200 YEARS OF MILITARY MEDICINE

U.S. ARMY MEDICAL DEPARTMENT

TWO HUNDRED YEARS

OF

MILITARY MEDICINE

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To the Soldiers —
and to the Nation they have served for 200 years

FOREWORD

For two hundred years, since its establishment by the Continental Congress on 27 July 1775, members of the Army Medical Department have been in the forefront among American Men of Medicine in the progress of the art and science of medicine around the world.

Advances in military medicine have had a significant impact on the course of civilian medical practice, even as progress in civilian medicine has affected the military. The two fields of medicine emerge from history as a single fabric, their elements imperceptibly merged.

Presented here, in chronological order, are some of the milestones in the evolution of the United States Army Medical Department.

It is particularly noteworthy that although the number of medical officers have been few in comparison to their civilian colleagues, their accomplishments for the betterment of mankind are legion.

One can expect that this proud tradition of service will continue during the decades which lie ahead.

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PREFACE

This chronology is not a history of the Army Medical Department nor is it a history of military medicine in the United States from 1775 to 1975. It is a compilation of the outstanding contributions made by the Army Medical Department to military and civilian science, medicine, and public health.

Certain assumptions guided us in our selection of entries from the record of the achievements of the Army Medical Department since 1775. We have focused on events that we judged were important to the nation, to science, and to the practice of medicine. We have not included many issues — mainly administrative — that are important only to the Army Medical Department. We have emphasized the achievements of the great soldier-scientists and physicians who were career officers in the Army. All military ranks or professional titles are given as the date of the event recorded. There is little mention made of those who have practiced clinical medicine in the Army for 200 years; their continuing care of the soldier in peace and war is the foundation upon which these more visible records were constructed.

This chronology had its origins in a modest pamphlet prepared in 1972 by the Technical Liaison Office, Office of the Surgeon General, at the request of Lieutenant General Hal B. Jennings, M.D., The Surgeon General. A revised and enlarged version was prepared in January 1973 by the present authors at the request of Major General Richard R. Taylor, M.D., then Commanding General of the U.S. Army Medical Research and Development Command, for distribution at the Army Scientific Advisory Panel meeting at the Walter Reed Army Institute of Research in March 1973. The present edition is the result of further revisions and additions.

Many members of the Medical Department, both active and retired, shared their knowledge of its history with the authors. Their invaluable contributions are gratefully acknowledged. A special note of appreciation is due Colonel John Lada, MSC, the Director, US Army Medical Department Historical Unit, and members of his staff, for support and assistance. We alone are responsible for any error of omission or commission.

The reading list at the end is not intended to be a citation of sources used in preparing this chronology. We have used these references, as well as many other specialized medical, military, and military medical histories and publications. The reading list is provided to entice the interested reader to further exploration of the history of military medicine and the US Army Medical Department.

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TWO HUNDRED YEARS OF MILITARY MEDICINE

1775 - On *27 July,* the Continental Congress established a medical service for an army of 20,000 men by creating a Hospital Department and named Dr. Benjamin Church of Boston as Director General and Chief Physician.

1775 - Dr. John Jones, a surgeon's mate, published *Plain, Concise, Practical Remarks on the Treatment of Wounds and Fractures* (New York, 1775), the first American textbook on surgery. It contained an appendix on camp and military hospitals, and was of great use to the young military and naval surgeons of the Revolution, for whom it was written.

1775 - In October, Dr. John Morgan, a brilliant Philadelphia physician and co-founder of the Medical School of the College of Philadelphia in 1765, which later became the School of Medicine of the University of Pennsylvania, replaced Dr. Benjamin Church as Director General and Chief Physician of the Hospital Department.

1777 - General Washington ordered the variolation of the Continental Army - inoculation with the virus of unmodified smallpox - to prevent smallpox. Smallpox was generally prevalent in the Continental Army during the first two years (1775-1777) of the Revolutionary War. The disease was a major factor in the failure of the Quebec campaign, and in the great suffering and mortality among the troops which fell back to Crown Point and Ticonderoga in the winter and spring of 1775-1776. Although after the introduction of inoculation the Army was not entirely free from smallpox, the disease never again caused losses like those suffered from it in the first two years of the war. This was the first time an entire army was immunized for a contagious disease by order of the Commanding General.

1778 - The first pharmacopoeia to be printed in America, a pamphlet of 32 pages, was compiled by Army surgeons at Valley Forge. With a Latin text and no authorship given, it was issued from the military hospital at Lititz, Pa., and has since been known as the "Lititz Pharmacopoeia."

1778 - Dr. Benjamin Rush, a highly influential physician, a signer of the Declaration of Independence, and Physician General of the Hospital in the Middle Department, Continental Army (1777-1778), was the author of numerous books and pamphlets, including *Directions for Preserving the Health of Soldiers: Recommended to the Consideration of the Officers of the Army of the United States,* the first textbook on preventive medicine published in this country. Rush's *Directions* continued to be used in the military medical service in the War of 1812 and even up to the time of the Civil War.

1779 - 1780 - Dr. James Tilton, later Physician and Surgeon General of the United States Army (1813-1815), designed and built, at Army Headquarters, Morristown, N. J., a small, well-ventilated, uncrowded hospital in which groups of patients could be kept separate. This early effort to construct isolation wards and to erect barriers against cross infection contributed greatly to the standard design of military hospitals in the late 18th and early 19th centuries.

1783 - 1790 - The first medical journal to be printed in America, a translation of the *Journal de Medecine Militaire,* was published in 1783. It was issued periodically until 1790.

1784 - At the end of the Revolutionary War, Congress drastically reduced the size of the Military Establishment. One surgeon and four surgeon's mates were left in the medical service. From 1784 to 1789 there was no formally organized Medical Department. The separate states furnished medical officers for the troops assigned to western posts.

1812 - On *May 26,* the War Department ordered that vaccination, or Jennerian immunization using cowpox, be substituted for inoculation to prevent smallpox in the United States Army. A milestone in military preventive medicine, vaccination soon became the generally accepted method for the prevention of smallpox in both the military and civilian communities.

1813 - At the beginning of the War of 1812, there was no formal medical department. An act of Congress passed on *3 March* established a medical department. It provided that a Physician and Surgeon General and an Apothecary General be appointed "for the better superintendence and management of the hospital and medical establishment." Dr. James Tilton was appointed Physician and Surgeon General of the Army. At the same time, Dr. Francis Le Baron was appointed Apothecary General.

1813 - Dr. James Tilton, Physician and Surgeon General of the United States Army (1813-1815), published his *Economical Observations on Military Hospitals; and the Prevention and Care of Diseases Incident to an Army.* In this treatise on military preventive medicine, based upon his experiences in campaigns from 1776 to 1782, he emphasized the primary responsibility of command for military hygiene.

1814 - On *2 April,* Dr. James Tilton, Physician and Surgeon General of the Army, directed hospital surgeons to record the weather. This was the beginning of systematic meterologic observations in the United States.

1815 - Congress reduced the strength of the Medical Department to five surgeons and 15 surgeon's mates.

1818 - On *14 April,* the Congress passed an Act which reorganized the staff departments of the Army. The Act

provided for a Medical Department to be headed by a Surgeon General. Dr. Joseph Lovell, appointed Surgeon General of the United States Army in April 1818, was the first to hold this position in the new organization. The passage of this law marks the beginning of the modern Medical Department of the United States Army.

1818 - 1890 - The Medical Department ordered surgeons to keep meterological records and to investigate the relation of disease incidence to climate and weather. As time passed, the annual records were published by the Surgeon General's office as "Meteorological Registers," in 1826, 1840, 1851, and 1855. A medical officer, Colonel Albert J. Myer, first Chief Signal Officer of the United States Army, 1863-1880, established a weather service in the Signal Service in 1870. This became the United States Weather Bureau in 1890.

1819 - Surgeon General Joseph Lovell, in collaboration with The Adjutant General, made provision for the collection of records of the sickness and mortality of troops at all key posts and stations. A uniform format for collecting the information made it possible to collate the data and make comparisons among geographic areas. These reports - the first public health statistics generally compiled - were published beginning in 1840.

1833 - Surgeon William Beaumont published *Observations on the Gastric Juices and the Physiology of Digestion* based on his 10-year study of an accidental stomach fistula in the Canadian woodsman, Alexis St. Martin. The first direct observation of the digestive process ever to be reported, this classic study in the physiology of gastric digestion became a cornerstone of modern gastroenterology.

1836 - Dr. Joseph Lovell, Surgeon General of the United States Army (1818-1836), established a collection of

medical and scientific books which became the nucleus of the great Library of the Surgeon General's Office. After passing through other stages designated as the Army Medical Library and The Armed Forces Medical Library, in 1956 this vast collection of books, journals, documents, and manuscripts became the National Library of Medicine, under the administration of the Public Health Service of the U.S. Department of Health, Education, and Welfare. At the time of the 1956 transfer, it was the largest medical library in the world and remains so to this date.

1840 - Under the supervision of Surgeon General Lawson, Assistant Surgeon Samuel Forry assembled, collated, and correlated data which had been kept by the Medical Department since 1819 on the sickness and mortality of troops at all Army posts and stations. Forry's *Statistical Report on Sickness and Mortality in the Army of the United States, 1819-1839,* the first nationwide report of public health statistics, was published in 1840.

1842 - Assistant Surgeon Samuel Forry published an original treatise *The Climate of the United States and Its Endemic Influences* based on material from the meteorological registers and the statistical reports on sickness and mortality in the Army which were maintained by The Medical Department. This publication was the first American book on medical climatology.

1842 - Congress appointed the distinguished scientist, James Pollard Espy, as meteorologist to the War Department. Although never an officer of the Army Medical Department, he was directly responsible to Surgeon General Lawson and continued to collect and maintain national meteorological records.

1847 - On *11 February,* Congress passed an Act (9 Stat. 124) giving military rank to medical officers for the first time.

1850 - 1872 Surgeon Elliott Coues, with his *Key to North American Birds,* and Surgeon James G. Cooper, with his *Ornithology of California,* represent many other Army medical officers who collaborated with Smithsonian Institution scientists in studies of natural history, ecology, mammalogy, anthropology, ornithology, and entomology by taking advantage of their postings to remote frontier forts to engage in original field research, observations, and specimen collection.

1855 - A Hospital for the Insane of the Army and Navy was established in Washington, D.C., with provisions for the care of District of Columbia patients. It became St. Elizabeths Hospital when transferred to the District of Columbia by Act of Congress on *1 July 1916.*

1861 - The first recognized act of valor for which the Medal of Honor was awarded was performed by First Lieutenant Bernard J. D. Irwin, an Assistant Surgeon. It was an act of heroism during an Indian attack against Cochise and his Apache Band of Chiricahua, on *14 April 1861,* in the area that later became the State of Arizona. The award was made notwithstanding the fact that the Army Medal of Honor was not authorized by Congress and signed into law by President Lincoln until *3 March 1863,* and Dr. Irwin did not receive the award until *21 January 1894.*

1862 - On *16 April,* Congress passed an Act (12 Stat. 379) reorganizing the Medical Department. The major provisions of this Act were increased rank (to general officer grade) for The Surgeon General; enlargement of the staff of the Medical Department; and a strengthened administrative position for the Medical Department within the War Department.

1862 - 1888 On *21 May,* Medical Department Circular No. 2 was published. It required surgeons to include in their monthly reports items such as case records, post mortem examination protocols, detailed medical and surgical information, and notes on the relation of sanitation to prevalent communicable diseases. These monthly reports provided the data from which a formal medical and surgical history of the War of the Rebellion was prepared. On *9 June,* Surgeon General Hammond directed Assistant Surgeon Joseph J. Woodward and Brigade Surgeon John H. Brinton to begin the preparation of the *Medical and Surgical History of the War of the Rebellion, 1861-1865.* A series of six volumes, three medical and three surgical, was prepared by Joseph J. Woodward, Charles Smart, George A. Otis, and Davis L. Huntington, and published under the direction of Surgeon General Joseph K. Barnes. Except for a modest history of the Royal Army Medical Corps in the Crimean War (1854-1856), this was the first detailed account of the medical and surgical findings of the impact of battle on an Army. These were published as they were completed with the first volume being published in 1875 and the sixth and last volume in 1888.

1862 - The Army Medical Museum, renamed the "Army Institute of Pathology" in 1946, was established. It became the professional and administrative base for many of the research contributions listed in this volume and was, in its time, one of the few medical research museums in the world. In 1949, the U.S. Navy and Air Force joined forces with the Army in this enterprise, so that the Institute, redesignated the "Armed Forces Institute of Pathology," became a total effort of the armed services under the executive management of The Surgeon General of the Army and the Secretary of the Army.

1862 - Surgeon Jonathan Letterman became medical director of the Army of the Potomac on *19 June.* His genius for medical administration brought about epoch-making reforms which became a pattern for all subsequent armies. He devised a system of forward field hospitals, reorganized medical field supply, and was the

originator of the new Ambulance Corps and its use in the forward evacuation of the wounded from the battlefield.

1862 - Dr. William A. Hammond, Surgeon General of the United States Army (1862-1863), was one of the earliest experimental physiologists, noted for his research on nutrition, diet, and curare. In 1862, a month after he took office as Surgeon General, he created the Army Medical Museum for the primary objective of collecting and preserving specimens illustrative of wounds and diseases causing death and disability in the Army. A strong proponent of civilian health and military preventive medicine, his landmark monograph, *A Treatise on Hygiene with Special Reference to the Military Service,* was published in 1863.

1862 - After distinguished duty as a surgeon in the Civil War,
1902 Lieutenant Colonel John Shaw Billings continued a 30-year career in military medicine and civilian public health of extraordinary scope, variety, and diversity. In 1869-1870, he was detailed to the Secretary of the Treasury to review the operation of the Marine Hospital System. His recommendations for reform were adopted and led directly to the establishment of the U.S. Public Health Service in its present form. From 1870 to 1875, he published extensively on hospital hygiene and ventilation, designed The Johns Hopkins Hospital in 1875 and became Medical Adviser to The Johns Hopkins Trustees in 1876 - being largely responsible for the design of the curriculum and recommending the selection of Welch and Osler as the first two professors. In 1865, he became librarian of the Surgeon General's Library; from 1876 to 1880, he planned and published (with Dr. Robert Fletcher) the *Index-Catalogue,* which was the first subject index to the world medical literature. In 1879, Billings and Fletcher began the *Index-Medicus,* the first monthly index to the world's periodical medical literature. In 1880, he was the first to suggest the use of mechanically

or electrically sorted punched cards for medical record keeping; and in 1889, he advised Herman Hollerith on the development and testing of such a system - initially at the Surgeon General's Office and later for the Census Bureau (for which Billings was the Consultant in Demography). Hollerith's company later became International Business Machines Corporation. Following his retirement in 1891, Billings became Professor of Hygiene at the University of Pennsylvania Medical School and designed and built their hygiene and clinic laboratories. In 1896, he was appointed the first Director of the New York Public Library, which he organized from several private libraries while building the library itself. Among his other accomplishments were designing Peter Bent Brigham Hospital in Boston, and serving as a Founding Incorporator of the Carnegie Institution in 1902.

1864 - Acting Assistant Surgeons S. Weir Mitchell, George R. Morehouse, and William W. Keen, serving at the U.S. Army Hospital for Diseases of the Nervous System in Philadelphia, published *Gunshot Wounds and Other Injuries of Nerves.* This contained the first clinical definition of causalgia and of nerve regeneration, and was a pioneering work in neurology in America.

1864 - Lieutenant Colonel Joseph J. Woodward, MC, and
1867 Major Edward Curtis, U.S. Volunteers, developed the process of photomicroscopy at the Army Medical Museum and published the first photomicrographs of bacteria.

1887 - The Army and Navy General Hospital, the Army's first general hospital, opened in Hot Springs, Ark.

1887 - On *1 March,* the Congress established the Hospital Corps (24 Stat. 435) consisting of hospital stewards and privates as a part of the Army Medical Department, and the men assigned to it were received by transfer from the line of the Army. They were to be trained and

used only by the Medical Department. Thus began the formal establishment of a career for enlisted personnel in the Medical Department. In 1891, Captain John Van Rensselaer Hoff, MC, organized the first company of instruction for members of the Hospital Corps at Fort Riley, Kan. The present day military and civilian programs for training physicians' assistants and paramedical staff had their origins in this program.

1892 - 1914 - Colonel Louis A. LaGarde, MC, in conjunction with the Ordnance Department, conducted a series of experiments which laid the groundwork for the modern science of wound ballistics. He also proved that wounds from bullets were not sterile. He demonstrated that, in contrast to the accepted view that the heat of the bullet destroyed the micro-organisms on skin and clothing, that they were conveyed directly into the wound. His monograph, *Gunshot Injuries*, a classic study in the history of wound ballistics, was published in 1914.

1892 - 1912 - As Chief of the Records and Pension Office and, later as The Adjutant General (1904-1912), Major General Frederick C. Ainsworth, MC, applied the techniques he had developed in the Office of The Surgeon General for handling medical records to the large problems of all military records. Among other innovations, he developed the jacket system for individual records. His record-card system for correspondence keeping was adopted by the War Department in 1894 and, subsequently, adopted by Army field units, other governmental departments, and private business. Through his efforts, 58 million carded military service records were compiled, leading to greater efficiency in record keeping and information retrieval. Among his other important archival contributions were the adoption of the principle of the inviolability of records, the emphasis given to the need for skilled archivists, and the impetus he gave to the establishment of the National Archives.

1892 - Dr. George M. Sternberg, Surgeon General of the United States Army (1893-1902), has been called the father of American bacteriology. A great scientific investigator, he disproved false suggestions about the etiology of yellow fever; first isolated the pneumococcus (1881); made the first photomicrograph of the tubercle bacillus (1882); and did research on cholera, yellow fever, and septicemia. In 1892, he described for the first time the occurrence of neutralizing antibody to vaccinia virus, and suggested that the antibody conferred immunity on those who possessed it. This interaction between a virus and a human antibody was demonstrated *in vitro,* and was the first proof of the existence of serum associated immunity. In his general writings, he was also extremely influential. In 1880, he published his translation of Antoine Magnin's volume *The Bacteria,* which had been published first in Paris in 1878. In 1892, he wrote the first American textbook of bacteriology. In 1895, he published *Immunity: Protective Inoculations in Infectious Diseases and Serum Therapy,* and in 1903, *Infection and Immunity with Special Reference to the Prevention of Infectious Diseases.* As Surgeon General, he founded the Army Medical School in 1893, and appointed and supervised the Reed-Vaughan-Shakespeare Typhoid Board in 1898 and the Walter Reed Yellow Fever Commission in 1900.

1893 - The Army Medical School, now the Walter Reed Army Institute of Research, is the oldest school of preventive medicine and public health in the United States. It was established by Surgeon General George M. Sternberg. Major Walter Reed, MC, was the first Secretary of the Faculty.

1894 - Colonel William H. Forwood, MC, Professor of Military Surgery at the Army Medical School, began a formal program in postgraduate education of future surgeons. His curriculum, which included didactic sessions, anatomical dissections, ward rounds and operating room work, was one of the earliest formal training programs in surgery in this country.

1895 - The Army Medical Museum became the formal repository of pathological material for the American Dental Association. In 1921, the first registry of pathology, the American Registry of Ophthalmology, was started at the Museum. By 1973, 26 registries of pathology for various American medical societies, academies, and associations were maintained by the Armed Forces Institute of Pathology, the successor of the Army Medical Museum.

1896 - 1900 - On *10 June 1896*, 6 months after Wilhelm Roentgen's discovery of X-rays was announced to the world, a Roentgen tube at the Army Medical Museum was used to locate a bullet in the hip of the victim of an accidental shooting. The use of roentgenologic equipment in the field and in hospital during the Spanish-American War was described by Captain William Cline Borden, MC, in *The Use of Roentgen Rays in the Medical Department of the U.S. Army in the War with Spain,* published in 1900, which was one of the earliest American monographs in radiology.

1898 - 1927 - Following a distinguished career as an Army medical officer, which included winning the Medal of Honor in 1886, Leonard Wood later commanded the "Rough Riders" (1898), was Military Governor of Cuba (1899-1900), of the Philippines (1903-1906), and Chief of Staff of the Army (1910-1914). Based on his experience with the Medical Reserve Corps, he originated the "Plattsburgh Idea" in 1915, which in turn, became the Officers' Reserve Corps. In 1916, he was a contender for nomination as candidate of the Republican Party for the Office of President of the United States. He ended his career as Governor General of the Philippines (1921-1927).

1898 - The Reed-Vaughan-Shakespeare Typhoid Board was established. This board, known from the names of its members, Major Walter Reed, MC, Major Victor C. Vaughan, MC, and Major Edward O. Shakespeare,

MC, carried out clinical, epidemiological, and etiological investigations. It found that typhoid fever was spread mainly by contact between persons and by flies. The major contribution of the Typhoid Board was to document that the control of sanitation was a direct responsibility of the line commander. This rapidly became Army doctrine, was taught at the U.S. Military Academy, and is now accepted as standard procedure by all Armies.

1899 - While stationed at Ponce, Puerto Rico, First Lieutenant Bailey K. Ashford, MC, discovered that Puerto Rican anemia was caused by a New World type hookworm, *Necator americanus.* He developed a drug therapy and a prevention and control program that reduced an endemic disease to a sporadic occurrence. His discoveries and methods were used later by the Rockefeller Foundation to attack hookworm in the American South.

1900 - The Yellow Fever Commission, headed by Major Walter Reed, MC, was sent to Cuba to investigate the cause and the mode of transmission of yellow fever. In a single year's span, 1900-1901, the Reed Commission proved that yellow fever was transmitted by *Aedes* mosquitoes and suggested a filterable virus as the etiological agent. These studies, performed in volunteer soldiers and Cuban civilians, permitted Colonel William C. Gorgas, MC, to eliminate yellow fever in the Panama Canal Zone, and led to mosquito control programs which eradicated yellow fever in the United States.

1900 - First Lieutenant Charles F. Craig, MC, distinguished medical parasitologist and first editor of the *American Journal of Tropical Medicine and Hygiene,* began his studies of amebic dysentery both in the United States and in the Philippines, where he discovered two new parasites in 1906. In 1911, he published an extensive monograph on his research entitled *Parasitic Amoeba*

of Man, which was the first of his 10 books on medical parasitology and tropical medicine. In 1929, he demonstrated that amebae produced antibodies in the serum of humans, and developed the first serological test (complement-fixation) for amebiasis.

1900 - 1934 - Three successive U.S. Army Medical Research Boards operated in the Philippine Islands, with headquarters in Manila, for a period of 34 years (except for the period 1902 to 1906). These boards investigated diseases prevalent in animals as well as in humans. In addition to studies in medical entomology and metabolic disorders, other diseases investigated were cholera, dengue fever, plague, malaria, surra, beriberi, and amebic dysentery. The University Medical School of the University of Manila was in part founded as a result of assistance from various members of the boards.

1901 - 1917 - On *2 February,* the first legislation was passed to provide for the appointment of dental surgeons for service in the U.S. Army. The bill authorized the employment of a maximum of 30 dental surgeons, on a contract basis, to serve the officers and enlisted men of the Regular and Volunteer Army. These contract dental surgeons were attached to the Medical Department. In 1908 they were authorized by law to become a part of the Medical Department. In March 1911, Congress officially established a Dental Corps consisting of first lieutenants, captains, and majors. In 1917, officers of the Army Dental Corps were given the same rank, pay, promotions, and retirement benefits as officers of the Army Medical Corps.

1901 - 1966 - The Army Reorganization Act of *2 February 1901* established the Nurse Corps (female) as a permanent corps of the Medical Department (31 Stat. 753). Miss Dita H. Kinney was the first Chief of the Corps. Members of the Corps were not given military rank. The relative rank of officers was granted in 1920 as an aftermath of the World War I service of 21,480 Army

nurses. The women of the Army Nurse Corps were granted temporary commissions in the Army of the United States in *June 1944.* After the Corps was established in the Regular Army in *April 1947,* its members were given actual commissioned rank. Public Law 294, 84th Congress, *9 August 1955,* authorized commissions for male nurses in the U.S. Army Reserve for appointment to the Army Nurse Corps. On *30 September 1966,* Public Law 89-609, 89th Congress authorized commissions in the Regular Army for male nurses.

1904 - 1918 - Using the knowledge developed by Reed's work in Cuba, Colonel William C. Gorgas, MC, eradicated yellow fever in the Panama Canal Zone while the canal was being constructed. His work as a sanitarian in Panama resulted in the control of malaria in the Zone as well as marked reduction in tuberculosis and other diseases. This improvement in disease conditions made it possible for the United States to build the Panama Canal. Later, he served as Surgeon General of the Army from 1914-1918 with the rank of major general. Upon his retirement as The Surgeon General in 1918, General Gorgas was awarded the first Distinguished Service Medal ever issued.

1907 - First Lieutenant Charles F. Craig, MC, and Captain Percy M. Ashburn, MC, working at the Army Medical Board in the Philippines, were the first to prove that dengue fever ("breakbone fever") was caused by a virus.

1908 - 1916 - Colonel Jefferson R. Kean, MC, and Major Louis L. Seaman, MC, developed a program for a Medical Reserve Corps. Using this program as a model, on *23 April,* the Congress established the Medical Reserve Corps for medical officers only (35 Stat. 66). The Medical Reserve Corps was the model for the Officers' Reserve Corps established by the National Defense Act of *3 June 1916.* At this time, the composition of the

Medical Reserve Corps was expanded to include Dental and Veterinary Corps officers as well as Medical Corps officers.

1909 - The experiments of Captain Edward B. Vedder, MC, in the Philippines, while working as a member of the Tropical Medicine Board, demonstrated that eating partially milled rice could prevent beriberi. He was also the first to demonstrate (in 1911) the specific use of emetine in treating amoebic dysentery.

1909 - Walter Reed General Hospital, in memory of Major Walter Reed, MC, opened in Washington, D.C.

1909 - 1911 Major Frederick F. Russell, MC, introduced antityphoid vaccination by subcutaneous injection of killed typhoid bacilli into soldiers in the U.S. Army. Vaccination against typhoid fever was made compulsory for the Army and Navy in 1911 and was followed by a great reduction in hospital admissions for typhoid and in mortality from the disease. His work eliminated typhoid fever as a major cause of manpower loss during campaigns, as had occurred in all previous wars.

1910 - The use of anhydrous chlorine to purify drinking water was developed by Major Carl R. Darnall, MC. Modifications of this method form the present basis for water purification all over the world.

1912 - 1917 Studies conducted by Dr. Lewis H. Weed and Major Edward L. Munson, MC, of the anatomy and physiology of the foot and of walking resulted in Munson's classic study, *The Soldier's Foot and the Military Shoe,* and the development of the "Munson last," which was the standard army shoe and bootlast until 1944.

1913 - Colonel George E. Bushnell, MC, emphasized the importance of good hygiene in the prevention of

tuberculosis, and thus brought to the Army the newest attitudes and practices about this disease, which was then a major cause of morbidity and mortality in troops. The closed system of medical practice in the Army, coupled with superior record-keeping methods, permitted Colonel Bushnell and his successors to provide the earliest reliable statistically sound data on new methods for the prevention and treatment of tuberculosis.

1913 - Lieutenant Colonel Fielding H. Garrison, MC, wrote *An Introduction to the History of Medicine,* the first general American textbook on the subject. He spent the major part of his career as the Assistant Librarian of the Army Medical Library. The Garrison Lecture of the American Association for the History of Medicine is named for him.

1913 - Major William J. Lyster, MC, invented the "Lyster bag," a doubly lined spigoted canvas bag for the chlorination of drinking water in the field and in camps by the addition of calcium hypochlorite to the water in the bag.

1914 - 1918 The greatest triumph of World War I from a medical point of view was the direct application of the science of infectious diseases to military sanitation. This was the first war of magnitude in history in which the mortality from communicable diseases was less than that from battle wounds.

1916 - 1949 The physical standards for pilots established by Lieutenant Colonel Theodore C. Lyster, MC, the founder of aviation medicine in the United States, were based almost entirely on empirical grounds. Colonel Lyster contended that the whole question of the physical examination of pilots, coupled with the appalling death rate among flying cadets from aircraft accidents, indicated the need for an extensive research program. Accordingly, the War Department

established the Aviation Medical Research Board in *October 1917.* One of the first acts of the board was to establish the Army Medical Central Research Laboratory at Hazelhurst Field, Mineola, Long Island, under the direction of Colonel William H. Wilmer, MC, in 1918, to study the medical aspects of aviator selection and performance. In *May 1919,* the School for Flight Surgeons was established as a new section of the laboratory to train flight surgeons for duty with Air Service organizations. In *November 1919,* the School for Flight Surgeons along with the parent organization was moved to Mitchell Field, Long Island. The name of the School was changed to "The School of Aviation Medicine" in 1922. In 1926, the School of Aviation Medicine moved from Mitchell Field to Brooks Field, Tex., and in *October 1931,* to Randolph Field, Tex. In 1949, with the establishment of an Air Force Medical Department, it was transferred to the Air Force and is now the School of Aerospace Medicine.

1916 - Recommendations for a Veterinary Corps as part of the Army Medical Department arose as early as 1853. Contract veterinarians were widely employed by the Army but it was not until *3 June 1916* that President Wilson signed the bill which provided for a commissioned Veterinary Corps.

1917 - On *18 May,* Congress authorized temporary increases in the Army and, on recommendation from The Surgeon General, the War Department established the Sanitary Corps on *30 June 1917.* Commissions were given to officers other than physicians, dental surgeons, and veterinarians who were skilled in sciences related to medicine. This was the forerunner of the present Medical Service Corps.

1918 - 1931 - The Army School of Nursing was established to relieve the increasingly serious shortage of nurses by adding to military nursing resources. Miss Annie W. Goodrich became the first Dean. The School was a major source

of career Army nurses until it was closed in 1931 as an economy measure.

1918 - Major Reuben L. Kahn, MAC, devised a simplified test for the detection of syphilis, while working at the Army Medical School. For a number of years, this was the primary standard serological test for the diagnosis of syphilis.

1918 - Expanding upon British work which recognized "shell shock" as an acute situational stress, Dr. Thomas W. Salmon (Colonel, MC, USAR) developed a therapeutic system in World War I for treating patients in their forward units and thus reducing manpower losses and long term disability due to evacuation to the rear. As a result of further experiences with "battle fatigue" in World War II and "combat exhaustion" in Korea, Colonel Albert J. Glass, MC, in 1959, codified the three principles of treatment - proximity, immediacy, and expectancy - now used widely in military medicine.

1918 - To assist the Office of The Surgeon General in the investigation of the epidemics of 1918 - pneumonia and pandemic influenza - the War Department established a Pneumonia Commission (known also as the Pneumonia Board), composed of distinguished pathologists and bacteriologists. The Pneumonia Board was the forerunner of the World War II Board for the Investigation and Control of Influenza and Other Epidemic Diseases in the Army. Established by the Secretary of War on *11 January 1941,* this latter Board became known as the Army Epidemiological Board, and later, in 1950, as the Armed Forces Epidemiological Board.

1920 - By authorization of the War Department on *13 May,* graduates of Class A medical schools became eligible for admission to the new Army Internship Programs at Walter Reed General Hospital, Letterman General Hospital, Fitzsimons General Hospital, Tripler General

Hospital, and the Station Hospital at Fort Sam Houston, Tex.

1920 - 1973 - The Medical Field Service School was opened at Carlisle Barracks, Pa., to train officers and enlisted men in military field medicine. It was also one of the earliest schools for instruction in medical administration in the United States. In 1947, the school was transferred to Fort Sam Houston, Tex. In 1973, it became the Academy of Health Sciences under the United States Army Health Services Command.

1921 - 1929 - *The Medical Department of the United States Army in the World War,* a series of 15 volumes on military medicine during World War I, was prepared and published under the direction of Major General Merritte W. Ireland, Surgeon General of the Army.

1922 - Captain Fernando E. Rodriguez, DC, working at the Army Dental School, isolated and characterized the bacteria found in deep carious lesions of the teeth. He demonstrated that they were facultative anaerobes, with a tendency to being complete anaerobes, and that they survived best at an acid pH. This demonstration of the cycle of infection was the foundation for the modern approaches to dental caries and to the present programs of preventive dentistry.

1923 - Based on his experience as a surgeon during World War I, Dr. Hiram W. Orr developed the closed method for treating compound fractures. The leg splint already in use was supplemented by immobilization of the extremities in plaster-of-paris casts. The Orr Treatment with modifications by Dr. Jose Trueta, Director of the Department of Surgery in the General Hospital of Catalonia, Barcelona, was field tested extensively during the Civil War in Spain (1936-1939). The low mortality rate and complete absence of gas gangrene in thousands of patients with compound gunshot wounds was attributed to the Orr-Trueta closed mode of treating these wounds.

1925 - Colonel Joseph F. Siler, MC, and Majors Milton W. Hall, MC, and Arthur P. Hitchens, MC, demonstrated the transmission of dengue by the *Aedes aegypti* mosquito, thus nullifying the long accepted belief that *Culex fatigans* was the vector.

1925 - Colonel Calvin H. Goddard, MC, began his pioneering research in forensic ballistics. During the next several decades, as an officer in the Medical Corps and later as a civilian, he developed the first accurate methods for comparing a fired bullet with one fired experimentally from a suspect weapon. He also compiled statistics on the rifling characteristics of various types of guns and studied the effects of projectiles on the human body.

1925 - Army hospitals were accredited for internship and residency training.

1925 - Colonel Edward B. Vedder, MC, published his monograph *The Medical Aspects of Chemical Warfare,* a work based on his research during and after the First World War. The various chemical warfare agents were considered, and there was full discussion of the means of both individual and collective protection against such chemicals. This book was the first American text to be oriented toward the medical problem of gas warfare, as considered from a modern point of view.

1926 - Major Louis H. Bauer, MC, who was the first Commandant of the Army School of Aviation Medicine, Mitchell Field, New York, published his text *Aviation Medicine.* This was the first American textbook on a new medical specialty concerned with the prevention and treatment of the medical problems of flying personnel. In this same year, the Department of Commerce established an Aeronautics Branch (which evolved into the Federal Aviation Administration). Major Bauer became the first Medical Director of Aeronautics and started the medical programs in civilian aviation medicine in this country. He was also

the founding editor of the *Journal of Aviation Medicine* and the founding president of the Aeromedical Association.

1927 - 1933 - Working at the Army Medical Board in the Philippines, Major Raymond A. Kelser, VC, developed a rinderpest vaccine and a new chloroform-treated rabies vaccine. In later work at the Army Medical School he discovered that *Aedes* mosquitoes were the vectors for equine encephalitis. His text, *A Manual of Veterinary Bacteriology* (1927), was a seminal contribution to the field.

1930 - The first edition of an important textbook on military sanitation, *Military Preventive Medicine*, by Colonel George C. Dunham, MC, was published. Revised editions were published in 1931 and 1938.

1931 - Major James S. Simmons, MC, and his colleagues demonstrated the presence of dengue infection in monkeys and the long persistence of immunity in man to a homologous infection. These studies led to research beginning in 1964 by Colonel Philip K. Russell, MC, and his collaborators at the Walter Reed Army Institute of Research on the pathogenesis and pathophysiology of dengue hemorrhagic fever, and on the development of a dengue vaccine.

1931 - Colonel Joseph F. Siler, MC, led an investigating team in Panama which performed the first controlled clinical studies on the use of marihuana by soldiers. It was determined that the drug was not addicting, produced no persistent neurological or mental changes, and was used mainly by men who were ineffective soldiers.

1933 - Atabrine (quinacrine; mepacrine) was introduced in the Army as a substitute for quinine in combating malaria. Medical officers in Panama began to test this new drug for the treatment and prophylaxis of malaria.

1933 - With the starting of the Civilian Conservation Corps, the Army Medical Department assumed the responsibility for entry physical examinations, clinical care, and food inspection for a population that eventually totaled 2.5 million men.

1935 - In a series of experiments, Colonel George H. Callender, MC, and Master Sergeant Ralph W. French studied the wounding effects of high velocity missiles. Their work documented the fact that a high velocity missile creates a transient, negative pressure cavity in its passage, which causes deformation and injury beyond the obvious immediate would track and often draws foreign material into the wound site. These data not only explained anomalies such as long bone fractures distant from the site of wounding, but also revolutionized the surgical debridement and care of such wounds by providing the scientific basis for wide excision and debridement rather than a simple repair of the visible injury. These improvements in surgical technique markedly reduced the incidence of gas gangrene, of late infection, of uncontrolled late hemorrhage, and of delayed wound healing.

1936 - The first centrifuge used to study acceleration effects on the human body was built by Major Harry G. Armstrong, MC, and Dr. John W. Heim at the Aeromedical Laboratory at Wright Field, Dayton, Ohio.

1938 - The rank of brigadier general was provided by law for the Director of the Dental Division. The first officer to achieve this rank was Brigadier General Leigh C. Fairbank, Chief of the Corps from 1938 to 1942.

1939 - Major Harry G. Armstrong, MC, later Surgeon General of the U.S. Air Force, published *Principles and Practice of Aviation Medicine,* the second American textbook on this subject and the text that remained dominant in the field.

1939 - Dental internships were established at Army general hospitals.

1939-1949 - Under the direction of Major Raymond Randall, VC, and Captain Ario T. Thompson, VC, scientists at the Army Veterinary School developed mass production techniques for growing the viruses of Western and Eastern equine encephalitis in eggs. This ability to harvest large quantities of viruses made possible the large-scale production of killed virus vaccines for these diseases.

1940-1945 - Some of the earliest studies of whole blood preservation and the use of plasma in treating experimental shock were done at the Army Medical School by Captain Douglas B. Kendrick, Jr., MC. Among other contributions, the program developed kits for the closed, sterile collection of blood from donors; developed the first system for the mass collection and shipment of liquid and dried plasma; was the first to use human albumin to treat shock; and made major contributions to the development of the system for collecting and refrigerating whole blood and shipping it overseas, and for production of standardized kits for rapid typing of blood.

1941-1975 - The Historical Unit, U.S. Army Medical Department, originally was established as an element in the Office of The Surgeon General to prepare the History of the Army Medical Department in World War II. In 1957, it was established as a separate Unit under the jurisdiction of The Surgeon General. To date there have been 53 publications; 36 volumes of World War II clinical and military history, 3 for the Korean War, and 14 miscellaneous volumes and monographs.

1942 - After the vaccine to prevent epidemic typhus was shown to have lost its potency, Lieutenant Colonel Harry Plotz, MC, working at the Army Medical School, began a study of the problem. In the course of his

investigation, he isolated a specific soluble polysaccharide antigen from rickettsial cultures which restored its potency. His work produced an effective vaccine which was one of the principal reasons for the decreased mortality rate from epidemic typhus in American troops in World War II.

1942 - Initiated by the Army Medical Department and established by Executive Order of President Roosevelt, a unique military-civilian organization, the United States of America Typhus Commission, was founded and given broad powers to attack the problems of typhus fevers. Rear Adm. Charles S. Stevenson, MC, USN, was the original director but was forced to resign after 1 month because of illness. He was succeeded by Colonel Leon A. Fox, MC. Under the direction of Colonel Fox and, later, of Colonel Stanhope Bayne-Jones, MC, Army, Navy, and civilian members of the Commission investigated epidemic and scrub typhus outbreaks all over the world. The Commission was responsible generally for field testing of DDT dusting of louse infested individuals, for field trials of epidemic typhus vaccine, for chemotherapeutic and clinical studies of the diseases, for epidemiological surveys for disease incidence, and for definition of the ecology of the vector and the findings of transovarial transmission in scrub typhus.

1942 - Army psychiatrists tended increasingly toward outpatient treatment of patients with neurotic-type disorders in the realization that hospitalization itself created or perpetuated this form of illness. At training camps outpatient psychiatric facilities were developed in the attempt to prevent emotional disorders or to diagnose and manage them in their earliest stages. This system was a forerunner of the MHCS (Mental Hygiene Consultation Services) now used throughout the Army. The civilian program of Community Mental Hygiene Clinics was modeled in large part on the Army development of the MHCS beginning in the 1950's.

1942 - The School of Military Neuropsychiatry, established at Lawson General Hospital, Atlanta, GA., on *20 December 1942*, moved to Mason General Hospital, Long Island, N.Y., in *October 1943*. Its primary function, in the beginning, was to offer an opportunity for review and military orientation to newly joined, already trained or experienced, psychiatrists and neurologists. Later, it became an intensive training center in psychiatry and neurology for general medical officers. The generalist physicians recruited and trained in this program later became the nucleus for the expansion of civilian psychiatry after World War II.

1942 - 1943 - The Climatic Research Laboratory, Lawrence, Mass., and the Armored Force Medical Research Laboratory, Fort Knox, Ky. (now combined as the U.S. Army Research Institute of Environmental Medicine, Natick, Mass.), were established to study the physiological effects of clothing (CRL) and of exposure to climatic extremes (MRL). Work at these two laboratories laid the foundations for the present scientific capability to design protective clothing and individual equipment, to define water requirements in the heat, to develop cold weather clothing, to describe the processes of acclimatization and physical conditioning, and to relate physical anthropometry to human engineering of vehicles.

1942 - On *17 March*, Colonel Raymond A. Kelser, VC, was promoted to the grade of brigadier general. He was the first in the history of the Army Veterinary Corps to attain general officer rank.

1943 - Penicillin, discovered and developed by British scientists before World War II, was first used on a large scale in the North African campaigns. Data secured from these field applications showed that the expectations aroused by the early clinical research studies were correct, and the groundwork was laid for

the massive introduction of penicillin and other antibiotics into civilian medical practice after the war.

1943 - The Medical Section of the Manhattan Engineering District under Colonel Stafford L. Warren, MC, was created to define the health hazards involved in this project which led to the development of the atomic bomb. The section devised and supervised safety procedures, conducted research in radiation biology, and was also responsible for the care of the populations of the secret sites where atomic research was being conducted.

1943 - DDT (dichlorodiphenyltrichloroethane) - first synthetized in 1870 - was evaluated by U.S. Department of Agriculture laboratories in 1942 and given its first major field-test by the Medical Department in 1943 in Naples, where it stopped an epidemic of typhus. Army malaria control teams introduced the use of DDT for mosquito control in the Pacific in 1944. Since World War II, DDT has been the primary insecticide for malaria control in every tropical country.

1943 - Public Law 38, 78th Congress, provided for the appointment of female physicians and surgeons in the medical Corps of the Army and the Navy for the duration of World War II and 6 months thereafter. The first woman to be commissioned in the Army Medical Corps under this act was Dr. Margaret D. Draighill who was commissioned as Major, MC, AUS, on *28 May 1943*. Major Craighill was assigned responsibility for the medical care of the newly formed WAAC (Women's Auxiliary Army Corps).

1944 - The first compilation of worldwide epidemiological, sanitary, and public health data was published by Colonel James S. Simmons, MC, Colonel Tom F. Whayne, MC, and their colleagues as *Global Epidemiology: A Geography of Disease and Sanitation.*

The first volume covered Asia and India; subsequent volumes using the same method of approach were produced in 1951 and 1954 by other authors. This first volume may fairly be said to be the beginning of the modern concepts of global medicine and the geographic mapping of disease and public health programs.

1944 - 1945 - An Army Medical Department team, led by Colonel Edward D. Churchill, MC, Lieutenant Colonel Fiorindo A. Simeone, MC, Lieutenant Colonel Tracy B. Mallory, MC, and Lieutenant Colonel Henry K. Beecher, MC, was established in the Mediterranean theater to study shock and the resuscitative process. The opportunity to study wounded men, rather than animal preparations, made clear that many hypotheses about shock that grew from World War I and interwar studies were in error. By applying the latest laboratory technologies to the problem, the team documented the need for whole blood use, rather than plasma, and made seminal observations on renal, hepatic, and muscle response to shock. The data from this work not only were applied in World War II, but also laid the groundwork for new therapeutic and research approaches used in military and civilian medicine ever since. Documentation of the need for large amounts of whole blood after acute trauma revolutionized the civilian practice of traumatic surgery after World War II.

1944 - Captain Stanley F. Erpf, DC, working at the Army Dental School, developed an artificial eye from acrylic plastic which closely resembled the coloring of the human eye and was unbreakable. Later developments of this prosthesis have followed the general approaches taken by Captain Erpf.

1944 - In *July*, three Commissions of the Army Epidemiological Board began a study of viral hepatitis. Among their contributions to the understanding of this disease was the determination that infectious and

serum hepatitis were two different entities and that gamma globulin would be useful in providing passive protection against the disease. They also developed concepts for studies of the transmission of both forms and for research on the disease.

1945 - The Army Medical Research Board was established by The Surgeon General to coordinate all Medical Department research with other components of the Army as well as with agencies outside the Army. In 1958, the Board was converted to the U.S. Army Medical Research and Development Command, the central agency through which The Surgeon General directs all Army Medical Department military medical research on a worldwide basis.

1945 - 1949 - Captain Edwin J. Pulaski, MC, began a lifetime of research studies on the use of antibiotics in treating surgical patients. His initial studies were on the use of streptomycin in war wounds, and his later contributions included investigations of the effectiveness of various antibiotics administered intravenously. In 1945, Captain Pulaski established the U.S. Army Surgical Research Unit which was transferred from its original site at Halloran General Hospital, Staten Island, N.Y., to Brooke Army Medical Center, Fort Sam Houston, Tex., in 1947. This laboratory was the first American center for the study of patients with burns. The Unit - now the U.S. Army Institute for Surgical Research - was the prototype for the many "burn centers" now established throughout the country. In 1949, Colonel Curtis Artz, MC, began his important series of investigations on the value of exposure treatment and skin grafting in the management of burns.

1945 - The Army Hand Laboratory, later the Army Prosthetic Research Laboratory, was established at Walter Reed Army Medical Center for prosthetic research, development, and education. During its early years this

Laboratory developed a technique for fabricating a one-piece seamless glove to provide a lifelike covering for the prosthetic hand, a shade guide for coloring the glove to match the skin color of the patient, and specifications for five hand sizes which would fit all patients from the small child to the large adult male.

1946 - 1972 - The Army Residency Programs in the medical and surgical specialties began on *11 February 1946*. This was the beginning of advanced post-graduate clinical education in Army teaching hospitals. Ever increasing numbers of career medical officers were certified by the specialty boards and provided a cadre of teachers, consultants, and specialty practitioners to the Army Medical Department. In 1961 the Army General Dentistry Residency Programs were initiated at Fort Hood, Texas. In 1971 nurse clinician programs were begun to provide a staff of physician extenders in the pediatric, obstetric, and neuropsychiatric specialties. In 1972 Family Practice residences were established. Approximately 60 percent of these physicians, dentists, and nurses return to civilian life after completing their obligated service and provide an important addition to the national community of well trained health care practitioners.

1947 - Under the direction of Colonel Carl W. Tempel, MC, staff members of Fitzsimons Army Hospital and of the U.S. Army Medical Research and Nutrition Laboratory began cooperative research studies on the diagnosis and treatment of tuberculosis patients. Long term follow-up procedures were established. A tuberculosis service with a daily census of approximately 1,000 patients in the early years of the work provided a unique opportunity to evaluate new antituberculosis drugs. New diagnostic methods soon followed and new surgical procedures developed. As a direct result of this investigative work the management of tuberculosis patients in the United States - both military and civilian - was advanced, well trained career military

personnel were restored to duty, and many millions of dollars in retirement and pension benefits were saved. Almost all military personnel can now be returned to duty, directly or after a short period of temporary retirement, whereas before 1948 practically all tuberculosis patients were permanently separated from military service.

1947 - Public Law 337, 80th Congress, enacted on *4 August*, established the Medical Service Corps as a component of the Army Medical Department. The new corps absorbed the existing Pharmacy Corps, Sanitary Corps, and Medical Administrative Corps.

1947 - 1972 - The U.S. Army Medical Research and Nutrition Laboratory, Denver, Colo., began a continuing series of studies to determine the minimum essential daily allowance of specific vitamins and minerals, to insure that military rations contained adequate amounts of these essential elements of nutrition. By 1972, the National Research Council had used data from this laboratory to establish national policy and recommended dietary levels for 11 of the 18 critical nutrients.

1947 - 1949 - While leading a research team from the Army Medical Graduate School, Dr. Joseph E. Smadel first demonstrated the efficacy of chloramphenicol in the treatment of scrub typhus, and Dr. Theodore E. Woodward reported the first specific cure of typhoid fever with chloramphenicol, while the team was working with British troops in Malaya.

1947 - 1949 - Effective on *18 September 1947*, the Army Air Force was abolished and the United States Air Force came into being as provided in the National Security Act of 1947. On *1 July 1949*, a separate medical service, the U.S. Air Force Medical Service, was established under Major General Malcolm C. Grow, first Surgeon

General, USAF, as a corollary development of a separate air force.

1947 - 1966 - Public Law 36, 80th Congress, *16 April 1947*, established the Women's Medical Specialist Corps and authorized Regular Army commissions for dietitians, physical therapists, and occupational therapists. The dietitians and physical therapists had been authorized relative rank in *December 1942*, but occupational therapists continued to serve as civilians in Army hospitals in the United States until the enactment of this law. Public Law 294, 84th Congress, *9 August 1955*, authorized Reserve commissions for qualified male dietitians, physical and occupational therapists in the WMSC. The name of the Corps was changed to the Army Medical Specialists Corps. Public Law 89-609 was enacted on *30 September 1966*. This bill permitted commissioning of male dietitians, and physical and occupational therapists in the Regular Army.

1949 - Captain Joseph V. Brady, MSC, began to develop a methodology for the measurement of behavior in subhuman species that became known as Conditioned Emotional Response. A long series of studies and observations of the shaping and quantification of behavior led not only to major conceptual understandings of experimental behavior but also directly to behavioral test systems which were used by the civilian pharmaceutical industry to test and develop the present generation of tranquilizers and psychoactive drugs.

1949 - While investigating platelet function, Lieutenant Colonel Joseph F. Ackroyd, MSC, was the first to demonstrate that a drug (Sedormid) could cause a thrombocytopenic purpura and that this was due to a hypersensitivity reaction. This work started the research areas of platelet immunology and of drug-induced toxic responses of the hematopoietic system.

1949 - A pilot course of 48 weeks of instruction for enlisted personnel on the practical nurse level was opened at Walter Reed Army Medical Center and became the Medical Specialist Advanced Course (91C) which prepares graduates for state licensure as Practical Nurses.

1950 - Vascular reconstruction of arteriovenous fistulas and false aneurysms in patients from Korea was begun at Walter Reed General Hospital by Lieutenant Colonel Robert G. Rate, MC, and Major Carl W. Hughes, MC, joined in 1951 by Captain Edward J. Jahnke, Jr., MC, under the supervision of Brigadier General Sam F. Seeley, MC, as Chief of Surgery. More than 300 such lesions were repaired, while as recently as World War II such lesions had been treated by ligation, often followed by amputation.

1950 - 1953 - Colonel Kenneth D. Orr, MC, led a Cold Injury Research Team in Korea that secured the first prospective epidemiological data on frostbite. Data were collected which permitted direct correlation between cold injury and ambient temperature, the effect of specific protective clothing, the interaction of psychosocial factors, and the utility of simple forward area weather observations to tactical planning and preventive measures. As a result of these studies, both military and civilian cold weather living have been made safer and more functional.

1950 - 1953 - Colonel George W. Hunter III, MSC, using new molluscicides, and drawing upon a lifetime of research experience in tropical parasitology and schistosomiasis, developed a snail poisoning program in Japan which essentially eliminated schistosomiasis in many areas of Japan.

1951 - Dr. Jodeph E. Smadel, Dr. Kenneth Goodner, Dr. Fred R. McCrumb, Jr., and Dr. Theodore E. Woodward, conducting studies in Madagascar from the Army

Medical Graduate School, were the first to demonstrate that broad spectrum antibiotics would cure septicemic and pneumonic types of human plague.

1951 - Major James C. Beyer, MC, Lieutenant Colonel Robert H. Holmes, MC, and their collaborators from the Army Medical Department and the Quartermaster Corps brought to fruition studies that had begun late in World War II on the development of lightweight body armor for ground troops. Their development and test programs, coupled with a wound injury survey they performed in Korea, provided a usable armor vest which was a significant factor in reducing mortality and morbidity from wounds in both Korea and Vietnam.

1951 - The first U.S. Army helicopter detachments with the primary mission of casualty evacuation became operational in Korea. By the end of the Korean War in 1953, more than 17,000 casualties had been evacuated. This test of forward air ambulances led to further development of helicopters for medical evacuation which produced the UH-1 "Huey" helicopter which was widely used as an ambulance and troop carrier in Vietnam.

1951 - The Army Medical Graduate School sent a Surgical
1953 Research Team to Korea led by Captain John M. Howard, MC, and supervised by Colonel Richard P. Mason, MC. Two members of the team, Major Edward Jahnke, MC, and Lieutenant Colonel Carl Hughes, MC, developed and taught newer methods of repair of vascular injury that markedly reduced the amputation rate. Advanced methods of resuscitation from shock were employed that contributed to a 50 percent reduction in mortality after wounding. A Renal Insufficiency Center established by Captain Paul E. Teschan, MC, and Major William E. Meroney, MC, used the first artificial kidney ever brought to a combat zone; this work made fundamental contributions to the

treatment of patients with Korean Hemorrhagic Fever and did the first studies which permitted clinicians to understand the separate contributions of uremia and sepsis to the syndrone of septic shock.

1951 - During the period 1951-52, Dr. Thomas C. Chalmers,
1955 M.D., led a team of military and civilian investigators in a study of the effects of diet and bed rest on the treatment of hepatitis. This research was done at the U.S. Army Hospital, Kyoto, Japan, and included detailed studies of 460 soldier patients, with a subsequent followup of 94 percent of a selected sample. This research documented the fact that prolonged strict bed rest was not required, but that ambulation of patients on an ad libitum basis was compatible with an early recovery from the disease. Studies of diet therapy demonstrated that high protein diets were beneficial. Patient followup with laboratory assay provided defined laboratory values useful for prognostic purposes. This large study finally answered key questions about the treatment of hepatitis that had not had statistically sound answers; the data made it possible for the military and civilian communities to reduce hospitalization time by significant amounts, with subsequent savings in time and money.

1951 - A formal educational program in Hospital
1953 Administration was initiated at the Medical Field Service School. Through an affiliation with the Graduate School of Baylor University, the first Master of Hospital Administration degrees were awarded to Army Medical Department officers in 1953.

1952 - Major William G. Gochenour, Jr., VC, demonstrated that Fort Bragg Fever (pretibial fever), widely believed to be caused by a virus, was in fact due to infection with a *Leptospira*. This discovery initiated a worldwide review of patients with fevers of unknown origin, with the finding that the clinical manifestations of human

leptospiroses were more variable and the disease more widely disseminated than had been appreciated.

1952 - 1955 - Captain Edward L. Buescher, MC, Captain William Scherer, MC, and their colleagues uncovered the natural ecology of Japanese B encephalitis in Japan. Their description of the heron or pig to man cycle, with a culicine mosquito as the vector, led to the use of screened pigpens by Japanese farmers and a marked decline in death and disability from the disease among the Japanese population.

1953 - 1957 - A Walter Reed Army Institute of Research Sprue Team worked in Puerto Rico under the supervision of Lieutenant Colonel William H. Crosby, MC. Modern research technologies were applied to studies of malabsorption, hematological abnormalities, and diagnostic techniques. The first electron microscopy studies of intestinal biopsy in sprue revealed a specific defect in the brush border. As a result of this work, the pathophysiology of tropical sprue was critically defined for the first time.

1955 - 1960 - Two innovations in medical instrumentation by staff members at the Walter Reed Army Institute of Research have become widely useful to the medical community. Colonel William H. Crosby, MC, and Mr. Heinz W. Kugler developed a gastrointestinal biopsy capsule that permitted *in vivo* biopsy of any portion of the human gut. The capsule was used for such research as studies of the intestine in cholera and for electron microscopy examinations of iron absorption in the small intestine. Dr. Joel E. Warren introduced the concept of "jet injection" for immunization and developed prototype models to establish its feasibility. After design modifications resulted in an apparatus of high reliability and endurance, Colonel Abram S. Benenson, MC, and his colleagues introduced the jet injector "gun" for mass immunization of troops. The device used compressed air to aerosolize vaccines and

imbed the vaccine particles in the subcutaneous tissue. The use of the jet injector eliminates the need for needles and syringes - thus reducing logistic costs and eliminating these causes of infectious hepatitis transmission - and permits large numbers of people to be immunized in a short time. The device has found wide application in military immunization programs and during disaster relief for preventing civilian epidemics.

1955 - 1967 - The Interdepartmental Committee on Nutrition for National Defense began a series of studies of the nutritional status of military and civilian personnel in emerging nations all over the world. These studies heavily involved members of the U.S. Army Medical Research and Nutrition Laboratory, Denver, Colo., as well as colleagues from universities and other Federal agencies. When the work of this group ended in 1967, 37 countries had been surveyed and critical data and recommendations given to national leaders which permitted them to improve the nutritional status of their citizens.

1955 - The Army Audiology and Speech Center developed the soft ear insert for defeating noise which was a major improvement over the hard acrylic ear insert for comfort, safety, and integrity of the acoustic seal.

1956 - 1966 - On *7 December,* the Dependents' Medical Care Program, commonly referred to as Medicare, was enacted by the Congress to provide inpatient and outpatient medical care through civilian facilities to the dependents of uniformed members of the Army, the Navy, the Marine Corps, the Air Force, and the U.S. Public Health Service. The Military Medical Benefits Amendments of 1966 represented a major augmentation of Medicare. Effective on *1 October,* the law created CHAMPUS (Civilian Health and Medical Program of the Uniformed Services) and greatly expanded the program of inpatient and outpatient

medical care through civilian facilities for dependents of active-duty military personnel.

1956 - 1969 - The U.S. Army Medical Unit was established at Fort Detrick, Frederick, Md., in *June 1956* as a result of a joint agreement between the Medical Service and the Chemical Corps on the division of responsibility for the conduct of research and development in defensive biological warfare. In *January 1969* the Unit was redesignated the U.S. Army Institute of Infectious Diseases. Its mission is to study infectious diseases with particular emphasis on problems associated with medical defense against biological warfare, on naturally occurring diseases of peculiar military importance, and on micro-organisms the study of which requires special containment facilities.

1957 - The virus causing Asian influenza was isolated at the Walter Reed Army Institute of Research by Dr. Maurice Hilleman and Major Edward L. Buescher, MC; this strain was then used by pharmaceutical companies to produce a specific vaccine.

1958 - The first edition of *Emergency War Surgery,* the United States version of the NATO (North Atlantic Treaty Organization) Emergency War Surgery Handbook, was published. This was the first international manual on military surgery. It was the product of the collaboration of military physicians from all the NATO countries who agreed upon a standard set of acceptable medical practices. In this sense, this endeavor can be said to be the first international textbook of surgery. Critical initial conceptual contributions to the development of the Handbook were made by Brigadier General Sam F. Seeley, MC, and Colonel Joseph R. Schaeffer, MC, beginning in 1954.

1958 - Army Medical Department investigators, collaborating with Navy colleagues, performed the "Able" and

"Baker" experiments; the first extended suborbital ballistic space flight of primates. These, and similar studies later performed by the U.S. Air Force and the National Aeronautics and Space Agency, provided the essential physiological data with which to predict the capability of the astronauts to survive and perform in space flight.

1959 - In pioneering studies of sleep deprivation, Major Harold L. Williams, MSC, documented the psychological and physiological decrements due to prolonged wakefulness. These studies led to the present understanding of the role of sleep in man in preventing the development of acute performance dysfunctions.

1960 - The Army Dental Corps pioneered a large-scale Preventive Dentistry Program. This concentrated effort on prophylaxis, patient screening, education, and the prevention of dental disease was a major philosophical contribution to community oral health practice.

1960 - In 1960, after almost 20 years of research, Army veterinary, medical, and allied scientists under the leadership of Colonel Trygve Berge, MSC, developed a safe, living, attenuated vaccine for Venezuelan Equine Encephalitis. The vaccine was used in 1969 and 1970 to stop explosive outbreaks of the disease in Central America. In 1970 and 1971 the vaccine was provided the United States Department of Agriculture and with the assistance of Army veterinarians and allied scientists brought under control a major outbreak in Texas by 1972, thus preventing spread through the United States.

1960 - Military medical requirements to provide a malaria chemoprophylactic for *vivax* malaria that would both suppress clinical attacks and prevent relapses resulted in the "once-a-week" combination tablet of chloroquine diphosphate and primaquine. Definitive field studies of the combination tablet, carried out by

Lieutenant Colonel Stefano Vivona, MC, and his colleagues in Korea, led to the present extensive use of the combination tablet, which still remains effective against *vivax* malaria.

1960 - The first of a new generation of Army hospitals, Walson at Fort Dix, N.J., was dedicated. In the next 5 years, 10 more new hospitals were dedicated: three in 1961 - Munson at Fort Leavenworth, Kan., Kimbrough at Fort George G. Meade, Md., and Dunham at Carlisle Barracks, Pa.; four in 1963 - Kirk at Aberdeen, Md., McDonald at Fort Eustis, Va., Kenner at Fort Lee, Va., and Noble at Fort McClellan, Ala.; and three in 1965 - McAfee at White Sands, N. Mex., Darnall at Fort Hood, Tex., and General Leonard Wood at Fort Leonard Wood, Mo.

1960 - 1970 - Lieutenant Colonel Dan C. Cavanaugh, MSC, and Lieutenant Colonel John D. Marshall, MSC, in studying the ecology of plague in tropical areas, related plague epidemics to weather as a function of flea physiology, developed serological tests for plague infection, and developed the data to demonstrate the efficacy of Dr. Karl F. Meyer's plague vaccine.

1961 - Formal training in Army aviation medicine was initiated at the Army Aviation Center, Fort Rucker, Ala.

1962 - Captain Paul D. Parkman, MC, Captain Malcolm S. Artenstein, MC, and Lieutenant Colonel Edward L. Buescher, MC, isolated the rubella virus (German measles) from the blood of a recruit hospitalized at Fort Dix with rubella. The rubella vaccine produced in 1969 by the National Institutes of Health was derived from this virus strain, using virological techniques developed at the Walter Reed Army Institute of Research.

1963 - Malaria not only remains both a major crippler of armies in tropical countries, but also is still the leading

cause of death worldwide. Colonel William D. Tigertt, MC, initiated in 1963 a still-continuing Army medical research program for the development of new drugs to prevent and treat malaria. This effort is the only such major program in the world.

1964 - Clinical studies of the pathophysiology of infectious hepatitis by Major Marcel E. Conrad, MC, Captain Franklin D. Schwartz, MC, and Master Sergeant Allan A. Young demonstrated the multiorgan, multisystem involvement produced by this disease. This work has suggested that many other viral infections, clinically recognized as primarily involving one organ or system, may in fact be affecting many other target sites; investigators are now exploring this hypothesis in other viral infections.

1964 - 1975 - Colonel William H. Crosby, MC, and Major Frank R. Camp, Jr., MSC, stationed at Walter Reed Army Institute of Research, completed a staff study on a program for research in blood transfusion and the training of Blood Bank Fellows. This study resulted in the establishment of the Blood Transfusion Research Division at the United States Army Medical Research Laboratory, Fort Knox, Ky., on *1 July 1965*. Although Army sponsored, it has served as a tri-service institution. Under the direction of Colonel Frank R. Camp, Jr., it has become a dominant scientific force in its field. In 1965, the Blood Group Reference Laboratory was opened, and the formal monitoring of biologics purchased by the Defense Personnel Support Agency started. In 1967, the Blood Transfusion Research Division was given institutional membership and approval for training by the American Association of Blood Banks. In 1971, it was designated as an AABB Reference Laboratory. Other major achievements were the establishment of a Frozen Red Blood Cell Bank in 1972 and a Rare Donor Register in 1973. An important contribution to all three military departments has been the training of Blood Bank Fellows.

1964 - The Walter Reed Army Institute of Nursing began operation in conjunction with the University of Maryland. Graduates earn a B.S. degree in nursing, and serve an obligated tour as officers of the Army Nurse Corps.

1965 - A Vascular Surgery Registry was established at Walter Reed Army Medical Center by Colonel Norman M. Rich, MC, to follow up patients with vascular injuries from the Korean and Vietnam Wars. To date, more than 7,000 cases have been recorded, providing the first compilation of data on the results of vessel repairs. This long-term information will provide guidance to all surgeons in the future about the proper operative approach to injured blood vessels.

1965 - Sulfamylon, an antibacterial cream, was developed by Colonel John A. Moncrief, MC, Dr. Arthur D. Mason, Jr., and Colonel Robert B. Lindberg, MSC, at the U.S. Army Institute of Surgical Research, Brooke Army Medical Center, Fort Sam Houston, Tex., for the treatment of patients with extensive burns. Its use has resulted in a marked reduction in mortality from sepsis secondary to infection of the raw burn surface.

1966 - A new type of artificial hand with automatic proportional grasp control, covered with a vinyl cosmetic glove which looked like a human hand, was developed by U.S. Army Medical Biomechanical Research Laboratory.

1966 - Public Law 89-609, enacted on *14 September,* authorized the grade of brigadier general for the Chief of the Medical Service Corps. On *10 November,* Colonel William A. Hamrick, Chief, Medical Service Corps, was promoted to brigadier general and was the first Medical Service Corps general officer.

1966 - Osteopathic physicians were made eligible for appointment to the Medical Corps in the Regular and Reserve components.

1966 - The 45th Surgical Hospital, the first medical unit, self-contained, transportable (MUST) hospital in Vietnam, became operational. This inflatable rubber shelter with integral electrical power, air conditioning, heating, hot and cold water, and waste disposal could be transported by truck, helicopter, or cargo aircraft. This integrated system for replacing tents as shelters for forward field hospitals has markedly improved patient care and comfort.

1966 - 1969 - Working as investigators under the Army Malaria Research Program, Dr. Martin Young of the Gorgas Memorial Research Institute infected owl monkeys with *vivax* malaria, and Dr. Quentin Geiman of Stanford University infected them with *falciparum* malaria. These findings were applied by Dr. Leon Schmidt at the National Center for Primate Biology at Davis, Calif., to the study of the clinical disease in owl monkeys and then to determining the responses of infected monkeys to various new antimalarial drugs. These series of studies produced the first small animal model of human malaria and made available for the first time a feasible experimental model for testing new drugs against those strains of malaria that infect man. Finally, the ability to maintain human malaria organisms in small nonhuman primates enabled researchers to begin extensive *in vitro* laboratory studies not previously possible because of the lack of a continuous supply of fresh parasites.

1967 - 1969 - Major Frank Top, MC, and Colonel Edward L. Buescher, MC, as the leaders of teams of investigators and epidemiologists, developed a live oral vaccine against adenovirus type 7; in combination with the previous vaccine for type 4, it has markedly reduced the incidence of upper respiratory infection in recruits in training.

1967 - 1971 - A collaborative study led by investigators from the Walter Reed Army Institute of Research investigated

the value of gamma globulin in preventing hepatitis in U.S. soldiers in Korea. This study, which involved 107,803 soldiers, showed that U.S.-produced gamma globulin can provide significant protection against clinical hepatitis Types A and B in overseas areas. This research delineated the effective dose (5 ml.), the period of protection (6 months), and the groups at greatest risk; made the observation that patients who had received gamma globulin and still developed hepatitis had a milder disease; and confirmed the fact that U.S.-produced gamma globulin provided no significant protection against other commonplace infectious diseases in troops stationed overseas. This was the first large-scale double-blind study of these questions, and it produced the first data which provided definitive answers to previous questions about the efficacy of gamma globulin used for these purposes.

1967 - Public Law 90-130, enacted on *8 November,* removed restrictions on the promotion of Army Medical Specialist Corps and Army Nurse Corps officers. This law provided that the Secretary of the Army could prescribe the strength in permanent grades for AMSC and ANC officers and that the same criteria for promotion and retirement would apply to these corps as to other corps of the Army.

1968 - In June, the Congress changed the 18-year-old name of the Army Medical Service back to its former 132-year-old (1818) designation as the Army Medical Department. The terminological confusion the Army had hoped to eliminate, by changing the title from "Department" to "Service" as part of the Army Organization Act of 1950, had persisted in another form. To eliminate confusion with the multitude of service functions in the Army, the name "Army Medical Department," a name considered to be more in keeping with the importance of military medicine and the professionalism of Army medical activities, was restored.

1969 - 1972 - Colonel Surindar N. Bhaskar, DC, Lieutenant Colonel Duane E. Cutright, DC, and Lieutenant Colonel Arthur Gross, DC, working at the U.S. Army Institute of Dental Research, developed a pulse-pressure technique for water lavage (jet lavage) by modification of the dental "water pick." The pulsating technique, coupled with novel applicator tips, became a new technique for surgical debridement. The pulsing jet has been used to debride oral, hand, and extremity wounds, and is useful for removing burned skin. Water debridement is more efficient at removing embedded particles and bacteria, less traumatic to normal tissue than the use of scalpel and forceps, and faster than more classic techniques. In 1972, further development of the pulse-pressure jet lavage technique resulted in a new method of preoperative hand scrubbing for surgeons. By adding standard detergents or disinfectants to the pulsed water stream, it is possible for a surgeon to become antiseptic in 90 seconds as compared to the classic 10-minute brush scrub.

1969 - Studying a hemorrhagic disease in dogs in Vietnam, Major David L. Huxsoll, VC, and Lieutenant Colonel Paul K. Hildebrandt, VC, and collaborators were the first to report that the rickettsial organism *Ehrlichia canis* was the cause of Tropical Canine Pancytopenia, a disease now recognized to be worldwide in distribution in tropical areas and a continuing threat to military and civilian canine populations.

1970 - On *15 May*, Colonel Anna Mae V. Hays, Chief, Army Nurse Corps, was nominated for the grade of brigadier general. Colonel Hays was promoted to this grade on *11 June,* thus becoming the first woman general in the U.S. Army.

1970 - The MAST (Military Assistance to Safety and Traffic) Program was initiated in San Antonio, Texas, with the Army furnishing the helicopter ambulance to provide medical assistance and evacuation as coordinated by

the Bexar County Sheriff's Office. This extension of the helicopter ambulance technique from military to civilian medicine is beginning to reduce mortality and morbidity in highway accidents and other catastrophic illness in the civilian communities to which it has been introduced.

1970 - Dr. Malcolm S. Artenstein, Captain Emil Gottschlich, MC, and Captain Irving Goldschneider, MC, developed a polysaccharide vaccine against Group C meningococcus which prevents meningococcal disease, thus preventing the epidemic spread of meningitis in recruit camps. Civilian studies of the efficacy of the vaccine in children are now underway.

1971 - After VEE (Venezuelan Equine Encephalitis) spread from Mexico to Texas, a team of Army and Air Force entomologists under Lieutenant Colonel Bruce F. Eldridge, MSC, was sent to Texas, Louisiana, Arkansas, and Oklahoma to collect and identify the mosquito vectors of VEE so that the limits of the potential spread of the disease could be defined. Studies of the mosquitoes for infection with the virus of VEE, performed at the U.S. Army Medical Research Institute of Infectious Diseases, Fort Detrick, Md., documented the potential for epidemic transmission. These data made it possible for the Department of Agriculture and the U.S. Public Health Service to protect the exposed human and equine populations, to determine areas of quarantine, and to establish vector control measures.

1971 - Lieutenant Colonel Charles R. Angel, MSC, and his colleagues, modifying and developing existing technology, established the first mass screening laboratory for urinalysis for heroin in large populations. This program began in Vietnam, was soon expanded to include amphetamines and barbiturates, and the technology was later used worldwide by the Department of Defense and by civilian drug treatment programs in this country.

1972 - Veterinary officers and enlisted technicians from the Army Medical Department joined with colleagues from the Air Force to support the U.S. Department of Agriculture program for the control of Newcastle Disease in domestic poultry in California. Working as team leaders, diagnosticians, laboratory personnel, and epidemiologists in charge of control measures, the Army members furnished the organized staff with field experience which was a critical element in containing this economically catastrophic disease of domestic fowl.

1972 - The Army Medical Department Physicians' Assistant
1973 Educational Program began operation with the initial enrollment of 60 students. In *August 1973,* the Academy of Health Sciences graduated the first class with Associate of Science degrees from Baylor University and concurrent appointments as Warrant Officers. The Staff and Faculty of the Academy of Health Sciences developed and implemented the U.S. Army Baylor University enlisted undergraduate program. As a result of this endeavor, 25 enlisted programs were recognized by Baylor University for full college credit, ranging from 4 to 62 semester hours. The Dental Therapy Assistant and medical laboratory procedures advanced programs were recognized for the award of the Associate of Science Degree by Baylor University. During the first 8 months of operation more than 3,000 enlisted students were enrolled or had received college credit. Associate of Science Degrees were awarded, for the first time, to 36 graduates of the advanced medical laboratory procedures program.

1973 - The Dental Therapy Assistant Program was formally established to provide ancillary dental personnel with expanded capabilities to augment professionals in the delivery of oral health care.

1973 - In January, as part of the general reorganization of the Army, the United States Army Health Services

Command was established at Fort Sam Houston, Texas. It provided a single manager for the entire health care delivery and educational system within the continental United States. The 750-man headquarters became operational on *1 April*, to provide command and control for all stateside hospitals and other health care facilities. All medical education and training activities were integrated into the Academy of Health Sciences, U.S. Army, formerly the Medical Field Service School, under the Health Services Command. More than 50,000 military and civilian personnel constituted the new Command. Major General Spurgeon Neel, MC, formerly Deputy Surgeon General, was selected as the first Commander of the U.S. Army Health Services Command. In 1974, the Command assumed responsibilities for Army health care in Alaska, Hawaii, and the Canal Zone.

1975 - On *27 July*, the Army Medical Department observed the 200th Anniversary of the beginning of health care for the American soldier.

READING LIST

BOOKS

Adams, G. W. *Doctors in Blue.* Henry Shuman, New York, 1952, 253 pp. (Civil War - Union Army).

Ashburn, P. M. *A History of the Medical Department of the United States Army.* Houghton Miffin Co., Cambridge, Mass., 1929, 448 pp. (General history).

Ashford, B. K. *A Soldier in Science.* Wm. Morrow Co., New York, 1934, 425 pp. (Autobiography)

Bayne-Jones, S. *The Evolution of Preventive Medicine in the United States Army, 1607-1939.* U.S. Gov't Printing Office, Washington, D.C., 1968, 251 pp. (General history on both military and civilian medicine).

Bienfang, R. *History of Pharmacy in the U.S. Army,* Southern Pharmaceutical Journal, 37: 54, 77, 78, 1945. (Very brief, but covers a topic which might otherwise be omitted)

Brown, H. *The Medical Department of the United States Army,* Surgeon General's Office, Wash., D.C., 1873, 314 pp. (Covers period 1775 to 1872).

Cantlie, N. *A History of the Army Medical Department,* Churchill, Livingstone, London, 1974. Vol I., 519 pp. Vol II, 448 pp. (History of Royal Army Medical Corps - 1223 to 1898).

Cash, P. *Medical Men at the Siege of Boston,* Amer. Philosophical Soc., Philadelphia, 1973, 185 pp. (covers period April 1775 to April 1776).

Cunningham, H. H. *Doctors in Gray,* Louisiana State Univ. Press., Baton Rouge, 1958, 339 pp. (Civil War - Confederate States Army).

Cushing, E. *History of Entomology in World War II,* Smithsonian Institution, Wash. D.C., 1957, 117 pp. (General history).

Deutrich, M. E. *The Struggle for Supremacy,* Public Affairs Press, Wash. D.C., 1962, 170 pp. (Biography of F. C. Ainsworth).

Duncan, L. C. The Medical Department of the United States Army in the Civil War. 1914/? This is a volume of reprints of articles, by Capt. Louis C. Duncan, originally published in the *Military Surgeon,* vols. 30-33, 1912-1913.

Duncan, L. C. A Medical History of General Zachary Taylor's Army of Occupation in Texas and Mexico, 1845-1847. *Army Medical Bulletin,* No. 50, October 1939, 35 pp. (General history)

Duncan, L. C. Medical History of General Scott's Campaign to the City of Mexico in 1847. *Army Medical Bulletin,* No. 50, October 1939, 55 pp. (General history)

Duncan, L. C. Medical Men in the American Revolution. *Army Medical Bulletin,* No. 25, 1931, 414 pp. (General history)

Forry, S., & Lamson, T. *Statistical Report of the Sickness and Mortality in the Army of the United States.* Jacob Gideon, Jr., Washington, D.C., 1840, 346 pp. (Covers period 1819-1839).

Garrison, F. H. *Notes on the History of Military Medicine,* Assoc. Military Surgeons, Wash. D.C., 1922, 206 pp. (History of military medicine).

Garrison, F. H. *An Introduction to the History of Medicine.* W. B. Saunders Co., Philadelphia, 1913, 942 pp. (First American general text on history of medicine).

Garrison, F. H. *John Shaw Billings.* G. P. Putnam, New York, 1915, 432 pp. (Biography)

Gibson, J. *Bodo Otto and the Medical Background of the American Revolution.* C. C. Thomas, Baltimore, 1937. (More than a biography: The second part of the title is more accurate).

Gibson, J. M. *Physician to the World,* Duke Univ. Press, Durham, 1950, 315 pp. (Biography of W. C. Gorgas).

Gibson, J. M. *Soldier in White,* Duke Univ. Press., Durham, (Biography of G. M. Sternberg).

Gorgas, M. D. & Hendrick, B. J. *William Crawford Gorgas. His Life and Work.* Garden City Publishing Co., Garden City, N. Y., 1924, 359 pp. (biography).

Henry, R. S. *The Armed Forces Institute of Pathology. Its First Century, 1862-1962.* U.S. Gov't Printing Office, Washington, D.C., 1964, 422 pp. (General history of organization that began as Army Medical Museum).

Hume, E. E. *Victories of Army Medicine.* J. B. Lippincott, 1943, 250 pp. (General history with emphasis on scientific contributions).

Hume, E. E. *Ornithologists of the United States Army Medical Corps.* Johns Hopkins Press, Baltimore, 1942, 583 pp. (Specialized review).

Jones, H. W. The Centenary of the Army Medical Library, *Military Surgeon,* 80, 1-52, 1937 (General history).

Jones, H. W. Army Medical Library. *Medical Life,* 43, 533-604, 1936. (General review by various authors).

Kagan, S. R. *Life and Letters of Fielding H. Garrison,* Medico-Historical Press, Boston, 1938, 287 pp. (Biography)

Kelly, H. A. *Walter Reed and Yellow Fever.* McClure, Phillips, New York, 1906, 203 pp. (Biography, review of the work, and review of yellow fever history).

Love, A. G., Hamilton, E. L. & Helman, I. L. *Tabulating Equipment and Army Medical Statistics.* U.S. Gov't. Printing Office, Washington, D. C., 1958, 202 pp. (General history, covers period 1818-1957).

Major, R. H. *Fatal Partners - War and Disease,* Doubleday, New York, 1941, 342 pp. (General history of medicine in military operations).

Mann, J. *Medical Sketches of the Campaigns of 1812,* H. Mann, Dedham, Mass., 1816, 317 pp. (General and anecdotal history).

Myer, J. S. *Life and Letters of Dr. William Beaumont.* C. V. Mosby Co., St. Louis, Mo., 1939, 327 pp. (Biography)

Owen, W. O. *The Medical Department of the United States Army During the Period of the Revolution.* Hoeber, New York, 1920, 226 pp. (Legislative and administrative history).

Peyton, G. *Fifty Years of Aerospace Medicine.* Air Force Systems Command, San Antonio, Texas, 1968, 284 pp. (covers period 1918-1968).

Phalen, J. M. Chief of the Medical Department, United States *Army Medicine Bulletin,* No. 52, April 1940. 158 pp. (ends with MG J. C. Magee).

Senate Document 822, 61st Congress, 1911 *Yellow Fever, A Compilation of Various Publications.* U.S. Gov't Printing Office, Washington, D.C., 1911, 250 pp. (Basic document on research, with reprints of papers).

Senn, N. *Medico-Surgical Aspects of the Spanish-American War.* Amer. Med. Assoc., Chicago, 1900, 379 pp. (Anecdotal history).

Sternberg, M. L. *George Miller Sternberg.* American Medical Association, Chicago, 1920, 331 pp. (Biography)

Thacher, James *A Military Journal During the American Revolutionary War, from 1775 to 1783:* Describing interesting events and transactions of this period: with numerous historical facts and anecdotes, from the original manuscript. 2d edition. Boston:

Cottons & Barnard, 1827. (First-hand look at the Revolution).

Tobey, J. A. The *Medical Department of the Army.* Johns Hopkins Press, Baltimore, 1927, 161 pp. (General organizational history).

Toner, J. M. *The Medical Men of the Revolution,* Collins, Philadelphia, 1876, 140 pp. (General history plus list of names).

Truby, A. E. *Memoir of Walter Reed. The Yellow Fever Episode.* Paul B. Hoeber, Inc., New York, 1943, 239 pp. (Biography and review of the work).

Vedder, E. B. A Synopsis of the Work of the Army Medical Research Boards in the Phillippines. *Army Medical Bulletin,* No. 1, 1929, 179 pp. (Annotated contextual review of research studies).

Woodward, J. J. *Outlines of the Chief Camp Diseases of the United States Armies.* Hafner, New York, 1964, 364 pp. (facsimile reprint, in paper, of 1863 ed: - Civil War).

OFFICIAL HISTORIES

The Medical Department of the United States Army in the World War. Prepared and published under the direction of Major General Merritte W. Ireland, Surgeon General of the Army. Washington, Government Printing Office, 1921-1929, 15 vols.

The Medical Department of the United States Army in World War II. Prepared and published under the direction of The Surgeon General of the Army. Washington, Government Printing Office, 1954-1974, 38 vols.

Link, M. M. & Coleman, H. A. *Medical Support of the Army Air Forces in World War II.* Ofc. Surgeon General, USAF, Wash. D.C., 1955, 1027 pp.

McPherson, D. G. *The Role of the Army Medical Service in the Dominican Republic Crisis of 1965.* AMEDD Historical Unit, n.d., 87 pp.

Neel, S. *Medical Support of the U.S. Army in Vietnam, 1965-1970,* U.S. Gov't. Printing Office, Wash. D.C., 1973, 196 pp.

Smith, C. M. *U. S. Army in World War II: The Medical Department - Hospitalization and Evacuations, Zone of Interior.* U.S. Gov't Printing Office, Wash. D.C., 1956, 503 pp.

Wiltse, C. M. *U.S. Army in World War II: Medical Service in the Mediterranean and Minor Theaters,* U. S. Government Printing Office, Wash. D.C., 1965, 664 pp.

Woodward, J. J., *et al.* *Medical and Surgical History of the Rebellion (1861-65).* Prepared under the direction of Surgeon General Joseph K. Barnes, United States Army. Washington: Government Printing Office, 1870-1888, 2 vols., published in pts.

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NOTES


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