After sketching briefly the development of military preventive medicine in the U. S. Army, Dr. Whayne discusses the preventive medicine volumes of the official history of the U. S. Army Medical Department in World War II and points out their usefulness in civilian public health and preventive medicine.

The History of Preventive Medicine in World War II

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WHEN Sir William Osler, soon after the turn of the century, said that preventive medicine is the medicine of tomorrow, he was looking far ahead. He was to live through one world war, and when he died, the year after it ended, it was still regarded as the war to end all wars. He could not foresee the time, a quarter of a century later, when, in the stresses of a global war, all the knowledge of civilian experts in public health and preventive medicine would be pooled with that of medicomilitary experts to make history in these fields at home and in the far corners of the earth.

Modern advances in both military and civilian preventive medicine and public health grew out of the shocking morbidity and mortality of typhoid fever in the Spanish-American War and the challenge of yellow fever and malaria soon afterward. There was close cooperation in those days between Brig. Gen. George M. Sternberg and his group at the Army Medical School and the group on the Johns Hopkins Medical School faculty headed by William H. Welch. The cooperation was so close, in fact, that it would be hard to separate the military and civilian contributions of those years. Fortunately, this is not necessary. There was glory enough for all. Fortunately, too, there were young men like Maj. Walter Reed, who were eager to accept the challenge of the times and to use the new tools, the most useful of which was, and still is, field investigation using epidemiological techniques.

Although preventive medicine still had far to go when World War I began, the developments which had already occurred and the functional organization of resources and personnel accounted for a brilliant record of achievement, seriously marred only by the devastating epidemic of influenza in the fall of 1918. Epidemiological techniques, field investigations, combined epidemiological-laboratory teams for the expeditious evaluation of disease outbreaks and a focal attack upon them, methods developed for the control of the environment—these were far-reaching developments which have solved many a medicomilitary and civilian problem since.

At the beginning of World War II, Brig. Gen. James Stephens Simmons, outstanding in a group of outstanding preventive medicine and public health specialists in the Office of the Army Surgeon General, was selected to plan,

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develop, and administer the Army program in these fields. He was an admirable choice. He had inherited the traditions of Sternberg and Reed. He had served under Gorgas. He was a recognized authority in epidemiology, the laboratory sciences, and tropical medicine. He had worked closely, in an aura of warm personal friendships, with civilian experts in his own and other fields.

General Simmons was one of the somewhat limited group who appreciated from the beginning the global nature of World War II. He built up a flexible, practical, and highly effective military organization. He had the foresight to plan a medical intelligence organization which provided essential, global information on health hazards and conditions. His greatest contribution, however, was the forging of civilian and military experts into a homogeneous, cordial, and productive working relationship. The stimulus thus provided for cooperative endeavors was among the most precious commodities to come out of the war. By their joint efforts, these groups solved medical problems in environments ranging from the Arctic to the tropical lands of Africa and the far islands of the Pacific. The Army Epidemiological Board and the United States of America Typhus Commission, whose published reports fill a 3-foot shelf, were General Simmons' concept.

History of World War II

Medical military history, in the formalized modern sense, began with the publication, only 2 years after the end of hostilities, of the story of the Crimean War. This history was written because Andrew Smith, director general of the British Army Medical Service, found himself, on assuming his task, with "a complete absence of all details of previous wars calculated to instruct," and he determined that no successor of his should ever again find himself in that situation. In spite of the wide differences in the circumstances of the two wars, these volumes on the Crimean War, as Surgeon Joseph J. Woodward said, "gave direction" to the efforts of the U. S. Army Medical Department in the Civil War. Brig. Gen. Frank W. Weed, editor in chief of the Medical Department history of World War I, wrote later that if there had existed during the Civil War a dependable record of earlier wars in this country, epidemics might have been foreseen, even in those pre-epidemiology days, and diarrheas prevented.

The volumes that make up the series entitled "Medical Department, United States Army, in World War II" are part of a total series of about 125 (proposed) volumes dealing with all aspects of the war in all theaters in which it was fought. The Medical Department series will eventually consist of about 50 volumes. One volume, in the surgical series, was published in 1952. Since the fall of 1955, there also have been published, exclusive of the preventive medicine volumes, 1 (of 8 scheduled) administrative volume; 6 (of 15 scheduled) surgical volumes; and a dental volume and a volume on cold injury (in a series of 8 scheduled volumes on various other subjects). It is hoped that all the medical volumes can be completed by the end of 1961.

Preventive Medicine Volumes

When the preventive medicine series of this history was planned, General Simmons was selected as chairman of the advisory editorial board, a position which he filled brilliantly until his death in 1954. His work was then taken over by Brig. Gen. Stanhope Bayne-Jones (Ret.), who has served with equal wisdom and competence.

The advisory editorial board set up under General Simmons consists of men distinguished in the field of preventive medicine, all of whom were in service, in positions of responsibility, at home or overseas. They developed the outline for the history and selected the authors and reviewers for the various chapters. With great wisdom, they selected the authors from among men who had "been there," who understood administrative and other military problems as well as epidemiological and other preventive medicine problems, and who could relate both to the environment in which these problems arose.

Of the 8 volumes proposed in this series, 3 have already been published. One dealing with environmental hygiene and another with personal health measures and immunization were published in 1955. One of the three vol-

umes on communicable diseases was published in 1958; another will appear in 1959. The remaining volumes will cover the organization and operation of the program; malaria and other anthropod-borne diseases; civil health problems; and education, laboratories, and training.

The volume on environmental hygiene relates how sanitarians, entomologists, engineers, and physicians maintained standards of sanitation in areas of endemic disease and in the midst of destroyed water and waste disposal systems, or how they set up these systems in areas in which they had never existed. The subjects covered include food management, housing, water purification, waste disposal, insect control, rodent control, the research background of these programs, foreign quarantine, and preventive medicine in ports of embarkation and for persons in transit.

The story told in this book is impressive. Plague was not reported in U. S. Army personnel during the war. No plague-infecting rodent was recovered from a United States military vessel or aircraft. Only 13 cases of cholera were reported during the whole war, and only 102 cases of louseborne typhus, only 1 of which was fatal. There were no cases of yellow fever.

Subjects covered in the volume on personal health measures and immunization include the selection of manpower and the lessons learned from the physical and mental defects thus revealed, personal hygiene, clothing, malnutrition and deficiency diseases, preventive psychiatry, accidental trauma, and the Army immunization program. The tetanus program is typical of the success of many of these measures. Only 12 cases were recorded in the whole Army, and 6 of these were in personnel who had never been immunized.

During World War II, almost 33,000 deaths overseas were caused by nonbattle injuries. More realistically, nonbattle trauma was the cause of 1 in every 5 notifications of death sent to the family of a United States soldier. This is a problem which has existed since the Revolutionary War and which has increased in gravity as mechanization of the Armed Forces has increased. It is also, as a British military ophthalmologist forthrightly put it, augmented by "the stupidities of fools." As the war ended, it was outstandingly demonstrated that there was need for military and civilian organizations in many fields to combine their efforts for the solution of what is a major public health as well as a major military problem.

The first of the volumes on communicable diseases to be published concerns diseases transmitted through the respiratory and alimentary tracts. It begins with an excellent chapter on modes of transmission and then discusses special diseases and disease groups.

Interesting comparisons can be made between the diseases discussed in this volume and those discussed in the World War I history. The slight discussion of amebiasis in the World War I history and the extended discussion in this volume, for instance, indicate not only the importance of this disease at this time but also the greatly increased knowledge concerning it.

Tuberculosis was a major problem in World War I, when X-ray techniques were crude by modern standards and screening was chiefly characterized by good intentions. Patients from World War I are still part of the population of Veterans Administration hospitals. In World War II, the efficient screening and case-finding methods which had been developed between the wars were put to good use. The Military Government Organization undertook the control of tuberculosis as one of its first functions during the period of occupation, rightly regarding the restoration of normal casefinding and reporting practices as quite as

Availability of Volumes

Upon publication the preventive medicine volumes in the history of the Medical Department, United States Army, in World War II are placed on sale by the Superintendent of Documents, Government Printing Office, Washington 25, D. C. The following are now available:

Environmental Hygiene, vol. 2, 1955, 404 pp., $3.50.

Personal Health Measures and Immunization, vol. 3, 1955, 394 pp., $3.25.

Communicable Disease, vol. 4, 1958, 544 pp., $5.50.

important as the provision of beds for tuberculous patients. Research during the war also produced valuable information on two subjects. One was the inherent risk of small lesions whose activity is difficult to determine. The other was the causes of breakdown from tuberculosis, including the types of stress which lead to relapse and those which can be withstood without the breakdown of a latent lesion.

Historically, meningococcal meningitis has always been a disease of serious concern to workers in both civilian and military preventive medicine. Across the years, whatever progress has been made in prevention and treatment in one field has been quickly applied in the other. Both civilian and military experts worked on this disease in World War II. Sulfadiazine, used prophylactically, was reasonably effective in the military organization, but prevention in a heterogeneous and nonregimented civilian population was—and still is—impractical. Treatment, in spite of modern advances, is still far from satisfactory. The situation in World War II was improved over World War I. Although this disease ranked 76th in admissions to Army hospitals in the first world war, it was the 6th ranking cause of death because 40 percent of the cases were fatal. Civilian and military experts must continue to pool their efforts if the disease is to be controlled.

Use of Preventive Medicine Volumes

The volumes in the preventive medicine series are not a chronological record of events. Their primary objective is a searching evaluation of military preventive medicine in a global war. They tell the engrossing story of attempts to control diseases, modify environments, and maintain the health of military and civilian populations under wartime conditions in a conflict that covered the earth. Some diseases had never before been recognized. Every new environment offered new potential threats. The very water the troops drank and the rivers in which they bathed were hazards. As always happens, our knowledge of the natural history of disease and of human ecology in its broadest perspective was increased by these wartime experiences.

The principles and practices of preventive medicine and public health had to be applied to young and healthy men in military service, and they also had to be applied to large civilian populations of all ages and races and of both sexes. In liberated and occupied countries, this was the responsibility of the Civil Affairs and Military Government Organization. The prevention of disease and the control of environmental factors were accomplished rapidly and efficiently because of military-civilian teamwork. The principles and practices of military preventive medicine and of civilian public health often overlap, but they are fundamentally the same, even when the local population and environment to which they must be applied are different.

Reviewers of the volumes of the preventive medicine series have shown great appreciation of their objectives as well as of the methods by which these objectives have been attained. Among the points they make are these:

1. As these books show, preventive medicine is a comprehensive discipline, which encompasses far more than environmental sanitation and the control of communicable diseases.

2. In these books, the source material is so distilled that the reader who could not possibly digest it in the mass need concern himself only with the essence. They are packed with factual data, including comprehensive and extremely useful statistical data. They also frankly confess errors.

3. These are very readable books. Says a British reviewer, "Our American cousins have good reason to be proud." Says an American reviewer, who was undoubtedly in service himself, these volumes are recommended to "those hopefully still vigorous spirits who might enjoy just reminiscing," a point which reviewers of other volumes in the series have also emphasized.

4. The material is applicable to many areas of civilian public health and preventive medicine. These volumes contain much for such specialists as the sanitary engineer and the sanitarian, the entomologist, the industrial hygienist and others in industrial practice, the veterinarian, the nutritionist, and the public health nurse. They should also be of interest and profit to the organizations, institutions, and agencies in which these specialists work,

including both official and voluntary health agencies, medical schools and schools of public health, research institutions, hospitals, medical departments of commercial firms and factories, and national and international health agencies outside the United States.

Practicing physicians today must have a broad understanding of all aspects of the prevention of disease and of the influence of the physical and social environment upon their patients. They too will find these books useful.

Finally, civil defense organizations require a specific knowledge of emergency health programs which are applicable upon a mass basis. The preventive medicine story of World War II as it is recorded in these volumes is the basis of much of the medicine of the future, in which medicomilitary and civilian cooperation will be necessary for the protection and maintenance of health under conditions which invite disease and trauma.

It takes more than the mere existence of a medical military history to make such a history useful. The value of the Civil War history was never fully realized because it was distributed on an individual basis, through members of the Congress. The distribution of the World War I medical history was considerably more logical, but it was scarcely publicized, and we paid dearly for the oversight in World War II, when the majority of medical officers were almost completely ignorant of what had been done in World War I both in their special fields and in the general medicomilitary field. As I have helped to prepare the medical history of World War II, I have had many occasions, for comparative purposes, to refer to the World War I history, and, to my chagrin, I have often found in these volumes the plain and clear answers to many of the problems over which I and my associates struggled in World War II. It would pay all of us to remember another saying of Sir William Osler's, that by the historical method alone can many of the problems of medicine be approached most profitably.

Conclusions

Since the end of World War II, there has been a dramatic decline in the extent and severity of many diseases of public health and military significance. Malaria, for instance, by a continuation of the wartime lessons, is in a fair way to being tamed and even eradicated in most of the world within the near future. This is also true of other diseases. But the work is far from done, and those responsible for progress in preventive medicine and public health in civil life may profit greatly by studying the experiences of military men in World War II. In the volumes devoted to preventive medicine in the official history of the U. S. Army Medical Department are set forth methods, techniques, and basic philosophy as they are applicable to civilian public health and preventive medicine of today and even of tomorrow.

PHS Cancer Chemotherapy Project Matures

The Public Health Service's cancer chemotherapy program, mobilizing resources of hospitals, universities, research laboratories, industry, and government, has steadily expanded over the last 5 years with the following results:

- More than 40,000 compounds and other materials are being tested annually on more than a million mice to uncover chemicals with anticancer properties. About 70,000 materials have been screened.
- Between 400 and 600 materials a year are promising enough to be further analyzed with tests in mice and larger animals. Nine out of 10 materials are rejected as either ineffective or too toxic.
- About 40 materials a year are approved for clinical trials with human patients. Currently 70 are undergoing clinical trials.