

## **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 Kushner, 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 IC were protected.

Research requirements include: definition of the characteristics of hepatitis in the region concerned, agent identification and characterization, the effectiveness of JG 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.B.] 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-toxicogenic strains such as E 1292/75 (2A). From the therapy point of view, early treatment with trimethopim-sulfasoxazole 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 Boutonouse 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 Boutonouse 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 US. 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 pHiso hex 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 Tigert comes to mind as one who might be very helpful.

*The Armed Forces Epidemiological Board*

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 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 his belief that military and civilian medicine were comparable in certain of their objectives. His wisdom and perception helped the Board in its relationships with the military, and his role in maintaining the security of the Department 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 Board (AFEB) expresses its concern over the proposal that military medical research laboratories in foreign countries be reduced in their scope, eliminated or placed under civilian management by contractual arrangements. The Board devoted portions of its last two meetings to discussion of this important matter. Its considered judgment is that such action would lead to an unacceptable reduction in military operational and research capability. Any savings to our government in terms of expenditures for personnel and Operational costs would be trivial in comparison with the loss.

Board members feel obligated to voice their concern in view of the AFEB mission "to provide timely advice and recommendations concerning operational programs, policy development and research needs for the prevention of disease and injury and the promotion of health." Its competence to do so lies not only in its forty years of institutional involvement with military medical research programs, but also in the long personal and productive experience of several of its current members who have been active either in the direct operation of, or as consultants to, military medical research in supporting laboratories 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. USAJD 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 NIFI- 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 a 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 core 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 (gastricoduodenal 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 specimen 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; Moechar, 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 conferences 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: <i>Col. C. Fred Tyner</i> , Director, WRAIR
0840	Introduction: <i>Capt. J. Woody</i> , CO, Navy MRDC
0850	Introduction: <i>Maj. Gen. P. Russell</i> , CDR, USAMRDC
0900	Army Infectious Disease Program: <i>Col. D. Robinson</i>
0930	Navy Infectious Disease Program: <i>Capt. L. Laughlin</i>
1000	Break
1020	AFRIMS (Thailand): <i>Col. F. Sodetz</i>
1050	USAMRU-M (Malaysia): <i>Col. G. Lewis</i>
1110	NAMRU-2 (Philippines): <i>Capt. J. Coolbaugh</i>
1130	NAMRU-2 DET (Indonesia): <i>Cdr. F. Paleologo</i>
1150	USAMRU-ROK (Korea): <i>Col. K. Dixon</i>
1210	Lunch
1330	NAMRU-3 (Egypt): <i>Capt. M. Kilpatrick</i>
1400	USAMRU-K (Kenya): <i>Col. C. Roberts</i>
1420	Break
1440	NAMRI-DET (Peru): <i>Cdr. R. Buck</i>
1500	USAMRU-B (Brazil): <i>Maj. (P) McGreevy</i>
1520	Break
1540	HIV: <i>Col. E. Tramont</i>
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. Rappmund*  
1320 **Forest Ecology:** *Dr. I. Muul*  
1340 Doxycycline 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:

- 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.<sup>2</sup> 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.<sup>3</sup> 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."

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)<sup>5</sup> 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 pattern 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.<sup>6</sup>

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.<sup>7</sup> 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."<sup>8</sup> 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.'

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 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 Managexpent 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."<sup>10</sup>

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." 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.\* 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.<sup>13</sup>

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.<sup>14</sup>

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<sup>15</sup> 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,<sup>16</sup> 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."<sup>17</sup>

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.<sup>18</sup>

### **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, DQCPS, 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

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#### REFERENCES

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