

ANNUAL REPORT OF THE SURGEON GENERAL OF THE ARMY FOR THE
COMMANDING GENERAL, ARMY SERVICE FORCES [1943]¹

Although the destructive weapons of this war excel any devised before, and the wide geographical spread of the combat areas introduces new dangers and diseases, the Medical Department has been able to perform its mission of preserving and restoring the health of our troops with an unequaled degree of efficiency and dispatch. Credit for this accomplishment does not rest with the Medical Department of the Regular Army alone, but in many respects with the large groups of scientific men who have generously and patriotically responded to the Nation's call for their services. The excellence of the medical service is a tribute to the professional and administrative competence of the entire group of regular and emergency Medical Department officers.

While the basic principles upon which the Medical Department has operated during the present conflict stem from the soundly conceived procedures of past experience, built up over a long period of time, the nature of this war has necessitated many adjustments in military medicine. As the war has spread from one area to another, modification of plans, training, and equipment has been necessary to cope with the newly created situations and needs.

Among the new and improved measures for the treatment of the sick and wounded, one of the most outstanding is the introduction of mobile hospitals which operate near the front lines, often within range of the enemy's artillery. Heretofore, facilities for the early

¹ This report was prepared during the war but not published, presumably because it was considered to have classified information. It also lacked the statistical information that was normally included, perhaps because data from ongoing overseas operations were hard to gather.

This document has had punctuation and capitalization silently standardized, and spelling silently corrected. Original pagination has been retained. Additions are in [brackets].

definitive treatment of the wounded were located farther to the rear – a situation imposed by the dependence upon railway transportation that could not be brought so far forward.² Motorized and airborne mobile hospitals, equipped for definitive treatment, and advanced near the combat zone, then, constitute a marked advance in military medicine in that they make possible exceptionally rapid surgical treatment of the wounded. This has had a marked effect upon fatality rates.

Notwithstanding all the advances afforded by motor transport, there are many instances in which terrain renders its use impossible. In such cases, the wounded must still be evacuated by litter bearers. In New Guinea, yeoman service was performed in this connection by native people. Their familiarity with the hazardous terrain permitted a more speedy and comfortable movement of the wounded, in addition to relieving the overworked American litter bearers of this laborious task.³

The need for hospital facilities here and abroad has called for a large-scale undertaking. At the end of the fiscal year 1942, there were 15 general hospitals in the United States with nearly 15,000 beds. Hospital construction was expedited during the fiscal year 1943 with the results that 39 general hospitals, with a bed capacity of about 54,000 were open and receiving patients at the end of this period. In addition, 16 general hospitals have been better equipped and staffed to treat the sick and the wounded. This is attested by the fact that more men are being returned to duty and restored to health than in any previous war.⁴

² This is something of an exaggeration. In WWI, Mobile Hospitals (the forerunner of Surgical Hospitals of WWII and Mobile Army Surgical Hospitals of Korea) operated as far forward as their successors.

³ For details on the New Guinea campaign, see Condon-Rall ME, Cowdrey AE. *United States Army in World War II, The Technical Services, The Medical Department: Medical Service in the War Against Japan*. Washington, DC: Center of Military History, United States Army; 1998.

⁴ See Smith CM. *United States Army in World War II, The Technical Services, The Medical Department: Hospitalization and Evacuation, Zone of Interior*. Washington, DC: Center of Military History, United States Army; 1956, and the monthly *Health of the Army* (1942-1988).

To fulfill its mission, the Medical Department has had to train a veritable army of specialists sufficient for every branch of military medicine.⁵ At the end of the fiscal year 1943, there were 610,184 officers, nurses, and enlisted men serving in the Medical Department. Of particular significance has been the training of officer specialists to cope with two of the leading health problems of this war: malaria and the venereal diseases.

In Army hospitals, laboratories, and research centers newer methods of treatment and medical equipment can be tested and sometimes perfected. Among the newer developments in medicine are new and better methods of combating shock and hemorrhage by means of blood plasma; the use of atabrine in malaria therapy; the perfection of new anaesthetics, particularly sodium pentothal, which is quick, reliable, and easy to administer; the perfection of a portable x-ray machine for field hospitals; and other advances including a new chemotherapeutic agent of brilliant promise, penicillin. The last named product is not yet available for mass use, but limited clinical trials indicate that it is remarkably efficacious in controlling many infections that are resistant to other agents. It is thus quite important in military medicine.

The procurement and distribution of huge quantities of medical supplies and equipment for the Army and Lend-Lease has been accomplished efficiently.⁶ Without the benefit of early procurement planning, the medical supply problems might well have hampered the progress made on the medical front. The nation's industrial firms have responded splendidly to the demands made upon them for all types of medical

⁵ See Mullins WS, Parks RJ, eds. *Medical Department, United States Army, Medical Training in World War II*. Washington, DC: Office of The Surgeon General, Department of the Army; 1974.

⁶ See Anderson RS, Wiltse CM, eds. *Medical Department, United States Army, Medical Supply in World War II*. Washington, DC: Office of The Surgeon General, Department of the Army; 1968.

supplies and equipment.

Neuropsychiatric conditions have presented the Medical Department with a problem which it is meeting efficiently. Careful screening of inductees to weed out the mentally ill, and an enlightened method of treating cases that occur in the service will doubtless assist in reducing the gravity of the problem.⁷

Health of the Army

The rapid expansion of the Army and its highly mechanized status; the global character of the war with battlefields spreading from the malarious jungles of the South to the tundras of the North; the early unsuccessful phase of our battles; the liberalization of the physical standards of men inducted into the Army; the recent rise in the mean age of the inductees – all these factors have to be kept in the foreground in order to properly appraise the health of the Army.⁸

Three basic indices are used for measuring morbidity and mortality: (1) admission rate; (2) non-effective rate; and (3) death rate. They are essentially an appraisal of ill health, a problem of morbidity and mortality.

An annual admission rate shows the number of sick admitted during the year per 1,000 strength; the non-effective rate the proportion of the men absent from duty because of sickness or injury. Thus a total yearly non-effective rate of 30 signifies that that number of men per 1,000 were incapacitated each day. The death rate is the yearly number of deaths per 1,000 strength. As measures by these indices, the health record of the Army has been quite satisfactory in the United States as well as overseas.

⁷ See Anderson RS, Glass AJ, Bernucci RJ, eds. *Medical Department, United States Army, Neuropsychiatry in World War II, Volume 1, Zone of Interior*. Washington, DC: Office of The Surgeon General, Department of the Army; 1966 and Mullins WS, Glass AJ, eds. *Medical Department, United States Army, Neuropsychiatry in World War II, Volume 2, Overseas Theaters*. Washington, DC: Office of The Surgeon General, Department of the Army; 1973.

⁸ For data, see Lada J, Reister FA, eds. *Medical Department, United States Army, Medical Statistics in World War II*. Washington, DC: Office of The Surgeon General, Department of the Army; 1975 and the monthly *Health of the Army* (1942-1988).

The non-effective rate for the troops in the United States was lower during the fiscal year 1943 (32.9) than in 1942 (34.4) and 1941 (33.8). It was lower, even though the admission rate was higher – 803 in 1943 as compared with 788 in 1942. The increase was due to the occurrence of more cases of sickness. There were fewer cases of injuries. The increase of disease was chiefly due to a greater number of respiratory diseases. The average loss of time from such cases was so small that the greater number of them did not increase the non-effective rate sufficiently to overbalance the decline in the loss of time from other causes.

The death rate from all causes was the lowest ever recorded in the history of the Army, it being 2.0 as compared with 2.2 in 1942, and 2.1 in 1941. Of the total 0.7 was due to disease and 1.3 to injuries.

Venereal diseases as usual presented a major problem. Although the control of such diseases in the Army was as effective as in the previous years, the admission rate from them increased slightly to 41.1 from 40.4 for 1942. The rise began around December 1942 when the Army started to induct uncomplicated cases of gonorrhea and chancroid, and syphilis, except cardiovascular, cerebrospinal, and visceral cases.⁹ In addition, a considerable number of venereal cases that were contracted during the furlough time allowed to the inductees were recorded as admissions. They naturally raised the admission rate.

Relatively there were more cases of measles and scarlet fever but fewer of mumps. There were an abnormal number of cases of meningococcic meningitis, but the disease never reached an alarming rate.

⁹ On physical standards at induction, see Anderson RS, Wiltse CM, eds. *Medical Department, United States Army, Physical Standards in World War II*. Washington, DC: Office of The Surgeon General, Department of the Army; 1967.

The combined non-effective rate for theaters of operation overseas (33.7) was not much higher than the one for the United States (32.9). There were, however, wide variations between such rates in the several theaters, the range being from 53.0 for the South Pacific to 23.2 in North America. The higher rates are partly due to battle casualties and partly to specific tropical diseases. In the case of the South Pacific it was chiefly malaria.

The combined admission rates for the overseas theaters were: 756 for disease, 138 for injuries, and 13 for battle casualties. The variations by theaters were large; the highest ones from disease were in the South Pacific (1,147), Southwest Pacific (1,026), Middle East-Central Africa (1,019), and Asiatic (975). For the other areas the admission rates were about the same as in the United States and in some cases even lower.

The admission rates for injuries paralleled the admission rates for disease. The rates for injury were: 187 in the South Pacific, 183 in the Southwest Pacific, 178 in Middle East-Central Africa, and 93 in Asiatic theaters of operation.

The combined death rate was 2.7 for overseas as compared with 2.1 for the continental United States. As might be expected, the highest ones were in the Southwest Pacific (4.2), Middle East-Central Africa (4.2), Asiatic (3.9), and South Pacific (3.2). The higher death rates in those theaters were due largely to more deaths from injuries, with only a slightly greater number from disease. The average for all theaters was: from disease 0.5, injury 1.8, and battle casualties in hospital 0.4.

The outstanding problem in preventive medicine has been malaria. The highest rates were in the Southwest Pacific (180), South Pacific (125), Asiatic (122), Latin America (91), and Middle East-Central Africa (82).

Control

The function of The Surgeon General's Office under the direction of the Secretary of War, and in cooperation with the components of the Army, is to assist the medical units and installations in the field, both at home and abroad in carrying out their military objectives.

During the fiscal year ending 30 June 1943 there were material changes in the office to enable it to perform its functions more effectively.¹⁰ The activities of the divisions, with the exception of Technical Information and Control, were grouped more logically into five services, namely: Administrative, Personnel, Operations, Supply, and Professional. On 1 July 1942 the Finance and Supply Division was separated into Supply and Fiscal. During the year the Legal and the Office Service Divisions were organized. The Army Medical Museum and the Army Medical Library became field installations.

A number of former activities were transferred to the control of the commanding generals of Service Commands. Those included the general hospitals with the exception of Walter Reed (August 10, 1942), civilian personnel in hospitals (September 1, 1942), and approval of accounts for civilian dental attendance (August 10, 1942), and authority to appoint nurses for affiliated units (September 1, 1942).

Plans

Adequate medical service, including the protection of the health of the troops and the efficient care of the sick and wounded, is

¹⁰ See Coates JB, Wiltse CM, eds. *Medical Department, United States Army, Organization and Administration in World War II*. Washington, DC: Office of The Surgeon General, Department of the Army; 1963. The current document omits all mention of the War Department investigation into the Medical Department, which led to many of the organizational changes mentioned.

important for the success of any military campaign. Consequently, it is necessary that the war plan for any theater of operation include a carefully prepared medical one. Many factors such as climate, the military efficiency of the enemy, the probable intensity of the campaign, and the like, must all be carefully evaluated. The plan must include the percentage of beds in mobile nondivisional hospitals and in fixed hospitals, medical supplies, laboratory functions, number and type of sanitary personnel and other nondivisional medical units and facilities.¹¹

During the past year the Plans Division was required to submit plans or modifications of existing plans for Theaters of War scattered over the entire globe. Inadequacies and deficiencies in personnel and supplies reported from any theater have been corrected.

War experience necessitated rewriting our many tables of organization. In the new tables the number of commissioned and enlisted personnel has been reduced as much as possible.

Correspondingly, nearly all of the tables of equipment have been revised to meet the changing requirements and to simplify the computation of allowances. Only by constant changes and additions can medical equipment continue to be adequate and satisfactory. As new ideas are developed by war experience or from the study of the problems here or abroad, certain items are modified or new ones developed. All of them are submitted to laboratory, field, and service tests. Any article that is considered satisfactory is submitted to the Medical Department Technical Committee for consideration.

Research and Development

The projects are of two types:

¹¹ For details of the Medical Department support on campaign, see Wiltse CM. *United States Army in World War II, The Technical Services, The Medical Department: Medical Service in the Mediterranean and Minor Theaters*. Washington, DC: Center of Military History, United States Army; 1965, Cosmas GA, Cowdrey AE. *United States Army in World War II, The Technical Services, The Medical Department: Medical Service in the European Theater of Operations*. Washington, DC: Center of Military History, United States Army; 1992, and Condon-Rall ME, Cowdrey AE. *United States Army in World War II, The Technical Services, The Medical Department: Medical Service in the War Against Japan*. Washington, DC: Center of Military History, United States Army; 1998.

(1) Those involving fundamental scientific research, carried on by cooperating civilian agencies; (2) developmental projects executed by the Medical Department. This division of function proved to be economical of personnel and funds, and enabled the Army to utilize to the fullest possible extent the advice and assistance of the most highly qualified civilian groups. On 1 July 1942, 86 projects were active; during the fiscal year 48 new ones were initiated, and 45 completed; on 1 July 1943, 61 projects were active.

The research activities in the Medical Department increase[d] substantially. Research expenditures totaled \$12,614 in the fiscal year 1940, \$78,957 in 1941, \$92,203 in 1942, and \$425,226 in 1943. The estimate for 1944 is \$1,306,780.

The amazing promise of penicillin in the control of otherwise hopeless infections led in May 1943 to a large scale program of experimentation and clinical testing of this new therapeutic agent. An additional \$467,000 was allotted for this study.¹²

The Equipment Laboratory at Carlisle Barracks continued its tests of medical field equipment, both individual and unit. New items of equipment were designed, and continuous efforts were made to improve present standard items and to find substitute materials for those of a highly critical nature.

The activities of the Edgewood Arsenal in the development of preventive and therapeutic measures against casualties caused by chemical agents have so increased as to overtax the capacity of its facilities. A new laboratory was approved in June 1943, and construction has been started.

¹² On penicillin, see Hare R. *The birth of penicillin and the disarming of microbes*. London, Allen and Unwin; 1970.

Research continued on an expanded scale at the Army Medical Center¹³ in the diagnosis, prevention and treatment of diseases and wounds. Emphasis was placed on the development of vaccines, serums, blood substitutes, and on medical and dental supplies, equipment and procedures. Research on x-ray equipment and radiology continued at the Army School of Roentgenology in Memphis, and on the diagnosis, prevention, and treatment of animal diseases at the Veterinary Research Laboratory at Front Royal, Virginia.

The medical problems of the Armored Forces are, like the problems of aviation medicine, a relatively new development of this war. The Armored Force Medical Research Laboratory, Fort Knox, Kentucky, was activated in August 1942. It has undertaken an extensive research program on problems peculiar to service with armored vehicles, [and] on physiological problems met by troops serving in climates with extremes of temperature and humidity.

Many individual research projects have been conducted at various military stations with facilities peculiarly suited to the investigation planned. A study of motion sickness was undertaken at Camp Edwards, and a study of dermatology at Fort Benning. Many preventive and therapeutic agents, procedures, and types of equipment can be properly evaluated only by observations on military personnel or in special situations under military control.

Close liaison relationships have been maintained with the Division of Medical Sciences, National Research Council.¹⁴ This close cooperation has made available to the Army the professional advice and assistance

¹³ Then titled the Army Medical Center, it was commonly known as Walter Reed and in 1952 renamed Walter Reed Army Medical Center.

¹⁴ Material on the Division of Medical Sciences is available through the National Academy of Sciences. See <http://www.nasonline.org/about-nas/history/archives/collections/advisory-committees.html>.

of some 300 eminent physicians, surgeons, and scientists representing all fields of science with potential capacity to contribute to new developments in military medicine. The various committees and sub-committees of the Council serve two functions: (1) professional advice and (2) medical research.

The professional and technical personnel of the Council's committees have been of great service in furnishing authoritative opinions on problems dealing with the prevention, diagnosis, and treatment of disease and injuries, [and] on drugs and medical equipment.

In the field of medical research the committees and subcommittees of the Council have been able to conduct research of a fundamental character on numerous problems referred by The Surgeon General. Some of the projects have been financed by the Committee on Medical Research of the Office of Scientific Research and Development, while others were financed by civilian institutions and philanthropic foundations.¹⁵ Over \$5,000,000 have been expended by the Office of Scientific Research and Development on medical research during the fiscal year 1943. In addition, the Medical Department of the Army has had access to research findings of other agencies accumulated at a cost of many millions of dollars.

Personnel

One of the major problems of the Medical Department during the year has been the procurement, classification, and assignment of its personnel.¹⁶ Each of the several corps includes several groups of specialists. In the Medical Corps alone there are 18 specialist groups. Individual medical units and installations must each have an adequate number of properly trained specialists of the type required.

¹⁵ Papers of the CMR, OSRD are at the Library of Congress. See also Andrus, EC. *Office of Scientific Research and Development. Committee on Medical Research. Advances in military medicine, made by American investigators.* Boston: Little, Brown and Co.; 1948.

¹⁶ See Coates JB, Wiltse CM, eds. *Medical Department, United States Army, Personnel in World War II.* Washington, DC: Office of The Surgeon General, Department of the Army; 1963.

During the year personnel expanded as follows:

	July 1, 1942	July 1, 1943
Medical Corps	16,872	37,145
Dental Corps	4,500	12,046
Veterinary Corps	916	1,836
Sanitary Corps	635	1,755
Medical Administrative Corps	1,900	11,623
Contract Surgeons	41	250
Army Nurse Corps	12,475	30,956
Dietitians	0*	263
Physical Therapy Aides	0*	386
Enlisted Men	187,801	513,924

* They were civilian employees until December 22, 1942.

At the beginning of the year the Medical Department had one or more Officer Recruiting Boards in each state that had been organized in May 1942. The monthly procurement rate increased steadily from July 1 through October, but there was a marked drop in November when most of the Recruitment Boards had been discontinued. Prior to 1 January 1943 all of them had been recalled at the request of the Procurement and Assignment Service. In the meanwhile, in accordance with the desires of the War Manpower Commission, the Officer Procurement Service had been established by the War Department on 7 November, 1942.

Since January 1 the recruitment of physicians had declined steadily. There were several factors responsible for the decline, among which were the discontinuance of the induction of registrants over 37 years of age, and the decreasing number of physicians under 45 remaining in civil life who were physically qualified.

During the current year no additional affiliated Medical Department units were organized.¹⁷ Units that have been activated and put into professional operation have rendered highly satisfactory service.

¹⁷ Affiliated units were hospitals organized in conjunction with a civilian hospital.

All of those organized have been activated; soon they will be assigned to theaters of operation where they can function professionally.

The Act of 22 December 1942, authorizing relative rank for the Army Nurse Corps (Colonel to Second Lieutenant) with the same pay and allowances as unmarried officers, provided the same status for female physical therapy aides and hospital dietitians (Major to Second Lieutenant). Early in 1941 The Surgeon General's Office, anticipating a shortage of dietitians and physical therapy aides, drew up, with the approval of the American Standardization Committee, a plan under which their training would be accelerated by the joint efforts of civilian schools, military schools, and military hospitals. The plan proved satisfactory.

Training

The rapid expansion of the Army has necessitated an unprecedented intensification of the training program.¹⁸ Military operations have demonstrated the necessity of changes in tactical doctrines and in the principles of the employment of tactical units. Such experience has required a modification of training doctrines.

The basic training of enlisted men is completed when practical at the four Replacement Training Centers. During the first 6 months of the current year there was a 10 week cycle that was later lengthened to 14 weeks. In each instance one week was required for receipt and classification and one week for clearing and shipment of men to their assignments. At the beginning of the year the annual capacity of the four Centers was 20,688. This was increased during the period to 44,349, with an annual capacity based upon a 14 week training cycle of 164,091. The number of men completing the training was 158,175 as compared with

¹⁸ See Mullins WS, Parks RJ, eds. *Medical Department, United States Army, Medical Training in World War II*. Washington, DC: Office of The Surgeon General, Department of the Army; 1974.

79,764 during the previous fiscal year, an increase of 98.3 per cent.

In addition to the basic training provided, the four Centers trained selected men in occupational specialties. Among these were approximately 16,000 truck drivers, 11,000 clerks and typists, 2,000 automobile mechanics, 7,000 cooks, and 1,400 mess sergeants.

A large number of enlisted technicians are required for the hospitals at home and abroad. Limited numbers of inductees are qualified for such work by training received in civil life. Since the number of such technicians are grossly insufficient to meet the requirements of the Medical Department, technicians schools are operated in Army general hospitals. At the beginning of the fiscal year there were six such schools. Three additional ones began operation on 1 July 1942, and the capacity of the one at the Fitzsimons General Hospital was doubled. In November the demand for technicians was so acute that four of the schools were required to conduct two classes a day, each for eight hours. The annual capacity of the schools on 1 July 1943 was almost 70,000 as compared with 21,000 on 1 July 1942. The technicians include veterinary, x-ray, medical, dental, laboratory, pharmacy, surgical, sanitary, and meat and dairy inspectors. There were also included in the totals orthopedic mechanics and equipment-maintenance technicians for whom special training was provided. Orthopedic mechanics are being trained in 12 general hospitals. In the training of the technicians emphasis was placed upon the practical application in hospital wards, laboratories, and in field installations, of knowledge gained in lectures, by reading, and through demonstration.

Rubber moulages which simulate actual war wounds are prepared at

the Army Medical Museum. Each set consists of eight; over 200 sets have been distributed to various training centers.

Additional specialists common to the various branches of the Army have been trained at other Service Schools.

Medical Department officers, other than those of the Medical Administrative Corps, have received their professional training in civilian schools prior to commissioning. All of them, however, require indoctrination in principles of medico-military tactics, and, in addition, the special application of their professional knowledge to the needs of the military service. Moreover, the Army requires a greater number of specialists than are available in civil life.

The capacity of the Medical Field Service School has been expanded to provide: (a) a six weeks basic course for officers with a capacity of 1,500, having an enrollment of 500 each two weeks; (b) a four weeks course, with a capacity of 50, for medical and field sanitary inspectors; (c) a four weeks refresher course for division and corps medical officers, with a capacity of 150.

Other courses include those at the Army Medical School, at the Army School of Roentgenology (University of Tennessee Medical School), and at general hospitals for Medical Department Replacement Pool officers. To train officers in the handling of medical supply, especially in medical depots, a three months training course was inaugurated on 1 March 1943 at the St. Louis Medical Depot.

Though chemical agents have not been used in this war, the training of medical officers in the prevention and treatment of casualties caused by such agents is essential. Consequently, the Medical Department, in

conjunction with the Chemical Warfare Service, conducts at the Edgewood Arsenal a four weeks course in the treatment of chemical warfare casualties. The capacity is 100 officers.

The fact that military operations are conducted in areas where tropical diseases are endemic necessitated the assignment of at least one medical officer trained in tropical medicine to units destined for such areas. In addition, medical units in the Zone of the Interior need such officers for the definitive treatment of evacuated military personnel. It was indispensable, therefore, that training in tropical medicine should be accelerated. The capacity of the eight weeks course at the Army Medical School, begun in the summer of 1941, was increased from 50 to 200 officers; a similar course was started at Tulane University School of Medicine in New Orleans. Special emphasis was also given to tropical diseases in courses on epidemiology and clinical laboratory [work]. As special training [in] the control of malaria was urgently needed, selected officers who successfully completed the training at Tulane or the Army Medical School were given an intensive three weeks field course in mosquito control and other phases of malaria prevention. A few well qualified officers, or those with unusual supervisory ability, were sent to Central America under the auspices of the Pan-American Highway for field work under actual tropical conditions.¹⁹

The necessity was appreciated quite early of training Medical Administrative Corps officers to replace graduate physicians in non-professional positions in hospitals and medical units. The large majority of them have been trained at the Officer Candidate Schools as the Medical Field Service School and at Camp Barkeley, Texas. Selected

¹⁹ Before the war the Army had operated a tropical medicine school in the Panama Canal Zone, which would be reopened in 1944.

enlisted men are sent to those schools from medical units and hospitals and from the Replacement Training Centers. Those from the Replacement Training Centers receive preliminary courses, with the elimination of the unsuitable men before they are sent to the Officer Candidate School. The capacity of the two schools for the year was over 11,000. The total number completing the course and receiving commissions was 8,600. The school at the Medical Field Service School had been discontinued to provide additional space for training commissioned officers, but expanded facilities have been provided at Camp Barkeley, where the capacity is now 1,000 per month. After 1 July 1943 the former 12 week course will be lengthened to 16 weeks. It is anticipated that by 1 January 1944 there will be a reserve pool of approximately 400 Medical Administrative officers.

The officer training in leading civilian medical schools that began in September 1942 was expanded greatly in 1943. The annual capacity was 2,289, with 2,067 being assigned, and 2,014 completing courses in such varied specialties as neuropsychiatry, maxillo-facial surgery, roentgenology, blood plasma technique, medical and field sanitary inspection, and the like.

Beginning in July 1942 the activation of all numbered field, general and station hospitals, hospital centers, sanitary companies, and most other types of medical units became the responsibility of the Commanding General, Army Service Forces. A total of 803 numbered medical units, comprising an aggregate theater of operation strength of 153,930, were assigned to the Army Service Forces for training.

These units included 94 general hospitals, 228 station hospitals, 36 field hospitals, 42 malaria control units, 26 malaria survey units, as well as a number of auxiliary surgical groups, medical ambulance battalions, sanitary companies, and the like. Inspections of the training of numbered medical units have been made frequently, and appropriate recommendations have been submitted to the Director of Military Training, Army Service Forces. Units destined for early movement have received special attention, and maximum effort has been made to assure their readiness for movement. Rated technicians²⁰ are automatically supplied to the newly activated units, which have received from 50 to 100 per cent of those needed.

Training must be based on sound doctrine and on adequate programs, including well-designed training aids. Recent advances in medicine and military changes have necessitated a constant revision of doctrine and policy. These must be disseminated through field manuals, teaching manuals, film strips, and training films. Twenty-seven field and technical manuals are now available. These manuals range in subject matter from first-aid and sanitation to instruction on "Medical Service in Joint Overseas Operations." Other manuals deal with supply, the operation of supply depots, and with the care and maintenance of medical equipment. A program was initiated for the preparation, revision, and production of 11 training films and 25 film strips. Eighteen training films are available or in production. Most of these deal with sanitation and first-aid. Sixty-four film strips are available. These, again, deal mostly with first-aid, sanitation, and the various services

²⁰ i.e. those who had graduated from training schools rather than receiving on-the-job training.

performed by enlisted men. They depict, among other subjects, the medical work in collecting and clearing stations, in medical battalions, describe various types of bandaging, and the like.

The courses for enlisted technicians have been refined and perfected throughout the year, and field lessons incorporated in the curricula in order that the efficiency of the men might be at a high pitch for service with field units.

Mobilization training programs²¹ which will standardize all courses of instruction in units, replacement training centers, enlisted technicians schools, and schools for officers in both military and civilian institutions have been prepared or revised. Literature on 16 training programs has been developed for the various types of training required.

All evidence considered, the training task has been a major problem during the last year, and, whatever the failures, the achievements far outweigh them.

Hospitals

The problem of providing sufficient hospital beds, here, in overseas areas, and in troop ships and hospital ships has been, like the tasks of planning, research, personnel growth and training, a task of very considerable magnitude.²² The Surgeon General is charged with the preparation and maintenance of basic plans for, and the supervision of military hospitalization and evacuation. Needs are anticipated and general policies formulated.

The new hospitalization during the year has, for the most part, been of the cantonment type. In order that the hospitals constructed may be available for other uses in the future, the President on 31 March 1943 directed that all recommendations for hospital construction of more

²¹ Army standard syllabi for training whole units.

²² See Smith CM. *United States Army in World War II, The Technical Services, The Medical Department: Hospitalization and Evacuation, Zone of Interior*. Washington, DC: Center of Military History, United States Army; 1956.

than 150 beds be approved in turn by the Federal Board of Hospitalization²³, the Bureau of the Budget²⁴, and the President.

Hospitalization needs at the station hospitals have been based on four per cent of the troop strength. General hospitals have been provided for one per cent of the total strength of the Army, plus the bed needs of patients evacuated from overseas, estimated at present as an additional 0.7 per cent of overseas strength.

On 1 July 1942 there were 15 general hospitals in the United States with a normal capacity of nearly 15,000 beds. By the end of the fiscal year there were 39 general hospitals open and receiving patients with a bed capacity of about 54,000. In addition, 16 general hospitals, with a capacity of almost 27,000 beds, were under construction. Of these, seven are expected to open in July, August, and September with a total of nearly 12,000 beds.

On 1 July 1942 there were 264 station hospitals in the United States with 82,000 beds. A year later there were about 500 station hospitals with a capacity of 220,000.

The actual construction, maintenance, and repair of Army hospitals is a function of the Engineers, while supervision of the program from the medical standpoint is a function of The Surgeon General. Hospital sites have been carefully chosen and a few conversions of hotels undertaken. For various reasons hotels are rarely adaptable for hospital use.

The rapid emergency construction of many cantonment-type hospitals, often with poor workmanship, brought diverse problems. The shrinkage of green lumber, for example, tore the tar-paper roofs, resulting in leaks. Similarly, the floors constructed of such materials were difficult to

²³ A committee to avoid overlap in Federal medical programs and facilities, consisting of the Army and Navy Surgeons General, the Surgeon General of the US Public Health Service, the Administrator of Veterans Affairs, the Commissioner of Indian Affairs, the Director of the Bureau of Prisons, and the Assistant Administrator of Veterans Affairs, in Charge of Medical and Domiciliary Care.

²⁴ Predecessor of the Office of Management and Budget.

maintain properly. However, these defects were promptly remedied.

Among the recent improvements has been the air-conditioning of operating rooms, recovery wards, and x-ray dark rooms at several installations. These facilities will be extended to other hospitals in the warmer sections of the United States. A few hospital functions that have grown with exceptional rapidity (i.e., the dental service, with the lowering of induction standards), have required enlargement and alteration.

The program for hospitalization of members of the Women's Army Auxiliary Corps, for prisoners of war, and for the retraining of convalescent patients in general hospitals is being rushed to completion.

The bed-credit system, authorized in June 1941, [is] working well. Bed credits in named general hospitals are allotted to the commanding generals of service commands, Commanding General, Army Air Forces, commanding generals of ports of embarkation, and to the general hospitals concerned. Patients may then be transferred to beds allotted in named general hospitals without reference to higher authority. Posts not having bed credits allotted by The Surgeon General obtain them from the commanding general of their service command. In this manner the transfer of patients is coordinated and controlled. The advantage of the bed credit system became apparent also when many patients had to be evacuated from the West and East Coasts to the interior.

From August 1942 to 1 July 1943 nearly 27,000 patients were transferred between general hospitals, and nearly 28,000 patients were evacuated from overseas to the United States.

Toward the end of the year certain named general hospitals were designated for the specialized treatment of selected types of medical and surgical cases.

Plans for hospital ships and for hospitalization on transports have been given special consideration. Ward cars have been provided for hospital trains. The standard chair-cars are converted by the installation of folding, double-decked beds and two side doors for the loading of patients. Three of these cars, with a small dressing room at the end of one of them, are required for a complete hospital train, the other cars being of the standard railroad type. Two hospital ships were in service on 1 July 1943, and 24 were authorized. On the same date, 23 hospital trains (i.e., sets of three ward cars) were in service and 40 authorized.

Fiscal

A noteworthy development was the establishment on 1 July 1942 of a separate Fiscal Division.²⁵ The centralization of fiscal operations in this division has proved highly satisfactory in that many accounting, contractual, and administrative procedures have been simplified, and increased volumes of work expedited.

On 1 January 1943, eleven fiscal branch offices were activated at the principal Medical Department Procurement Districts and Depots. Their work has resulted in a more proficient and prompt administration of many financial procedures. Under the former system, funds were

²⁵ See Coates JB, Wiltse CM, eds. *Medical Department, United States Army, Organization and Administration in World War II*. Washington, DC: Office of The Surgeon General, Department of the Army; 1963.

allotted to more than 600 installations directly by The Surgeon General's Office. This rendered supervision over personnel and the handling of funds difficult. As a result, errors were frequent and much time and energy were required in their correction. Since the installation of the field system, thorough supervision has been possible and errors have been reduced to a minimum. Moreover, the decentralization of many fiscal operations had relieved congestion and made office space available for other purposes.²⁶

The Fiscal Division has been instrumental in negotiating certain agreements that have greatly simplified financial transactions relative to hospitalization of military personnel. Two agreements of this nature are: (1) An agreement between The Surgeon General, U.S.A., and the Director General, Medical Service, Canada, whereby military personnel of either government may be treated in military hospitals of the other without charge except for subsistence of officers²⁷ and unusual expenses; and (2) an agreement between the Secretary of War and the Secretary of the Navy whereby personnel of either service may be treated without charge in hospitals of the other service outside the United States. These agreements, operative for the duration of the war and six months thereafter, have greatly simplified the cumbersome bookkeeping systems formerly involved in the hospitalization of military personnel.

In addition, an agreement was made with the United States Employees' Compensation Commission whereby much of the detail formerly required by the Commission in connection with accounts for the out-patient treatment of its beneficiaries by Army agencies has been eliminated, thus saving much time and labor in the presentation of reimbursement charges. The

²⁶ Both numbers of personnel for the Surgeon General's Office and physical space were limited.

²⁷ Under regulations of the period, officers were charged for their food while in hospital.

volume of such accounts has been increased enormously by the Army Industrial Hygiene Program at Army-owned and operated plants. The introduction of simplified accounting measures in connection with these three agreements has reduced clerical personnel and space requirements.

An effort has been made to decentralize activities, to expedite procedures, and to conserve manpower and equipment. In putting this streamlined program into effect, professional accountants, selected because of their experience and proficiency in civilian positions, were commissioned in the Army and put in charge of the work. Fiscal methods have been simplified as a result of the general overhauling of many important procedures on budgetary estimates, on the settlement of accounts for blood transfusion, and on the processing of vouchers for the spectacle program and for hospital laundries. This has served to speed the voluminous amount of work involved.

One branch of the Fiscal Division has been charged with the duty of obtaining, analyzing, and consolidating financial data covering all phases of Medical Department activity. Thus, accurate information on operating costs is continuously available in connection with budget estimates, the allotment of funds, the establishment of new installations and the like. To achieve this financial measuring rod, detailed cost reports are required at regular intervals from many varied medical installations. The unit costs on personnel, supplies and materials, medical, surgical, and dental services, pharmacy operation, out-patient services, messes, and recreational activities are calculated. These studies have been extremely valuable in clarifying and justifying

estimates before the Budget Officer of the War Department, the Bureau of the Budget, and the House Appropriations Committee; and have also provided data on the “cost factor per man year”. Of the estimate for the fiscal year 1944 submitted to Congress, 25 per cent was for personnel services, 40 per cent for supplies and materials, 31 per cent for equipment, and 4 per cent for all other services.

Supply

A vast and exceedingly varied armamentarium of medical supplies is needed to protect the health and to safeguard the lives of our rapidly expanding Army.²⁸ The ever-widening stream of war activity, the dispersion of our troops to far-flung areas, and the needs of our fighting Allies have made the medical supply problems of this global war unprecedented in scope and in scale. Thus the Supply Service of the Medical Department has had to plan in terms of figures and quantities that make former procurement look insignificant. For instance, in quantity and dollar volume, the purchases of supplies and equipment reached an all-time peak of \$500,000,000 during the year. This was an increase of approximately \$350,000,000 over the previous fiscal year, but that period included only seven months during which the country was at war. Lend-Lease requirements also loomed large as the year began. A procurement program was set up to purchase approximately \$60,000,000 worth of supplies for distribution through Lend-Lease channels. While requisitions against this program were slow in materializing, shipments during the past six months have markedly accelerated.

With the exception of a few critical items, our armed forces here and abroad have had at their disposal the medical equipment necessary for the conservation of health and treatment of the wounded. In meeting

²⁸ See Anderson RS, Wiltse CM, eds. *Medical Department, United States Army, Medical Supply in World War II*. Washington, DC: Office of The Surgeon General, Department of the Army; 1968.

the enormous demands for medical supplies, American industry deserves full measure of credit. The problems of the industries so engaged involves great technical precision. Yet industry has been immensely resourceful in overcoming the obstacles besetting it, and has forged ahead to meet requirements.

To insure more efficient operation, several changes in the personnel and functions of the Supply Service were made. However, established policies and objectives have been adhered to for the most part, especially as regards industrial relations. It has been necessary to maintain close liaison with contractors in order to interpret the changing trends in priorities, specifications, production schedules, allocations of materials, and procurement policies. Every contract issued by the Supply Service has been analyzed, and realistic schedules of delivery prepared to guide Medical Department contractors in setting up their production schedules. Some concept of the growing magnitude of the Department's industrial relations may be gleaned from the fact that, whereas a year ago 700 contractors were serving the Department, in 1943 2,500 contractors had 25,000 contracts in force.

Conservation has been consistently followed when the procurement of supplies has been jeopardized by conservation orders, the Department has cooperated with the War Production Board and with industry in standardizing and developing alternate materials. One of the first groups of items to be affected was hospital utensils, formerly made of corrosion-resistant steels. New specifications were prepared and iron, chromium, wood, and other less critical materials substituted.

The first aid packet, an essential part of every soldier's equip-

ment, affords another interesting example of conservation. When steel became unavailable, the Medical Department developed a container made of laminated paper and lead foil. Many additional firms are now able to manufacture the item, and a saving of at least 5¢ per case should result in an economy during 1944 of many hundreds of thousands of dollars.

To secure adequate supplies of atabrine for the Army and for Lend-Lease additional production facilities became necessary. Heretofore production had been confined to one manufacturer, whose total output was inadequate. Consequently a number of chemical and dye plants were converted to the manufacture of the components of the atabrine, while other plants took over the final steps in processing and tableting. The net result has been that production has increased 60 per cent from April to June. It is expected that the production of atabrine during the calendar year 1943 will approximate minimum military and civilian needs. As new facilities are geared to full production, the output for the calendar year 1944 should fully meet presently calculated requirements.

No medical development of the present war has aroused more interest than the use of dried human plasma as a substitute for whole blood.²⁹ The technique of converting human blood into dried plasma had already been perfected before America entered the war. Its life-saving qualities and its manifold uses, however, have been intensified by the present world crisis. Since Pearl Harbor dried plasma has become a principal item in medical procurement, and the man in the street is instinctively responding to the appeal of the American Red Cross for donations of blood to be converted into plasma. There is something about the donation of blood which brings the democratic idea home with peculiar force. This can be

²⁹ See Coates JB, McFetridge EM, eds. *Medical Department, United States Army, Blood Program in World War II*. Washington, DC: Office of The Surgeon General, Department of the Army; 1964.

felt strongly in the bleeding centers where donors sit, nerving themselves for the imagined ordeal of having blood taken. Where will the blood go? Who will get it? Will it save a life? These are some of the thoughts that are uppermost in the minds of donors waiting their turn in the bleeding cubicles. A peculiar intimacy, born of such thoughts, often pervades the waiting room. In days like these, when fantastic differences between man and man are being created by ignorance and megalomania, it is a pity that more of us do not visit rooms such as this where human warmth, kindness and understanding pervade the atmosphere.

The Red Cross organized 33 bleeding centers to accommodate 4,000,000 blood donations in 1943, and the public is now giving its blood at the rate of over 90,000 bleedings per week. This program is enabling the Army and Navy to meet their 1943 requirement. Formerly, only one contractor was equipped to process plasma. Through the efforts of the Medical Department, other contractors were extended the privilege of using the process for the duration of the war without payment of royalty to the patent owner. Production of plasma has been increased over 100 per cent in the past six months through the aid which The Surgeon General's Office has given manufacturers in obtaining necessary machinery and equipment. Requirements of the Army and Navy were larger than deliveries in the early months of the year, so there developed a 50 per cent deficiency in production. This has been reduced to about 6 per cent and it is hoped that production will soon be well ahead of known requirements.

As our troops entered typhus-infested regions, the need for a potent typhus vaccine became imperative. In the early days of the war,

small quantities of typhus vaccine were produced, and as contemplated requirements were projected, efforts were made to expand production facilities. Typhus vaccine, however, does not readily lend itself to mass production techniques, and experiments showed that the immunitive factor in the increased output was inadequate. The manufacturer of this product has made efforts to increase the potency of the vaccine, and the Army is now assured of receiving a superior preparation to combat the threat of typhus.

As the medical supply program expanded, it became clear that decentralization of purchases was necessary if the Medical Department was to have close and active contact with its suppliers. Hence the bulk of the buying was divided between two large procurement districts at St. Louis and New York. A complete purchasing organization was established in each district with buying divisions arranged on the basis of the type of drugs, supplies or equipment purchased. Officers could then specialize on particular items, and became thoroughly familiar with the many detailed problems involved in buying and producing various supplies.

A complete plant inspection service is attached to these procurement districts. The practice of inspecting goods at destination was not efficient for war-time procedures, and the policy of inspecting goods as they came off the production line, rather than after they had been packed and shipped, was adopted. This system has lessened the amount of merchandise rejected at the depots, and has also led many contractors to set up control and testing laboratories. As a result of the work of the inspection service, the Medical Department is assured of supplies that conform to specifications and that are of the finest type obtainable.

In its prewar planning, the Medical Department made a careful inventory of existing plant facilities and their potential expansion. The contemplated output of these sources was considered to be sufficient to meet the requirements of an Army of 4,000,000. Later, when the needs of a greatly enlarged Army, and the flood of Lend-Lease requirements became apparent, the inadequacy of existing facilities was recognized. It was necessary to find new sources for many critical drugs and equipment. In accordance with plans made during the years of procurement planning, the quest for new supplies led procurement officers far beyond the usual field of medical contractors and arrangements were made for converting the facilities of some manufacturers and for the construction of others. Certain large silverware manufacturers converted to the production of surgical instruments, and their output has helped prevent a sizable shortage in surgical instruments. A shortage of surgical dressings was averted by establishing a new concern whose entire output is now being taken by the Medical Department.

Small war plants have also been utilized to increase production. In the past year, contracts with these plants have amounted to approximately \$220,000,000 or 56 per cent of total procurement. In number of contracts placed, however, the percentage has run much higher, about 69 per cent for the year.

In an effort to recapture excessive profits, contract renegotiation proceedings have been initiated on 229 contracts, of which 82 have been completed. Refunds and price reductions of \$4,500,000 have resulted. In addition, voluntary price reductions aggregating \$2,300,000 have been made through the Price Renegotiation Law.

Since the vastness of the distribution requirements severely taxed the existing organization, it was necessary to decentralize as many distribution functions as possible to depots and stations. Now depots are charged with final action on the majority of requisitions for drugs, medical items and equipment. During the past six months, the time for processing requisitions through depots has been reduced 50 per cent.

The supply distribution system of the Medical Department is divided into five individual types of depots, situated at strategic points, each type designed to fulfill special requirements. The depots by type are: distribution, assembly, filler, reserve, and holding and reconsignment points.

At the end of fiscal year 1942, storage space at depots and warehouses amounted to 7,000,000 square feet. During the past twelve months, storage space has been increased up to approximately 13,000,000 square feet, an increase of over 80 per cent.

Several important specialty items have engaged the attention of the Supply Service. The regulation providing that auxiliary spectacles be issued during the training period placed a sudden heavy drain on production facilities. Repairs to spectacles have also become a matter of serious consideration. Steps have been taken to set up repair and replacement units at all important overseas theaters. A portable repair unit for field use has been included in two standard medical chests, and a stockpile of supplies for repairs for overseas requirements has been set up at the Binghamton, New York depot.

Attention has also been given to the provision of orthopedic appliances, artificial eyes and limbs. Likewise, x-ray and radiologic needs have been studied with respect to standardization of equipment

and improved techniques.

Legal Division

The Surgeon General is charged with heavy business responsibilities for the purchase of medical supplies for the Army and for Lend-Lease. Legal advice is necessary on many phases of the contracts.

During the summer and early fall of 1942, the Legal Division, then in the Supply Service, was concerned primarily with supply problems.³⁰ After 30 November 1942, when it became a separate division, these activities were continued; and, in addition, legal problems were handled for almost every division of The Surgeon General's Office. The problems presented cover a wide cross-section of administrative law, involving the interpretation of statutes, executive orders, directives, contract provisions, and the like.

Contract forms have been revised and simplified, and counsel offered in connection with the renegotiation, cancellation and modification of contracts. Claims receive a share of attention. In order to be more certain of the legal propriety and sufficiency of contracts, legal sections have been set up in the Procurement Districts.

Preventive Medicine

The activities of preventive medicine have been expanded greatly both in range and complexity as our troops have moved forward to fight in many regions where unusual health hazards abound.³¹ In shaping the programs and operations, the Surgeon General has had the cooperation and advice of all the important Governmental and civilian agencies concerned with public health and preventive medicine. Through these cooperative relationships, information needed by the Army in the immediate future and for the service of the country after the war has been acquired.

³⁰ See the memoir of LTC Tracy Voorhees, *A Lawyer Among Army Doctors*, <http://history.amedd.army.mil/memoirs/VorheesTraceyStebbins.pdf>. Voorhees largely worked on supply issues.

³¹ The eight-volume history of preventive medicine is: Coates JB, Hoff EC, eds. *Medical Department, United States Army, Preventive Medicine in World War II, Volume 2, Environmental Hygiene*. Washington, DC: Office of The Surgeon General, Department of the Army; 1955; Coates JB, Hoff EC, Hoff PM, eds. *Volume 3, Personal Health Measures and Immunization*. 1955; Coates JB, Hoff EC, Hoff PM, eds. *Volume 4, Communicable Diseases Transmitted Chiefly Through the Respiratory and Alimentary Tracts*. 1958; Coates JB, Hoff EC, Hoff PM, eds. *Volume 5, Communicable Diseases Transmitted Through Contact or By Unknown Means*. 1960; Coates JB, Hoff EC, Hoff PM, eds. *Volume 6, Communicable Diseases: Malaria*. 1963; Coates JB, Hoff EC, Hoff PM, eds. *Volume 7, Communicable Diseases: Arthropodborne Diseases Other Than Malaria*. 1964; Lada J, Hoff EC, eds. *Volume 8, Civil Affairs/Military Government Public Health Activities*. 1976; Anderson RS, Hoff EC, Hoff PM, eds. *Volume 9, Special Fields*. 1969.

Malaria has been a source of constant concern as it constitutes a threat to the success of our operations in tropical theaters. To combat this menace, many measures have been initiated including the training of malariologists and the organization of survey and control teams for overseas duty in malaria areas. A number of these special units have been activated and recommendations made for the activation of others. In training Medical Corps officers for this specialized work, emphasis has been placed on practical field experience, following formal instructions in tropical medicine at the Army Medical Center. Moreover, constant study has been devoted to the development of new insecticides, mosquito repellants, and antimalarial drugs. Extraordinary success has attended the efforts to control the disease among troops in this country, as evidenced by the fact that the malaria rate among Army personnel stationed in the United States was 0.65 per 1000 per annum in 1942, the lowest in the history of the Army. While the situation as regards overseas is not encouraging, it is hoped that through continued application of mosquito-eradication measures and the perfection of better methods of treatment, rates in those infested regions may be reduced.

One of the most constructive steps taken by the War Department toward venereal control was the assignment of specialists in this disease to the major headquarters of the Army, to all camps, and to all theaters of operation. These officers analyze the problem, determine where and under what circumstances soldiers are being infested [sic], why rates vary, and what new forms of treatment or improved administrative methods may reduce the days lost from duty. These officers cooperate with local health and police authorities, and have been influential in starting detention homes for the treatment of infected women.

Other developments contributing to the favorable venereal disease outlook are: more effective prophylactic measures, a program of instruction in the fundamental facts regarding the diseases and their control, and improvement in treatment methods. As to the last, sulfa drug therapy has virtually revolutionized the management of gonorrhea. The new drug penicillin is also being used successfully in treating this disease. Syphilis therapy has been shortened and intensified. Treatment in the usual case is now completed in six months as compared with 12-18 under the system previously in operation.

Mobilization of new recruits for the Army and the consequent crowding of men in barracks have been associated with an unusual number of cases of meningococcic meningitis, rheumatic fever, and primary atypical pneumonia. The most striking development in the prevention of meningitis in military groups was made during the course of this outbreak through the administration of sulfonamide to entire bodies of troops. This was done at several large posts, and, in instances where control groups were set up, definite evidence was obtained that the incidence was markedly reduced.

The epidemic of rheumatic fever was localized in posts in the Seventh Service Command, especially in Colorado and Wyoming. Plans have been made for an extensive field study in regions where cases are occurring.

Atypical pneumonia was made reportable in March 1942. Cases increased steadily to a peak in January 1943, then gradually declined. Numerous investigations have been undertaken to shed more light on this somewhat baffling infection.

Over 700 cases of coccidioidomycosis occurred during the first eleven months of the fiscal year. The cases were limited to certain endemic areas,

namely, Southern California, Arizona, and a small part of Southwestern New Mexico, and Southern Nevada. Outbreaks occurred following troop maneuvers in regions known to be heavily infested with the causative fungus.

The few cases of typhoid and paratyphoid fever reported from the United States have been investigated with a view to determining whether vaccine failed to produce immunity. Evidence of such failure has been extremely rare.

The incidence of respiratory diseases was higher than in the previous fiscal year. Fortunately there was no epidemic of influenza.

Efforts have been continued to develop new and more efficacious immunizing agents for use in the Army. The potency and immunizing properties of the typhus, cholera, and plague vaccines are constantly being improved through research activities. An aqueous-base yellow fever vaccine has replaced the serum-base vaccine formerly considered by many to have been associated with jaundice. The continued routine use of tetanus toxoid had completely eliminated tetanus among our troops.

Among the new supplies and sanitary appliances developed during the year were the effective delousing agent, methyl bromide. Fumigation bags and ampoules of this product were made items of organizational equipment and sent to overseas theaters, particularly North Africa. Reports on the usefulness and efficiency of this product in the field have been very favorable.

Other notable sanitary developments include the perfection of the pyrethrum-freon aerosol "bomb" spray, a reliable insecticide; an effective larvacide which exerts prolonged action against mosquito larvae; new and improved dishwashing facilities in Army messes.

Joint studies with the Quartermaster General's Office and the Chemical Warfare Section were undertaken to provide clothing to meet physiological requirements of troops operating under extremes of climate and to incorporate protective agents in clothing worn by troops engaged in chemical warfare.

Further advances in the science of sanitation dealt with water purification, salt and water requirements, and acclimatization of troops subjected to hot climates, disinsectization of airplanes, and a large group of measures aimed at the improvement of sanitation within the Army and the protection of the country against the introduction of disease from abroad.

Sanitary surveys of 86 areas or countries were completed in which information was gathered as to the current prevalence of certain infectious diseases, environmental conditions, medical facilities, and varied sanitary conditions. These surveys have been utilized in planning military operations and in the development of major civilian programs of health control and relief.

Much of the structure of Army Service Forces rests upon the well-being of the 730,000 industrial workers in the 500 Army-operated industrial plants. An extensive industrial hygiene program has been undertaken to protect these employees, many of whom are constantly working with dangerous and toxic substances. The motive underlying this program is the conservation of man-hours of production. Plant dispensaries, first-aid service, medical supervision and hospitalization, safety precautions, and the improvement of working conditions are component parts of this service.

Medical Practice Division

The medical and surgical treatment of the sick and wounded in Army hospitals has been superior, and on the same high plane as that in the better hospitals in civil life.³² Professional advances have been put into practice promptly. Our limited experience indicates that the fatality from war wounds has been greatly reduced by the use of (a) sulfa drugs, (b) the transfusion of blood, and of dried and liquid plasma, (c) the early surgical treatment by air to fixed hospitals.

It is no idle boast, but literally true, that our Army has the best medical service in its history. The rapid growth of hospitals and medical units, the enormous increase in well-trained personnel – medical, surgical, neuropsychiatric, sanitary and nutritional – the rapid adoption of recent scientific advances, the emphasis on research, and the prompt and thorough diffusion of its results have all contributed to low sick and fatality rates.

The assignment of specialists as consultants to Service Command Headquarters and to Surgeons in overseas theaters has raised standards.³³ Carefully chosen officers of exceptional richness of background and with high levels of professional attainment, many of them formerly occupying professorial posts in leading medical schools, have been assigned to these consultative posts. Not a few enjoy a reputation for eminence in their specialties. In the United States these consultants coordinate the professional practice, appraise therapeutic and diagnostic procedures and evaluate, promote, and improve the quality of care. Their valuable reports have made possible appropriate modifications of existing medico-military practice and the innovation of more efficacious procedures.

³² Some 20 of the historical volumes published by the Office of The Surgeon General cover advances in professional medical matters, including surgery, medicine, and psychiatry.

³³ See Coates JB, Carter BN, McFetridge EM, eds. *Medical Department, United States Army, Surgery in World War II, Activities of Surgical Consultants, Volume 1*. Washington, DC: Office of The Surgeon General, Department of the Army; 1962, and *Volume 2*. Washington, DC: Office of The Surgeon General, Department of the Army; 1964 and Coates JB, Havens WP, eds. *Medical Department, United States Army, Internal Medicine in World War II, Volume 1, Activities of Medical Consultants*. Washington, DC: Office of The Surgeon General, Department of the Army; 1961.

Continued efforts are being made to prevent the entrance into the Army of cases of tuberculosis, and to detect, prevent, treat, and dispose of such cases already in the Army. All men and women entering the Army now have chest x-ray films before acceptance. Particular emphasis has been placed upon improving diagnosis at induction centers. The preparation of an Atlas of Chest X-ray Films, the technical improvement in films, and other steps have all contributed to the more rapid discovery and disposition of cases. Of all cases of tuberculosis admitted to the Army through error, 30 per cent are discovered and put under treatment in the first month of service; 75 per cent within the first six months. In the United States the admission rate for tuberculosis was 1.9 per 1000 in 1941, 1.6 in 1942, and 1.3 in the first quarter of 1943. The corresponding rate during World War I was 13.52.

Malaria and dysentery are significant problems for the Army. The schedule for the treatment of malaria has been revised with special emphasis on the use of atabrine. That drug has given satisfaction, and does not have serious, immediate, untoward effects. Patients with malaria and dysentery, especially those returning from overseas, are closely followed. During the year it became apparent that not only sulfaguanidine, but also sulfadiazine, is, in like degree, effective in the treatment of bacillary dysentery.

Constant study of the modernity and suitability of surgical instruments, devices, sutures, etc., has caused many items to be deleted from the supply catalog and better equipment to be added. For example, the replacement of catgut with cotton thread, which is actually a better suture material, has resulted in substantial savings. Likewise, critical

materials have been conserved. The same procedures of constant revision have been followed in the instances of drugs and biologicals.

During the year an extensive blood plasma program was undertaken. Up to 1 February 1943, 1.5 million bleedings of 500 cc. each were delivered, and 1,150,000 units of blood plasma were furnished the Armed Forces.

The mental health of the Army is just as important as its physical health.³⁴ For a nervous or mental disease may render a man just as non-effective as malaria or a gunshot wound. The mental illnesses found in the Army are similar to those found in civilian life. No new mental disturbance has as yet been detected in the present war either from our own experience or from that of our Allies. Although the clinical picture found among the military men is similar to that characteristic of civilians, many military neuropsychiatrists have observed numerous schizophrenic-like manifestations, emotional disturbances, and peculiar personality disorders which appear rapidly, approach a full-blown psychosis frequently defying differentiation from the accepted syndromes, only to dissolve quite rapidly under brief hospitalization.

Efforts have been made to improve screening at induction and training centers. At the induction centers large numbers of men are processed as rapidly as possible. But the time for examination is too short; psychiatrists lack adequate background information on the men; and psychiatrists are scarce. All these problems have been faced frankly, and appropriate measures instituted. But no test yet devised is so perfect that it can detect all the psychopaths and potential psychoneurotic individuals on brief examination. If a screen were tight enough to eliminate

³⁴ See Anderson RS, Glass AJ, Bernucci RJ, eds. *Medical Department, United States Army, Neuropsychiatry in World War II, Volume 1, Zone of Interior*. Washington, DC: Office of The Surgeon General, Department of the Army; 1966 and Mullins WS, Glass AJ, eds. *Medical Department, United States Army, Neuropsychiatry in World War II, Volume 2, Overseas Theaters*. Washington, DC: Office of The Surgeon General, Department of the Army; 1973.

anybody who might possibly develop a nervous breakdown, it would be so tight as to eliminate nearly everybody. By the standards in use in many induction centers at the present time certain military leaders and heroes of history might have been rejected. A certain proportion of 18-20 year men are physically and emotionally immature. While regulations can be laid down to govern selection, there is no substitute for sound professional judgement.

A second screening process is now instituted at the Replacement Training Centers. There, a trained staff of psychiatrists, psychologists and psychiatric social workers, cooperating with line officers, chaplains and others, further observe the newly inducted soldier. Worries, fears, tensions, disciplinary problems are analyzed and frequently resolved.

Better screening, as important as it is, is not sufficient. Moreover, screening is not genuine "prevention" at all. It "prevents" people who might have a nervous break-down from getting into the Army, but it does nothing to "prevent" soldiers actually in the Army from becoming psychiatric casualties. It is important that line officers become as conscious of the necessity of the prevention of psychiatric disorders as they are of the prevention of malaria or venereal diseases. The major job of preventive psychiatry must be done by the line officer, since he directly controls the everyday life of the soldier. There are many unanswered questions in psychiatry, but it is pretty well established that a soldier's relationship with his officer and fellow soldiers may cause or prevent a nervous breakdown; that not only fatigue, climate and hunger play an etiological role, but that disciplinary measures, leaves and furloughs, letters from home, promotions, types of training, and job classification

have a direct bearing on mental health.

There is a growing body of evidence, moreover, that patterns of attitudes brought to, or developed in the Army, may prove to be of the utmost importance in the causation and prevention of mental breakdowns. A man who wants to fight is less apt to become a neuro-psychiatric casualty than one who doesn't want to fight and is in the Army only because he has to be. Attitudes, therefore, are extremely important. It is highly probable that the wave of cynicism and pacifism, which was prevalent for many years before the Pearl Harbor attack, was associated with attitudes that may be important background causative factors. This suggests that the mental health a man brings to the Army is just as important as the physical resources he brings and that the control of psychiatric casualties starts if not in the cradle then in the social conditioning of childhood and youth. Therefore, what the Army can do by way of prevention has certain limits. However, teaching men why they fight, a program recently undertaken, may help to recondition attitudes.

While the selection, detection, and elimination of those mentally ill are essential, treatment has not been neglected. Though shock therapy and occupational therapy can be used in the rear, the British have shown that prolonged rest, induced by sedative drugs if necessary, good food, and reassurance given near the front, will return to duty an estimated 70-80 percent of the cases of acute combat neuroses. The experience of our troops has confirmed this contention. Most of the conditions can be cared for in an evacuation hospital; only those resistant to treatment need to be sent to station and general hospitals in the rear. As in the last war, experience teaches that the further the patient is removed from the situation in which his mental disturbance occurred, the less likely are the chances of salvage

for further duty. On the other hand, the Army cannot undertake the prolonged care of large numbers of severe cases of psychosis and neurosis. These men have to be discharged.

The disposition of mental cases requiring discharge from the Army has been slow, but efforts have recently been taken to speed up the process. A few state hospitals have been reluctant to accept them, and altogether too many hospital beds have been occupied too long by men awaiting such discharge. However, the passage of Public Law No.10, approved 17 March 1943, has immensely simplified their disposition. The Federal Government accepts responsibility for hospital care of such patients. Also soldiers, except those dishonorably discharged, who will require hospitalization after separation from the service, are eligible for care in a Veterans' Facility.

During July and August 1942, the Physical Standards Branch cooperated with the Military Personnel Division, Army Service Forces, in the establishment of a developmental battalion at Fort McClellan, Alabama, to determine experimentally the possibility of using limited service men to replace general service soldiers. This, and later experiments, showed that five or six per cent of the limited service men could be reclassified for general duty. Accordingly, the physical standards of the Army were lowered.

The Nutrition Branch, which had a total of 125 nutrition officers on 30 June 1943, has made systematic efforts to improve nutrition in the Army and to reduce food waste, both on the soldier's plate and in the kitchen by the use of nutritional surveys followed up by an educational program. The wise use of food to maintain nutritional adequacy, and the correction of over- and under-issue of food, has been emphasized. Nutrition officers have been appointed to supervise the messes of several camps. A basic

vitamin policy has been established, tests conducted on the adequacy of rations, and a research and educational program undertaken to reduce the loss of vitamins through improper cooking.

Dental Division

An unprecedented undertaking in mass dentistry devolved upon the Dental Corps as a result of the very marked reduction of dental standards for induction.³⁵ Many men entering the service had never received dental care prior to induction, and thus the effort to correct dento-oral conditions found among so many of those accepted for service has resulted in a hitherto unequalled volume of work. So great has been the pressure of work that many clinics are operating on a 24-hour shift to take care of the thousands of new inductees and their multiple dental problems.

The immense volume of dental work accomplished bespeaks a tribute to the dental officers and their devotion to duty. This is all the more impressive in view of the fact that there had been a shortage of dental officer, an acute lack of dental laboratory technicians, and a critical deficiency in virtually all types of equipment and supplies. Measures have been put into effect to relieve, insofar as possible, each of these shortages. Large numbers of dentists are being commissioned and their services are being utilized for professional duties only. There was approximately one dental officer to every 595 men in the Army as of 1 June 1943. As regards technicians, men are now being trained in several different centers, provisions having been made for approximately 600 students each month. An increased flow of supplies and equipment to the respective stations is also helping to relieve the critical need in this connection.

³⁵ See Jeffcott GF. *Medical Department, United States Army, United States Army Dental Service in World War II*. Washington, DC: Office of The Surgeon General, Department of the Army; 1955.

The incidence of dental and oral infections (cellulitis, osteomyelitis, and the various types of stomatitis) have been remarkably low. This may be attributed to better camp facilities, including dental clinics; a more adequate hospitalization program; instruction and interest in dental hygiene, as well as well-balanced food rations. The number of jaw fractures has also been lower than anticipated.

The five central dental laboratories were markedly expanded during the year. Additional equipment and an increase in officer and enlisted personnel assigned to these laboratories have resulted in an unequalled production schedule. The establishment of laboratory service at many of the larger camps and the use of civilian laboratory facilities have considerably reduced the volume of work carried by the central laboratories, especially in relation to the large number of dentures that had to be constructed in a short period of time for troops alerted for overseas service. The five central laboratories completed 41,129 dentures, or 28 per cent of the total number processed for the entire Army in 1942.

Veterinary Division

The two primary functions of the Veterinary Corps are: (a) service to animals, and (b) the inspection of meat and dairy products to determine their safety, wholesomeness, and suitability for food purposes in order that the health of troops might be protected.³⁶ Although the latter is the larger and more important problem, it is interesting that the Army had more horses and mules in 1942 than in 1941.

During the fiscal year about 950 veterinary officers were placed on active duty, making a total of about 1900 veterinary officers on 30 June 1943. Some 450 veterinary officers received special training at various schools in field service, and in meat and forage inspection.

³⁶ See Miller EB, Coates JB, Caldwell GL, eds. *Medical Department, United States Army, United States Army Veterinary Service in World War II*. Washington, DC: Office of The Surgeon General, Department of the Army; 1961.

Over 1400 enlisted men received technician's training in special service schools. The Technicians' School at Camp Grant was directed to conduct an eight weeks' course in meat and dairy hygiene for enlisted personnel of the Army Air Forces.

The inspection of foods of animal origin is not only to protect the health of the troops, but to insure that foods meet Federal specifications and contract requirements as to grade, type, and quality. Inspections are made not only at the point of origin, which provides many economies, but also upon delivery, during storage, and when foods are moved or issued to troops.

During the first three quarters of the calendar year 1942 the Army Veterinary Corps inspected nearly two billion pounds of food of animal origin (of which nearly 100 million pounds were purchased for, or diverted to, the Navy, Marine Corps, and other agencies). Of this amount, nearly 131,000,000 pounds were rejected because of failure to meet contract provisions on type, class, or grade, while 14,500,000 pounds were rejected because of their unsound or insanitary condition. This is an increase of more than 200 per cent over the amount inspected during the calendar year 1941. When all figures for the fourth quarter of the calendar year 1942 are received and compiled, it is estimated that the total amount of food products inspected during the year will total about 3.2 billion pounds.

Inspection at the point of origin increased each month because of the economies effected. Such inspections reduced the number of rejections at destination because of the failure of the contractor to comply with grade requirements; the difficulty of replacement is minimized, and transportation and other expenses are saved.

The procurement of adequate amounts of milk of suitable type became difficult late in the summer of 1942. Many large camps are distant from areas producing large quantities of milk of suitable grade. A heavily-taxed transportation system, including an acute shortage of truck transportation, shortage of critical items, [and the] scarcity of skilled and unskilled labor [all] rendered the procurement of milk very difficult in many localities. The regular inspection of dairy farms, placing emphasis on improved cleanliness and better sanitation rather than on new construction, has conserved critical war materials and increased the supply.

The Army acquired approximately 9,500 war dogs during the year. Of this number 5,850 were processed, trained, and furnished to various Army units and installations. The estimated requirements for the year 1944 are approximately double the number procured last year. Special facilities for their hospitalization and treatment were constructed, and plans and specifications for standard types of kennels, dog dispensaries, and wards were developed. Four War-Dog Reception and Training Centers were established during the year.

The average horse and mule strength for the year 1942 was 50,000, a slight increase over the previous year. The sickness admission rate was 668 per 1000, and the daily non-effective rate averaged 39 per 1000. The death rate, including destruction, was 44. Some 14,000 horses and mules were examined for purchase, and half of them were accepted. The infection rate was very low. Equine encephalomyelitis, one of the most serious of all diseases of horses and mules in the United States, was

again completely excluded from Army animals as a result of the vaccination program. While the rate for this disease among civilian animals was considerably less than in previous years, about 5,000 cases were reported from 35 states, with a mortality rate of 25 per cent. This is the fourth consecutive year that Army animals have been vaccinated with vaccine prepared at the Army Veterinary Schools. During this period only one case of equine encephalomyelitis has occurred among Army animals, and that one was due to a different virus. Additional veterinary hospital facilities have been approved at four Army installations. In cooperation with other groups, experimental rations for horses and mules have been developed, providing not only sufficient nutrition for the hard work of field conditions but requiring less cargo space. This program is not yet complete, but feeding tests are under way.

Veterinary laboratory service is conducted at the Army Veterinary School, at each of the service command laboratories, and in various overseas laboratory installations. The Front Royal Remount Depot is undertaking research on equine diseases, notably influenza and its complications, periodic ophthalmia, and on breeding problems. The laboratory at the Army Veterinary School, in addition to its research program, produces large quantities of vaccine, diagnostic agents, and other biological products for the Veterinary Service. The laboratory service, in addition to its work on the diagnosis, treatment, and control of diseases among military animals undertakes a vast amount of other work. This consists of bacteriological and chemical analyses of meat and dairy products to determine their fitness for human consumption and to ascertain the degree to which they comply with Federal specifications and contract requirements.

Nurses

On December 22, 1942, Congress provided that during the present war and for six months thereafter, Army nurses shall have relative rank and receive the same pay and allowances as officers.³⁷ Promotions were made commensurate with the needs of the service. A new table of allotments provided for a greater number of Chief Nurses at various hospitals and other medical installations than formerly.

The age limit for appointment as Reserve Nurse was raised to 45 years. Regulations were changed to permit the appointment of married nurses on the same basis as single nurses, provided that they did not have dependent children whose care would interfere with the full performance of their military duties. This provision was later changed to include nurses with dependent children under 14 years of age. The retention of those who married while in the service has notably decreased the number of discharges.

A new procedure for nurse procurement has been set up, closely coordinating the work of the Red Cross, Office of Procurement Service, and the Service Command Headquarters. The evaluation of applicants' credentials is handled entirely by the Red Cross Nursing Service. To assist in recruiting, members of the Corps have been assigned to the field offices of the Office of Procurement Service. Educational work, by radio, press, and moving picture, has been undertaken to expedite procurement.

A systematic program for the training of student nurses in Army hospitals is being made effective under the Bolton Law of 15 June 1943.³⁸ Under this law, student nurses in their senior year may elect to complete their last six months of training in Army, other Federal, or civilian hospitals. Upon successful completion of the course, they return to their

³⁷ On nursing, see Coates JB, Wiltse CM, eds. *Medical Department, United States Army, Personnel in World War II*. Washington, DC: Office of The Surgeon General, Department of the Army; 1963 and Sarnecky MT. *A History of the U.S. Army Nurse Corps*. Philadelphia, PA: University of Pennsylvania Press; 1999.

³⁸ This law created a Cadet Nurse Corps, administered by the Public Health Service, to train nurses.

home schools for graduation; then, after registering, they are available for service wherever they may be needed in military, Federal, or essential civilian institutions. About 1,500 students can be accommodated each six months in Army hospitals. It is estimated that this will release 1,200 graduate registered nurses for other assignments.

Psychiatric training will be offered 12 nurses every two months at Lawson General Hospital. Upon completion of the course, these nurses will serve as supervisors of psychiatric services in the hospitals to which they will be assigned. Corresponding training in anaesthesia for nurses has been set up in certain general hospitals.

On Bataan and Corregidor Army nurses worked unselfishly and efficiently in improvised hospitals with little regard for their own safety and comfort. Since that time they have carried their humane service to the sick and wounded American soldiers wherever the local situations permitted. When our troops landed in North Africa, they closely followed the soldiers ashore, and established nursing service in advanced hospitals. During the Tunisian Campaign, with small evacuation hospitals they served much nearer the combat lines than was formerly considered practical.³⁹ And so it has been with their unselfish and devoted service all over the world.

The Surgeon General, Maj. Gen. Norman T. Kirk succeeded Maj. Gen. James C. Magee as The Surgeon General of the Army on 1 June 1943.

³⁹ As noted above, this is something of an exaggeration.