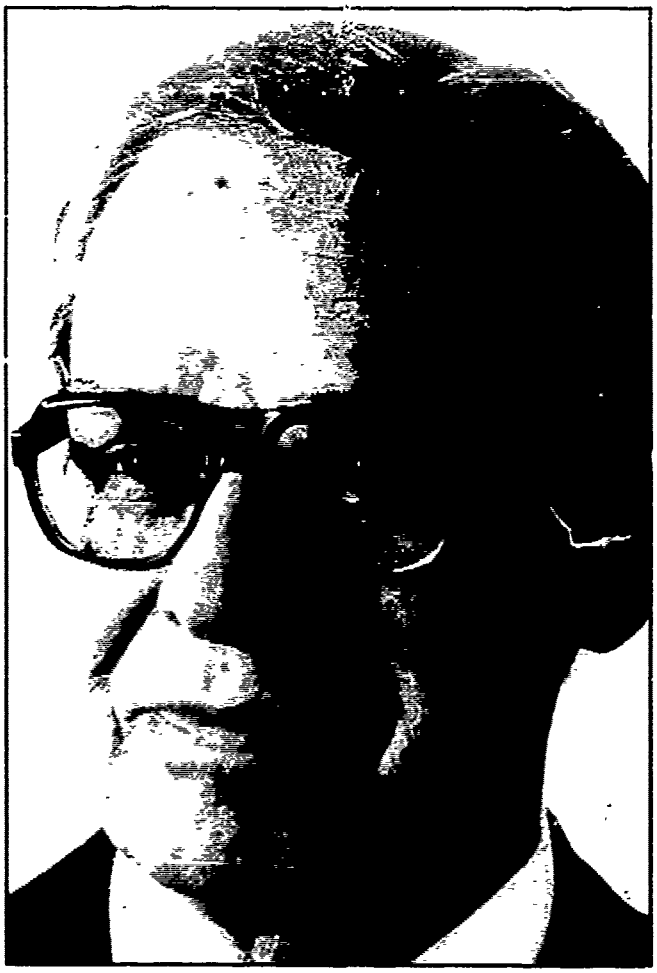
> that a reduced dose of 5 mcg of the Merck Recombivax-HB vaccine may be used for the immunization of adults up to the age of 30. The recommended dose of Energix B should be 20 mcg until studies indicate that a reduced dose is immunogenic and effective.

During these discussions, the Board leaned heavily on Dr. Saul Krugman for advice and guidance. His broad and authoritative experience in the fields of hepatitis and its control by hepatitis vaccines has made him an important resource, not only for the Board, but also for the nation.

A Problem with the Jet Injector Gun

During a Board meeting in June 1986, Captain Michael Stek, Jr., MC, USN, presented data and press clippings that suggested that a contaminated jet injector gun, which had been used at a private clinic in California in 1985, was responsible for causing hepatitis in sixty-four patients. The possibility was also raised that HIV infection might be transmitted by the jet gun when biological products, such as gamma globulin, were administered. After numerous meetings, the Board **recommended**, in March 1988,

> that the jet injector gun be used only with authorized military technical parts and that it be sterilized according to standard procedures.



SAUL KRUGMAN, M.D.

A 1939 graduate of the Medical College of Virginia, Saul trained in pediatrics at Bellevue Hospital in New York, and received his research training there under an NIH fellowship. In 1960 he was appointed Chairman of the Department of Pediatrics at New York University School of Medicine, and he directed the pediatric service at Bellevue Hospital. Saul Krugman is one of this country's most distinguished research pediatricians, and he is one of our foremost authorities on hepatitis

The AFEB and its Commissions on Virus Diseases and Hepatitis have profited from his advice. He has been one of the AFEB's most faithful contributors. His comments are concise and, if the information desired is unavailable, he takes or suggests the steps needed to find the answer. He is scholarly and gracious, and the AFEB is in his debt.

Furthermore, the Board stated that the chance of transmitting HIV infection through gamma globulin given by jet injector was too remote to be significant. Those persons most responsible for formulating these decisions and recommendations had previously had extensive experience with the jet injector; Dr. Abram Benenson had worked with it since it was developed.

Continuing Recommendations on Malaria

During the September 1986 meeting of the Board, and during subsequent meetings of the Disease Control Subcommittee and the Board, the problem of malaria was always discussed. In view of the complexity of the problem, the Board **recommended** that military medical research on malaria concentrate on two major research areas: *(a)* the search for effective drugs for chemoprophylaxis and treatment, and *(b)* the development of effective vaccines.

At the request of the Department of Defense's Office of Health Affairs, the Board studied malaria-research programs currently underway in both the military and civilian sectors, and determined that the military malaria-research programs were appropriately integrated with other federally sponsored programs. There had been, for awhile, the appearance that the efforts were not appropriately coordinated. It became clear that the United States Agency for International Development (USAID) and the military groups had somewhat differing objectives, and thus were not in conflict. The search for an effective vaccine continues and is greatly needed.

At the request of the Army Surgeon General, the AFEB considered the matter of Mefloquine prophylaxis during its 28–29 September 1989 meetings. The questions posed to the Board related to *(a)* confusion that might arise from a complicated prophylaxis schedule, and *(b)* the potential side effects such as dizziness and psychotic behavior that might occur in patients taking the medication. The Subcommittee on Disease Control discussed the problem in considerable detail and was aided by Dr. Hans O. Lobell of the Centers for Disease Control and other expert consultants. Based on expert consideration of the relevant data, the AFEB **recommended** that:

> Mefloquine should be used for the prevention of malaria in doses of 250 mg, with the first dose given immediately prior to deployment, then weekly continuously during exposure and for three weeks thereafter. Standard terminal prophylaxis for *P. vivax* and *P. ovale* should be given, when indicated. The need for a loading dose of Mefloquine requires further evaluation and is not recommended at this time. The Board recommends Mefloquine or Doxycycline use in military personnel deployed to areas of Chloroquine-resistant *P. falciparum* malaria until toxicity reactions are clarified definitively.

In addition, the AFEB made the following **recommendations** regarding the use of Mefloquine for military personnel in flight status:

> Flight personnel should be exempted from the use of Mefloquine until adverse neurologic and physiologic effects are studied using the above dosage regimen and are found to be insignificant. Should these results prove unacceptable from the standpoint of military effectiveness, including the function of flight personnel, further research will be required to determine minimal effective dosage regimens and blood levels necessary for prevention of P. *falciparum* infection in susceptible adults.

The Encephalitides

Japanese B Encephalitis. In 1986, a U.S. Air Force general stationed in the Far East became ill with Japanese B encephalitis. Better control measures, particularly with the use of vaccines, promptly attracted attention. The potential for Japanese B encephalitis applied particularly to those military



Armed Forces Epidemiological Board and Committee Directors
25–26 February 1988

Left to right: Frank B Engley, Jr., Ph.D.; Samuel D. Thompson, Ph.D.; Richard D. Remington, Ph.D.; Ronald C. Shank, Ph.D; William R. Harlan, M.D.; and Colonel Robert A. Wells, Ph.D., MSC, USA, Executive Secretary.

Left to right: Walter R Dowdle, Ph.D.; William S. Jordan, Jr., M.D., Abram S. Benenson, M.D.; Theodore E Woodward, M.D., President of the Board; Frank M Townsend, M.D.; and Leonard T Kurland, M.D.



Armed Forces Epidemiological Board and Committee Directors
February 1989

Seated, left to right. Dr. Carol J. Johns; Dr. Abram S. Benenson; Dr. William E. Mayer, Assistant Secretary of Defense for Health Affairs, Dr. Theodore E. Woodward, President of the Board, and Dr William E. Jordan, Jr.

Standing, left to right. Dr. John Doull; Dr. Frank B. Engley, Jr., Dr. Richard B. Hornick, Dr. Scott B. Halstead, Colonel Robert A. Wells, MSC, USA, Executive Secretary of the Board; Dr. Frank M. Townsend, Dr. William R. Harlan; Dr. Norton Nelson; Dr. Llewellyn J. Legters; and Dr. Leonard T. Kurland.

personnel stationed in Korea, Thailand, the Philippines, and China.

Inactivated vaccines used extensively by the Japanese were reputed to cause minimal side reactions and to have a protective efficacy rate of 90 to 95 percent. Attenuated Japanese B vaccines had been under development in Japan for a number of years, although the degree of protection and the potential for vaccine virus conversion were not fully known. In 1986 and in subsequent years, the Subcommittee on Infections and the Board concluded that both inactivated and attenuated Japanese B vaccines should be used selectively, as determined by local command decisions. Military scientists were advised to continue trying to work out the details until more reliable data became available.

California Virus Encephalitis. In April, 1987, the Board was apprised of the prevalence of California virus (LaCross) encephalitis (CVE), which occurs in the mid-United States. Other forms of arthropod-borne encephalitis (arbor viruses) are western and eastern equine encephalitides and St. Louis encephalitis. Chikungunya, dengue, and yellow fever are related viral illnesses that differ in their clinical expressions.

Dr. Thomas Monath, a very capable entomologist from the Arbor Virus Center in Denver, reported on the importance and prevalence of *Aedes albopictus*, a good transmitter of CVE. This mosquito is found in about twelve states, including Mississippi, Alabama, Louisiana, Texas, Illinois, Florida, and California. *A. albopictus* transmits CVE horizontally and transovarially more avidly than does *A. aegypti.* This mosquito was apparently imported into the United States via old tires acquired from various parts of the world, particularly the Far East. Approximately 16 percent of such tires hold water that is contaminated with either ova or larvae of *A. albopictus.* Viable ova in tires can be inactivated with methyl bromide gas fumigation, but the most cost-effective method to inactivate the ova is to heat the tires to 100° C. The reason that the old tires were imported into the United States was never elucidated.

A Historical Footnote. An attenuated Venezuelan equine encephalitis vaccine that was developed at USAMRIID under AFEB and the Commission of Epidemiological Survey sponsorship was used in a massive field control program in Central America, Mexico, and Texas in 1971. The vaccine stopped an epizootic of encephalitis. This epidemic, if uncontrolled, not only would have destroyed much of the horse population in the United States but also would have infected large numbers of humans.

Board Briefing on Lyme Disease

At its meeting on 25 February 1988, Major (P) Donald Driggers, MSC, USA, and Commander David Trump, MC, USN, briefed the AFEB on Lyme disease. This affliction is potentially of massive importance to both the military and the public in many areas of the continental United States. Many epidemiologists believe that, were it not for the advent of AIDS, Lyme disease would now be the nation's primary infectious disease problem. Incidence of the disease is steadily rising in the United States, more commonly among males, and with widespread distribution. Rodents and deer are the favorite hosts of the tick vector, *Ixodes dammini.* Birds may be responsible for the widespread distribution of the infected ticks. Central nervous system signs are often early manifestations of this infectious disease, and troublesome arthritis is a common late sign. The need for early specific treatment was emphasized. Due to the extreme importance of this disease, the Board will continue to monitor progress and events in this area.

Continuing Recommendations on Human Immunodeficiency Virus

On 20 September 1989, the Surgeon General of the Army requested that the AFEB discuss Zidovudine (AZT) and make recommendations regarding its use in the armed forces. In particular, the Surgeon General asked that the Board consider AZT as it is used to treat patients in the early stages of Human Immunodeficiency Virus (HIV) infections, both now and in the immediate future.

At its 28–29 September 1989 meeting, the AFEB considered in some detail the issue of AZT chemotherapy in military patients infected with HIV-1. The Board's experts presented the current knowledge. AZT is an expensive drug that, according to the limited information available, may prolong the lives of patients with AIDS But the drug may also be associated with additional problems, such as developing resistance to AZT and other drugs or developing other adverse effects from long-term usage.

The use of AZT signals the advent of antiviral chemotherapy for this deadly infection. When the Food and Drug Administration (FDA) approved its use in the treatment of certain patients with AIDS, some in the medical profession were prompted to adopt this drug as the standard of care. The FDA gave its approval based on significantly different outcomes of 281 patients. Currently, no subsequent promising studies with confirmatory data have been released or published. By virtue of the unavailability of complete data, the Board made the following statement:

> Currently the AFEB cannot make any specific recommendations regarding the appropriate therapeutic or prophylactic use of AZT. The Board recognizes that publication of the pertinent studies, as well as a National Institute of Allergy and Infectious Disease (NIAID)-sponsored consensus conference and other meetings, will occur shortly. At that time, assessment of the effect of varying doses of AZT on therapeutic effectiveness and associated toxicity will be available. Credible answers to questions raised by the military can then be formulated.

In its deliberations, the Board recognized that a few strains of HIV-1 that are resistant to AZT have been isolated, and that this resistance appears to develop when the drug is administered over long periods of time. Furthermore, the virus's drug-resistance appears to cross over to other promising experimental drugs. Hence, the AFEB **recommended** that:

> Because of the potentially adverse influence of resistance on the efficacy of AZT, this effect needs prompt additional clinical and *in vitro* study. The military anti-HIV drug testing program is an excellent resource to assess the significance of this resistance on the future use of AZT and other drugs.

The AFEB further noted the implementation of the so-called "parallel track" program for drug evaluation, wherein control preparations are omitted from studies on medications of potential use in the treatment of patients infected with HIV-1. The Board was deeply concerned that this development might make it difficult to assess newer drugs that might be effective. The Board therefore **recommended** that:

> carefully designed studies on potential antiviral drugs be conducted by the military, in addition to other establishments within the scientific community.

Important scientific contributions of the WRAIR group that included Lt. Colonel John Brundage, Lt. Colonel Robert Redfield, Colonel Edmund Tramont, and Colonel Donald Burke assisted the Board in fulfilling its advisory role on HIV-control in the military. They developed clinical and epidemiological data on HIV infections, formulated a helpful clinical classification based on the stages of the illness, and sharpened the laboratory diagnostic procedures.

Military Readiness Issues Related To Worldwide Deployment

In March of 1984, Dr. William Mayer, the Assistant Secretary of Defense for Health Affairs, had requested that the AFEB evaluate the current worldwide reporting systems of epidemiological data, with reference to the prevalence of diseases and their incidence. The Board was asked to direct its attention to the epidemiological information relating to potential trouble-areas of the world and to comment about

those preventive measures best suited to insuring preventive control measures. (The complete report of the ad hoc Committee, chaired by Dr. Paul Densen, that addressed these problems is found on pages 211–220.

One of the Board's important recommendations pertaining to the medical problems of rapid deployment was that a physician-epidemiologist be appointed and assigned to the Armed Forces Medical Intelligence Center (AFMIC) at Fort Detrick, whose major responsibilities would be to *(a)* designate the diseases prevalent in a country, *(b)* rank them in order of their military importance, and *(c)* list the preventive measures necessary to deal with them.

The Board periodically addressed these important issues, but fiscal and other constraints caused some delays. In the interim, Colonel Robert Wells, the Board's Executive Secretary, and I visited AFMIC at Fort Detrick. At this meeting, during the fall of 1988, the Board's views and wishes in terms of the desired objectives were discussed. As a consequence of that preliminary discussion, during the February 1989 meeting of the Board, Lt. Colonel H. Jack Baghdassarian, MC, USAF, gave an objective and complete report directly related to the aforementioned subject. In his report, Colonel Baghdassarian detailed the important epidemiological diseases country by country. The report described the topography, climate, water sources, animal threats, prevalent arthropods, plant threats, hospital and other medical-treatment sites, location of major air fields, and included a complete listing and description of the diseases of operational importance. His exhaustive document represented a resource of considerable importance; the Board unanimously recommended its adoption. The following description of Kuwait is excerpted from Colonel Baghdassarian's excellent report:

KUWAIT

Location

Continent: NE Arabian Peninsula.

Borders: NW, N-Iraq, E-Persian Gulf, S,SW-Saudi Arabia

Capital: Kuwait City (2920N 4800E).

Major Cities: Hawalli (2917N 4800E); Mina Al Ahmadi (2900N 4800E), Al Jahrah (2920N 4749E), Khawr al Mufattah (2921N 4755E); Al Shuaybah (2903N 4808E).

Local Time: ZULU +3, EST +8

Topography

General: 99% hot arid desert land 1% cultivated land.

Subregions: Largely desert with small rolling hills, Kuwait Bay and urban/port concentrations along the Eastern border.

Major Features: Kuwait is located on a gradually sloping plain which rises westward from the Persian Gulf and reaches a maximum elevation of 951 ft at the extreme western border. The country consists primarily of sandy, riverless desert with some oases and a few fertile patches. Although 90% of Kuwait's roads are paved, there are few major roads in the western desert area of the country. Kuwait Bay extends approximately 30 miles inland from the Persian Gulf on the central eastern border. The Jal az-Zawr escarpment, reaching elevations of 475 ft, extends along the northwestern shore of Kuwait Bay. A natural harbor and the capital city of Kuwait are located on the southern shore of the Bay and urban/port concentrations extend southward along Kuwait's eastern border.

Climate

General: Essentially hot, desert climate with minimum rainfall. Summer precipitation is nearly non-existent and temperatures often reach 125° F and occasionally go as high as 165° F. Kuwait's annual 4 inches of precipitation occurs almost exclusively in the winter and, even in the coolest months, temperatures are comfortable averaging nearly 60° F.

Seasonal: Sand and dust storms occur throughout the year, but are especially common from March through August.

Climatic Brief: Kuwait International Airport (prepared 12 May 1980) [NOTE Colonel Baghdassarian's report contained a detailed weather chart here, which I have omitted. TLW]

Water Supply

Sources: There are no permanent water sources in the country. Desalinated, chlorinated sea water is the principal water source for populated areas. Outlying areas rely on desert wells, waterholes and intermittent surface water sources. These supplies are generally contaminated.

Potability and Treatment: The municipal water supply in Kuwait City is generally considered safe for drinking, but bottled water is still recommended for consumption. In all other parts of the country, *only* bottled or treated water should be consumed.

Electricity

[Current]

AC 50, V 240/415

Adapters

Plugs: Type C,D & G

Animal Threats

[NOTE Colonel Baghdassarian's report contained tables of antivenin sources for and illustrations of animal and plant threats in Kuwait, which I have omitted. TLW]

Snakes

Sea Snakes (Hydrophidae): *Hydrophis spp. Lapemis curius, Pelamis platurus, Thalassophis viperinus*

Desert Black Snake (Elapidae): *Walterinnesia aegyptia,*

Vipers (Viperidae). *Cerastes cerastes gassperettii, Echis carinaatus pyramidium, Pseudocerastes persicus persiccus*

Marine Invertebrates

Sea urchins,cones, nettles, octopuses, Portuguese man-of-war, and sea wasps (box jellyfish), inhabit the coastal waters of Kuwait. Their venomous stings, toxic bites and/or contact irritants pose a potentially serious threat to unprotected personnel.

Arthropods

Blister Beetles: *(Cylindrothrox spp., Mylabris tenelrosa)*

Centipedes: *(Scolopendra spp., Scolopocryptops spp., Otostigmus spp.)*

Scorpions: *(Leiurus quinquestraiatus, Androctonus crassicauda)*

Spiders: (*Latrodectus spp.*, Black Widow)

Plant Threats

Ingested plant parts of the commonly occurring jimson weed, juniper, lantana, castor bean, night shade, oleander, or poppy can seriously debilitate personnel and, in severe poisonings, may be fatal. There are no contact vesicant plants which pose a major threat in Kuwait.

Immunizations

WHO Recommendations: No vaccination requirements for any international traveler.

Military Requirements: Routine immunizations.

Note: State Department recommends gamma globulin.

HIV-Screening Requirements. The Kuwaiti government requires proof of negative AIDS testing from individuals applying for resident visas. Results of tests performed in the United States are accepted.

Additional Information of Operational Importance

The extreme heat in Kuwait will degrade unprotected medical supplies. Tablet, rather than capsule, medications are recommended. All personal medications should be officially labeled and no alcoholic beverages should be included with personal effects.

MEDICAL TREATMENT AND EVACUATION INFORMATION

Kuwaiti Hospitals in Kuwait City (2920N 4800E)

Ibn Sina and *Al Sabah Hospital Complex* (800+ beds) major referral center, ambulance service, helipad, 76-bed

burn care unit is scheduled for completion in Sep 1988, tel # 81200.
Mubarak Hospital (544 beds) most specialty services, ambulance service, tel #312725.
Amiri Hospital (400+ beds) general care facility, some specialty services, ambulance service, tel # 447589.

U.S. Medical Facilities: None identified.
U.S. Embassy: Bneid al-Gar, Kuwait (opposite the Hilton Hotel), tel #2424150-9
mailing address: P.O. Box 77 Safat, Kuwait, State of Kuwait
message address: 22039 HILTELS "Pass to American Embassy"

Major Airfields
Kuwait International (2913N 4758E) L-11152, W-150, joint military-civilian control, suitable for all aircraft.
Ahmed Al Jaber AB (2856N 4747E) L-10000, W-140, military control, daylight, visual operations only, suitable for C-130, C-141B
JMRO: Rhein-Main AFB, Germany/AV #330-1110, X7426/7 COMM # 011-49-69-999-1, X 7426/7.

KUWAIT EPIDEMIOLOGY: DISEASES OF OPERATIONAL IMPORTANCE

Short-term Incubation Periods (Usually Less Than 15 Days)
Acute non-specific diarrhea (12 hours to 4 weeks)
General: Endemic. Occurs year-round.
Potential Agents: *Entamoeba histolytica, Salmonella spp., Shigella spp.*, and enterotoxigenic *Escherichia coli* (resistant to ampicillin, sulphonamide and trimethoprim/sulphamethoxazole).
Transmission: Fecal contamination of food, water or fomites.
Prevention: Proper sanitation measures.
Cholera (usually 2 to 3 days, range of a few hours to 5 days)
General: Not endemic, but sporadic outbreaks occur in immigrant populations during late summer months. 113 imported cases in 1985, 38 in 1986.
Agent: *Vibrio cholerae.*
Transmission: Fecal contamination of water or food contaminated by dirty water, feces, soiled hands or flies.
Prevention: Standard sanitation measures.
Crimean-Congo hemorrhagic fever (CCHF) (3 to 12 days)
General: Virus has been isolated from Kuwaiti Bedouins who commonly cross into bordering countries which have reported CCHF.
Agent: Crimean-Congo Hemorrhagic Fever Virus, a Nairovirus.
Transmission: Bite of an infective adult *Hyalomma spp.* tick.
Prevention: Avoidance of tick-infested areas and animal hosts. Frequent tick inspections and proper removal techniques. Tick repellents.
Dengue (usually 5 to 6 days, range of 3 to 15 days)
General: May be present in the Persian Gulf area, but current incidence and distribution data not available.
Agent: Dengue virus, types 1-4, Flaviviruses.
Transmission: Bite of an infective *Aedes spp.* mosquito.
Prevention: Proper sanitation measures and vector control. Insecticides, insect repellents, and bed nets.
Malaria (12 days)
General: Not indigenous but potential vectors are present. About 500 imported cases occur annually.
Agent: *Plasmodium spp.*
Transmission: Bite of infective female anopheline mosquito.
Prevention: Proper sanitation measures and vector control. Insecticides and insect repellents. Suppressive drugs.
Sand Fly Fever (usually 3 to 4 days, range of 3 to 6 days)
General: Known vector, *Phelbotomus papatasi*, is present, but incidence data from Kuwait not available. Disease is reported from bordering countries.

Agent: Sandfly fever group of viruses, Pleboviruses.
Transmission: Bite of an infective sandfly.
Prevention. Avoidance of sandfly-infested areas. Destruction of animal hosts. Insecticides and insect repellents.

Typhoid and Paratyphoid (1 to 3 weeks)
General: Cases occur, about 200 annually.
Agent: *Salmonella typhi, S. paratyphi.*
Transmission: Fecal contamination of water or food (especially shellfish, dairy products) contaminated with causative agent(s).
Prevention: Proper sanitation measures.

Viral Hepatitis (15 to 50 days, average 28 to 30 days)
General: Hepatitis A is highly endemic. A 1985 survey showed 98% of the native population over 20 was serologically positive, indicating childhood acquisition of the disease.
Agent: Hepatitis A virus.
Transmission: Person to person or the fecal oral route.
Prevention: Proper sanitation measures and personal hygiene. Prophylactic doses of gamma globulin.

Long-term Incubation (Usually More Than 15 Days)

Leishmaniasis (week to many months)
General: Small, but increasing number of cutaneous cases reported. Known vector, *Phlebotomus papatasi,* is present, but no zoonotic reservoir has been identified. The disease may not be endemic.
Agent: *Leishmania tropica, Le. major, Le. aethiopica.*
Transmission: From the zoonotic reservoir through the bite of infective female phlebotomines (sandflies).
Prevention: Elimination of sandfly breeding sites. Residual insecticides. Destruction of animal reservoirs.

Schistosomiasis (2 to 6 weeks)
General. Not currently reported in Kuwait, but *S. haematobium* is highly endemic in the Tigris and Euprates waterways of neighboring Iraq.
Agent: *Schistosoma mansoni, S. haematobium.*
Transmission: Free swimming larvae penetrate human skin immersed in contaminated fresh water sources.
Prevention. Prevent exposure to contaminated water. Vigorous towel drying followed by applications of 70% alcohol to skin surfaces wet with suspected water. Reduction of snail habitats and use of molluscicides on snail breeding sites.

Additional Epidemiological Notes

Sexually transmitted diseases
Gonorrhea and syphilis occur, but incidence data are not available.
Penicillin-resistant gonorrhea (PPNG) has been reported.
One case of AIDS had officially been reported as of 31 May 1988.

Rabies
Reported to be endemic in Kuwait; reservoirs include cats, dogs, wolves, and jackals.

Helminthic infections
Intestinal helminths, especially ascarids (transmitted by ingestion of eggs on soil-contaminated foods), are widespread.

Brucellosis
Widespread throughout the Middle East, has been increasing in incidence in Kuwait where the consumption of fresh milk accounts for most infections.

AFEB Support of the Medical Follow-Up Agency

The Board met at Parson's Island, Maryland on 28–29 September 1989. The following agenda shows the topics discussed, together with the participants, and provides a glimpse at the wide scope of Board concerns:

AGENDA

ARMED FORCES EPIDEMIOLOGICAL BOARD
PARSON'S ISLAND, MARYLAND

Theodore E. Woodward, M.D.
President, AFEB

William S Jordan, Jr., M.D.
Acting Chairman, Disease Control Subcommittee

Thursday, 28 September 1989

0825–0830	Opening Remarks	*Dr. T. E. Woodward, Col. R. Wells*
0830–0930	Army Question: Hepatitis B Vaccine	*Col. E. Takafugi, Dr. West, Dr. Boscia, Dr. Krugman*
0930–1015	Antimalarial Drug Research Overview	*Col. Milhous*
1015–1115	Army Question: Mefloquine	*Col. Takafugi, Cmdr. Oberst, Dr. Schuster, Dr. Lobel*
1115–1130	Food-Borne Outbreak Update	*Lt. Col. Warner*
1130–1200	Team Spirit Exercise	*Lt. Cmdr. Hanson, Maj. Sanchez*
1200–1300	Lunch	
1300–1400	Preventive Medicine Officer Reports	*Col. Erdtmann, Capt. Bina, Lt. Col. Wright, Cmdr. Makela*
1400—1500	Status Report: HIV in the Armed Forces	*Col. Erdtmann, Capt. Bina, Lt. Col. Wright, Cmdr. Makela*
1500–1615	Army Question: Zidovudine (AZT) Use	*Col. Burke, Col. Oster, Cmdr. Mayers*
1615–1630	Streptococcus Update	*Lt. Cmdr. Gray*

Friday, 29 September 1989

0800–0845	Medical Follow-up Agency	*Dr. Robinette and Dr. Page*
0845–0930	Pest Management Board	*Col. Clegern*
0930–1015	Theater Army Medical Management Information System (TAMMIS)	*Maj. Fletcher*
	Status Report on Influenza Vaccine	*Dr. Jordan*
1015–1045	Executive Session	
1045–1200	Brunch and Departure	

One of the most important agenda items for this meeting was a discussion of the activities of the Medical Follow-up Agency of the Institute of Medicine of the National Academy of Sciences. Throughout the past several decades, the AFEB has emphasized the need for a longitudinal, long-term, follow-up system that would provide continuing information relating to current health-care practices, not only for the treatment of the individual patient but also to provide information on changing trends and practices in the various fields of medicine. The ensuing comprehensive discussion at this meeting of the Board led to the following memorandum, which was transmitted on 3 November 1989, and follows:

MEMORANDUM FOR
The Assistant Secretary of Defense for Health Affairs
The Surgeon General, Department of the Army
The Surgeon General, Department of the Navy
The Surgeon General, Department of the Air Force
The Honorable Alan Cranston, Chairman, United States Senate Committee on Veterans Affairs

SUBJECT: Support for the Medical Follow-up Agency of the National Academy of Sciences

1. Throughout its distinguished history, the Medical Follow-up Agency (MFUA) has served the Armed Forces by providing critical medical data of eminent practical importance. This information has been essential not only to the military, but has also served the long-term interests of the civilian health care community as well. This agency is, in fact, a national resource which ultimately impacts on both our defense posture and the well-being of every American.

2. Due to the realities of an ever-shrinking Federal budget, the existence of this key organization is now threatened. Through a Congressional mandate last year, a panel, under the auspices of the Office of Technology Assessment evaluated the status of the MFUA. As a result of the panel's recommendations, the agency is to be continued for a five-year period with a budget of $0.5 million per year in core support—providing that these funds will, in fact, be available. It is ironic that there may be difficulty in funding this relatively small amount for an organization that has done so much good over the years. In the words of the Office of Technological Assessment (OTA) working group, "There is a little dispute that the MFUA is the clear choice for studying long-term-effects of military experiences (whether war-associated or incidental)."

3. The facts speak for themselves. The resources of the MFUA provide essential information to many long-term studies of major importance. For example, the National Heart, Lung, and Blood Institute (NHLBI) of the NIH collaborated with this agency in establishing twin registries for WWII and Vietnam veterans. These data have been utilized on multiple occasions and have yielded scientific data on the genetic relationships of cardiovascular diseases and pertinent risk factors. There are many other examples which could be readily referenced, describing work by the MFUA on coronary disease, cancer and stress, and related epidemiological studies which impact on the well-being of us all.

4. At its recent meeting, the Armed Forces Epidemiological Board (AFEB) and its panel of experts devoted considerable time to discussing the contributions of the Medical Follow-up Agency and the relevance of the information to the military as well as to the public. The Board was unanimous in its strong recommendation that funds must be committed to keep this agency viable. The AFEB, therefore, strongly encourages ongoing support for the continued funding of the MFUA. It is imperative that collaborative studies with this organization be expanded so that there be a continuum in the utilization of this key medical information on into the future.

FOR THE ARMED FORCES EPIDEMIOLOGICAL BOARD

Theodore E. Woodward. M.D.
President, AFEB

Robert A. Wells. Ph.D.
Colonel, USA, MSC
Executive Secretary

The Fiftieth Anniversary

The AFEB held its winter meeting in February 1990 at WRAIR. Because of the publication deadlines for this volume, it was not possible to include details of the meeting. It is fitting, however, to close with the agenda for the Fiftieth Anniversary Celebration of the Board, to be held at WRAIR on 28 June 1990. That agenda (tentative) follows:

Armed Forces Epidemiological Board
Golden Anniversary Celebration
28 June 1990

Theodore E. Woodward, M.D. Presiding

1200	Reception and Luncheon in the Armed Forces Institute of Pathology Museum
1300	The Army Band
1315	Presentation of the Colors National Anthem Invocation: Chaplain, Walter Reed Army Medical Center
	Welcome: *Maj. General Philip K. Russell, MC, U.S. Army,* Commander, Medical Research and Development Command
	Introductions of Invited Guests
	The Honorable George H. W. Bush, President of the United States *The Honorable Dick Cheney,* Secretary of Defense *The Honorable Michael P. W. Stone,* Secretary of the Army *Lt. General Frank F. Ledford, Jr., MC,* Surgeon General of the Army *Vice Admiral James A. Zimble, MC,* Surgeon General of the Navy *Lt. General Monte B. Miller, MC,* Surgeon General of the Air Force *Maj. General Robert H. Baker, MC,* Deputy Surgeon General of the Army
	Introductions of Past Presidents of the AFEB
	Gustave J. Dammin, M.D., 1960–1972 *Edwin H. Lennette, M.D., Ph.D.,* 1972–1976 *Herschel E. Griffin, M.D.,* 1978–1980 *Theodore E. Woodward, M.D.,* 1976–78; 1980–1990
	Presentation of AFEB History to Invited Guests
1430	Recess and Coffee
1500	Call to Order by the President of the AFEB: *Theodore E. Woodward, M.D.* Report of the Executive Secretary: *Colonel Robert A. Wells, Ph.D., MSC, U.S. Army*
	Greetings *Enrique Mendez,* Assistant Secretary of Defense for Health Affairs *Lt. General Frank F. Ledford, Jr., MC,* Surgeon General of the Army *Vice Admiral James A. Zimble, MC,* Surgeon General of the Navy *Lt. General Monte B. Miller, MC,* Surgeon General of the Air Force *Maj. General Richard D. Cameron, MC,* Commanding General Walter Reed Army Medical Center
1545	The Future of the AFEB: *Paul M. Densen, D.Sc.*
1600	The Joseph E. Smadel Lectures *William S. Jordan, Jr., M.D.* *William D. Tigertt, M.D.*
1700	Adjournment
1900	Formal Reception and Dinner, Navy Officers Mess, Bethesda

UNPAID DEBTS

by

Theodore E. Woodward, M.D.
President, Armed Forces Epidemiological Board

Text of a talk delivered on the occasion of the Fiftieth Anniversary of the AFEB

Walter Reed Army Institute of Research, Washington, D.C.
Sternberg Auditorium
28 June 1990

The strength of any enterprise, whether a business, a corporation, a medical center, or a scientific institution, is not its buildings, its plush surroundings, or its modern laboratories. Rather, it is the people who work within its walls. Perhaps more than anything else, this is why the AFEB, with its system of Commissions and advisory Committees, has been so successful. The founders built the AFEB on rock by selecting and recruiting the right people to assist the military services in their mission to maintain good health among the troops. They initially conceived that all of the Board's activities would be directed toward the goals of better understanding and prevention of diseases, thereby insuring a healthy military service.

One of the important and enriching experiences in my life was the opportunity to mature and develop during the five years I spent in the military. After World War II, there was an even greater chance for intellectual growth through the privilege of participating in the scientific activities of several Commissions of the Board, and later with the Board itself.

This is not the time to review the many activities of the Board and its Commissions; those remarkable events are now a matter of historical record. A history of the AFEB's first fifty years is now available and is presented in book form today. Individual Commission reports are also in preparation by directors of those Commissions, and some are nearly at the printing stage. This prompts me to thank wholeheartedly those who undertook the important task of writing and recording these activities of medical and historical importance. For my own part, preparation of the Board's history has been a privilege because it is a report of the accomplishments of many persons whose work is an achievement almost beyond measure. It is to those persons who contributed so much and to this organization that I feel such a sense of indebtedness.

I plan to speak in my own way for a few minutes. So relax, you are neither to be guided nor misguided. My favored life as a medical-school teacher, clinical observer, practitioner, and sometimes a doer, has enriched me far beyond that which I have contributed. In searching through the memories of my experiences these past fifty years, I came across a number of unpaid IOUs to several persons who, by virtue of their stature, professional example, and teaching, unwittingly allowed me to borrow from them. It is not possible to make proper repayment, but I take some solace in realizing that others, too, have borrowed heavily from those special persons. Their help to me was incalculable. Their contribution through the AFEB to the cause of epidemiology is a bright light in the history of public health. Each of you has special heroes; permit me to have mine. The persons about whom I have chosen to comment are but a small sample of a large group, all with strong roots in the health and welfare of the military services.

Stanhope Bayne-Jones set an example by the conduct of his productive life and by his insistence that a professional person should accept the responsibility for any role of benefit to society and then should complete the assignment.

My dear friend ***Joe Smadel*** taught me much about science and helped me sift out difficult medical problems. He clarified for me the importance of the bridge between the bench and the patient and showed that bench and field work, rather than armchair philosophy, were essential. When I was a young

departmental chairman, he helped me to formulate my criteria for selecting good people. Good training, teaching ability, interest in teaching, and creativity are not enough; the creative person must also have shown documented evidence of that creativity by publishing something decent and readable.

Ken Goodner, my most irascible, unpredictable, and sensitive friend, was not soft, sentimental, patronizing, or scornful of medical students. Rather, he was their friend. He encouraged young men and women to achieve their potential as fine physicians and never ceased to impart the glow of his enthusiasm, which was fed by the rich tradition of medical history, one of his constant preoccupations. He appreciated the lessons of the old masters of medicine.

Colin M. MacLeod and ***Thomas Francis, Jr.,*** themselves close friends, were leaders with versatility, wisdom, absolute insistence on scientific accuracy, and little tolerance for stupidity. Each knew so well how to properly evaluate the important characteristics of people, how to analyze important scientific issues, and how to spend public funds intelligently. To see them in action was to learn.

K. F. Meyer was sincerely respected by those who knew and learned from him. His ability as a field scientist, coupled with his picturesque turns of phrase, gave me, a neophyte, a clearer view of why a problem is a problem, and the route to take to find the solution.

I am indebted to ***John H. Dingle*** and there are many others who feel the same way. One of his creeds, "One must take time to design the study of a problem," he applied to his early work on acute respiratory diseases. Others of his creeds, "Utilize the natural setting when possible; don't manipulate nature's way; don't force results; have adequate data; temper your conclusions by possessing full knowledge of the earlier accomplishments of others, and acknowledge their findings and views," are important for all of us to understand and practice.

When my wartime boss ***Leon A. Fox*** had confidence in anyone, he expressed his wishes succinctly and then watched, rather than directed, as long as the issue seemed to be progressing well and heading toward its solution. He accomplished his objectives by taking action rather than by issuing memoranda. One of his basic principles was, "Know the subject or shut up," which is not a bad rule.

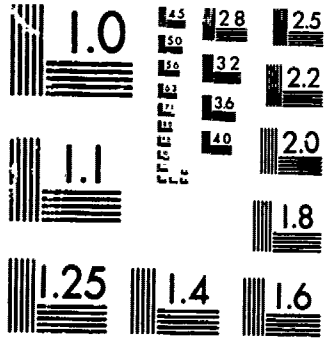
All one has to do is to peruse the historical data: the documents, minutes, accounts of events, and letters, to understand that the activities of these pioneers and many others shaped, and helped to shape, the military health standards and the practice of preventive medicine during World War II and thereafter. A small sample of their scientific "firsts" and contributions to the medical literature is displayed in the foyer outside this hall.

My purpose today has been to relate how a few men strove for—and achieved—excellence in their chosen fields. In so doing, they favored the AFEB and its Commissions, and they, along with others, were pillars of strength. By the conduct of their lives and their wise counsel, they enhanced our profession and inspired us. In addition to building solid foundations in the basic and clinical sciences, they provided us the opportunity to associate closely with informed professionals, a link of immeasurable value. This is what the AFEB has done for me.

It is not possible for me to measure the extent of my indebtedness to those I have named, but in no way do I exclude the many others who have helped and enriched my growth, and who are still with us today. A stanza from Kipling's "Spies March" is a fitting tribute to mark these fifty years of epidemiological science:

There are no leaders to lead us to honor,
and yet without leaders we sally.
Each man reporting for duty alone, out of
sight, out of reach of his fellow.
There are no bugles to call the battalions,
and yet without bugles we rally,
from the ends of the earth to the ends
of the earth, to follow the standards of yellow.

Administrators of the Board



MICROCOPY RESOLUTION TEST CHART
NATIONAL BUREAU OF STANDARDS-1963-A



Brigadier General Stanhope Bayne-Jones, MC, USA
1941–1946, Administrator
Board for the Investigation and Control of Influenza and Other Epidemic Diseases



Major Edward H. Vogel, MC, USA
1947
Assistant Administrator
Army Epidemiological Board



Lt. Colonel Frank L. Bauer, MC, USA
1947–1948, Assistant Administrator
Army Epidemiological Board
1949–1951, Administrator
Armed Forces Epidemiological Board



Colonel Frederick J. Knoblauch, MC, USA
1951
Administrator



Colonel Adam J. Rapalski, MC, USA
1951–1953
Administrator
1953–1955
Executive Secretary



Captain Robert W. Babione, MC, USN
1955–1959
Executive Secretary



Colonel John Rizzolo, MC, USAF
1959–1961
Executive Secretary



Colonel Charles H. Moseley, MC, USA
1961–1963
Executive Secretary



Captain Sidney A. Britten, MC, USN
1963–1968
Executive Secretary



Colonel Bradley W. Prior, MSC, USAF
1968–1972
Executive Secretary



Lt. Colonel Norman E. Wilks, MSC, USA
1972–1974
Executive Secretary



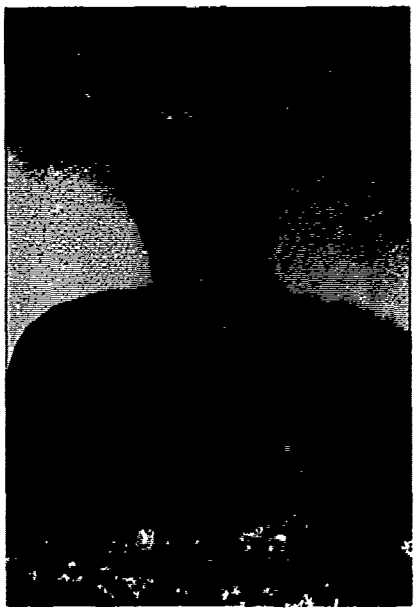
Lt. Colonel Duane C. Erickson, MSC, USA
1974–1978
Executive Secretary



Captain Charles W. Halverson, MSC, USN
1978–1982
Executive Secretary



Colonel Robert R. Nikolewski, BSC, USAF
1982–1985
Executive Secretary



Colonel Robert A. Wells, MSC, USA
1985–1990
Executive Secretary



Betty L. Gilbert



Jane Eldridge



Jenny McGinnis



Jean Ward

Awards to Board Members



Colin M. MacLeod, M.D. (left) presents the Certificate of Appreciation to Richard E. Shope, M.D., 15 May 1962



Gustave J. Dammin, M.D., AFEB President, (left) presents a Certificate of Appreciation to Stanhope Bayne-Jones, M.D., 23 May 1966 (Silver Anniversary)



Major General James T. McGibony, DSGA, (right) presents the Outstanding Civilian Service Award to John H. Dingle, M.D., 9 November 1967



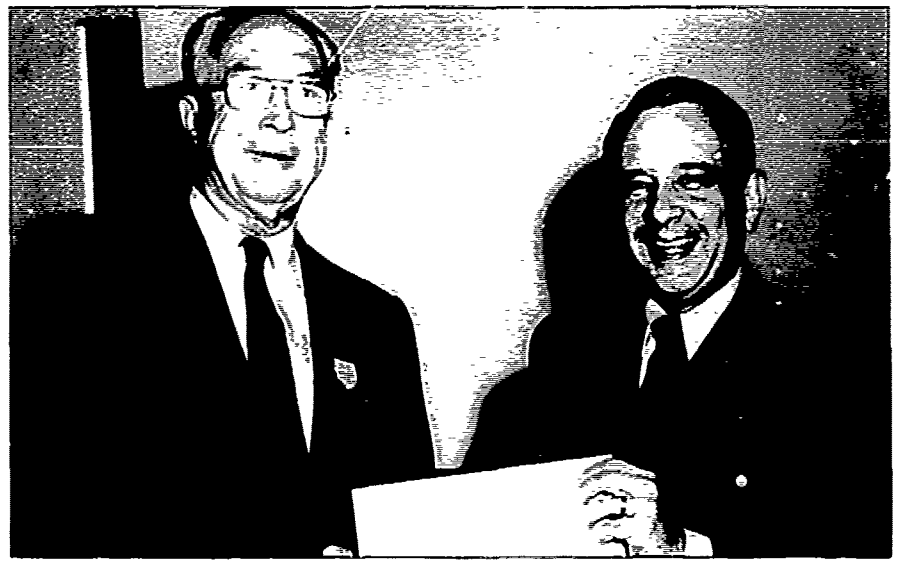
Lt. General Charles C. Pixley, The Surgeon General, (left) presents the Army Meritorious Service Award to Betty L. Gilbert, 11 October 1978



Major General Garrison Rapmund, MC, USA, (left) presents the Outstanding Civilian Service Award to AFEB member Anna Baetjer, M.D., September 1981.
Captain Charles W. Halverson, MSC, USN, Executive Secretary of the Board, is on the right.



Major General Enrique Mendez, Jr., DSGA, (right) presents a second Outstanding Civilian Service Award to William S. Jordan, Jr., M.D., 5 February 1981



Major General Enrique Mendez, Jr., DSGA, (right) presents a second Outstanding Civilian Service Award to Charles H. Rammelkamp, Jr., M.D., 5 February 1981



Major General Edward J. Huycke, MC, (left) presents the Commander's Civilian Service Award to Abram S. Benenson, M.D., 1 September 1983



Major General Edward J. Huycke, MC (left) presents the Outstanding Civilian Service Award to William S. Spicer, Jr., M.D., 1 September 1983



Lieutenant General Frank Ledford, Sr., The Surgeon General, (right) presents the Outstanding Civilian Service Award to Paul Densen, D.Sc., September 1988

Preventive Medicine Officers



Brigadier General James S. Simmons
1940–1946



Colonel Karl R. Lundeberg
1946–1947



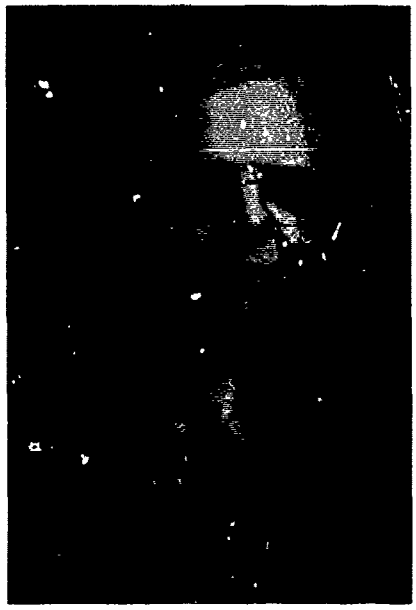
Colonel Tom F. Whayne
1947–1948; 1951–1955



Colonel Don Longfellow
1948–1951



Colonel Robert L. Callison
1955–1957



Colonel Arthur P. Long
1957–1961



Colonel Adam J. Rapalski
1961–1966



Colonel Herschel E. Griffin
1966–1969



Colonel Thurmond D. Boaz
1969–1970



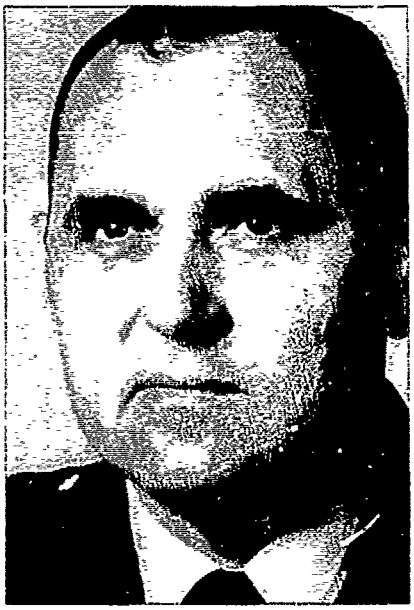
Colonel Jerome H. Greenberg
1970–1973



Colonel Robert T. Cutting
1973–1975



Colonel Llewellyn J. Legters
1975–1977



Colonel Taras Nowosiwsky
1977–1980



Colonel George E. T. Stebbing
1980-1984



Colonel Manmohan V. Ranadive
1984–1986



Colonel Dennis Swanson
1986–1988



Colonel Joel C. Gaydos
1988–1989



Colonel Frederick J. Erdtmann
1989–Present

Department of the Navy:



Captain J. R. Phelps
1917–1921; 1923–1927



Commander R. F. Jones
1921–1923



Captain M. A. Stuart
1927–1930



Captain W. H. Bell
1930–1932



Captain O. J. Mink
1932–1933



Captain S. S. Cook
1933–1936



Rear Admiral C. S. Stephenson
1936–1942



Captain T. J. Carter
1942–1945



Captain O. L. Burton
1945–1948



Captain R. W. Babione
1949–1952



Captain J. J. Sapero
1953–1955



Captain H. K. Sessions
1955–1959



Captain L. B. Shone
1959–1960



Captain J. W. Millar
1960–1967



Captain C. H. Miller
1967–1971



Captain C. E. Alexander
1971–1976



Captain D. F. Hoeffler
1976–1977; 1980–1981



Captain R. L. Marlor
1978–1979

Captain R. A. Nelson
1982–1983
(no photo available)



Captain W. B. Mahaffey
1984–1985



Captain M. Stek
1986–1987



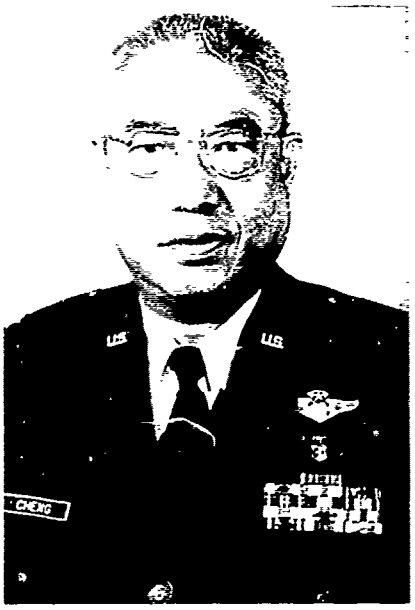
Commander R. L. Buck
1987–1988



Captain W. F. Bina
1988–Present



Lt. Colonel John Rizzolo
1959



Colonel Alfred K. Cheng
1978–1987



Lt. Colonel James A. Wright
1987–Present

Photos are not available for the following:

Colonel Francis L. Duff
1951–1954
Colonel Theodore C. Bedwell
1954–1956
Colonel George K. Fair
1956–1958
Lt. Colonel Gordon F. Fischer
1958–1959
Colonel Lee B. Grant
1960–1961
Colonel Franklin L. Bowling
1961–1966
Colonel Stanley Lutz, Jr.
1966–1969
Colonel George W. Powell
1969–1971
Colonel Paul F. Nugent, Jr.
1971–1973
Colonel William D. Howell
1973–1976
Lt. Colonel Jay C. Bisgard
1976–1978

Commandants of
Walter Reed Army Institute of Research



Colonel George Russell Callender
1940–1946



Colonel Rufus Leroy Holt
1946–1949



Colonel Elbert DeCoursey
1949–1950



Colonel William Spencer Stone
1950–1954



Colonel John Ruxton Wood
1954–1956



Colonel Richard Patrick Mason
1956–1961



Colonel Conn Lewis Milburn, Jr.
1961–1963



Colonel William David Tigertt
1963–1968



Colonel William H. Meroney
1968–1971



Colonel Edward L. Buescher
1971–1975



Colonel Robert J. T. Joy
1975–1976



Colonel Garrison Rapmund
1976–1979



Colonel Philip K. Russell
1979–1983



Colonel Franklin H. Top, Jr.
1983–1987



Colonel C. Fred Tyner
1987–Present

Members of the Commissions

Roster of AFEB Commission Members

Abernethy, Theodore J., M.D., 1941–1946
George Washington University

Akers, William A , M.D , 1969–1973
Letterman Army Institute of Research

Alexander, E. Russell, M.D., 1975–1976
Bureau of Medicine and Surgery

Alexander, Hattie E , M D., 1944–1944
Columbia University

Altemeier, W A.
University of Cincinnati

Altman, Robert M , M D., 1969-1971
Walter Reed Army Medical Center

Anderson, Gaylord, M.D., 1941-1944
University of Minnesota Medical School

Andrews, Justin M , Ph D., 1953-1963
National Institutes of Health

Anthony, Bascom F., M.D., 1970-1974
University of California, Los Angeles

Aring, Charles D., M D , 1941-1944, 1949
University of Cincinnati

Arnold, John D., M.D , 1967-1973
University of Missouri

Audy, J. Ralph, M.D., 1960-1968
University of California Medica Center

Austen, K. Frank, M.D., 1965-1973
Harvard Medical School

Austrian, Robert C., M.D , 1963-1975
New York University

Avery, Oswald T , M D., 1941-1944, 1949-1954
The Rockefeller Institute for Medical Research

Aycock, William L., M D., 1944
Harvard Medical School

Ayoub, Elia M , M.D , 1971-1973
University of Florida

Babione, Robert W., M.D., 1959-1963
Captain, USN

Badger, George F , M D., 1941-1943, 1947-1948, 1951-1963
Johns Hopkins University

Baer, Rudolf L , M.D., 1967-1973
New York University Medical Center

Baetger, Anna M , M.D., 1954-1981
Johns Hopkins University

Baker, Edgar E , Ph.D , 1955-1969
Boston University School of Medicine

Baker, J. Stannard, B.S., 1957-1969
Northwestern University

Baker, Stewart, Jr , M.D , 1977-1979
Veteran's Administration

Balamuth, William B., Ph.D , 1954-1956, 1959-1973
University of California

Bancroft, Huldah, 1947-1948
Western Reserve University

Bang, Frederik B , M.D., 1942, 1958-1974
The Rockefeller Institute for Medical Research

Barker, Lewellys F., M.D , 1965-1976
National Institutes of Health

Barkulis, Sam S , M.D., 1954-1959
University of Illinois

Barnett, Herbert C., M.D., 1963-1967
University of Maryland

Battigelli, Mario C., M.D , 1969-1973
University of North Carolina

Bauer, Theodore, M D , 1954-1956

Bayne-Jones, Stanhope, M D , 1941-1947, 1957-1965
Brigadier General, USA, Retired

Bean, William B , M.D., 1951-1953
University of Iowa

Beard, Joseph W , M.D , 1943-1973
Duke University Medical Center

Beard, Rodney R , M.D , 1942-1944, 1954-1974
Stanford University School of Medicine

Beaver, Paul C , Ph D , 1953-1973
Tulane University

Beck, Dorothy Margaret, 1941-1944
California State Department of Health

Becker, Elmer L , M.D , 1956-1973
Walter Reed Army Institute of Research

Beeson, Paul B , M.D., 1944, 1947-1948, 1951-1959
Yale University

Belding, Harwood S., Ph D., 1962-1964
University of Pittsburgh

Bell, E. John, Sc.D., 1963-1969
Rocky Mountain Laboratory

Bell, Joseph A , M.D , 1951-1968
National Institutes of Health

Benenson, Abram S., M.D., 1956-1983, 1985-1990
Walter Reed Institute of Research

Benham, Ross S., Ph.D., 1953-1956
University of Chicago

Bennett, Ivan L., Jr., M.D., 1956-1973
New York University

Berlin, Byron S., M.D., 1969-1971
Northwestern University Medical School

Berman, Sanford L , Ph.D., 1966-1976
Walter Reed Army Institute of Research

Bernheimer, Alan W., Ph D., 1955-1973
New York University

Blackman, Samuel S., Jr., M.D , 1941-1945
Johns Hopkins University School of Medicine

Blake, Francis G , M.D., 1941-1944, 1947-1951
Yale University School of Medicine

Blank, Harvey, M.D., 1959-1973
University of Miami School of Medicine

Bliss, Eleanor A., Sc.D., 1941-1944
Johns Hopkins University School of Medicine

Block, Walter D., Ph D., 1955-1957

Bloomfield, Arthur L., M.D., 1942-1944
Stanford University School of Medicine

Blough, Herbert A , M.D., 1969-1973
University of Pennsylvania

Boisvert, Paul L., M.D., 1942-1944
Yale University School of Medicine

Bond, Howard W., M.D , 1965-1969
University of Rhode Island

Bond, Victor P., M D , 1963-1973
Brookhaven National Laboratory

Borne, John E., M D , 1954-1958

Bosch, Herbert M., B.S , 1955-1962
University of Minnesota

Bovarnick, Marianne R., Ph.D., 1955-1965
Harvard School of Public Health

Boyd, Mark F , M.D , 1941-1945
The Rockefeller Foundation

Bozeman, F. Marilyn, B S , 1963-1975
Walter Reed Army Institute of Research

Brand, Gerhard, M.D., 1959

Breslow, Lester, M D., 1976

Brooke, Marion M., Sc.D , 1954-1974
Communicable Disease Control, Atlanta

Brown, John William, M.D., 1941-1942, 1965-1973
University of California School of Medicine

Brues, Austin M., M.D , 1958-1970
Argonne National Laboratory

Buddingh, Gerrit J., M D , 1941-1943, 1948-1971
Vanderbilt University School of Medicine

Bueding, Ernest B., M D., 1953-1973
Louisiana State University

Buescher, Edward L , M.D.1965-1973
Walter Reed Army Institute of Research

Bunim, Joseph J., M.D., 1949-1954
New York University

Bunn, Ralph, M.D., 1959-1961

Burgdorfer, Willy, Ph.D , 1967-1975
Rocky Mountain Laboratory

Burgess, Perry, 1944-1945
Leonard Wood Memorial, Ohio

Burrows, William, Ph D
University of Chicago

Calderone, Frank A , M.D , 1941-1944
New York University

Campbell, Robert J , Ph.D , 1965-1969
Cornell Aeronautical Lab, Inc

Cannon, Paul R., M.D., 1941-1944
University of Chicago Medical School

Capps, R. B , M D , 1951-1953
Northwestern University Medical School

Carpenter, Charles C J., M.D., 1971-1973
Johns Hopkins University

Casals-Ariet, Jordi, M.D., 1947-1973
Yale University School of Medicine

Chamberlain, Roy, Sc.D , 1966-1971
National Communicable Disease Center, USPHS

Chanock, Robert M., M.D , 1963-1974
National Institutes of Health

Chapman, S Stephen, M.D., 1969-1971
University of Minnesota

Chase, Merrill W , Ph.D., 1956-1961
Rockefeller University

Cheever, Francis S , M.D., 1953-1973
University of Pittsburgh

Chin, James, M D , 1977-1983
California State Health Department

Choppin, Purnell W , M D., 1968-1973
Rockefeller University

Cluff, Leighton E , M.D , 1959-1974
Johns Hopkins Hospital

Clyde, David F , M D., 1967-1973
University of North Carolina

Clyde, Wallace A , Jr , M.D , 1969-1973
University of North Carolina

Coatney, G. Robert, Ph D , 1959-1961, 1965-1973
National Institutes of Health

Coffey, Julia M , 1942-1944
New York State Department of Health

Coggeshall, Lowell F., M.D , 1949-1961

Cohn, Melvin, M.D., 1959-1963
Stanford University School of Medicine

Cohn, Zanvil A., M.D., 1968-1970
Rockefeller University

Connor, Daniel H , M.D , 1969-1973
Armed Forces Institute of Pathology

Contacos, Peter G., M.D., 1965-1973
National Institutes of Health

Cooke, Jean V , M D., 1942-1944
Washington University School of Medicine

Coons, Albert H., M.D., 1954-1973
Harvard Medical School

Cornell, Lewis L , M.D , 1959
University of Pennsylvania

Cornish, Herbert H., Ph.D.
University of Michigan

Couch, Robert B., M D , 1969-1973
Baylor University College of Medicine

Craighead, John, M.D., 1965-1967
Harvard Medical School

Cressy, Norman L., MAJ, MA, AUS, 1941-1945
Ft. Bragg, North Carolina

Crozier, Dan, COL, USA, MC, 1961-1973
Commanding Officer, U.S. Army Medical Unit

Culver, Benjamin D., M.D., 1980-1984
Southern Occupational Health Center, CA

Culver, James O , M.D , 1953-1961

Curnen, Edward C., Jr , M.D., 1949-1969
Presbyterian Medical Center

Cutler, Jeffrey A , M.D , 1977-1979
Wisconsin College of Medicine

Dammin, Gustave J., M.D., 1944-1945, 1951-1983
Harvard Medical School

Davenport, Fred M., M D , 1952-1975
University of Michigan School of Public Health

Davidson, Charles S., M.D., 1947-1953
Harvard University

Dawson, James R., Jr., M.D., 1942-1944
Vanderbilt University School of Medicine

Dawson, Martin H., M.D., 1942-1944
Columbia University

Deinhardt, Frederich H., M.D., 1966-1973
University of Illinois

DeKruif, Hendrik, M.D., 1947-1948
University of Minnesot

Delamater, James N., M.D., 1951-1952
University of California

Denny, Floyd W., Jr., M.D., 1952-1983
Vanderbilt University School of Medicine

Densen, Paul M., D.Sc., 1975-1988
Harvard University

Dethier, Vincent G., Ph D., 1961-1963
University of Pennsylvania

Dick, George F., M.D., 1942-1944
University of Chicago

Dillon, Hugh C., Jr., M D., 1968-1973
University of Alabama Medical Center

Dingle, John H., M.D., 1941-1945, 1947-1974
Harvard Medical Center

Dinman, Bertram D., M D., 1965-1973
Ohio State University

Dochez, Alphonse R., M.D., 1942-1944
Columbia University

Donaldson, Robert, M.D , 1970-1972
Boston University School of Medicine

Doull, John, M.D., Ph.D., 1990
University of Kansas Medical Center

Dowdle, Walter R., Ph.D., 1969-1973, 1986-1990
National Communicable Disease Center,
USPHS

Dowling, Harry F., M.D., 1953-1957, 1969-1973

Downs, Wilbur G , M.D., 1962-1973
The Rockefeller Foundation

Drinker, Philip, S.B., 1953-1960
Harvard University

Dubos, Rene J., M.D., 1958-1960
The Rockefeller Foundation

Duff, Fratis L., M.D., 1950-1952
The Surgeon General, Air Force

Dull, H. Bruce, M.D., 1971-1973
Centers for Disease Control

Dunlap, Jack W., M.D., 1951-1961
Dunlap & Associates Inc.

Duttweiler, David W., Ph.D., 1968-1974
University of Georgia

Dyer, Rolla E., M.D., 1949-1950
National Institutes of Health

Eagle, Harry, M.D , 1949-1954, 1960-1962
Albert Einstein College of Medicine, Yeshiva
University

Earle, David P., M.D., 1952-1955, 1967-1973

Eaton, Monroe D., M.D., 1941-1959
The Rockefeller Foundation

Ebaugh, Franklin G., M.D., 1952-1953
University of Colorado

Ebert, Robert H., M.D., 1954-1957

Edsall, Geoffrey, M.D , 1950-1973
Army Medical Service Graduate School

Eickhoff, Theodore E., M.D., 1963, 1969-1977
Communicable Disease Center, Atlanta

Eisen, Herman N., M.D., 1955-1973
Washington University School of Medicine

Eisenbud, Merrill, Sc.D.
New York University

Elberg, Sanford S., Ph.D., 1969-1973
University of California

Elderfield, Robert C., Ph.D., 1965-1973
University of Michigan

Eliassen, Rolf, Sc.D., 1963-1969
Stanford University

Elisberg, Bennett L., M.D., 1963-1976
Tulane University

Elmendorf, John E., Jr.
The Rockefeller Foundation

Enders, John F., Ph.D., 1941-1967
Harvard University Medical School

Engley, Frank B., Jr., Ph.D., 1983-1990
University of Missouri

Epstein, William L., M.D., 1960-1965
University of California

Fabrikant, Irene B., Ph.D., 1970-1976
University of Connecticut

Fair, Gordon M., M.D., 1947-1953
Harvard University

Faust, Ernest C., Ph.D., 1941-1945
Tulane University

Feldman, Harry A., M.D., 1954-1956, 1966-1976
State University of New York

Feller, Alto E., M.D.,1941-1946, 1947-1948, 1951-1967
University of Iowa College of Medicine

Ferguson, William W., M.D., 1954-1967
Michigan Department of Health

Finland, Maxwell, M D., 1950-1957, 1963, 1969-1975
Boston City Hospital

Fiset, Paul, M.D., 1965-1976
University of Maryland

Foley, George E., M.D., 1959

Forbus, Wiley D., M.D., 1942-1944
Duke University School of Medicine

Formal, Samuel B., Ph D., 1963-1973
Walter Reed Army Institute of Research

Fox, Eugene N., Ph.D., 1968-1974
University of Chicago

Fox, John P., M.D., 1955-1975
New York Public Health Research Institute

Francis, Thomas, Jr., M.D., 1941-1969
University of Michigan

Frank, Paul F., B.S., 1961-1967
U.S. Naval Hospital, Great Lakes

Fraser, Donald T., M.D., 1953-1955
University of Toronto

Freter, Rolf G., Ph.D., 1964-1974
University of Michigan

Freund, Jules, M.D., 1955-1957
Research Institute

Frisch, Arthur W., M.D., 1963
University of Oregon

Frye, William W., M.D., 1949, 1952-1973
Louisiana State University

Fuller, Henry S., M.D., 1955-1967
Walter Reed Army Institute of Research

Furth, Jacob, M.D.,1942-1944
Cornell University Medical College

Gammon, George D., M.D., 1942-1944
University of Pennsylvania School of Medicine

Gangarosa, Eugene J., M.D., 1967-1973
National Communicable Disease Center, USPHS

Gaskill, Herbert S., M.D., 1954-1960
University of Colorado

Gauld, Ross L., M.D., 1947-1969
Walter Reed Army Institute of Research

Geary, John M., M.D., LTC, USAF, MSC, 1965-1969
Walter Reed Army Medical Center

Geiman, Quentin M., Ph.D., 1951-1973
Harvard School of Public Health

Gellis, Sydney H , M.D., 1941-1943
Johns Hopkins Medical School

Gey, George
Johns Hopkins University

Gezon, Horace M., M.D., 1956-1958, 1960-1973
University of Pittsburgh

Gill, Thomas J. III, M.D., 1966-1976
University of Pittsburgh

Ginsberg, Harold S., M.D., 1951-1956, 1959-1976
Columbia University

Glaser, Robert, M.D., 1957-1961
University of California

Gochenour, William S., LTC, USA, VMD, 1966-1974
Walter Reed Army Institute of Research

Goddard, James A., M.D., 1956-1960
Goddard & Associates

Goddard, James L., M.D., 1957-1961
U.S. Public Health Service

Goldblum, Nathan, M.D.
Rogoff Medical Research Institute

Goldstein, Gerald, M.D., 1962-1966
University of Virginia

Goodner, Kenneth, M.D., 1947-1965
Jefferson Medical College

Goodpasture, Ernest W., M.D., 1942-1944
Vanderbilt University

Gordon, Francis B., M.D., 1942-1944
University of Chicago

Gordon, Irving, M.D., 1941-1946, 1953-1971
University of Southern California

Gotschlich, Emil C., M.D., 1971-1973
University of Connecticut Medical Center

Graef, Irving, M.D., 1942
New York University College of Medicine

Graves, Robert W., M D., 1942-1944
Duke University School of Medicine

Grayston, J. Thomas, M.D., 1965-1975
University of Washington

Greiff, Donald F. J., Sc.D., 1955-1959
Medical College of Wisconisn

Greisman, Sheldon E., M.D., 1965-1973
University of Maryland

Grieves, Robert B., Ph.D.
Northwestern University

Griffin, Herschel E , M.D., 1973-1984
San Diego State University

Grossberg, Sidney E., M.D., 1966-1969
The Marquette University

Grune, Werner, Ph.D.
Georgia Institute of Technology

Gwaltney, Jack M., Jr., M.D., 1968-1972
University of Virginia

Gyorgy, Paul, M.D., 1947-1949
University of Pennsylvania

Habel, Karl, M.D., 1967-1971
Scripps Clinic & Research Foundation

Haddon, William, Jr., M.D., 1965-1969
U.S. Department of Transportation

Hagen, Paul, M.D., 1947-1948
University of Minnesota

Hale, William M , M.D., 1941-1944, 1947-1949
University of Iowa, College of Medicine

Halstead, Scott B., M.D., 1966-1973, 1987-1990
Rockefeller University

Halvorson, Harold O., Ph.D., 1952-1960

Hamburger, Morton, Jr., M.D., 1942-1944, 1947-1954
University of Cincinnati

Hammon, William McD., M D., 1941-1944,
1947-1973
University of California

Hamre, Dorothy, 1966-1968
University of Chicago

Hantover, Matthew, M.D., 1955-1957

Hardy, Albert V., M.D., 1949-1973
Florida State Board of Health

Harford, Carl G , M.D., 1951-1957
Washington University School of Medicine

Harlan, William R , M.D., 1982-1990
National Institutes of Health

Harman, Louis E., Jr., M D., 1969-1971
Walter Reed General Hospital

Harrell, George T., M D., 1961-1970
Hershey Medical Center

Hartley, George, Jr., M.D., 1941-1942
Harvard University Medical School

Havens, W Paul, M.D., 1947-1969
Jefferson Medical College

Heidelberger, Michael, Ph.D., 1942-1944, 1947-1948,
1951-1968
Columbia University

Helwig, Elson B., M.D., 1968-1974
Armed Forces Institute of Pathology

Hendrix, Thomas R., M.D., 1968-1974
Johns Hopkins University

Henle, Werner, M.D., 1953-1973
University of Pennsylvania

Hennessy, Albert V , M.D., 1957-1973
University of Michigan

Hernandez, Thomas, M.D., 1965-1967
Louisiana State University

Hertig, Marshall, M.D., 1952-1955
Gorgas Memorial Institute

Hilleman, Maurice R., M.D., 1955-1961
Merck, Sharp & Dohme Research
Laboratories

Hirsch, James G., M.D., 1962-1974
The Rockefeller Foundation

Hirst, George K., M.D., 1941-1961
The Rockefeller Institute for Medical Research

Hitchens, Arthur P., M.D., 1942-1946
University of Pennsylvania

Hodes, Horace L., M.D., 1942
Johns Hopkins University

Hodge, Harold, M.D., 1952-1954

Hodges, Richard G., M.D., 1947-1948,
1951-1953
Western Reserve University

Hoffbauer, F. W., M.D., 1947-1953
University of Minnesota

Hoffert, Warren R., Ph.D
Florida State Board of Health

Hook, Edward W., M.D., 1961-1969
University of Virginia

Hopps, Hope E , B S., 1963-1975
National Institutes of Health

Hornick, Richard B., M D., 1965-1975, 1983-1990
Orlando Regional Medical Center

Horsfall, Frank L., M.D., 1941-1941, 1947-1955
The Rockefeller Institute for Medical Research

Houser, Harold B., M.D., 1954-1957, 1961-1973
Western Reserve University

Howe, Calderon, M.D., 1969-1973
Columbia University

Howe, Howard A , M.D., 1947-1950
Johns Hopkins University

Huff, Clay G., M.D., 1955-1971
National Naval Medical Center

Hugh, Rudolf, Ph.D.
George Washington University

Hullinghorst, R. L., COL, MC, USA
Armed Forces Institute of Pathology

Hunter, George W , M.D.
Walter Reed Army Institute of Research

Hutchinson, George B., M.D., 1977-1979
Harvard University

Ingelfinger, Franz J., M.D., 1961-1972
Boston University

Ipsen, Johannes, M.D., 1952-1957
Massachusetts State Institute of Laboratories

Jablon, Seymour, 1981-1984
National Cancer Institute

Jackson, Elizabeth B., 1963-1969
Walter Reed Army Institute of Research

Jackson, George G., Jr., M D., 1954-1975
University of Illinois

Jahnes, William G , CAPT, Sn.C., USA

Janeway, Charles A., M.D., 1942-1947
Harvard Medical School

Jeffery, Geoffrey M , Sc.D., 1965-1973
National Communicable Disease Center, USPHS

Jensen, Keith E., Ph.D , 1956-1961
Pfizer, Inc.

Johns, Carol J., M.D., 1985-1990
Johns Hopkins University

Johnson, Kenneth G., M.D., 1977-1983
University of New York

Johnson, Russell C., M.D , 1970-1974
University of Minnesota

Jordan, William S., Jr., M.D.: 1951-1990
Case Western Reserve University

Julianelle, Louis A., Ph.D., 1941-1944
Public Health Research Institute,
New York

Jung, Rodney C., M.D., 1967-1973
City of New Orleans

Kaiser, Robert L , M.D., 1969-1973
National Communicable Disease Center,
USPHS

Kalser, Martin H., M D.
University of Miami

Kaplan, Arthur M., Ph.D., 1968-1974
U.S. Army Natick Laboratories

Kaplan, Melvin H., M.D., 1954-1971
Case Western Reserve University

Kasel, Samuel L., M.D., 1969-1974
National Institutes of Health

Kathan, Ralph H., Ph.D., 1965-1967
University of Illinois

Katz, Samuel L., M.D., 1969-1974
Duke University

Keefer, Chester S., M.D , 1942-1944
Boston University

Kelly, Everett L., Ph.D , 1959-1961
University of Michigan

Kempe, C. Henry, M.D., 1958-1974
University of Colorado

Kern, Richard A., M.D., 1956-1968
Temple University Hospital

Kerr, John A., M.D., 1944-1945
California Department of Public Health

Kidder, George W., Ph D., 1959-1963
Amhurst College, Massachusetts

Kilbourne, Edwin D., M.D., 1959-1975, 1978-1983
Mount Sinai School of Medicine

King, Barry G , Ph.D., 1951-1969
Civil Aeronautics Administration

Kirkbride, Mary B., Sc.D., 1942-1946
New York State Department of Health

Kligman, Albert M., M.D., 1968-1970
University of Pennsylvania

Kneeland, Yale, 1941-1942
Columbia Univ. Coll. of Physicians and Surgeons

Knight, J. Vernon, M.D., 1963-1975
Baylor University

Knox, John M., M.D , 1968-1974
Baylor College of Medicine

Koenig, M. Glenn, M.D., 1964-1974
Vanderbilt University

Kotin, Paul, M.D., 1976-1979
John-Manville Corporation

Kraft, Merwyn A., 1952-1967
American Transit Association

Krampitz, Lester O., Ph.D., 1954-1957
Western Reserve University

Krause, Richard M., M.D., 1960-1974
Emory University

Krugman, Saul, M.D., 1958-1983
New York University School of Medicine

Kruse, Cornelius W., D.P.H., 1963-1973
Johns Hopkins School of Hygiene & Public Health

Kurland, Leonard T., M.D., 1983-1990
Mayo Clinic

Kuttner, Ann G., Ph.D., 1942-1944
Irvington House, Irvington on Hudson

LaBarthe, Darwin R., M.D., 1976-1983
University of Texas

Lancefield, Rebecca C , Ph.D., 1948-1973
The Rockefeller Institute for Medical Research

Langmuir, Alexander D., M.D , 1941-1946, 1947-1948
Centers for Disease Control

Lanza, Anthony J., M.D., 1953-1960
President's Commission on Veteran's Pensions

Lawrence, H. Sherwood, M.D., 1956-1974
New York University

Legters, Llewellyn J., M.D., 1983-1990
Uniformed Services University of the Health Sciences

Lemon, Henry M., 1943-1945
University of Chicago

Lennette, Edwin H., M.D., 1947-1976
California State Department of Public Health

Lennette, Francis, M.D., 1957-1961
California Department of Public Health

Lepow, Irwin H., M.D., 1960-1971
Western Reserve University

Lester, William, M.D., 1952-1953
Emory University

Levine, Bernard B., M.D., 1971-1973
New York University Medical School

Lewert, Robert M., M.D., 1959-1973
The University of Chicago

Ley, Herbert L., M.D., 1959-1974
Harvard School of Public Health

Lilienfeld, Abraham M., M.D., 1973-1979

Livingood, Clarence S., M.D., 1955-1973
Henry Ford Hospital

Lobitz, Walter C., Jr., M.D., 1955-1973
University of Oregon Medical School

Lockwood, John S., M.D., 1942-1944
University of Pennsylvania School of Medicine

Logan, John A., D.Sc., 1955-1963
Northwestern University

Logan, M. A
University of Cincinnati

Long, Perrin H., 1941-1942
Johns Hopkins University School of Medicine

Loosli, Clayton G., M D., 1942-1973
The University of Chicago

Lowenthal, Joseph P., Sc.D., 1966-1976
Walter Reed Army Institute of Research

Lumpkin, Lee R., M.D., 1969-1973
Wilford Hall USAF Medical Center

Lyall, Harold W., Ph.D., 1942-1944
New York State Department of Health

Lyons, Champ, M.D., 1942-1944
Harvard Medical School

Lyttle, John D., M.D., 1942-1944
Columbia University

Mack, Walter Noel, Ph.D., 1941-1942
University of California

Mackaness, George B., M.A , 1967-1974
Trudeau Institute

Mackie, Thomas T., 1941-1942
New York, New York

MacLennan, John D., M.D., 1953-1957
Columbia University

MacLeod, Colin M., M.D., 1942-1944, 1947-1973
New York University College of Medicine

Magill, Thomas P., M.D., 1941-1971
Cornell University Medical College

Maloney, Peter, M.D., 1954-1956
John Hopkins University

Markowitz, Milton, M.D., 1971-1973
University of Connecticut

Marshall, E. K , M.D., 1965-1966
John Hopkins University

Marshall, John D., Jr., Ph.D., 1968-1974
U.S. Army Medical Research Institute of Infectious Diseases

Mason, Richard A., Ph.D., 1969-1975
National Institutes of Health

Mathewson, John H., M.S., 1959-1961
University of California

Maxcy, Kenneth F., M.D., 1942-1944, 1947-1948
Johns Hopkins University

McCarty, Maclyn, M.D., 1951-1973
The Rockefeller Institute for Medical Research

McCollum, Robert W., Jr., M.D., 1958-1973
Yale School of Public Health

McCrumb, Fred R., Jr., M.D., 1959-1969
University of Maryland School of Medicine

McFarland, Ross A., Ph.D., 1951-1969
Harvard School of Public Health

McGuinness, Aims C., M D , 1942-1946, 1951-1960
Childrens Hospital of Philadelphia

McKee, Albert P., M.D., 1948-1971
State University of Iowa

McKhann, Charles F., M.D., 1942
University of Michigan Medical School

McLean, Donald M., M.D., 1969-1973
University of British Columbia

McLean, I. W., LT, MC, AUS, 1944

McMullen, Donald B., M.D., 1945-1967
Walter Reed Army Institute of Research

Meigs, J. Wister, M.D., 1953-1973
Yale University School of Medicine

Meiklejohn, Gordon N., M.D., 1947-1975
University of California

Meleney, Frank L., M.D., 1942-1944
Columbia University

Meleney, Henry E., M.D., 1942-1945, 1953-1959
New York University College of Medicine

Meyer, Karl F., Ph.D., 1942-1948, 1950-1957, 1959-1973
University of California Medical Center

Michener, C. D., Ph.D.
University of Kansas

Middlebrook, Gardner
University of Colorado

Milam, Daniel F., Ph.D., 1942-1944
Duke University School of Medicine

Millar, Jack W., M.D., 1967-1974
The George Washington University

Miller. Charles H., M.D., 1972-1974
Womack Army Hospital

Miller, Charles P., M.D., 1942-1946, 1948-1954
The University of Chicago

Miller, Lloyd F., M.D., 1962-1964
University of Nebraska

Miller, Robert, M.D., 1979

Milone, Nicholas A., M.D., 1962-1968
University of Michigan

Minard, David, M.D., 1965-1974
University of Pittsburgh

Mirick, George S., M.D., 1956-1969
New York City, New York

Mogabgab, William J., M.D., 1959-1973
Tulane University School of Medicine

Moody, Max D., M.D.1969-1974
National Communicable Disease Center, USPHS

Moore, Alice E., M.D., 1959
New York University

Moore, Carl V., M.D., 1944
Barnes Hospital

Moore, John A., DVM, 1957-1960
Environmental Protection Agency

Moore, John O., B.Sc., 1955-1961
Cornell University

Moore, Robert A., M.D., 1941-1944
Washington University School of Medicine

Morales-Otero, Pablo, M.D., 1942-1944
University of Puerto Rico

Morehead, Mildred A., M.D., 1977-1980
Albert Einstein College of Medicine

Morgan, Isabel M., M.D., 1947-1949
Johns Hopkins University

Morris, J. Anthony, M.D., 1965-1969
National Institutes of Health

Morse, Stephen, M.D., 1964-1968
The Rockefeller Foundation

Mortimer, Edward A., M.D., 1961-1973
University of New Mexico School of Medicine

Most, Harry, M.D., 1953-1973
New York University School of Medicine

Muckenfuss, Ralph S , M.D., 1947-1963
City of New York Department of Health

Mueller, John H., Ph.D., 1942-1944
Harvard Medical School

Murray, Edward S , M.D., 1955-1975
Harvard School of Public Health

Murray, Roderick, M.D., 1953-1967
National Institutes of Health

Nagler, Frederick P., M.D., 1959-1969
Department of Health & Welfare

Narva, William M., M.D., 1969-1973
National Naval Medical Center

Neefe, John R., M.D., 1947-1953
University Hospital Philadelphia

Nelson, John B., Ph.D., 1942-1945, 1969-1972
The Rockefeller Institute for Medical Research

Nelson, Norton, Ph.D., 1954-1990
New York University Medical Center

Neva, Franklin A., M.D., 1959-1968
Harvard School of Public Health

Newill, Vaun A., M.D , 1975-1983
Exxon Corporation/Medical Research Division

Norins, Leslie C., M.D., 1969-1973
Centers for Disease Control

Oliver, J.
State University of New York

Ormsbee, Richard A., Ph.D., 1959-1975
National Institute of Health, Montana

Oseasohn, Robert O., M.D., 1964-1974
Case Western Reserve University School of Medicine

Osler, Abraham G., Ph.D., 1965-1973
Johns Hopkins School of Medicine

Otto, Gilbert F., Sc.D., 1953-1959
Louisiana State University

Owen, Philip S., M.D., 1956

Pappagainis, Demosthenes, M D., 1966-1974
University of California

Pappenheimer, Alvin M., Jr., M.D., 1947-1973
New York University

Parker, Raymond C., M.D., 1959
Washington University

Parker, Robert F., M.D., 1959

Pastor, Jose R , M.D., 1942-1944
University of Puerto Rico

Paul, John R., M.D., 1941-1944, 1947-1967
Yale University

Payne, Anthony M., M.D., 1961-1965
Yale University

Peckinpaugh, Robert O., M.D., 1965-1973
Naval Medical Research Unit

Pepper, O. H. Perry, M.D., 1942-1944
University of Pennsylvania

Perez, Manuel A., 1942-1944
University of Puerto Rico

Phair, John J., M.D., 1942-1946
Johns Hopkins University

Philip, Cornelius B., M.D., 1947-1955
U.S. Public Health Service, Montana

Pillemer, Louis, M.D., 1950-1957
Western Reserve University

Pillsbury, Donald M., M.D., 1954-1968
Duhring Laboratories University Hospital

Pittman, Margaret, Ph.D., 1967-1973
National Institutes of Health

Plescia, Otto J., Ph.D., 1965-1971
Rugters

Plummer, Norman, M.D., 1941-1944
Cornell University Medical College

Pomales-Lebron, Amerigo, M.D.,
1942-1944
University of Puerto Rico

Pond, M. Allen, M.D., 1953
University of Pittsburgh

Porter, Richard J., Ph.D., 1951-1956
University of Michigan

Portnoy, Bernard, M.D.
University of Southern California

Powell, Robin D., M.D., 1964-1973
University of Chicago

Price, Winston H., M.D., 1955-1959
Johns Hopkins University

Puck, Theodore T., Ph.D., 1944, 1950-1955
University of Chicago

Quie, Paul G., M.D., 1965-1973
University of Minnesota Hospitals

Quilligan, J. Joseph, Jr., M.D., 1957-1971
Los Angeles County Hospital

Rafelson, Max E., Ph.D., 1963-1969
Presbyterian-St. Lukes Hospital

Rammelkamp, Charles H., Jr., M.D.,
1942-1981
Case Western Reserve University

Ranson, John P., Ph.D.
New England Institute for Medical Research

Rantz, Lowell A., M.D., 1942-1944, 1947-1948
Stanford University School of Medicine

Rapmund, Garrison, 1966-1971
MG, USA, MC, Medical Research and
Development Command

Rasmussen, Frederick A., M.D., 1947-1973
University of Wisconsin

Ravdin, Isidor S., M.D., 1949-1951
University of Pennsylvania

Reeves, Richard E., Ph.D.
Louisiana State University

Reeves, William C., Ph.D., 1947-1948,
1960-1974
University of California School of
Public Health

Reinhold, John R., M.D., 1951-1953
University of Pennsylvania

Remington, Richard D., Ph.D., 1980-1983,
1987-1990
University of Iowa

Ress, Don M., M.D., 1947-1948
University of Utah

Rickard, Elsmere R., M.D., 1943-1945
Minnesota Department of Health

Rinehart, James F., M.D., 1942-1944
University of California School of Medicine

Rippon, John W., Ph.D., 1968-1974
The University of Chicago

Rivers, Thomas M., M.D., 1949-1953
Rockefeller University

Rizzolo, John, COL, MC, USAF, 1961-1963

Robbins, Frederick C., M.D., 1956-1976
Cleveland Metropolitan General Hospital

Robbins, John B., M.D., 1956-1960,
1971-1973
National Institutes of Health

Robertson, Oswald H., M.D., 1941-1946
The University of Chicago

Robinson, Elliott S., M.D., 1941-1942
Massachusetts State Antitoxin
& Vaccine Laboratory

Robinson, Roslyn Q., 1962-1973
National Communicable Disease Center, USPHS

Rock, Robert Edwin, M.D., 1950-1952
University of Minnesota

Rogers, David E., M.D., 1958-1969
Vanderbilt University School of Medicine

Rogers, Edward S., M.D., 1942-1944
Union University, Albany Medical College

Rohlich, Gerard A., Ph.D., 1963-1969
University of Wisconsin

Rose, Harry M., M.D., 1942-1944, 1949-1975
Columbia Univ. Coll. of Physicians and Surgeons

Rosen, Fred S. M.D., 1969-1973
Children's Hospital Medical Center

Rosen, Leon, M.D., 1969-1973
National Institute of Allergy & Infectious Diseases

Rosenwinkel, Norbert E., M.D., 1971-1973
Grinnell Corporation

Rozeboom, Lloyd E., Sc.D., 1942-1943
1953-1973
Johns Hopkins University

Rudnick, Albert C., Ph.D., 1966-1973
University of California

Ruegsegger, James M., M.D., 1941-1943
Westwood, New Jersey

Ruffin, Julian M., M.D., 1942-1945
Duke University School of Medicine

Russell, Philip K., M.D., 1969-1973
Walter Reed Army Institute of Research

Ryan, Allan J. M.D., 1964-1969
Fellow American College of Sports Medicine

Sabin, Albert B., M.D., 1941-1943,
1947-1971
University of Cincinnati College of Medicine

Sadun, Elvio, H., Sc.D, 1965-1973
Walter Reed Army Institute of Research

Sadusk, J. F., M.D., 1941-1942, 1947
Yale University

Salk, Jonas E., M.D., 1944-1969
University of Michigan

Sanford, Jay P., M.D., 1969-1974
University of Texas

Sapiro, J. J., CAPT, USN
Department of the Navy Bureau of Medicine and Surgery

Sartwell, Philip E., M D., 1947-1948, 1954-1961
Johns Hopkins University

Sawyer, Wilbur A , M D., 1942-1943
The Rockefeller Foundation

Saylor, Louis F , M.D., 1964-1969
California State Department Public Health

Scanlon, John, Ph D., 1969-1973
University of Texas

Schaedler, Russell W., M.D., 1966-1974
Jefferson Medical School of Thomas Jefferson University

Schaeffer, Morris, M D., 1961-1969
New York City Health Department

Scherer, William F., M D., 1961-1974
Cornell University Medical College

Schlesinger, R. Walter, M.D., 1944-1945
Robert Wood Johnson Medical School

Schliessmann, Donald J., M.S., 1960-1974
National Communicable Disease Center, USPHS

Schmidt, Leon H., Ph.D., 1964-1966
University of California, Davis

Schmidt, Willard C , M.D., 1956-1972
University of Rochester School of Medicine and Dentistry

Schmitt, Richard P., B.S., 1968-1974
Cleveland Metropolitan General Hospital

Schoenbach, Emmanuel B., M D., 1941-1943,
1947-1948
Harvard University Medical School

Schulman, Jerome L , M.D., 1969-1973
Cornell University Medical College

Schultz, Edwin W., M.D., 1942-1944
Stanford University

Schwentker, Francis F., M.D., 1942, 1947-1949
The Rockefeller Foundation

Seal, John R., M.D , CDR, MSC, USN, 1952-1958
Great Lakes Training Center

Seastone, Charles V., M.D., 1942, 1947-1969
University of Wisconsin Medical School

Seegal, David, M.D. 1942-1944
Columbia University

Sessions, Howard F., M.D., 1955-1959

Shaffer, Morris F., Ph.D., 1942-1944,
1951-1960
Harvard Medical School

Shank, Ronald C., Ph.D., 1983-1989
University of California

Shannon, James A., M.D., 1944-1945
Goldwater Memorial Hospital, New York

Shattuck, George C., M.D., 1942-1945
Harvard University Medical School

Shaw, Edward B., M.D., 1942-1944
Stanford University School of Medicine

Shelley Walter B., M.D., 1958-1962
University of Pennsylvania

Shelokov, Alexis, M.D., 1966-1969
National Institutes of Health

Shepard, Charles C., M.D., 1959-1975
National Communicable Disease Center, USPHS

Shepard, William P., M.D., 1954-1960

Sherman, James M., Ph.D., 1942-1944
Cornell University

Shope, Richard E., M.D., 1953-1964
The Rockefeller Foundation

Silverman, Myron S., Ph.D., 1969-1973
Brookhaven National Laboratory

Silverstein, Arthur M., Ph.D., 1971-1973
Johns Hopkins University School of Medicine

Simmons, James S., M.D., 1947-1954
Harvard University School of Medicine

Slade, Hutton D., M.D., 1957-1961

Smadel, Joseph E., M.D., 1947-1967
National Institutes of Health

Smillie, Wilson G., M.D., 1942-1944
Cornell University Medical College

Smith, Carroll N., Ph.D., 1958-1976
U.S. Department of Agriculture

Smith, Charles E., M.D., 1941-1944, 1947-1948,
1952-1969
Stanford University

Smith, David H., M.D., 1970-1974
Children's Hospital Medical Center, Boston

Smith, David T., M.D., 1942-1944
Duke University School of Medicine

Smith, Lawrence W., M.D., 1942-1944
Philadelphia, Pennsylvania

Smithburn, Kenneth C., M.D., 1952-1953
The Rockefeller Foundation

Snyder, John C., M.D., 1941-1943, 1947-1952,
1955-1976
Harvard School of Public Health

Soper, Fred L., M.D., 1942-1945
The Rockefeller Foundation

Spark, Richard F., M.D., 1976-1983
Beth Israel Hospital

Spicer, William S., Jr., M.D., 1977-1983
University of Maryland

Spink, Wesley W., M.D., 1942-1944
University of Minnesota Medical School

Sprunt, Douglas H., M.D., 1941-1944
Duke University School of Medicine

Stacy, Ralph W., M.D., 1965-1967
University of North Carolina

Stallones, Reuel A., M.D., 1972-1983
University of Texas School of Public Health

Stanley, W. M., 1945
The Rockefeller Institute for Medical Research

Stauber, Leslie A., Ph.D., 1965-1973
Rutgers, The State University

Stebbins, Ernest L., M.D., 1942-1944, 1949-1957
Columbia University

Sternberg, Thomas H., M.D., 1955-1959
University of California

Stetson, Chandler A., M.D., 1965
New York University

Stewart, George F., M.D., 1965-1971
University of California

Stewart, William H., M.D., 1955-1959

Stokes, Joseph, Jr., M.D. 1942-1944,
1947-1953
University of Pennsylvania School
of Medicine

Stollerman, Gene H., M.D., 1956-1974
Northwestern University Medical School

Stoner, Richard D., Ph D., 1966-1973
Brookhaven National Laboratory

Stoughton, Richard B., M.D , 1961-1973
Western Reserve University

Strauss, Elias, M.D , 1941-1946
Columbia University

Strauss, John S., M.D., 1968-1974
Boston University

Stull, Arthur, M.D , 1956
Office of The Surgeon General,
Research & Development DA

Suthff, Wheelan D , M D , 1942-1944
New York City Department of Health

Swift, Homer F., M.D., 1942-1944
The Rockefeller Institute for Medical
Research

Syverton, Jerome T., M.D., 1959-1961

Tager, Morris, M.D., 1968-1972
Emory University

Talbott, John H., M D , 1962-1972
Lake Shore Drive, Chicago, Illinois

Tamm, Igor, M D., 1969-1973
The Rockefeller Foundation

Taplin, David, M D , 1967-1974
University of Miami Medical School

Tatlock, Hugh, Captain, MC, 1943-1945
Ft. Bragg, North Carolina

Tauraso, Nicola M., M.D , 1969-1973
National Institutes of Health

Taylor, Grant, M D , 1949
Duke University

Taylor, Richard M., M.D., 1955-1969
University of California

Ten Broeck, Carl, M.D., 1942-1945
The Rockefeller Institute for Medical
Research

Thomas, Lewis, M.D.: 1951-1970
New York University College of Medicine

Thompson, Samuel D., Ph.D, 1983-1990
Division of PH&E Laboratories, Trenton, NJ

Tiedeman, Walter T., B.E , 1947-1963
University of Michigan

Tigertt, William, M.D , 1941-1944, 1948-1973
BG, USA, MC
Walter Reed Army Institute of Research

Tillett, William S . M.D., 1941-1944,
1948-1967
New York University College of Medicine

Tillmann, William A., M.D., 1951-1953,
1957-1961
University of Western Ontario

Top, Franklin H., M.D., 1942-1944
Wayne University

Topping, Norman L., M.D., 1951-1956
National Institutes of Health

Townsend, Frank M., M D , 1983-1990
University of Texas

Trager, William, Ph.D., 1959-1961, 1965-1973
The Rockefeller Institute for Medical Research

Trask, James D., M.D , 1941-1942
Yale University School of Medicine

Traub, Robert, Ph.D., 1964-1976
University of Maryland School
of Medicine

Treffers, Henry P., Ph.D., 1947-1955
Yale University

Treter, Rolf, Ph.D.
Jefferson Medical College

Turner, Roy H., M.D., 1947-1951
Tulane University Medical School

Uhr, Jonathan W., M.D., 1962-1973
New York University School of Medicine

Updyke, Elaine L., Sc.D., 1957-1967
National Communicable Disease Center,
USPHS

Verwey, Willard F., M.D., 1965-1973
The University of Texas

Vinson, J. William, M.D., 1965-1969
Harvard School of Public Health

Vivona, Stefano, M.D., 1963-1967
Walter Reed Army Institute of Research

Vorwald, Arthur J., M.D., 1952-1956
University of Chicago

Vosti, Kenneth L , M.D., 1970-1974
Stanford Medical Center

van der Schalie, Henry, Ph D , 1953-1973
University of Michigan

van Rooyen, C. E , M.D., 1949-1961
University of Toronto

von Lichtenberg, Franz C , M.D., 1959-1961, 1965-1969
Peter Bent Brigham Hospital

von Oettiangen, Wolfgang F., M.D., 1954-1960
National Institutes of Health

Wade, Winsor H , M D., 1945
National Institutes of Health

Wagner, John, M.D., 1967-1973
National Institutes of Health

Wagner, Robert R., M.D., 1966-1969
University of Virginia

Wannamaker, Lewis W., M.D., 1954-1974
University of Minnesota Medical School

Ward, Robert, M.D., 1942-1944, 1947-1973
University of New York

Ward, Thomas G., M D., 1951-1956

Warren, Andrew J., M.D., 1942-1944
The Rockefeller Foundation

Watson, Cecil J., M D., 1947-1953
University of Minnesota Medical School

Watson, Dennis W., Ph.D , 1947-1960
University of Minnesota

Watson, Robert B , M D., 1944-1945
University of Tennessee School of Medical Research

Watt, James, M.D., 1948-1959
Louisiana State University

Wearn, Joseph T., M.D., 1947-1949
Western Reserve University

Wedgewood, Ralph J., M D.
University of Washington

Wegman, Myron E., M.D., 1949-1952
Louisiana State University

Weidenkopf, Stanley J., B S., 1965-1973
University of North Carolina

Weidhass, Donald E , Ph.D , 1970-1976

Weinbach Eugene C., 1961-1963
National Institute of Health

Weiss, Emilio, I h D., 1959-1975
Naval Medical Research Institute

Weller, Thomas H., M D., 1953-1983
Harvard School of Public Health

Wells, William F., M.D., 1942-1944
University of California

Wesselhoeft, Conrad, M.D., 1944
Boston, Massachusetts

Wheeler, Clayton E., Jr., M.D., 1961-1973
North Carolina Memorial Hospital

Wiley, Grove G., M.D., 1960-1972
Alfred I. duPont Institute of the Neumours Foundation

Wilkening, George M., M.D., 1977-1983
AT&T Bell Laboratories

Williams, W. Lane, M.D., 1947-1948
University of Minnesota

Wilson, Armine T., M.D., 1949-1965
Alfred I. duPont Institute of the Neumours Foundation

Wilson John T., Jr., M.D., 1977-1980

Winzler, Richard J., Ph.D., 1960-1973
University of Illinois

Wise, Robert I., M.D., 1958-1966
Jefferson Medical College

Wisseman, Charles L., Jr., M.D , 1955-1983
University of Maryland

Witten, Victor H , M.D., 1968-1972
University of Miami

Wolf, Robert A., 1963
Aeromedical Laboratory

Wolinsky, Emanuel, M.D., 1969-1973
Case Western Reserve University

Wood, Harrison F., M.D., 1957-1965
Yale University

Wood, William B., M.D., 1942-1944, 1948-1971
Johns Hopkins University

Woodward, Theodore E., M D., 1950-1990
University of Maryland

Work, Tilford H , M D., 1962-1973
National Communicable Disease Center, USPHS

Wright, Willard H., Ph.D., 1945-1973
National Institutes of Health

Yaglou, Constantin P , M.D., 1947-1960
Harvard School of Public Health

Yoeli, Meir, M D., 1966-1973
New York University

Young, Martin D., Sc.D., 1965-1973
Gorgas Memorial Laboratory

Younger, Julius S., Sc.D., 1959-1975
University of Pittsburgh

Zimmer, James G., M.D., 1977-1979
University of Minnesota

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Appendix 1

The Funding of the Board

THE RESEARCH ACTIVITIES OF THE ORIGINAL BOARD

The fiscal and administrative responsibilities for the activities of the Board and its Commissions were assigned to the Department of the Army. No funds, however, were directly assigned to support the research that was conducted or sponsored by the various Commissions. Initially, funds to support Commission research were channeled through the Surgeon General of the Army and designated for AFEB research activities; these allocations were not in competition with other Army funds. In 1958, the Army's Research and Development Command was established. Budgeted funds to support the Command activities were requested through standard budgetary channels, and they were authorized by Congress. After the funds were allocated by the Office of the Budget, they were channeled through the Department of Defense to the Research and Development Command. In 1983, the funding for research and development for all three services was consolidated and made the administrative responsibility of the Department of the Army.

The Board was expected to, and did, take into consideration *(a)* research that was being conducted by governmental and nongovernmental agencies on similar problems, *(b)* the propriety of the methods of research that were recommended to be employed by the military, and *(c)* the pertinent practices that were emphasized by the military departments in the preventive medicine program. Intramural research activities that were performed by scientists within the military had a direct bearing on the contracts and grants awarded to fund the research that the Board and its Commissions sponsored. Duplication was avoided, unless confirmation or extension of data was needed. Commission grants and contracts were subject to the Board's approval. These were not rubber-stamp approvals, since the competition was quite keen. The contract was awarded by the Research and Development Command and operated under the usual contractual system. Grants usually extended from three to five years, depending upon the quality of the research and the nature and extent of the problem. Projects were modified, extended, or terminated depending upon the military relevance of the work, the significance of the work, and its quality. Detailed written reports were submitted annually and included descriptions of the scientific methods used, results of the work performed, expenditures, and budgetary items.

Three or four times annually, the Commission Directors met with the full Board, usually at the Walter Reed Army Institutes of Research. High-level government and military officers often attended the Board meetings, including the respective Surgeons General or their designated deputies and the Deputy Secretary of Defense for Health Affairs. The Preventive Medicine Officers of the Army, Navy, and Air Force reported on the prevalence of illness among military personnel. This arrangement permitted the Commission Directors to present detailed reports of research that was in progress or that had been completed under their aegis. Discussion concerned the quality of the work, its relevance to immediate health problems, and the prevention of illness. The military representatives and the civilian scientists involved engaged in frank discussions in the give-and-take atmosphere of the meetings.

The following tables, which are reprinted from a report prepared by Stanhope Bayne-Jones in January 1946, clearly demonstrate that the Board expended the military's funds carefully and wisely:

Shown in the following Tables are the contract figures and expenditures for work conducted by the AEB and Commissions for the fiscal years 1943, 1944, 1945 and 1946:

Status of Expenditures under Research Contracts for Commissions Under Army Epidemiological Boards

Fiscal Year 1943

Contractor	Amount of Contract	Expenditures through 30 November 1945
University of Chicago	43,800 00	41,096.45 (Final) (W-709-MD-293)
Yale University	56,155.00	31,192.34 (Final) (W-709-MD-294)
University of Michigan	54,687 00	31,111.55 (Final) (W-709-MD-295)
University of Pennsylvania	44,140 00	25,145.59 (Final) (W-709-MD-296)
Johns Hopkins University	22,300 00	19,286.34 (Final) (W-709-MD-297)
Yale University	18,000.00	17,820.81 (Final) (W-709-MD-298)
New York University	18,100.00	9,092.07 (Final) (W-709-MD-299)
Columbia University	18,500 00	1,714.09 (Final) (W-709-MD-303)
Rockefeller Foundation	25,000.00	735.98 (Final) (W-709-MD-312)
Totals	300,682.00	177,195.22

NEPHTUNE FOGELBERG, Major, MAC, Assistant Director, Fiscal Division, December, 1945

Fiscal Year 1944

Contractor	Amount of Contract	Expenditures through 30 November 1945
Boston University	30,000.00	15,968.63 (Final) (W-709-MD-469)
University of Chicago	58,588.00	54,503.32 (Final) (W-709-MD-471)
Johns Hopkins University	25,000.00	21,165.03 (Final) (W-709-MD-472)
The Regents of the University of Michigan	50,000.00	36,598.31 (Final) (W-49-007-MD-3)
New York University	21,380.00	15,565.27 (Final) (W-709-MD-467)
The Rockefeller Foundation	15,000.00	6,920.02 (Final) (W-709-MD-470)
University of Pennsylvania	30,000.00	30,000.00 (Final) (W-709-MD-468)
Yale University	96,000.00	76,617.20 (Final) (W-709-MD-464)
Yale University	30,000.00	20,867.08 (Final) (W-709-MD-465)
Yale University	44,000.00	35,270.17 (Final) (W-709-MD-466)
Dept. of Commerce National Bureau of Standards	(None)	1,429.18 (Final)
Totals	399,968.00	314,904.21

NEPHTUNE FOGELBERG, Major, MAC, Assistant Director, Fiscal Division, December, 1945

Status of Expenditures, continued:

Fiscal Year 1945

Contractor	Amount of Contract	Expenditures through 31 December 1945
Boston University	21,000 00	12,519.67 (W-49-007-MD-52)
University of Chicago	76,834.00	63,772 20 (W-49-007-MD-50)
Johns Hopkins University	25,000.00	18,937.06 (W-49-007-MD-55)
Regents of the University of Michigan	60,000.00	36,390.40 (W-49-007-MD-53)
New York University	26,170.00	23,160.57 (W-49-007-MD-57)
New York University	25,000.00	176.41 (W-49-007-MD-58)
University of Pennsylvania	95,000 00	80,848.78 (W-49-007-MD-54)
Yale University	136,000.00	127,551.31 (W-49-007-MD-49)
Yale University	71,000.00	46,183.02 (W-49-007-MD-51)
Yale University	67,000 00	64,613.87 (W-49-007-MD-56)
Totals	603,004.00	474,153.29

A. H. LAWRENCE, Captain, MAC, Acting Director, Fiscal Division, 5 January 1945

Fiscal Year 1946

Contractor	Amount of Contract	Expenditures through 30 November 1945
Boston University	23,000 00	1,229.23 (W-49-007-MD-308)
University of Chicago	53,750.00	8,005.48 (W-49-007-MD-309)
Johns Hopkins University	10,000.00	3,185.89 (W-49-007-MD-310)
The Regents of the University of Michigan	54,170.00	847.49 (W-49-007-MD-311)
New York University	19,800.00	1,634.52 (W-49-007-MD-312)
New York University	10,000 00	0 (W-49-007-MD-313)
University of Pennsylvania	109,000.00	15,667.30 (W-49-007-MD-314)
Yale University	86,200.00	32,977.19 (W-49-007-MD-315)
Yale University	13,154.00	1,472.68 (W-49-007-MD-316)
Yale University	83,000 00	11,948.48 (W-49-007-MD-317)
Totals	462,074.00	76,968.26

NEPHTUNE FOGELBERG, Major, MAC, Asst. Director, Fiscal Division, 5 December 1945

The presidents of the AFEB, because of their continuing obligations to the academic institutions that they served, often required office-staff support; this was accomplished through the medium of an Army contract. In addition to a full-time secretary, part-time professional staff were needed periodically to conduct the work of an academic department in a university medical school or hospital. These funds were applied for through the Medical Research and Development Command. This type of stipend to the Office of the President of the AFEB ceased in 1973 after the AFEB was reorganized and its Commissions were abolished.

ORGANIZATIONAL AND FUNCTIONAL PROBLEMS CAUSED BY FISCAL CONSTRAINTS

A near crisis caused by fiscal limitations, which was of considerable importance to the AFEB, occurred in late January 1976. Lt. Colonel Duane Erickson, Executive Secretary of the AFEB, informed me that the planned 12–13 February meeting of the Board would have to be cancelled. This information had come from the Office of the Surgeon General. Colonel Erickson had previously talked with Dr. Lennette, who was then President of the Board, who had accepted this decision and concurred that the meeting would have to be cancelled.

This action alarmed me for several reasons. The principal one was, simply, that Board members were already restive. The activities and responsibilities of the AFEB as an advisory group had obviously waned since the Commission system had been abolished. To cancel a meeting for lack of funds at this time might well have conveyed to Board members that their advisory services were no longer perceived as important. This cancellation might have seemed to be a passive suggestion from the military that the Board would soon fade or be phased out. At least, these were the ominous thoughts that crossed my mind.

I immediately called Ed Lennette and asked for his approval of a plan that I had, which would allow the meeting to proceed. He gave his full assent for me to carry through and to negotiate in any way possible with Lt. General Richard Taylor, the Surgeon General of the Army. I simply proposed to General Taylor that all Board members coming from within five hundred miles of Washington would defray their own travel expenses, and that none of us accept an honorarium, only per diem reimbursement for the actual costs of living during the meeting. Should this plan not be acceptable to General Taylor, I told him, other appropriate funds would be found to meet the expense of the meeting. He immediately took action, approved the plan, and located funds to allow the meeting to proceed. Without this support, it is highly likely that the AFEB would have terminated at this point. Members of the Board needed to be made aware that their services were definitely of significant importance to the military, and would be adequately supported.

THE BOARD'S INTERACTION WITH THE MEDICAL RESEARCH AND DEVELOPMENT COMMAND AND THE MILITARY SERVICES ON THE BUDGETS FOR MILITARY PREVENTIVE MEDICINE

At each of its meetings, the AFEB heard presentations from the Commander of the Medical Research and Development Command and the military service representatives regarding budget forecasts and constraints. Because of congressional budgetary decisions, there were often questions of whether the services could or could not conduct their assigned missions with the available funds.

In 1979, Dr. Herschel Griffin, President of the Board, appointed an ad hoc group to consider the matter of adequate funding for research programs in the field of infectious diseases of military significance. Drs. Benenson, Jordan, Rammelkamp, and I served on this study group. The resolution that we formulated

was approved by the Board and submitted to the appropriate authorities, dated 9 October 1979, and follows:

MEMORANDUM FOR:

The Assistant Secretary of Defense (Health Affairs)
The Surgeon General, Department of the Army
The Surgeon General, Department of the Navy
The Surgeon General, Department of the Air Force

SUBJECT: Resolution on Funding for Infectious Disease Research Programs of Military Significance

The Armed Forces Epidemiological Board (AFEB), in the meeting held 27–28 September 1979, reviewed a letter from the Surgeon General of the Navy expressing concern over recent reductions in funds for medical research of military importance. The AFEB shares this concern over these reductions in research funds and hereby resolves that.

Whereas: Epidemics of infectious disease have been the concomitant of war throughout history, have often accompanied recent U.S. military actions and must be expected in future wars. They have often been, and may again be, the deciding factor in the outcome of numerous battles and campaigns. While advances in medical science had materially reduced the impact of infectious disease in the Vietnam action, the world experience in the control of disease in the last decade indicates a very serious deterioration, rather than improvement, in the control of several diseases of great potential military importance.

Whereas: The battle against malaria, carried out under the aegis of the World Health Organization, with the goal of world-wide eradication, proceeded with success until mosquitoes became resistant to the insecticides on which the program was based. Then the malaria parasites themselves became resistant to chloroquine and the related drugs which had been developed because of the great problem of malaria during World War II. As a consequence there has been a disastrous resurgence of malaria and fatality therefrom in most tropical areas—especially in Asia and South America. Insecticide resistance has been present for some time in African mosquitoes and now drug resistant parasites have also emerged. The present lack of an effective chemoprophylactic drug assures that military operations of any magnitude out of CONUS or Europe will be associated with a serious loss of manpower.

Whereas: Schistosomiasis has increased, rather than lessened, as a threat to military personnel in field operations because of the construction of extensive hydroelectric hydroelectric reservoirs in Africa, Asia, and Mid-East and South America. No drug is available which will prevent infection; no vaccine has reached the point of human testing; treatment methods are in dire need of improvement.

Whereas: While old viral diseases like dengue in tropical areas and the encephalitides to which our troops have been exposed in eastern Asia and in tropical forests anywhere continue to pose unresolved problems, new ominous diseases have emerged such as Bolivian hemmorhagic fever and Argentinian hemorrhagic fever in South America, and Lassa fever, Ebola virus disease and Rift Valley fever on the continent of Africa. These are highly fatal diseases which can be expected among our forces if we dispatch troops to the infected areas, boundaries of which have not been clearly defined. Our defenses against these new diseases are currently non-existent.

Whereas: Although tropical diseases are of growing concern to civilian agencies, and the National Institute of Allergy and Infectious Diseases has long supported research in this area, funds available to NIH for this purpose have been limited because of the priority assigned to diseases important in the United States. A recent analysis of support of tropical disease research by all federal agencies showed that the studies supported by DoD and DHEW are complementary, with minimal duplication. For example, with particular reference to malaria, almost the only support for research and development of chemoprophylatic and chemotherapeutic drugs is that currently funded by the Army. Aggregations of military personnel in the recruitment process have always been associated with epidemics of disease which exist in but constitute only a minor problem to the civilian population such as meningitis, influenza, and "childhood diseases," field operations have been associated with diarrheal disease, often militarily disastrous. While these matters are subjects to concern to civilian medicine, they are largely considered to be only of importance to pediatricians and are seldom studied with reference to the rapid mobilization and crowding of masses of susceptibles.

Therefore, be it hereby resolved: The Armed Forces Epidemiological Board strongly urges that DoD take all efforts to provide a realistic increase in the funds available for intensive research activities, in-house and by contract,

to seek early solutions of these problems so that military operations can be carried out anywhere on the globe without the need to anticipate a serious loss of fighting strength from diseases which might be preventable.

Herschel E. Griffin, M.D.
President

AFEB SUPPORT OF BUDGETS AND FINANCIAL REQUESTS FOR MEDICAL RESEARCH

At least once annually during AFEB meetings, the Commander of the Medical Research and Development Command advised the Board on fiscal matters and described in broad, as well as in specific, terms the funds that were available to the Command for conducting medical research. This was always an important discussion, since many of the Committees' and the Board's scientific capabilities were directly related to the availability of funds. Throughout its history, the Board has been called upon, in its advisory role, to render helpful advice and to testify before various committees when support was needed to justify budgetary requests and expenditures. Brig. General Garrison Rapmund transmitted the following letter, dated 10 December 1980, to me:

Dear Ted,

On 19 September 1980, you wrote offering the assistance of the Board to Army Medical Research. This was in follow-up to my presentation to the Board at Parson's Island outlining budgetary problems. The Board's assistance is needed and I am grateful for this assistance.

Since September, there has been much activity. I am happy to report that the Joint Conference of House and Senate Appropriation Committees has fully restored specific reductions proposed by the House in infectious disease ($3.0 million), surgery ($3.0 million) and dental research ($0.23 million). Restoration of non-specific reductions in Army R&D was less complete, so some decrements will occur to the Army Medical R&D program from the original FY-81 Presidential submission. The net effect for FY-81 is likely to be a continuation of the austerity funding of medical research which we experienced in FY-80. But, the worst case impact I presented to the Board seems to have been averted.

The House-passed Defense Appropriate Bill directed the Secretary of Defense to conduct a study of consolidation of medical research activities in the Department of Defense (Encl 1). This study is proceeding now under the overall supervision of the Principal Deputy Under Secretary of Defense for Research and Engineering, Dr. Walter LaBerge. The study is examining options for change to the management structure which guides DOD medical research. A report will be submitted to Congress in January. I am confident a copy of the report can be shared promptly with the Board.

As you can see from Enclosure 1, some familiar concerns continue to influence the Congress. There are misconceptions about our program that must be corrected. There are misconceptions about how biomedical science is conducted that also must be corrected. We do our best to communicate with Congress on both counts. But, that is not enough. Others who are informed, who have national and international scientific reputations, who are known and respected by the Congress must validate what we report to the Congress. Certainly the members of the AFEB fit this description. Therefore, over the coming months, I shall be forwarding to you material describing our program, DOD issue papers, interagency correspondence, GAO and other survey and investigation reports, and other material which I believe will place Board members in the strongest position to make their views known.

The next meeting of the Board in February in Bethesda is an opportunity to take stock. I look forward to seeing you then. With warm personal regards.
Sincerely,

Garrison Rapmund
Brigadier General, MC
Assistant Surgeon General for Research and Development

Not long thereafter, General Rapmund, by then a Major General and Commander of the Research and Development Command, faced even more serious—and almost incapacitating—budgetary cuts that would have seriously crippled the Research and Development programs. Dr. William D. Tigertt (a Brigadier General, retired, and a former Board member) and I joined General Rapmund in testifying before a DoD budget committee meeting at the Pentagon. We presented a historical perspective of the military medical research program that had been of inestimable value to each of the services. We discussed how Medical Research and Development had directly influenced military operations during wartime. Malaria, dengue fever, meningococcal infections, schistosomiasis, other parasitic diseases, and dysenteric disorders were put in their proper perspective. This testimony helped not only prevent further budget cuts, but it also helped to restore prior reductions in the budgets. As we left the meeting, the chairman of the budget committee simply said, "We will work with you." A day or so later, General Rapmund called me to express his thanks and remarked that all the funds had been restored to his budget for the coming year.

Appendix 2

Memoir

by

Joseph Stokes, Jr., M.D.

Dr. Joe Stokes wrote a memoir for his family and he sent a copy of it to me to include in the AFEB archives. In his letter to me, dated 14 January 1972, he wrote, "This experience happened to be of far greater importance to the men [in] all the services than to those in the Army alone. If [Secretary of War] Henry Stimson had not supported this approach, it is my feeling that almost all of the work of the Army Epidemiological Board during World War II would, so to speak, have gone 'down the drain.' After writing this brief report, I checked it carefully with Aims McGuinness, who, as you recollect, assisted B. J. in the administration of the Board, and he has said that he can corroborate all of the details. . . ." The following, which I have edited slightly, is an excerpt from Dr. Stokes's memoir:

An exceptional opportunity arose early in the conflict as the result of two personal contacts. First, my brother and his wife, Dr. and Mrs. S. Emlen Stokes, were long-time friends of Mr. Henry L. Stimson, the Secretary of War, through their common membership in the Ausable Club, located in the highest mountains of the Adirondacks. Henry Stimson had cut out mountain trails and had spent many of his summers exploring the natural wilderness. Second, Dr. Philip Stimson of New York, who was first cousin to Secretary of War Stimson, had been interested in the Philadelphia studies on measles. Dr. Stimson suggested that his cousin Henry Stimson discuss with me both the extremely high rates of disease casualties in World War I and the possibility of controlling infectious diseases, particularly among recruits in boot camps, where high rates of infection had previously occurred. [NOTE: Joe Stokes was at that time the Director of the Commission of Measles and Mumps. TLW.] Dr. Philip Stimson had suggested to the Secretary of War that epidemic diseases should be attacked as early as possible and that a discussion of the Philadelphia studies and developing concepts be held soon. Mr. Henry Stimson quickly agreed, and a meeting was scheduled in his Washington, D.C., office. That meeting, a free discussion among Secretary Stimson, General George Marshall, and me, was not, in itself, a historic occasion, but the lives of thousands of GIs were probably saved as its result.

Simply through controlling or preventing epidemic diseases, huge numbers of casualties were prevented. The introduction to so astonishing an outcome lay in Secretary Stimson's parting remark to me after General Marshall had returned to his office (which was immediately adjacent to the secretary's). Mr. Stimson said, in effect, "If you feel that anything medically serious is occurring that apparently could be remedied, and yet the remedy appears to be completely blocked, please do not hesitate to call me directly by telephone or send me a letter marked 'Personal and Confidential', and you shall hear from me." At the time, I thought this was just a courteous comment made in appreciation for my visit to Washington, and could foresee no need for me to implement it. Such, however, was far from the case.

An impasse had been slowly developing in the Preventive Medicine Service that brought Mr. Stimson's request forcibly to mind. James C. Magee, the Surgeon General of the Army, had demonstrated a certain lack of astuteness in the earliest months of the war by allowing his Office (and the entire Medical Service of the Army) to be placed under the command of General Sommervel in the Services of Supply. Consequently, Surgeon General Magee had no direct line of communication to General Marshall. Many requests for changes or additions of personnel thus tended to

founder on General Sommervel's desk, often with greatly delayed action. This tendency became increasingly acute when various Commissions of the Board lost some of their vital researchers. They were being drafted into the regular armed forces and effective research teams were being split up. Able investigators such as Aims McGuinness, Sydney Gellis, John Dingle, and Albert Sabin were in danger of being separated from the Epidemiological Board, more importantly, the research studies that they and others did (that had saved, and would save, thousands of lives and many thousands more of casualties from infectious diseases) would be interrupted, if not lost entirely.

I recalled Henry Stimson's courteous request when it became clear to me (as Director) that the Commission on Measles and Mumps would probably lose the services of Aims McGuinness. This reminder was greatly accentuated by several compelling circumstances. It had become apparent that, because of the Army's inept policy, such able men as McGuinness were being wooed away by the other services and that our strong research teams were being broken up. McGuinness had been approached to join those in charge of the U.S. Navy's blood banking program at Bethesda. I also learned that Colonel Simmons, Colonel Bayne-Jones, and Dr. Francis Blake, President of the Board, had all failed in their efforts have these scientists assigned to the Epidemiological Board as uniformed officers in the Army Medical Corps. The situation for the various Commissions and for the entire Board was desperate Colonel Simmons, Colonel Bayne-Jones, and Dr. Blake all agreed with me that an approach to Secretary Stimson could do no harm and was a chance worth taking.

I therefore placed a call to Secretary Stimson. Purely by chance, it was on the morning that the Army had first landed in north Africa. The call occurred late in the morning and Stimson's private secretary said that he, himself, had not yet been able to speak with Mr. Stimson. I told the private secretary the purpose of my call and, most surprisingly, I received a call back in two hours. Secretary Stimson had already made an appointment for Dr. Blake and me to meet with General Miller White, who was in charge of all Army personnel matters, at the Pentagon on the following Monday morning.

General White was all we could possibly have hoped for. He listened carefully to our joint presentation, which was made principally by Dr. Blake. He quickly agreed that our request, that Medical Officers be assigned to the Board to work on the Commissions, was appropriate, and should and would be implemented immediately. He was upset that the prevention of epidemic diseases had been so endangered, and said that the complement of twenty-five medical officers would be assigned as quickly as possible to the Board to continue the research work of the Commissions.

No word came during the next three weeks. Aims McGuinness regarded the situation as hopeless and proceeded to take steps to join the Navy to work with their blood program. On a gloomy Friday I called Dr. Blake concerning this strange silence, and he promised to call General Miller White that day about the lack of action. To be on the safe side, I also called from Philadelphia. General White was in high dudgeon when he learned that the order that he had placed three weeks before had not yet been implemented. I had no doubt, from the tone of his voice, that he would conduct an immediate investigation and take appropriate action. Three days later, on the following Monday morning, an elated Aims McGuinness called to say "Congratulations! Three colonels have called me from Washington this morning, and I am to go down to the Army-Navy Club tonight, to be inducted tomorrow as a medical officer assigned to the Army Epidemiological Board."

This was the type of quiet direct statesmanship for which Henry Stimson was so well known. I had the opportunity, after the war was over, to personally express my appreciation to him for this evidence of his wisdom. I tried to convey to him the broad significance (of which he already had some inkling) that our almost-chance meeting had had in conserving lives by preventing epidemics.

Colonel Simmons and Colonel Bayne-Jones had to guard repeatedly against the sniping that was directed at the Board's complement of medical officers. There continued to be fears that the Board might be partially or wholly abolished. In fact Henry Stimson's original order continuously hung over the Office of the Surgeon General as a warning that something could be done at the highest level to preserve the Board—and to preserve the lives of many GIs.

The Commissions continued their work and no one, beyond those immediately involved, knew of the part that Henry Stimson had played. Most of the key scientists in the Commissions were inducted into the Army's Medical Corps and the work of the Commissions proceeded with renewed vigor and confidence

Appendix 3

A List of the Board's Recommendations from 1955 through 1989

The following chronological list of the recommendations that were made by the Armed Forces Epidemiological Board from 1955 through 1989 was compiled by Executive Secretaries Colonel Robert R. Nikolewski, BSC, USAF, (from his 1985 White Paper) and Colonel Robert A. Wells, Ph.D., MSC, USA:

06/14/55	Recommendation with Respect to the Use of Hyperimmune Anti-rabies Serum
08/11/55	Prophylaxis of Streptococcal Infections
05/24/58	AFEB Recommendations on Cutaneous Diseases
05/11/59	Prophylaxis of Streptococcal Infections
06/16/60	Armed Forces Epidemiological Board Recommendations on Griseofulvin
12/14/60	Use of Duck-Embryo Rabies Vaccine
12/19/60	Dosage of Gamma Globulin for Prophylaxis of Infectious Hepatitis
12/12/61	AFEB Recommendations on Adenovirus Vaccine
12/12/61	AFEB Recommendation on Influenza Immunization for Children
12/12/61	AFEB Recommendation on Influenza Immunization and Pregnancy
12/12/61	AFEB Recommendation on Influenza Vaccine Formula for FY 1963
12/15/61	AFEB Recommendations on the Use of Oral Poliovirus Vaccine in the Military Services
05/28/62	Revised AFEB Recommendations on the Use of Oral Poliovirus Vaccine in the Military Services
07/06/62	Drugs for Parasitic Infections
12/14/62	AFEB Recommendations on Influenza Vaccine Formula for FY 1964
12/26/62	Mineral Oil Adjuvant Vaccines
01/07/63	Amended AFEB Recommendations on the Use of Oral Poliovirus Vaccine in the Military Services
05/10/63	AFEB Recommendations on Influenza Vaccine for FY 1964
06/12/63	AFEB Recommendations on Malaria
07/02/63	Instruction in Infectious Disease
11/22/63	AFEB Recommendation on Tuberculosis Control
12/11/63	Antimalarial Drug Research and Development

12/11/63	Influenza Virus Vaccine to Be Used by the Military during FY 1965
12/11/63	Malaria Resistant Chloroquine and Other Synthetic Antimalarial Drugs
12/11/63	Safe Operation of Laser Systems
12/13/63	Use of Trivalent Oral Poliomyelitis Vaccine
12/16/63	Malaria Suppression Program
12/18/63	Medical Service Infectious Hepatitis Control
06/04/64	Emergency Supply of Marboran
06/04/64	Smallpox Vaccination during Pregnancy
06/04/64	Tetanus Immune Globulin (Human), Stocking of
06/04/64	Toxicology Program, U S Army Environmental Health Agency
06/04/64	Typhus Immunization of Military Dependents
06/04/64	Vaccinal Immune Globulin (Human)
06/04/64	Yellow Fever Vaccination
06/05/64	Insect Repellents, Coordinated Program [for]
06/11/64	Butazolidan, Toxic Properties of
06/26/64	Committee on Tuberculosis Control, Establishment of
07/31/64	Ad Hoc Committee on Q Fever Vaccine
02/17/64	Amended AFEB Recommendations on the Use of Oral Poliovirus Vaccine in the Military Service
12/18/64	Cyclic Recurrences of Epidemics of Meningococcal Infections, Study of
12/21/64	Tuberculin Testing of Personnel Serving in Potentially High Risk Environments Overseas
12/22/64	Study of Tuberculin Positive Filipino Recruits
12/23/64	Use of Live Adenovirus Vaccines
01/14/65	Influenza Virus Vaccine to Be Used by the Military during FY 1966
03/08/65	Influenza Virus Vaccine to Be Used by the Military during FY 1966
06/02/65	Acetone Killed and Dried (AKD) Typhoid Vaccine
06/02/65	Collection of Medical Information and Specimens
06/02/65	Dosage Schedule for Plague Vaccine
06/02/65	Hygienic Standards for Beryllium
06/02/65	Interim Use of Trivalent Inactivated Adenovirus Vaccine
06/02/65	Live Type 4 Adenovirus Vaccine
06/02/65	Live Measles Vaccine, Including the Newly Licensed "Further Attenuated" (Swarz) Live Measles Virus Vaccine, Use of

06/02/65	Meningococcal Field Research Laboratory
06/02/65	Mineral Oil Adjuvant Influenza Virus Vaccine, Use in the Military
06/02/65	Paratyphoid A and B Vaccines
06/02/65	Prevention of Scrub Typhus by Immunoprophylactic Measures
06/02/65	Prevention of Scrub Typhus by Repellent-Impregnated Uniforms
06/4/65	Intradermal Smallpox Vaccination by Jet Injector
06/28/65	Commercial Scale Development of Japanese B Encephalitis Vaccine
08/03/65	Malaria Prophylaxis
08/05/65	Drugs for Parasitic Infections
08/17/65	Combined Active-Passive Immunization with Absorbed Tetanus Toxoid and Tetanus Immune Globulin (Human)
12/09/65	Griseofulvin Tablets, Replacement of
12/10/65	Commission on Cutaneous Diseases Proffer of an Expert Team
12/10/65	Corticosteroid Cream for Personal Use on any Early Skin Lesion, Study of
12/10/65	Oral Griseofulvin Prophylaxis
12/17/65	Adenovirus Vaccine
12/17/65	Malaria
12/17/65	Proposal from the Commission on Enteric Infections for a Longitudinal Study of Diarrheal Disease among Military Personnel in Southeast Asia
12/17/65	Influenza Virus Vaccine
02/02/66	Influenza Virus Vaccine for FY 1967
05/27/66	Chemical Prophylaxis against Scrub Typhus in Southeast Asia
05/27/66	Live Oral Type 4 Adenovirus Vaccine, Administration of
05/27/66	M-1960 Uniform Repellent, Field-Testing Concerning Odor
05/27/66	Rocky Mountain Spotted Fever Vaccine, Efficacy of
05/27/66	Typhus Vaccine, Potency of
06/06/66	Blood Group Substances in Existing Vaccines
06/06/66	Pattern of Malaria in Vietnam
08/08/66	*Neisseria gonorrhoeae*, Culture Medium [for]
09/27/66	Routine Typhoid Immunization Recommendation
09/28/66	Sunscreen Filter Chemically Induced in Normal Skin (Mixture of Dihydroxyacetone and a Naphthoquinne, Applied to the Skin)

09/28/66	Dengue or Chikungunya Virus Infections; Recommendations
10/04/66	Sunscreen Filter Chemically Induced in Normal Skin (A Composition Containing Dihydroxyacetone and a Naphthoquinne Applied to the Skin)
12/08/66	Proposed Respiratory Disease Study
12/14/66	Aqueous Influenza Vaccine, Formula for
12/14/66	Guidelines, Use of Adenovirus Vaccine at Recruit Bases during This Fall and Winter
01/23/67	Plague Immunization Schedule
01/27/67	The Use of Gamma Globulin for Prophylaxis against Infectious Hepatitis
05/26/67	Booster Intervals for Diphtheria-Tetanus Toxoids
05/26/67	Booster Intervals for Typhoid Vaccine
05/26/67	Commission on Cutaneous Disease Proffer of an Expert Team
05/26/67	Court Case Concerning[A] Staphylococcal Infection [that] an Infant Acquired in [the] U.S. Naval Hospital, Charleston, South Carolina
05/26/67	Falciparum Malaria; Treatment Regimens [for]
05/26/67	Use of Antibacterial Soaps
05/26/67	Vivax Malaria; Prophylaxis and Treatment
09/14/67	Possible Danger of Moving Dengue Virus to Potentially Receptive Areas in the Pacific
11/29/67	Live Type 4 Adenovirus Vaccine, Use of
01/09/68	Procurement of Large Volumes of Unpassaged Dengue Viruses from Man
01/09/68	The Recent Human Disease Caused by Contact with African Green Monkeys in Germany
01/09/68	Yellow Fever Vaccine Free of Avian Lymphomatosis Virus
02/26/68	Aqueous Influenza Vaccine, Formula for FY 1969
05/23/68	Epidemiology of Recruit Infectious Diseases, Study at the Recruit Training Center, Orlando, Florida
05/24/68	Blood Donor Criteria—Malaria
05/24/68	Central Source for Meningococcal Typing Sera, Recommendation that Such be Made Available
05/24/68	Final Report, Dermatologic Team of the Commission on Cutaneous Diseases of the Armed Force Epidemiological Board to Vietnam, Harvey Blank, M.D.; Nando Zaias, M.D.; and David Taplin
05/24/68	Recommended Length of Boiling Time
05/24/68	Serological Test for Syphilis, Recommendation [for]
06/25/68	Recommendation Concerning Administration of Live Vaccines
07/19/68	Live Measles Virus Vaccine Booster Inoculation for Military Dependents Who Have Previously Received Inactivated Measles Virus Vaccine

08/08/68	Dose of Acetone-Killed and Dried Typhoid Vaccine
09/20/68	Revised Influenza Vaccination Recommendation, 1968-1969
12/04/68	Influenza Virus Vaccine
12/23/68	Amantadine Hydrochloride
02/26/69	Chloroquine [and] Primaquine Prophylaxis
05/27/69	Disinfection of Swimming Pool Water
06/03/69	Specifications for Tetanus Toxoids
06/03/69	Uniform Computer Reporting System on Disposition Diagnoses
01/08/70	Influenza Virus Vaccine Composition for Use in the Period 1970–1971
03/12/70	Malaria: Conclusions and Recommendations
06/02/70	Oral Polio Vaccine
06/02/70	Procurement and Use of Type 4 Adenovirus Vaccine
06/02/70	Research and Use of Meningococcal Vaccines
06/02/70	Research and Use of *Myocoplasma pneumoniae* Vaccines
06/02/70	Use of Adenovirus Vaccines and Need for Research
06/08/70	Disposition Diagnoses
06/08/70	Doxycycline Chemotherapy and Chemoprophylaxis of Rickettsial Diseases
06/20/70	Epidemic Typhus Vaccine for Military Use—Specifications for
08/12/70	Typhoid Vaccine, Acetone Inactivated Dried
12/04/70	Influenza Virus Vaccine Composition for Use in the Period 1971–1972
01/15/71	Hepatitis Associated Antigen
02/02/71	Vaccination of Air Force Personnel with Oral Live Type 4 Adenovirus Vaccine
2/23/71	Malaria: Conclusions and Recommendations
02/12/71	Malaria Prophylaxis
03/31/71	Influenza Virus Vaccine
05/27/71	Surveillance of *M. pneumoniae* Infection
05/28/71	E Strain Typhus Vaccine Acceptability Trials
05/28/71	Killed Epidemic Typhus Vaccine Procurement
05/28/71	Killed Q Fever Phase I Vaccine Acceptability Trials
05/28/71	Live Types 4 and 7 Adenovirus Vaccine

05/28/71	*M. pneumoniae* Infection
05/28/71	Medical Surveillance of Personnel Exposed to Microwaves
05/28/71	Recommendations for Research on Biomedical Effects of Microwaves
05/28/71	Meningococcal Vaccine
05/28/71	Recommendation of Field Methods for Testing Free Chlorine Residuals in Potable Water
05/28/71	Recommendations on Other Respiratory Diseases
10/26/71	Investigation of Drug Abuse in Military Personnel
01/24/72	Influenza Virus Vaccine Composition for Use in the Period 1972–1973
02/23/72	Development of Improved Footwear
02/23/72	Spectinomycin (Trobicin, Upjohn) for the Treatment of Gonorrhea
02/24/72	Recommendation for Continued Support of Research on Tropical Diseases
02/24/72	TB MEDs, Need for Revision
04/24/72	Recommendation of the AFEB ad hoc Committee on Drug Abuse
05/10/72	Suggested Corrections, Additions and Revisions of TB MED 232
05/26/72	Group C Meningococcal Vaccine—Routine Year-round Use
05/30/72	Recommendations for the Treatment of Gonorrhea
05/31/72	Development and Production of Efficacious and Safe Vaccines
05/31/72	Immunization Against Rubella
05/31/72	Tetanus Prophylaxis in Wound Management
05/31/72	Yellow Fever Vaccine
06/07/72	Group C Meningococcal Vaccine—Routine Year-round Use
01/02/73	Influenza Virus Vaccine Composition for Use in the Period 1973–1974
01/23/73	Confidentiality of Venereal Disease Records in the Military Services
04/19/73	Reports of New Influenza V Strain
05/30/73	Periodic Medical Examinations
06/06/73	Influenza Vaccine Composition
09/18/73	Cholera Vaccination
09/18/73	Group C Meningococcal Vaccine
09/18/73	Integrated Training in Health and Environment
09/18/73	Live Types 4 and 7 Adenovirus Vaccines
09/18/73	Rubella Immunization Policy

09/18/73	Teaching of Tropical Medicine
09/26/73	DoD Directive 6200 1, 27 April 1973, Venereal Disease Control Program of the Armed Forces
10/12/73	Recommendation for Scheduling Dosage for Oral Poliovirus Vaccine in the Military Service
11/12/73	Procurement Standards Pertaining to Weight and Blood Pressure
12/26/73	Typhoid Immunization Requirements for Children
02/14/74	Influenza Virus Vaccine Composition for Use in the Period 1974–1975
11/01/74	Establishment of an Infectious Disease Investigation and Vaccine-Trial Capability
11/01/74	Health Maintenance and Prospective Medicine Programs in the Three Armed Services
11/01/74	Potential Disease Threat at Yuma Proving Ground
11/01/74	Refresher Training in Primary Medical Care
11/01/74	Teaching of Tropical Medicine
11/08/74	Acute Respiratory Disease Surveillance Programs in the Armed Forces
11/08/74	Modifications of Physical Standards in Recruitment for the All- Volunteer Forces
11/12/74	Influenza Vaccine Trial Protocols
75–1	Excessive Insecticide Contamination of the Environment
75–2	Cholera Vaccination
75–3	Booster Intervals for Diphtheria Tetanus Toxoids
75–4	Medical Facility Utilization within the Armed Forces
75–5	Influenza Virus Vaccine Composition for Use in the Military for the 1975–76 Season
75–6	Recommendation re: Chest X-ray Examinations for Recruits
75–7	Military Health Care Study
75–8	Nosocomial *Staphylococcus epidermidis* Infection
76–1	Influenza Vaccine Composition for the 1976–77 Season
76–2	Influenza Vaccine Composition for the 1976–77 Season
76–3	Report of the ad hoc Study Team for Review of the Scope of Periodic Physical Examinations in the Army
76–4	Recommendations of the ad hoc Study Team on Cholinesterase Inhibitors
76–5	Administration of Oral Polio Vaccine
76–6	Health Care Personnel with Hepatitis-Associated Antigenemia
76–7	Influenza Vaccine Composition for the 1976–77 Season
76–7S	Supplement to the Recommendation on Influenza Vaccine Composition for the 1976–77 Season
77–1	Recommendation on Influenza Immunizations for Feb-Mar 77 and for the 1977–78 Season

77–2	Recommendation on Poliomyelitis Immunization for Armed Forces Personnel
77–3	Recommendations on Policy for Immunization against Smallpox
77–4	Recommended Purity Level Specifications for Tetanus Toxoid
77–5	Recommendation on Immunization of Military Recruits with Meningococcal Vaccine
77–6	Recommendations on Administration of Live Virus Vaccine to Female Recruits
78–1	Influenza Immunizations Against the Type A/(H_1N_1) Strain for the 1978–1979 Season
78–2	Recommendations on Influenza Vaccine Policy
78–3	Recommendations on Policy for Cutaneous Leishmaniasis
78–4	Recommendations on Policy for Asbestos-related Health Problems
78–5	Recommendation on Policy for Chest X-ray Examinations for Periodic Physical Examinations
78–6	Recommendations for the Operation of the Medical Examination Review Board
79-1	Influenza Vaccine Composition and Immunization Procedures for the 1979–1980 Season
79–2	Recommendations Concerning Protection of Armed Forces Personnel against Rubella and Rubeola
79–3	Recommendations on the Scope of Current Periodic Physical Examinations in the Armed Forces
79–4	Recommendations Concerning Protocol for "Epidemiologic Investigation of Health Effects in Air Force Personnel Following Exposure to Herbicide Orange"
80–1	Recommendation on Policy for Smallpox Immunization
80–2	Recommendations on Policy for Measles Immunization
80–3	Recommendations Concerning Review of a Proposed Protocol for a Malaria Prophylaxis Study
80–4	Recommendations on Policy for the Use of Amantadine for Protection of Armed Forces Personnel against Type A Influenza
80–5	Recommendation on Influenza Vaccine Policy for 1980–81
80–6	Typhoid Immunization Requirements for Dependents
81–1	Recommendations on a Proposed Clinical Protocol for an Efficacy Trial of Gonococcal Pilus Vaccine
81–2	Recommendation on Influenza Vaccine Dosage for 1981–82
81–3	Recommendation on Policy for Smallpox Immunization
81–4	Resolution Concerning Influenza Surveillance in the Armed Forces
81–5	Cholera Vaccine Use in the U.S. Armed Forces
81–6	Resolution Concerning the Continuation of the AFEB Task Force on Epidemiological Methods
81–7	Recommendations Regarding an Assessment of Population-Based Forecasting Models at the Office of Planning and Policy Analysis
81–8	Recommendations Concerning Tetanus/Diphtheria (td) and Plague Vaccine Dose Schedules in the Armed Forces

82–1	Recommendations Concerning the Use of Hepatitis B Virus Vaccine in the Armed Forces
82–2	Recommendation on Influenza Vaccine Use for 1982–1983
82–3	AFEB Resolutions Concerning Epidemiological Methods in the Health Care Delivery System
82–4	Resolution Supporting the NCI Follow-up Study on a Potentially Hyperimmunized Population
82–5	Armed Forces Epidemiological Board (AFEB) Recommendations Regarding Potentially Hyperimmunized Individuals
82–6	Armed Forces Epidemiological Board (AFEB) Recommendations on the Use of Antibiotics for Early Treatment of Rickettsial and Diarrheal Disease among Rapid Deployment Joint Task Force (RDJTF) Personnel
82–7	Armed Forces Epidemiological Board (AFEB) Recommendations Regarding Continued Vaccination against Smallpox in the Armed Forces
82–8	Recommendations Regarding Use of Quadravalent Polysaccharide Meningococcal Vaccine
82–9	Armed Forces Epidemiological Board (AFEB) Recommendation Concerning the Immunization Schedules in the Armed Forces
82–10	AFEB Recommendations Regarding Plague Vaccine and Tetanus-Diphtheria Toxoids Dose Schedules
82–11	Armed Forces Epidemiological Board (AFEB) Recommendations Concerning the Immunization Requirements for Recruit and Active Duty Personnel during Pregnancy
82–12	Armed Forces Epidemiological Board (AFEB) Recommendations Regarding Collaborative Efforts between the Military Medical Services and the Centers for Disease Control with Respect to Penicillinase Producing *Neisseria gonorrhoeae* (PPNG) Isolates and Epidemiologic Data
83–1	AFEB Recommendation for the Influenza Vaccine Composition, 1983–1984
83–2	Doxycycline Chemoprophylaxis against Leptospirosis
83–3	Recommendations on Epidemiological Methods in the Military Medical Health Care Delivery Systems
83–4	Utilization of 1983–1984 Influenza Vaccine
83–5	Review of Routine Chest X-ray Examinations for Recruits and Officer Candidates
83–6	Utilization of 1982–1983 and 1983–1984 Influenza Vaccine
83–7	Penicillin Prophylaxis Regarding Streptococcal Disease in Navy and Marine Corps Recruit Facilities
83–8	Malaria Chemoprophylaxis for Air Force Personnel
84–1	Smallpox Immunization of Military Personnel
84–2	Rubella Prevention and Control
84–3	Armed Forces Epidemiological Board Review of the U.S. Navy Asbestos Medical Surveillance Program (AMSP)
84–4	Composition and Dosage of the 1984–1985 Influenza Vaccine
84–5	Meningococcal Typing Surveillance of U.S. Navy Recruit Personnel
84–6	Hepatitis B Vaccine Use in the U.S. Disciplinary Barracks and Personnel Assigned to Korea

84–7	Armed Forces Epidemiological Board Scientific Advisory Panel Nominations to the Navy Asbestos Medical Surveillance Program
85–1	Availability and Quality of Epidemiological Data Relevant to Readiness Related Issues Regarding the Incidence and Prevalence of Disease Worldwide
85–2	Epidemiological and Preventive Medicine Capabilities Regarding Potential Worldwide Trouble Spots
85–3	Medical Constraints and Consequences of Increasing Participation of Women in the Armed Forces
85–4	Disposition of Hepatitis B Carriers
85–5	Route of Administration and Dosage of the Currently Licensed Hepatitis B Vaccine
85–6	Minimization of Disease Risks and Disinfectant Use during Cardiopulmonary Resuscitation Training Utilizing Manikins
85–7	Interim Recommendations Concerning Chemoprophylaxis of Chloroquine Resistant *Plasmodium Falciparum* (CRPF) Malaria
85–8	Human T-Lymphotrophic Virus Type III (HTLV–III) Antibody Positivity
85–9	Immunization of Asplenic Personnel
86–1	Spectinomycin-Resistant *Neisseria gonorrhoeae*
86–2	Composition and Dosage of the 1986–1987 Influenza Vaccine
86–3	Additional Study, B Component, Armed Forces Influenza Vaccine
86–4	Revised Recommendations Concerning Chemoprophylaxis of Chloroquine Resistant *Plasmodium Falciparum* (CRPF) Malaria
86–5	Recommendation on Japanese B Encephalitis Prevention
86–6	Federal Malaria Vaccine Programs
86–7	Revised Influenza Vaccine for 1986–1987
87–1	Recommendation on Japanese B Encephalitis Prevention
87–2	Recommendation on Tetanus Toxoid Purity
87–3	Recommendation for Deletion of the Med-E-Jet from the Federal Stock System and Its Non-use for Injections by the Military Services
87–4	Recommendations on Human Immunodeficiency Virus (HIV)
87–5	Recommendations on the Potential for Health Risks of the Bradley Fighting Vehicle (BFV)
87–6	Composition and Dosage of the 1987–1988 Influenza Vaccine
87–7	Ceftriazone Treatment of Gonorrhea
87–8	Recommendation on *Aedes albopictus*
87–9	Recommendations on Infections with Dysgonic Fermenter Type 2 in Splenectomized Individuals
87–10	Recommendations on Korean Hemorrhagic Fever

88–1	Recommendation on Cardiovascular Screening of Soldiers Age Forty and Over
88–2	Recommendations on Human Immunodeficiency Virus (HIV) Infection
88–3	Recommendation on the Utilization of Hypodermic Jet Injector Guns for the Immunization of Military Personnel
88–4	Recommendations on Tuberculosis
88–6	Recommendations on Hepatitis B
89–1	Recommendation on the Disease and Environmental Alert Report Worldwide (DEAR WW)
89–1	Composition and Dosage of the 1989–1990 Influenza Vaccine
89–3	Recommendation on the Draft Technical Bulletin on Nonfragmentary Injuries behind Defeated Armor
89–4	Recommendation on Typhoid Fever Vaccine
89–5	Recommendation on the Composite Health Care System (CHCS)
89–6	Recommendation on the Reduced Dose Regimens for Recombinant Hepatitis B Vaccine
89–7	Recommendations on Mefloquine Chemoprophylaxis for Military Personnel
89–8	Recommendations on the Use of Zidovudine (AZT) in the Military

Appendix 4

The Charters of the Armed Forces Epidemiological Board and Its Predecessor Organizations

THE 1940 CHARTER

The Board for the Investigation and Control of Influenza and Other Epidemic Diseases in the Army

The initial authorization that established the Board for the Investigation and Control of Influenza and Other Epidemic Diseases in the Army, signed by A. P. Sullivan, Adjutant General, and dated 11 January 1941, appears on page 20 of this volume together with the original charter, dated 27 December 1940, and signed by General James C. Magee, The Surgeon General of the Army.

THE 1949 CHARTER

Armed Forces Epidemiological Board

SUBJECT: Armed Forces Epidemiological Board

TO: The Secretary of the Army

THRU: Director of Logistics
General Staff, United States Army

1. Reference is made to memorandum dated 21 February 2949 from the Secretary of Defense to the Secretary of the Army and Comment No. 1, dated 2 March 1949 from the Director of Logistics to the Surgeon General, subject of each: Standardization of Preventive Medicine Practices and Procedures within the Armed Forces. Under this authority and with the concurrence of the Surgeons General of the Navy and the Air Force, paragraph (d) of the recommendations of the Committee on Medical and Hospital Services of the Armed Forces has been implemented and an Armed Forces Epidemiological Board hereby established.

2. The Armed Forces Epidemiological Board is organized as follows:
   a. *Name:* Armed Forces Epidemiological Board.

b. ***Authority:*** The authorization for establishment of the original Army Epidemiological Board was based upon approval of such a request by the Secretary of War on 11 January 1941. Authority for expansion into an Armed Forces Epidemiological Board is based upon Memorandum from the Secretary of Defense to the Secretary of the Army instructing that the present Army Epidemiological Board be expanded to reflect the needs of the three services in the fields of medical, operational, and research problems.

c. ***Mission:*** The Mission of the Armed Forces Epidemiological Board will be:

(1) To furnish advice to the Armed Forces in establishing uniform and effective epidemic prevention and control procedures.

(2) The provision within the National Military Establishment for specialized scientific advice, consultation, and active working participation with members of the Armed Forces Medical Departments in the study and solution of communicable disease and other preventive medicine problems.

d. ***Administration:*** The administration and policy of the Armed Forces Epidemiological Board will be effected by The Surgeon General of the Army as mutually agreed upon by the Surgeons General of the Army, Navy, and Air Force.

e. ***The Board:*** The Board will consist of nine civilians who are selected on the basis of national standing in fields allied to the function of the Armed Forces Epidemiological Board. Initially, appointments will be three each for a period of two, three, and four years. After a two-year period, one-third of the membership of the Board will be appointed. After the initial two- and three-year terms, appointments will be for a period of four years. The Board will select a President from its own membership. The members of the Board will be appointed as consultants to the three Surgeons General and will be selected from nominations made by the Armed Forces Medical Departments and with the final concurrence of the three Surgeons General.

f. ***Commissions:*** The Board will recommend to The Surgeon General of the Army the establishment of such commissions as it deems necessary from time to time, and for necessary periods, to assist it in accomplishing its stated mission. When scientifically competent committees and subcommittees of the National Research Council are available, these agencies will be used for advice rather than to establish separate commissions. The Board will select the members and designate the chairman of each commission to serve during the life of the commission or for two years, whichever is the shorter period.

g. ***Consultant Status:*** The Board and commissions will hold a minimum of one formal annual meeting and such additional meetings as are necessary. At the annual meeting of the Board, the Armed Forces requirements will be reviewed, reports will be received from all commission chairmen, a review of the past year's work and plans for future work in each particular field will be discussed and recommendations made. The President of the Board will report to the Surgeons General of the Army, Navy, and Air Force on matters pertaining to their services. The Surgeons General will take cognizance of these reports and determine the indicated action.

h. ***Administrative Liaison:*** The coordination of the activities of the Armed Forces Epidemiological Board and its commissions with the medical departments of the Armed Forces will be through an Army Medical Corps officer designated by The Surgeon General of the Army as the Administrator, Armed Forces Epidemiological Board.

i. ***Funding:*** The cost of routine administration of the Armed Forces Epidemiological Board will be financed by the United States Army Medical Department. The Surgeon General of the Navy and The Surgeon General of the Air Force will support The Surgeon General of the Army in budgetary presentations and appropriation hearings before reviewing authorities as such pertain to this joint Armed Forces organization. No travel, consultation, administrative work over and beyond routine or research projects are considered as routine administration. These may be undertaken on the basis of a specific request by one or more of the Services, and in these instances the requesting Service or Services will then finance the same. Routine administration costs are considered to be the cost of the annual meetings of the Board and Commissions and the necessary clerical assistance.

3. A list of the Board's membership is enclosed.

R. W. Bliss
Major General
The Surgeon General

THE 1953 CHARTER

The Armed Forces Epidemiological Board

The Armed Forces Epidemiological Board was established formally by Department of Defense Directive 5154-8, dated 8 October 1953, and follows:

SUBJECT: Armed Forces Epidemiological Board

I. INTRODUCTION

Pursuant to the authority vested in the Secretary of Defense by the National Security Act of 1947, as amended, there is hereby reconstituted within the Department of Defense the Armed Forces Epidemiological Board (hereinafter referred to as "The Board"). The Board shall function as a joint agency of the three Military Departments under the management control of the Secretary of the Army, subject to the authority, direction and control of the Secretary of Defense. The purpose of this Board is to provide the Military Departments with scientific and research assistance and advice on matters pertaining to problems in preventive medicine.

II. ORGANIZATION

A The Board shall be composed of nine members, selected from civil life on the basis of their national standing in fields allied to the functions of the Board. Members of the Board shall be selected and appointed on a consultant basis by the Secretary of the Army, as management agent, based on nominations made by the three Surgeons General of the Military Departments. Each member shall be appointed for a period of four years. The members of the Board shall elect a President from among themselves who will serve in this capacity for a period of two years unless extended by re-election.

B. The Board may establish such commissions as it deems necessary from time to time to assist in the performance of its functions. Members of commissions shall be selected and appointed on a consultant basis by the Secretary of the Army, as management agent, based on nominations of the Board. Such members shall serve during the life of the commission or for two years, whichever is the shorter period. The Board shall designate one of the members of each commission to serve as its director.

C The Board shall be assisted by an Executive Secretary and such qualified military and civilian personnel as may be required in the administration of the activities of the Board. The Executive Secretary shall be a medical corps officer of the Army, Navy or Air Force, selected on the basis of high professional qualifications and demonstrated medical administrative ability in fields allied to the functions of the Board. The Executive Secretary shall be appointed by the Secretary of the Army, subject to the approval of the Secretary of Defense, based on nominations received from the Army, Navy and Air Force. Normally, such appointment shall be for a period of four years and shall be made on a rotating basis in the order of Army, Navy and Air Force, provided that the Military Department next in line has an individual who meets the qualifications of the position and is acceptable to the nominating and approving authorities. The Executive Secretary shall be responsible to the Secretary of the Army, as management agent, on administrative matters and to the Board on professional matters.

III. FUNCTIONS AND RESPONSIBILITIES

A Under established Department of Defense policies, the Board shall:

1 Serve as a consultant body to the Military Departments on technical aspects of the prevention and control of disease and injury.

2 Through research, field investigation and active working participation with members of the medical

services of the Military Departments, study communicable diseases and other preventive medicine problems, and based upon findings furnish the Military Departments with specialized scientific advice and recommendations.

B. The commissions shall assist the Board in the performance of its functions by undertaking studies, field and laboratory investigations, and make recommendations to the Board on such specific technical problems as are assigned.

C. In the investigation of preventive medicine problems of the Armed Forces, the Board shall take into consideration research conducted by other governmental and non-governmental agencies on similar problems, the propriety of methods of research recommended to be employed by the military medical services, and the pertinent practices employed by the Military Departments in the preventive medicine program.

D. It shall be the responsibility of the Board to make certain that the standards of ethics and scientific safeguards are maintained in the performance of these functions, particularly with respect to programs involving medical research and that such is consistent with the highest standards of military and civilian medicine, and further that unnecessary duplication of effort be avoided.

IV. ADMINISTRATION

A The Secretary of the Army, as management agent, shall be responsible for the determination and provision, within the limits of resources available to the Department of the Army for such purposes of adequate administrative support required for the operation of the Board and its commissions. The term "administrative support," as used in this directive, is defined to include budgeting, funding, fiscal control, manpower control and utilization, personnel administration, security administration, space, facilities, supplies and other administrative services. The Secretary of the Army, as management agent, may redelegate his authority in connection with these responsibilities within the command structure of the Department of the Army.

B The Assistant Secretary of Defense (Comptroller) shall arrange with the three Military Departments for the financing of the Board and its activities.

C The Board shall meet as frequently as is necessary with the provision that a minimum of one formal meeting be held annually. At each annual meeting the Board will review and discuss any existing problems and requirements referred to it by the Military Departments which are related to its functions, evaluate the past year's work and activities of the Board and its commissions in each particular field and plan for future work. The President will report the findings of the Board to the three Military Departments.

D. The Executive Secretary shall supervise the administrative staff of the Board, provide such other assistance and services as the Board and its commissions may require and perform such other pertinent duties as may be specified from time to time by the Secretary of the Army, as management agent, and by the Board.

V. RELATIONSHIPS

A The President, the Board, its commissions, and the Executive Secretary are authorized to communicate directly with other agencies of the Department of Defense and the Military Departments and appropriate subdivisions thereof, concerning any matter within its jurisdiction and in which there exists a mutual interest or responsibility.

B The Board and its commissions shall coordinate their efforts with all agencies within and outside the Department of Defense which have a mutual interest or responsibility with respect to any of its programs.

VI. MEMORANDA SUPERSEDED

This directive supersedes that portion of Secretary of Defense memorandum, dated 21 February 1949, Subject: "Standardization of Preventive Medicine Practices and Procedures within the Armed Forces," which pertains

to the Armed Forces Epidemiological Board and the letter from the Surgeon General of the Army to the Secretary of the Army, dated 29 November 1949, which established the Armed Forces Epidemiological Board

THE ORGANIZATION OF THE COMMISSIONS OF THE AFEB

A. MEMBERSHIP OF COMMISSIONS

1. *Members*

   Members of a commission are nominated to the Board by the director on the basis of the competences required to carry out the mission of the commission. The number of members of a commission will depend upon its work, but in general will be not more than 10 After approval by the Board, members will be appointed as consultants to The Surgeon General of the Army, and may be employed as consultants by any of the three Surgeons General. Ordinarily a secret security clearance will be requested (see Chapter V).

2. *Associate Members*

   Associate members may be nominated to the President of the Board by the director and appointed with the approval of the President. Such members may represent special fields of research, or geographical or organizational areas which the director wishes to include in order to provide broad advice and prompt assistance when problems arise.

3. *Responsible Investigator*

   Scientists doing research under contracts sponsored by a commission are designated as responsible investigators under the commission. They may or may not be members or associate members of the commission.

B. TERMS AND METHODS OF APPOINTMENT

1. *Full Members*

   Full members of a commission are appointed to two-year terms by The Surgeon General, Department of the Army, upon the recommendation of the Armed Forces Epidemiological Board. There is no limit to the number of terms that a member may serve. The director is designated by the Board. The director selects, with or without the advice of other commission members, the persons who are to be nominated for commission membership and submits their names to the Board for approval, usually at the Spring Meeting

2. *Associate Members*

   Associate members are appointed by a commission director, with the concurrence of the President of the Board, and are formally notified by the Office of the Executive Secretary. Terms are for two years, ending 30 June of the appropriate year, and there is no limit to the number of terms an associate member may serve. Appointments to committees, task groups, etc., are made by commission directors with the concurrence and approval of the President of the Board.

3. *Responsible Investigators*

   Responsible investigators hold appointments for the duration of their contracts The status of responsible investigator is for an indefinite period, ending when the commission-sponsored research is terminated, or sooner if either party wishes to withdraw from the arrangement.

C. MEETINGS

1. *Commissions*

   Commissions will hold at least one meeting each year. At this meeting the progress made by its investigators should be reviewed, the future work of the commission outlined, and an estimate made of the funds necessary to support these endeavors. The representatives from the Armed Forces should be requested to present current problems that come within the competency of the commission. Recommendations may be prepared for submission to the Board Commissions will hold such additional meetings each year as are deemed necessary.

2. *Ad Hoc Committees*

   Ad hoc committees can be formed within a commission to deal with specific problems, or from the membership of two or more commissions to deal with broader problems. Committees of some permanency

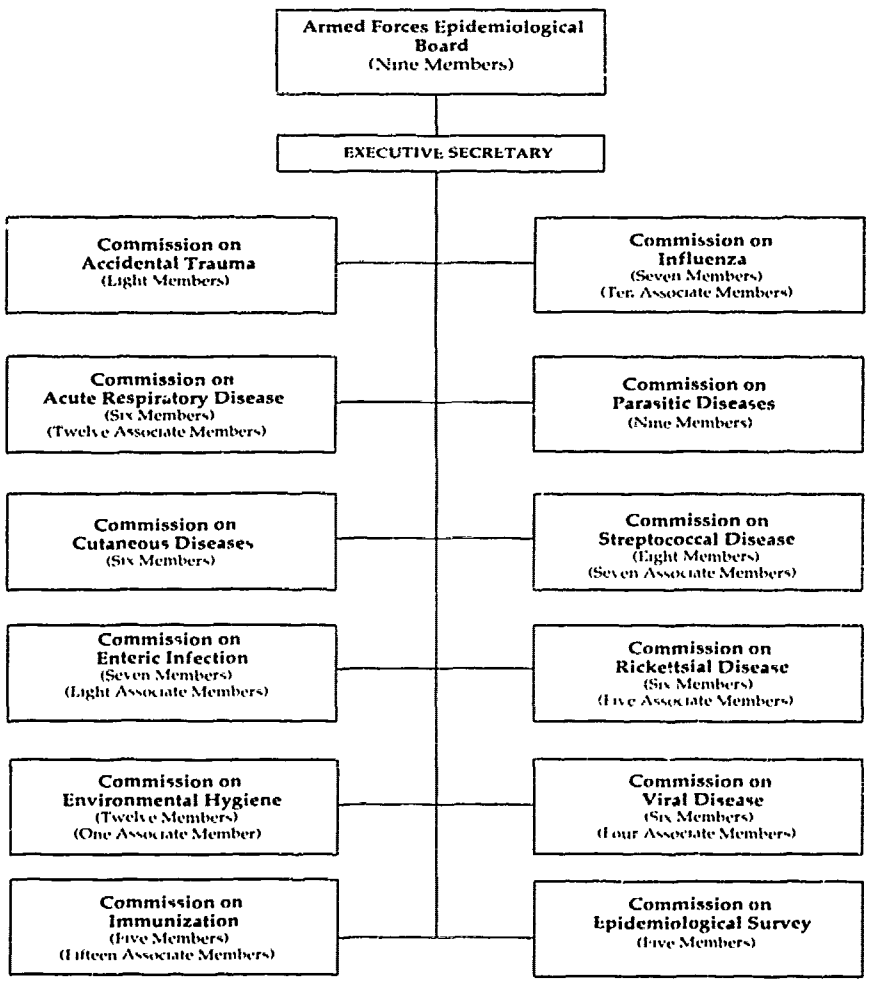
and joint committees should be approved by the President of the Board. As many meetings may be held as are deemed necessary to accomplish their mission. The chairmen of such committees can call such meetings after notifying the directors of the commissions concerned. However, if such meetings involve travel orders or other expenses, the approval of the President of the Board must be obtained in advance, and the Executive Secretary notified so that appropriate orders may be issued, service representatives notified and other necessary meeting arrangements made. A commission director is normally afforded membership, *ex officio*, in such a committee.

3. *Field Teams*

The Board may at any time, when requested to assist the Armed Forces in a specific situation, organize a team for field investigation. Such investigations may last from one day to ninety days or more, depending entirely on the problem.

Melvin A. Casberg, M.D.
Assistant Secretary of Defense
(Health and Medical)

DEPARTMENT OF DEFENSE
ARMED FORCES EPIDEMIOLOGICAL BOARD
ORGANIZATIONAL CHART



THE 1974 CHARTER

The Board, Commissions, and Committees of the Armed Forces Epidemiological Board

OTSG Memorandum No. 15–22, 9 January 1974
This memorandum supersedes OTSG Memorandum 15–22, 10 May 1970

1. REFERENCES

a. Public Law 92–463, 6 October 1972
b. Executive Order 11686, 7 October 1972
c. CSR 10–32, "Organization and Functions, Office of The Surgeon General"

2. BACKGROUND

a. In accordance with references a and b, the Charter for the Armed Forces Epidemiological Board filed 8 January 1973 (See Appendix):

(1) Reconstituted the Armed Forces Epidemiological Board as a joint agency of the Military Departments with the Secretary of the Army as Executive Agent (Sec D).

(2) Defined the purpose of the Board to serve "as a continuing scientific advisory body to the Surgeons General of the military departments to provide them with scientific and professional advice and guidance in matters pertaining to operational programs, policies, procedures, and research needs in the prevention of disease and injury and promotion of better health" (Sec B).

(3) Provided that the Board will be composed of not less than 9 nor more than 13 principal members who will be selected and nominated by the Surgeons General of the Military Departments and appointed by the Secretary of the Army. They will be appointed on a consultant basis by the Secretary of the Army (Sec E).

(4) Provided that when necessary, the Board shall recommend the establishment of subcommittees called commissions. Members of Commissions shall be appointed on a consultant basis by the Secretary of the Army based on recommendations of the Board and nominated by the Surgeons General (Sec H [1]).

(5) Provided that when required, the Board shall recommend establishment of informal ad hoc Study Teams to advise on immediate medical problems of a crisis or urgent nature (Sec H [2]).

(6) Provided that the Army Medical Department is responsible for providing necessary support for the Board.

b. Reference 1c designated the Directorate of Health Care Operations, that it provide administrative support and staff direction of the Armed Forces Epidemiological Board.

3. PURPOSE

This memorandum:

a. Defines the specific areas of responsibility of the staff elements of DASG having staff supervision over all duties and responsibilities of The Surgeon General relative to the Board.

b. Clarifies the channels of communication between The Surgeon General and the Board.

4. RESPONSIBILITIES

a. Chief, Health and Environment Division:

(1) Has primary staff responsibility for TSG in all matters relative to the Armed Forces Epidemiological Board. These responsibilities include, but are not limited to:

(a, Coordination between TSG and the AFEB on all communications that relate to requests for professional advice and recommendations concerning operational programs and policy development in the area of disease and injury prevention and health promotion to include application of epidemiological principles to the control of acute and chronic diseases, environmental pollution control, and occupational health and the

design of new systems of health maintenance.

(b) Nomination of Board members

(c) Nomination and appointment of Executive Secretary

(2) Serves as point of contact in keeping the Board current on health and environment programs

(3) [E]nsures that all staff actions are fully coordinated within DASG and other appropriate staff or command activities before transmittal to the AFEB through the Executive Secretary.

Appendix to the Charter
The Armed Forces Epidemiological Board

A. DESIGNATION

The official designation of this committee is the Armed Forces Epidemiological Board, hereinafter referred to as "the Board."

B. OBJECTIVES AND SCOPE

The Board serves as a continuing scientific advisory body to the Surgeons General of the military departments to provide them with scientific and professional advice and guidance in matters pertaining to operational programs, policies, procedures, and research needs in the prevention of disease and injury, and the promotion of better health.

C. DURATION

The period of time necessary for the Board to carry out its activities is two years. Should the requirement for the Board continue beyond that period, rechartering of the Board will be accomplished in accordance with the provisions of Public Law 92–463, "Federal Advisory Committee Act," 6 October 1972, E.O. 11686 and implementing OMB and DoD Regulations.

D. RESPONSIBLE AGENCY

The Board shall function as a joint agency of the three military departments with the Secretary of the Army as Executive Agent The Surgeon General of the Army or his representative is the designated Federal employee who shall approve all meetings and agendas in advance, be in attendance [at] all meetings, and is authorized to adjourn any meeting when he determines adjournment to be in the public interest. The reports of the Board shall be made to the Surgeons General. An Annual Report shall be submitted to the Executive Agent.

E. COMPOSITION

1 The Board shall be composed of not less than nine nor more than thirteen Principal Members selected from civil life on the basis of their nationally recognized competence in fields allied to the functions of the Board. Principal Members of the Board shall be selected and nominated by the Surgeons General of the military departments and appointed by the Secretary of the Army. Principal Members of the Board shall, in addition, be appointed on a consultant basis by the Secretary of the Army.

2 Term of office shall be two years, with terms staggered so that the appointments of one-half of the Board shall expire each year. A Principal Member may be appointed to a full two-year term, or to complete an unexpired term, and may be reappointed to succeed himself, except that no Principal Member may serve more than two full terms in succession. A former Principal Member may be reappointed to the Board after an interval of not less than two years following completion of his last appointment.

3 The Principal Members of the Board shall elect from among themselves a President who shall serve in this capacity for a period of two years, unless extended by reelection, but not to exceed two successive terms.

F. SUPPORT

The Army Medical Department is responsible for providing necessary support to the Board.

G. EXECUTIVE SECRETARY

1 The Board shall be assisted by an Executive Secretary and such other qualified military and civilian personnel as may be required in administration of the activities of the Board. The Executive Secretary shall be an officer

of the Army, Navy, or Air Force, a full-time salaried government employee selected on the basis of demonstrated professional and administrative ability in fields allied to Board functions. The Executive Secre' shall be appointed by the Secretary of the Army based on nominations of the Surgeons General. Normally the appointment shall rotate among the three military departments in the order Army, Navy, and Air Force.
2. The Executive Secretary shall have authority to adjourn any meeting of the Board, its commissions, and ad hoc Study Teams when it is considered to be in the public interest. He shall be assisted by an Administrative Assistant and necessary clerical support. The Army Medical Department shall provide office space and operational funds for salaries, travel, supplies, office, and related expenses.

H. DUTIES

The Board shall assist the three Surgeons General by providing timely professional advice and recommendations concerning operational programs and policy development in the broad area of disease and injury prevention and health promotion to include application of new technological and epidemiological principles to the control of acute and chronic diseases, environmental pollution control, occupational health, and the design of new systems of health maintenance. The Board shall review preventive medicine programs of the military departments as required.
1. Commissions. When necessary, the Board shall recommend the establishment of standing subcommittees, hereinafter called Commissions. The Commissions shall be chartered in accordance with the provisions of PL 92–463, E.O. 11686 and implementing OMB and DoD Regulations. In addition, members of the Commissions shall be appointed on a consultant basis by the Secretary of the Army based on recommendation of the Board and nominated by the Surgeons General. The Board shall designate one of the members of each Commission to serve as its Director.
2. Ad Hoc Study Teams. When required, the Board shall recommend establishment of such informal ad hoc subcommittees or panels, hereinafter called ad hoc Study Teams, to advise on immediate medical problems of a crisis or urgent nature. Such ad hoc Study Teams shall terminate when no longer required, but in no case longer than twelve months. Upon nomination by the three Surgeons General and approval by the Secretary of the Army, each member of an ad hoc Study Team shall be appointed to associate membership of the Board.

I. ESTIMATED COSTS

The estimated annual operating cost of the Board is as follows:

1. Office of the Executive Secretary
   Man-years: Military 1; Civilian 3
   Budget: $32,000 (civilians only)
2. Board (and Study Teams)
   Budget: $25,000 (two 2-day meetings of the Board and five 4-member ad hoc Study Teams)

J. MEETINGS

The Board shall meet at least once annually for an expected two-day period. Commissions, if established, shall also meet at least once annually. Study Teams shall meet as needed.

K. TERMINATION DATE

The Board shall terminate 5 January 1975 or when its mission is completed, whichever is sooner, or unless prior approval for its continuation is obtained.

L. DATE FILED

8 January 1973

FOR THE SURGEON GENERAL:

Gerald D. Allgood
Lt. Colonel, MSC
Assistant Executive Officer

THE 1975 CHARTER

Armed Forces Epidemiological Board

(Reprinted from *Federal Register*, Vol. 40, No. 7, Friday, 10 January 1975)

Establishment, Organization, and Functions

In accordance with the provisions of Pub. L. 92–463, Federal Advisory Committee Act, notice is hereby given that the Armed Forces Epidemiological Board has been found to be in the public interest in connection with the performance of duties imposed on the Department of Defense by law.

The charter for the Armed Forces Epidemiological Board is as follows:

1. OFFICIAL DESIGNATION

The Armed Forces Epidemiological Board; hereinafter referred to as "the Board."

2. OBJECTIVES AND SCOPE

The Board serves as a continuing scientific advisory body to the Surgeons General of the military departments to provide them with scientific and professional advice and guidance in matters pertaining to operational programs, policies, procedures, and research needs in the prevention of disease and injury and [the] promotion of better health.

3. DURATION AND OPERATION

The Board is established for a period of two years or when its objectives have been attained, whichever is sooner, unless prior approval is received for continuation. The Board will operate in accordance with the provisions of Pub. L. 92–463, EO 11769, and OMB, DoD, and DA regulations governing Federal Advisory Committees.

4. RESPONSIBLE AGENCY

The Board shall function as a joint agency of the three military departments with the Secretary of the Army as Executive Agent and under the management control of the Surgeon General, Department of the Army. The Reports of the Board shall be made to the Surgeon General. An Annual Report shall be submitted to the Executive Agent.

5. SUPPORT AGENCY

The Army Medical Department is responsible for providing necessary support to the Board. The Executive Secretary shall be assisted by an Administrative Assistant and necessary clerical support. The Army Medical Department shall provide office space and operational funds for salaries, travel, supplies, office, and related expenses.

6. COMPOSITION

a. The Board shall be composed of not less than nine nor more than thirteen Principal Members selected from civil life on the basis of their nationally recognized competence in fields allied to the functions of the Board. Principal Members of the Board shall be selected and nominated by the Surgeons General of the military departments and appointed by the Secretary of the Army. Principal Members of the Board shall, in addition, be appointed as consultants to The Surgeon General, Department of the Army.

b The term of office for Principal Members shall be two years, with individual terms staggered in order to assure continuity A Principal Member may be appointed to a full two-year term, or to complete an unexpired term, and may be reappointed for a second term, except that no Principal Member may serve more than two full

terms in succession. A former Principal Member, having served two terms in succession, may be reappointed to the Board after an interval of not less than two years following termination of his last appointment.

c. The Principal Members of the Board shall elect from among themselves a President who shall serve in this capacity for a period of two years. The President may, by reelection, serve a second term, but shall not exceed two successive terms.

d. The Board shall be assisted by an Executive Secretary and such other qualified military and civilian personnel as may be required in [the] administration of the activities of the Board. The Executive Secretary shall be an active-duty officer of the Army, Navy, or Air Force, selected on the basis of demonstrated professional and administrative ability in fields allied to Board functions. The Executive Secretary shall be appointed by the Secretary of the Army based on nominations by the three Surgeons General. Normally the appointment shall rotate among the three military departments in the order: Army, Navy, and Air Force.

e. A full-time employee or officer of the Federal Government will be designated who will attend each meeting and has the authority to adjourn any meeting which he determines not to be in the public interest.

7. DUTIES

The Board shall assist the three Surgeons General by providing timely professional advice and recommendations concerning operational programs and policy development in the broad area[s] of disease and injury prevention and health promotion, to include application of new technological and epidemiological principles to the control of acute and chronic diseases, environmental pollution control, occupational health, and the design of new systems of health maintenance. The Board shall review preventive medicine programs of the military departments as required.

a. Commissions. To assist the Board in the performance of its functions and provide augmentation with nationally recognized experts in the scientific specialties represented in each of these broad areas of concern to the Board, three formal standing subgroups, hereinafter called Commissions, shall hereby be chartered with the Board. These shall be designated as follows:

(1) Commission on Disease Control
(2) Commission on Environmental Quality
(3) Commission on Health Maintenance Systems

The Surgeon General of the Army or his representative is the designated Federal Employee who shall approve all meetings and agendas in advance and attend all meetings. He is authorized to adjourn any meeting when he determines adjournment to be in the public interest. The reports of Commissions shall be made to the Board. The Commissions shall terminate or be renewed coincident with the Board, based upon recommendations from the three Surgeons General. Other Commissions may be established as necessary, in accordance with the provisions of Pub. L. 92–463, EO 11769, and implementing OMB, DoD, and DA regulations. Members of the Commissions shall be appointed by The Surgeon General, Department of the Army, as management agent of the Secretary of the Army, based on nominations by the Board and the Surgeons General. The term of office shall be two years. No Commission member shall serve more than two successive terms. The Board shall designate one of the members of each Commission to serve as its Director. Commission members shall be appointed as consultants to The Surgeon General, Department of the Army.

(a) *Commission on Disease Control.* Objectives, scope, and duties: The Commission on Disease Control shall function as an advisory body to the Board and the Surgeons General, providing timely professional advice and recommendations regarding operational programs and policy on disease control problems in the Armed Forces. This group of infectious disease specialists will constitute the working arm of the Board in the area of disease control. It shall meet as necessary, with the approval of the Board, for [the] purpose of providing the latest scientific evaluations and recommendations concerning immunizations, chemoprophylaxis, and therapy, as well as disease surveillance, prevention, and control.

(b) *Commission on Environmental Quality.* Objectives, scope, and duties: The Commission on Environmental Quality shall function as an advisory body to the Board and the Surgeons General providing timely professional advice and recommendations for the protection of the environment from adverse effects of military activities and [the] protection of members of the Armed Forces from disease and injury associated with their military duties. This group of environmental- and occupational-health specialists will constitute the working arm of the Board in the area of environmental quality. It shall meet as necessary with the approval of the Board

for [the] purpose of providing the latest scientific evaluations and recommendations concerning [the] protection of both the environment and military personnel in all activities of the Armed Forces.

(c) *Commission on Health Maintenance Systems.* Objectives, scope and duties: The Commission on Health Maintenance Systems shall function as an advisory body to the Board and the Surgeons General providing timely professional advice and recommendations regarding operational programs and policy in those areas relating to maintenance of health in the Armed Forces. This group of health-maintenance and chronic-disease-control specialists will constitute the working arm of the Board in the area of health maintenance systems. It shall meet as necessary, with the approval of the Board, for the purpose of providing the latest scientific evaluations and recommendations concerning the assessment of those physical, nutritional, behavioral, hereditary, and other characteristics of individuals and populations which are associated with the development of chronic disease or disability, and those programs which can be implemented to prevent those events which result in lost duty-time for Armed Forces personnel.

b Ad Hoc Study Teams. When necessary, the Board shall recommend the establishment of temporary, informal ad hoc subcommittees or panels, hereinafter called ad hoc Study Teams, to advise on immediate medical problems of a crisis or urgent nature. Each ad hoc Study Team shall terminate within twelve months after [its] establishment, or whenever its mission is completed, whichever occurs first. Members shall be nationally recognized experts in those specialties pertinent to matters to be considered by the Team, and shall be appointed by The Surgeon General, Department of the Army, based on nominations by the Board and the Surgeons General. The Team Chairman shall be designated by the Board.

8. COSTS

The estimated annual operating cost of the Board is as follows:

a. Office of the Executive Secretary:

Man-years:

Military—1

Civilian—2

Budget:

$29,000 (civilians only)

b. Board (including Commission and ad hoc Study Teams):

Budget:

$40,000 (two 2-day meetings of the Board, three 1-day meetings of each Commission, and two 1-day meetings of ad hoc Study Teams)

9. MEETINGS

The Board shall meet at least once annually for an expected two-day period. Commissions and ad hoc Study Teams shall meet as needed. It is estimated that the Board will meet twice annually for 2-day meetings, that each of the 3 Commissions will meet annually for 1-day meetings, and that an ad hoc Study Team will meet twice annually for 1-day meetings.

10. TERMINATION DATE

5 January 1977

11. DATE CHARTER FILED

9 January 1975

Maurice W. Roche
Directorate for Correspondence and Directives
OASD (Comptroller)

THE 1978 CHARTER

Department of Defense Directive 5154.8

Date: 6 November 1978
Subject: Armed Forces Epidemiological Board

References:

(a) DoD Directive 5154.8, "Armed Forces Epidemiological Board," 8 October 1953 (hereby cancelled)
(b) Public Law 92–463, "The Federal Advisory Committee Act," 6 October 1972
(c) Executive Order 12013, "Advisory Committee Functions," 1 December 1977
(d) DoD Directive 500.19, "Policies for the Management and Control of Information Requirements," 12 March 1976

A. REISSUANCE AND PURPOSE

This Directive:

1. Reissues reference (a) to (a) establish the Armed Forces Epidemiological Board (hereafter referred to as the "Board"), pursuant to the authority of the Secretary of Defense (10 U.S.C. 125 and 133); and (b) continue the Board in consonance with present rules, regulations, and practices concerning Federal Advisory Committees; and
2. Establishes the Office of the Executive Secretary for managing and administering the activities of the Board.

B. APPLICABILITY

The provisions of this Directive apply to the Office of the Secretary of Defense and the Military Departments.

C. POLICY

1. The Secretary of the Army, subject to the authority, direction, and control of the Secretary of Defense, shall serve as Executive Agent, and the Surgeon General, United States Army, shall exercise management control of the Board. The Board shall function as a joint entity of the Military Departments, subject to the provisions of references (b) through (d).
2. The Board shall serve as a continuing scientific advisory body to the Assistant Secretary of Defense (Health Affairs) and the Surgeons General of the Military Departments, providing them with timely, scientific, and professional advice in matters pertaining to operational programs, policy development, and research needs for the prevention of disease and injury and the promotion of health.

D. DURATION

The Board, as a continuing advisory committee, shall be subject to renewal every 2 years in accordance with Public Law 92–463 (reference [b]).

E. ORGANIZATION AND MANAGEMENT

1. The Board shall be comprised of a maximum of 13 members, selected on the basis of their nationally recognized competence in fields allied to the functions of the Board, nominated by the Surgeons General of the Military Departments, and appointed by the Secretary of the Army.

a. Members of the Board normally shall be appointed as consultants to the Surgeon General, Department of the Army, unless at the time of appointment to the Board the individual already holds an appointment as a consultant to the commander of a medical center or to the surgeon of a major headquarters, which may be continued.

b. Members may be employed as consultants on a "without compensation" or a "when actually employed" basis by each of the Military Departments. A security clearance of SECRET shall be requested for Board members.

(1) A full term or office for members shall be 2 years, with individual terms staggered in order to assure continuity. A member may be appointed to a full 2-year term, or to complete an unexpired term, and may be reappointed for a second term, except that no member may serve more than 4 year in succession. A former member, having served 4 years in succession, may be reappointed to the Board after an interval of not less than 2 years following termination of the last employment.

(2) The members of the Board shall elect from among themselves a President who shall serve in this capacity for a period of 2 years or the elected member's remaining term of office, whichever is less. The President may, by reelection, serve a second term if eligible under paragraph E.1.b.(1), but shall not exceed two successive terms.

2. When necessary, subcommittees, either continuing or ad hoc, shall be established as the working groups of the Board to assist the Board in the performance of its functions.

a. Subcommittees shall (1) conform to the provisions of Public Law 92–463 (reference [b]) and implementing OMB and DoD issuances which govern the operations of the Board, and (2) receive support from and report through the Board. They shall meet as often as is necessary to serve the needs of the Armed Forces.

b. Subcommittee members shall be Board members whose major interest and expertise fall within the scope of concern of the particular subcommittee to which they are appointed. The President of the Board shall appoint members to subcommittees and designate one of them to serve as the director of continuing subcommittees and chairpersons of ad hoc subcommittees. Board members may be appointed members of more than one subcommittee.

c. When necessary, a subcommittee may request the advice of a number of nonvoting consultants in order to enable it to carry on its work while providing the requisite balance in viewpoints represented and breadth of expertise. Consultants used repeatedly may be appointed consultants to the Surgeon General, Department of the Army, others may be utilized as temporary consultants on a "when actually employed" basis by service contract. Qualified active duty military and civil service scientists, as well as nongovernmental civilian experts, may be utilized as consultants.

d. Ad hoc subcommittees may be established to obtain the advice of nationally eminent specialists whose expertise is needed for the consideration of specific medical problems requiring immediate attention and action. Each ad hoc subcommittee shall terminate within 12 months after establishment, or when its mission is completed, whichever occurs first.

3. The Board shall be assisted by an Executive Secretary who shall be an officer of the Army, Navy, or Air Force, selected on the basis of demonstrated professional and administrative ability in fields allied to Board functions.

a. The Executive Secretary shall be appointed by the Secretary of the Army, based on nominations by the Surgeons General of the Military Departments. Normally, the appointment shall be for a period of 4 years and shall rotate among the Military Departments in the order of Army, Navy, and Air Force, provided that the Military Department next in rotation has an individual available who satisfies the qualifications for the position and is acceptable to the nominating and appointing authorities and to the Board.

b. The Executive Secretary shall be assisted by military and civilian personnel as may be required in the administration of the activities of the Board.

4. The Surgeon General of the Army, or a representative, is designated the official required by the Federal Advisory Committee Act (Public Law 92–463, reference [b]) to (a) approve all board and subcommittee meetings and agenda in advance; (b) attend all meetings; and (c) adjourn any meeting when it is determined to be in the public interest.

F. RESPONSIBILITIES AND FUNCTIONS

1. *Administrative support.* The Surgeon General, United States Army, as management agent, shall be responsible for providing administrative support for operation of the Board. This support includes funding, fiscal control, manpower control and utilization, personnel administration, security administration, space, facilities, supplies and other administrative services.

2. *Research Progress Briefing.* Representatives of the Military Departments shall conduct an annual review to keep

the Board informed of the military research progress in the field of infectious diseases.

3. *Duties*. The Board shall assist the Military Departments by providing timely, scientific, and professional advice and recommendations concerning operational programs, policy development, and research needs for the (a) prevention of disease and injury, (b) promotion of health by the application of new technological and epidemiological principles to the control of acute and chronic diseases, (c) protection of the environment, (d) improvement of occupational health programs, and (e) design of new system of health maintenance.

a. The Board shall review preventive medicine programs of the Military Departments as appropriate.

b. Written requests for assistance, advice, or guidance may be presented to the Board by representatives of the Office of the Secretary of Defense or of the Surgeons General during formal Board meetings or at any time a problem requires consideration.

4. *Meetings*. The Board shall meet as frequently as is necessary to accomplish its mission with at least one formal meeting annually. Subcommittees shall meet as frequently as necessary with the approval of the designated Federal official and the Board. All meetings shall be held in conformance with Public Law 92–463 (reference [b]) and E.O. 12013 (reference [c]).

5. *Reports*. The President shall report the Board's findings and recommendations through the Executive Secretary to the Assistant Secretary of Defense (Health Affairs), The Surgeons General, and other agencies requesting the Board's assistance.

a. all subcommittee reports shall be issued to the Board through the Executive Secretary. These reports subsequently may be the basis for recommendations from the Board to the ASD(HA), The Surgeons General, or others.

b. Annual reports to the Executive Agent and Committee Management authorities shall be submitted by the Executive Secretary.

c. Such reports are exempt from licensing and approval pursuant to subsection VII.C., enclosure 3, DoD Directive 5000.19 (reference [d]).

6. *Office of the Executive Secretary*

a. The Office of the Executive Secretary is hereby established under the provisions of this Directive, and shall provide the channels through which the Armed Forces may obtain scientific and professional advice from civilian experts in matters related to the prevention of disease and injury and the promotion of health.

b. The Executive Secretary shall:

(1) Provide information and assistance as Board members may require in their Board activities and may serve as the liaison or point of contact between the Board and other agencies.

(2) Prepare reports, minutes, recommendations and records, and maintain the official files of all Board activities, costs, and closed meetings, in accordance with Public Law 90–462 and implementing directives and Executive Order 12013 (references [b] and [c]) governing the operation of Federal Advisory Committees.

(3) Ensure that all Board activities comply with the Federal Advisory Committee Act and Executive Order 12013 (references [b] and [c]).

7. *Subcommittees*. Three formal, continuing subcommittees shall be chartered with the Board. The Executive Secretary, in response to specific written requests for assistance, shall coordinate the organization and utilization of these subcommittees, as follows:

a. *The Subcommittee on Disease Control* shall:

(1) Function as an advisory body to the Military Departments through the Board, providing timely, professional advice and recommendations regarding operational programs, policy development, and research needs for disease control problems in the Armed Forces.

(2) Constitute the working arm of the Board in the area of disease control, and

(3) Meet as necessary with the approval of the designated Federal official and the Board for the purpose of providing evaluations and recommendations concerning immunizations, chemoprophylaxis and therapy, as well as disease surveillance, prevention, and control.

b. *The Subcommittee on Environmental Quality* shall:

(1) Function as an advisory body to the Military Departments through the Board, providing timely professional advice and recommendations regarding operational programs, policy development and research needs for the protection of the environment from adverse effects of military activities, and protection of Department of Defense personnel from disease and injury associated with their duties.

(2) Constitute the working arm of the Board in the area of environmental quality.

(3) Meet as necessary with the approval of the designated Federal official and the Board for the purpose of providing scientific evaluations and recommendations concerning protection of both the environment and DoD personnel in all activities of the Armed Forces.

c. *The Subcommittee on Health Maintenance Systems* shall:

(1) Function as an advisory body to the Military Departments through the Board, providing timely professional advice and recommendations regarding operational programs, policy development and research needs in those areas related to maintenance of health and particularly for meeting operational contingencies.

(2) Constitute the working arm of the Board in the area of health maintenance systems.

(3) Meet as necessary, with the approval of the designated Federal official and the Board, for the purpose of providing scientific evaluations and recommendations concerning:

(a) The assessment of those physical, nutritional, behavioral, hereditary, and other characteristics of individuals and populations which are associated with the development of chronic disease or disability.

(b) Those programs which can be implemented to prevent or decrease lost duty time for Armed Forces personnel, and

(c) Those epidemiological and management techniques applicable to the design of more efficient health service programs, particularly with regard to preparations for varies operational contingencies.

G. RELATIONSHIPS

On behalf of the Board, the President of the Board and the Executive Secretary are authorized to communicate directly with the agencies or the Department of Defense, the Military Departments, subdivisions thereof, other governmental and nongovernmental agencies, and consultants concerning matters in which there is a mutual interest or responsibility.

H. EFFECTIVE DATE AND IMPLEMENTATION

This Directive is effective immediately. Forward two copies of implementing regulations to the Assistant Secretary of Defense (Health Affairs) within 120 days.

C. W. Duncan, Jr.
Deputy Secretary of Defense

THE 1980 CHARTER

Organization and Functions
Armed Forces Epidemiological Board

Headquarters
Department of the Army
Washington, DC
15 May 1980

A. **OFFICIAL DESIGNATION**

The Armed Forces Epidemiological Board; hereinafter referred to as "the Board."

B. **OBJECTIVES AND SCOPE**

The Board serves as a continuing scientific advisory body to the Surgeons General of the military departments and the Assistant Secretary of Defense (Health Affairs) providing them with timely scientific and professional advice and guidance in matters pertaining to operational programs, policy development and research needs for the prevention of disease and injury, and promotion of health.

C. **DURATION**

The Board shall be established as a continuing advisory committee subject to renewal every two years in accordance with public law

D. **RESPONSIBLE AGENCY**

The Surgeon General, Department of the Army, will exercise management control of the Board subject to the authority, direction, and control of the Secretary of Defense with the Secretary of the Army serving as Executive Agent. Subject to the provisions of P.L. 92–463, EO 11769 and GSA, DoD and DA directives governing Federal Advisory Committees, The Surgeon General of the Army, or his representative, shall be the designated federal officer or employee required by the Federal Advisory Committee Act to approve all meetings and agenda in advance and attend all meetings. He shall be authorized to adjourn any meeting when he determines adjournment to be in the public interest. The executive Secretary, or other official may be designated as the representative of the Surgeon General. Reports, findings, and recommendations by the Board shall be made to the three Surgeons General, the Assistant Secretary of Defense (Health Affairs). and other DoD agencies requesting the Board's assistance.

E. **SUPPORT AGENCY**

The Surgeon General, Department of the Army, as management agent, shall be responsible for providing administrative support for operation of the Board Administrative support is defined to include budgeting, funding, fiscal control, manpower control and utilization, personnel administration, security administration, space, facilities, supplies, and other administrative services.

F. **DUTIES**

The Board shall assist the three Surgeons General and the Assistant Secretary of Defense (Health Affairs) by providing timely scientific and professional advice and recommendations concerning operational programs, policy development and research needs for the prevention of disease and injury, and promotion of health by the application of new technological and epidemiological principles to the control of acute and chronic diseases, the protection of the environment, the improvement of occupational health programs, and the design of new

systems of health maintenance. The Board shall review preventive medicine programs of the military departments as required.

G. COST

The estimated annual operating costs are:

Man-years: Military 1, Civilian 2

Budget (travel, honoraria, and staff salaries) $140,000

H. MEETINGS

The Board shall meet as frequently as is necessary to accomplish its mission, with the provision that a minimum of one formal meeting be held annually. Subcommittees shall meet as often as is necessary. It is estimated that the Board will meet three times annually for two-day meetings, that the three continuing subcommittees will each meet three times annually for one-day meetings, and that ad hoc subcommittees will meet four times annually for one-day meetings.

I. TERMINATION DATE

As a continuing advisory committee, the Board is subject to renewal two (2) years from the date this charter is filed.

J. COMPOSITION AND TERMS OF MEMBERSHIP

1. The Board shall be composed of a maximum of 13 members selected on the basis of their nationally recognized competence in fields allied to the functions of the Board. Members shall be selected and nominated by the Surgeons General of the military departments and appointed by the Secretary of the Army. Members of the Board normally shall be appointed as consultants to The Surgeon General, Department of the Army, unless at the time of appointment to the Board they are full-time officers or employees of the Federal government.

2. The term of office for members shall be two years, with individual terms staggered in order to assure continuity. A member may be appointed to a full two-year term, or to complete an unexpired term, and may be reappointed for a second term, except that no member may serve more than two full terms in succession. A former member, having served two full terms in succession, may be reappointed to the Board after an interval of not less than two years following termination of his last appointment. The members shall elect from among themselves a president who shall serve in this capacity for a period of two years. The president, by reelection, may serve a second term, but shall not exceed two successive terms.

3 The Board shall be assisted by an Executive Secretary and such other qualified military and civilian personnel as may be required in the administration of the activities of the Board. The Executive Secretary shall be an officer of the Army, Navy, or Air Force, selected on the basis of demonstrated professional and administrative ability in fields allied to Board functions. The Executive Secretary shall be appointed by the Secretary of the Army based on nominations by the Surgeons General of the military Departments. Normally, the appointment shall rotate among the three military departments in the order Army, Navy, and Air Force.

K. SUBCOMMITTEES

Subcommittees, either continuing or ad hoc, shall be established as needed as the working groups of the Board to assist the Board in the performance of its functions.

1 Subcommittees shall conform to the provisions of P.L. 92–463, EO 12024, and implementing GSA, DoD, and DA directives which govern the operations of the Board, and shall receive support, function, and report through the Board. They shall meet as often as necessary consistent with the needs of the Armed Forces.

2 Subcommittee members shall be Board members whose major interests and expertise fall within the scope of concern of a particular subcommittee. The president of the Board shall appoint members and designate one of them to serve as the director of a continuing subcommittee or the chairperson of an ad hoc subcommittee. When necessary, each subcommittee may request the advice of nonvoting consultants in order to enable it to carry on its work while providing the requisite balance in viewpoints represented and breadth of expertise.

3 Three formal, continuing subcommittees shall hereby be chartered with the Board These shall be as follows.

a *The Subcommittee on Disease Control* shall function as a subcommittee of the AFEB with specific emphasis

on operational programs, policy development, and research needs for disease control in the Armed Forces. This group of infectious disease specialists shall constitute the working arm of the Board in the area of disease control. It shall meet as necessary with the approval of the Board for the purpose of providing the latest scientific evaluations and recommendations concerning immunizations, chemoprophylaxis, and therapy, as well as disease surveillance, prevention, and control. The duties of this subcommittee are entirely within the duties of the parent committee (The AFEB) and all members of the subcommittee are members of the parent committee.

b. *The Subcommittee on Environmental Quality* shall function as a subcommittee of the AFEB with specific emphasis on operational programs, policy development and research needs, for the protection of the environment from adverse effects of military activities and protection of Department of Defense personnel from disease and injury associated with their duties. This group of environmental- and occupational-health specialists shall constitute the working arm of the Board for the purpose of providing the latest scientific evaluations and recommendations concerning protection of both the environment and DoD personnel in all activities of the Armed Forces. The duties of this subcommittee are entirely within the duties of the parent committee (The AFEB) and all members of the subcommittee are members of the parent committee.

c. *The Subcommittee on Health Maintenance Systems* shall function as a subcommittee of the AFEB with specific emphasis on operational programs, policy development, and research needs in those areas related to maintenance of health, and particularly for meeting operational contingencies. This group of health maintenance and chronic-disease-control specialists shall constitute the working arm of the Board in the area of health maintenance systems. It shall meet as necessary with the approval of the Board for the purpose of providing the latest scientific evaluations and recommendations concerning

(1) the assessment of those physical, nutritional, behavioral, hereditary, and other characteristics of individual and populations which are associated with the development of chronic disease or disability,

(2) those programs which can be implemented to prevent those events which result in lost duty time for Armed Forces personnel, and

(3) those epidemiological and management techniques applicable to the design of more efficient health service programs, particularly with regard to preparations for varied operational contingencies. The duties of this subcommittee are entirely within the duties of the parent committee (The AFEB) and all members of the subcommittee are members of the parent committee.

4. When necessary, the Board shall establish informal ad hoc subcommittees to consider specific medical problems of an urgent nature requiring immediate attention and action. Each ad hoc subcommittee shall terminate within 12 months after establishment, or whenever its mission is completed, whichever occurs first.

L. Date Charter filed
1 October 1980

By Order of the Secretary of the Army:

E. C. Meyer
General, United States Army
Chief of Staff

Official:
J. C. Pennington
Major General, United States Army
The Adjutant General

THE 1986 CHARTER

The Armed Forces Epidemiological Board

A. OFFICIAL DESIGNATION

The Armed Forces Epidemiological Board; hereinafter referred to as "the Board."

B. OBJECTIVES AND SCOPE

The Board serves as a continuing scientific advisory body to the Surgeons General of the military departments and the Assistant Secretary of Defense (Health Affairs) providing them with timely scientific and professional advice and guidance in matters pertaining to operational programs, policy development and research needs for the prevention of disease and injury, and the promotion of health.

C. DURATION

The Board shall be established as a continuing advisory committee subject to renewal every two years in accordance with public law.

D. RESPONSIBLE AGENCY

The Surgeon General, Department of the Army, will exercise management control of the Board subject to the authority, direction, and control of the Secretary of Defense with the Secretary of the Army serving as Executive Agent. Subject to the provisions of P.L. 92-463, EO 11769, and GSA, DoD, and DA directives governing Federal Advisory Committees, the Board shall function as a joint agency of the three military departments. The Surgeon General of the Army or his representative shall be the designated federal officer or employee required by the Federal Advisory Committee Act to approve all meetings and agenda in advance and attend all meetings. He shall be authorized to adjourn any meeting when he determines adjournment to be in the public interest. The Executive Secretary or other official may be designated as the representative of the Surgeon General. Reports, findings, and recommendations by the Board shall be made to the three Surgeons General, the Assistant Secretary of Defense (Health Affairs), and other DoD agencies requesting the Board's assistance.

E. SUPPORT AGENCY

The Surgeon General, Department of the Army, as management agent, shall be responsible for providing administrative support for operation of the Board. Administrative support is defined to include budgeting, funding, fiscal control, manpower control and utilization, personnel administration, security administration, space, facilities, supplies, and other administrative services.

F. DUTIES

The Board shall assist the three Surgeons General and the Assistant Secretary of Defense (Health Affairs) by providing timely scientific and professional advice and recommendations concerning operational programs, policy development and research needs for the prevention of disease and injury, and promotion of health by the application of new technological and epidemiological principles to the control of acute and chronic diseases, the protection of the environment, the improvement of occupational health programs, and the design of new systems of health maintenance. The Board shall review preventive medicine programs of the military departments as required.

G. COST

The estimated annual operating costs are:

1. Man-years: [a.] Military: 1; [b.] Civilian: 2
2. Budget. Travel, honoraria, and staff salaries: $13[illegible],850

H. MEETINGS

The Board shall meet as frequently as is necessary to accomplish its mission with the provision that a minimum of one formal meeting be held annually. Subcommittees shall meet as often as is necessary. It is estimated that the Board will meet three times annually for two-day meetings, that the four continuing subcommittees will each meet three times annually for one-day meetings, and that ad hoc subcommittees will meet four times annually for one-day meetings.

I. TERMINATION DATE

As a continuing advisory committee, the Board is subject to renewal two (2) years from the date this charter is filed.

J. COMPOSITION AND TERMS OF MEMBERSHIP

1. The Board shall be composed of a maximum of 13 members selected on the basis of the nationally recognized competence in fields allied to the functions of the Board. Members shall be selected and nominated by the Surgeons General of the military departments and appointed by the Secretary of the Army. Members of the Board normally shall be appointed as consultants to The Surgeon General, Department of the Army, unless at the time of appointment to the Board they are full-time officers or employees of the Federal government.

2. The term of office for members shall be two years, with individual terms staggered in order to assure continuity. A member may be appointed to a full two-year term to to complete an unexpired term, and may be reappointed for a second term, except that no member may serve more than two full terms in succession. A former member, having served two full terms in succession, may be reappointed to the Board after an interval of not less than two years following termination of his last appointment. The members shall elect from among themselves a president who shall serve in this capacity for a period of two years. The president may, by reelection, serve a second term, but shall not exceed two successive terms.

3. The Board shall be assisted by an Executive Secretary and such other qualified military and civilian personnel as may be required in the administration of the activities of the Board. The Executive Secretary shall be an officer of the Army, Navy, or Air Force,selected on the basis of demonstrated professional and administrative ability in fields allied to Board functions. The Executive Secretary shall be appointed by the Secretary of the Army based on nominations by the Surgeons General of the military departments. Normally, the appointment shall rotate among the three military departments in the order of Army, Navy, and Air Force.

K. SUBCOMMITTEES

Subcommittees, either continuing or ad hoc, shall be established as needed as the working groups of the Board to assist the Board in the performance of its functions.

1. Subcommittees shall conform to the provisions of P.L. 92–463, EO 12024, and implementing GSA, DoD, and DA directives, which govern the operations of the Board, and shall receive support, function, and report through the Board. They shall meet as often as necessary, consistent with the needs of the Armed Forces.

2. Subcommittee members shall be Board members whose major interests and expertise fall within the scope of concern of a particular subcommittee. The president of the Board shall appoint members and designate one of them to serve as the Director of a continuing subcommittee or the chairperson of an ad hoc subcommittee. When necessary, each subcommittee may request the advice of nonvoting consultants in order to enable it to carry on its work while providing the requisite balance in viewpoints through represented [*sic*] and breadth of expertise.

3. Four formal, continuing subcommittees shall hereby be chartered with the Board. These shall be as follows:

a. *The Subcommittee on Disease Control* shall function as a subcommittee of the AFEB with specific emphasis on operational programs, policy development, and research needs for disease control in the Armed Forces. This group of infectious disease specialists shall constitute the working arm of the Board in the area of disease control. It shall meet as necessary with the approval of the Board for the purpose of providing the latest scientific evaluations and recommendations concerning immunizations, chemoprophylaxis, and therapy, as well as disease surveillance, prevention, and control. The duties of this subcommittee are entirely within the duties of the parent committee (The AFEB) and all members of the subcommittee are members of this parent

committee.

b. *The Subcommittee on Environmental Quality* shall function as subcommittee of the AFEB with specific emphasis on operational programs, policy development, and research needs, for the protection of the environment from adverse effects of military activities, and protection of Department of Defense personnel from disease and injury associated with their duties. This group of environmental- and occupational-health specialists shall constitute the working arm of the Board in the area of environmental quality. It shall meet as necessary with the approval of the Board for the purpose of providing the latest scientific evaluations and recommendations concerning protection of both the environment and DoD personnel in all activities of the Armed Forces. The duties of this subcommittee are entirely within the duties of the parent committee (The AFEB) and all members of the subcommittee are members of this parent committee.

c. *The Subcommittee on Health Maintenance Systems* shall function as a subcommittee of the AFEB with specific emphasis on operational programs, policy development, and research needs in those areas related to maintenance of health, and particularly for meeting operational contingencies. This group of health-maintenance and chronic-disease-control specialists shall constitute the working arm of the Board in the area of health-maintenance systems. It shall meet as necessary, with the approval of the Board, for the purpose of providing the latest scientific evaluations and recommendations concerning:

(1) the assessment of those physical, nutritional, behavioral, hereditary, and other characteristics of individuals and populations which are associated with the development of chronic disease or disability;

(2) those programs which can be implemented to prevent those events which result in lost duty-time for Armed Forces personnel, and

(3) those epidemiological and management techniques applicable to the design of more efficient health service programs, particularly with regard to preparations for varied operational contingencies.

The duties of this subcommittee are entirely within the duties of the parent committee (The AFEB) and all members of the subcommittee are members of this parent committee.

d. *The Subcommittee on Acquired Immune Disease Syndrome (AIDS) and Human T-Lymphotropic Virus Type III (HTLV-III) Positivity* shall function as a subcommittee of the AFEB with specific emphasis on operational programs, policy development, and research needs for the control of AIDS and for the monitoring and interpretation of HTLV-III positivity in the Armed Forces. The group of infectious disease specialists shall constitute the working arm of the Board in this area of disease control. It shall meet as necessary with the approval of the Board for the purpose of providing the latest scientific evaluations and recommendations concerning immunizations and therapy, as well as surveillance, prevention, and control of this disease. The duties of this subcommittee are entirely within the duties of the parent committee (The AFEB) and all members of the subcommittee are members of this parent committee.

4. When necessary, the Board shall establish formal ad hoc subcommittees to consider specific medical problems of an urgent nature requiring immediate attention and action. Each ad hoc subcommittee shall terminate within 12 months after establishment, or whenever its mission is completed, whichever occurs first.

L. DATE CHARTER FILED

28 February 1986

THE 1988 CHARTER

Armed Forces Epidemiological Board

A. OFFICIAL DESIGNATION

The Armed Forces Epidemiological Board; hereinafter referred to as "the Board."

B. OBJECTIVES AND SCOPE

The Board serves as a continuing scientific advisory body to the Surgeons General of the military departments and the Assistant Secretary of Defense (Health Affairs), providing them with timely scientific and professional advice and guidance in matters pertaining to operational programs, policy development, and research needs for the prevention of disease and injury and the promotion of health.

C. DURATION

The Board shall be established as a continuing advisory committee subject to renewal every two years in accordance with public law.

D. RESPONSIBLE AGENCY

The Surgeon General, Department of the Army, will exercise management control of the Board subject to the authority, direction, and control of the Secretary of Defense, with the Secretary of the Army serving as Executive Agent. Subject to the provisions of P.L. 92–463, EO 11769, and Gsa, DoD, and DA directives governing Federal Advisory Committees, the Board shall function as a joint agency of the three military departments. the Surgeon General of the Army or his representative shall be the designated federal officer or employee required by the Federal Advisory Committee Act to approve all meetings and agendas in advance and attend all meetings. He shall be authorized to adjourn any meeting when he determines adjournment to be in the public interest. The Executive Secretary or other official may be designated as the representative of the Surgeon General. Reports, findings, and recommendations by the Board shall be made to the three Surgeons General, the Assistant Secretary of Defense (Health Affairs), and other DoD agencies requesting the Board's assistance.

E. SUPPORT AGENCY

The Surgeon General, Department of the Army, as management agent, shall be responsible for providing administrative support for the operation of the Board. Administrative support is defined as budgeting, funding, fiscal control, manpower control and utilization, personnel administration, security administration, space, facilities, supplies, and other administrative services.

F. DUTIES

The Board shall assist the three Surgeons General and the Assistant Secretary of Defense (Health Affairs) by providing timely scientific and professional advice and recommendations concerning operational programs, policy development, and research needs for the prevention of disease and injury, and the promotion of health by the application of new technological and epidemiological principles to the control of acute and chronic diseases, the protection of the environment, the improvement of occupational health programs, and the design of new systems of health maintenance. The Board shall review preventive medicine programs of the military departments as required.

G. COST

The estimated annual operating costs are:

1. Man-years: [a.] Military: 1; [b.] Civilian: 2
2. Budget (travel, logistical costs, and staff salaries): $134,850

H. MEETINGS

The Board shall meet as frequently as necessary to accomplish its mission, with the provision that a minimum of one formal meeting be held annually. Subcommittees shall meet as often as is necessary. It is estimated that the Board will meet three times annually for two-day meetings, that the three continuing subcommittees will each meet three times annually for one-day meetings, and that ad hoc subcommittees will meet four times annually for one-day meetings.

I. TERMINATION DATE

As a continuing advisory committee, the Board is subject to renewal two (2) years from the date this charter is filed.

J. COMPOSITION AND TERMS OF MEMBERSHIP

1. The Board shall be composed of approximately 15 members selected on the basis of their nationally recognized competence in fields allied to the functions of the Board. Members shall be selected and nominated by the Surgeons General of the military departments and appointed by the Secretary of the Army. Members of the Board normally shall be appointed as consultants to The Surgeon General, Department of the Army, unless at the time of appointment to the Board they are full-time officers or employees of the Federal Government.

2. The term of office for members hall be two years, with individual terms staggered in order to assure continuity. A member may be appointed to a full two-year term or to complete an unexpired term, and may be reappointed for a second term, except that no member may serve more than two full terms in succession. A former member, having served two full terms in succession, may be reappointed to the Board after an interval of not less than two years following termination of his last appointment. The members shall elect from among themselves a president who shall serve in this capacity for a period of two years. The president may, by reelection, serve a second term, but shall not exceed two successive terms.

3. The Board shall be assisted by an Executive Secretary and such other qualified military and civilian personnel as may be required in the administration of the activities of the Board. The Executive Secretary shall be an officer of the Army, Navy, or Air Force, selected on the basis of demonstrated professional and administrative ability in fields allied to Board functions. The Executive Secretary shall be appointed by the Secretary of the Army, based on nominations by the Surgeons General of the military departments. Normally, the appointment shall rotate among the three military departments in the order of Army, Navy, and Air Force.

K. SUBCOMMITTEES

Subcommittees, either continuing or ad hoc, shall be established as needed as the working groups of the Board to assist the Board in the performance of its functions.

1. Subcommittees shall conform to the provision of P.L. 92–463, EO 12013, and implementing GSA, DoD, and DA directives, which govern the operations of the Board, and shall receive support, function, and report through the Board. They shall meet as often as necessary, consistent with the needs of the Armed Forces.

2. Subcommittee members shall be Board members whose major interests and expertise fall within the scope of concern of a particular subcommittee. The president of the Board shall appoint members and designate one of them to serve as the Director of a continuing subcommittee or the chairperson of an ad hoc subcommittee. When necessary, each subcommittee may request the advice of nonvoting consultants in order to enable it to carry on its work while providing the requisite balance in viewpoints through represented [*sic*] and breadth of expertise.

3. Three formal continuing subcommittees shall hereby be chartered with the Board. These shall be as follows:

a. *The Subcommittee on Disease Control* shall function as a subcommittee of the AFEB with specific emphasis on operational programs, policy development, and research needs for disease control in the Armed Forces. This group of infectious-disease specialists shall constitute the working arm of the Board in the area of disease control. It shall meet as necessary, with the approval of the Board, for the purpose of providing the latest scientific evaluations and recommendations concerning immunizations, chemoprophylaxis and therapy, as well as disease surveillance, prevention, and control. The duties of this subcommittee are entirely within the

duties of the parent committee (the AFEB), and all members of the subcommittee are members of this parent committee.

b. *The Subcommittee on Environmental Quality* shall function a a subcommittee of the AFEB with specific emphasis on operational programs, policy development, and research needs for the protection of the environment from adverse effects of military activities, and the protection of Department of Defense personnel from disease and injury associated with their duties. This group of environmental-and occupational-health specialists shall constitute the working arm of the Board in the area of environmental quality. It shall meet as necessary, with the approval of the Board, for the purpose of providing the latest scientific evaluations and recommendations concerning protection of both the environment and DoD personnel in all activities of the Armed Forces. The duties of this subcommittee are entirely within the duties of the parent committee (the AFEB) and all members of the subcommittee are members of this parent committee.

c. *The Subcommittee on Health Maintenance Systems* shall function as a subcommittee of the AFEB with specific emphasis on operational programs, policy development, and research needs in those areas related to maintenance of health, and particularly for meeting operational contingencies. This group of health-maintenance and chronic-disease-control specialists shall constitute the working arm of the Board in the area of health maintenance systems. It shall meet as necessary, with the approval of the Board, for the purpose of providing the latest scientific evaluations and recommendations concerning:

(1) the assessment of those physical, nutritional, behavior, hereditary, and other characteristics of individuals and populations which are associated with the development of chronic disease or disability;

(2) those programs which can be implemented to prevent those events which result in lost duty-time for Armed Forces personnel; and

(3) those epidemiological and management techniques applicable to the design of the more efficient health service programs, particularly with regard to preparations for varied operational contingencies. The duties of this subcommittee are entirely within the duties of the parent committee (the AFEB) and all members of the subcommittee are members of this parent committee.

4. When necessary, the Board shall establish formal ad hoc subcommittees to consider specific medical problems of an urgent nature requiring immediate attention and action. Each ad hoc subcommittee shall terminate within 12 months after establishment, or whenever its mission is completed, whichever occurs first.

L. DATE CHARTER FILED

29 February 1988