

*New Jersey's
Revolutionary Experience*

12

*Medicine
in Revolutionary
New Jersey*

DAVID L. COWEN

New Jersey Historical Commission

NEW JERSEY'S REVOLUTIONARY EXPERIENCE

Larry R. Gerlach, *Editor*

This series of publications is dedicated to the memory of Alfred E. Driscoll, governor of New Jersey from 1947 to 1954, in grateful tribute to his lifelong support of the study and teaching of the history of New Jersey and the United States. He was a member of the New Jersey Historical Commission from 1970 until his death on March 9, 1975.

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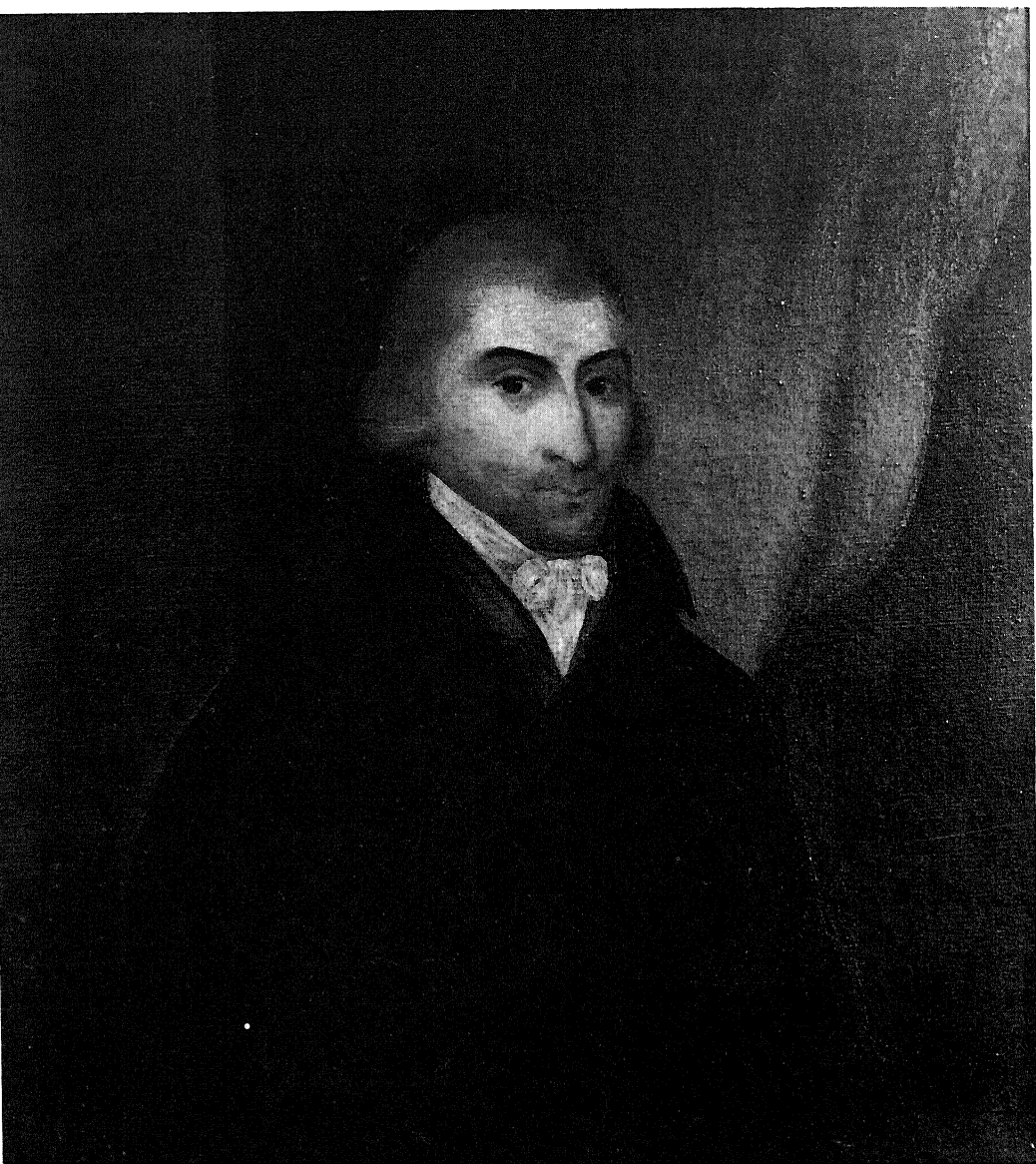
**THE NEW JERSEY AMERICAN
REVOLUTION BICENTENNIAL
CELEBRATION COMMISSION**

Foreword

New Jersey's Revolutionary Experience is a Bicentennial pamphlet series published by the New Jersey Historical Commission with a grant from the New Jersey Bicentennial Commission. The twenty-six numbers and two teachers' guides are intended to acquaint secondary school students and the general public with the state's history during the era of the American Revolution. Some titles treat aspects of the Revolution in New Jersey, while others show how important themes of the colonial period developed during the revolutionary years; some bring together the results of existing scholarship, while others present the findings of original research; some are written by professional historians, and others by laymen whose investigations of Jersey history exceed avocation. Because the series is directed to a general audience, the pamphlets have no footnotes but contain bibliographical essays which offer suggestions for further reading.

New Jersey's Revolutionary Experience is the product of a cooperative venture by numerous individuals and agencies. On my behalf and that of the pamphlets' readers, I accord recognition and appreciation to the individual authors for their contributions to New Jersey history, to the New Jersey American Revolution Bicentennial Celebration Commission and the New Jersey Historical Commission for their support of the project, to Hank Simon, president, Trentypo, Inc., for his invaluable suggestions and cooperation in producing the series, and to the staff of the Historical Commission: Richard Waldron, Public Programs Coordinator, who as project director supervised the series from commencement to completion; Peggy Lewis, Chief of Publications and Information, and Lee R. Parks, Assistant Editor, who edited and designed each number; and William C. Wright, Associate Director, who contributed valuable suggestions at every stage of production.

Larry R. Gerlach
University of Utah



William Burnet (1730-1791), physician and surgeon general, Eastern District military hospitals, Continental army. Courtesy New Jersey Historical Society.

"Americanus," writing in 1760, boasted that in New Jersey thousands of lives had been saved by a pioneering method of treatment that involved the use of two powerful mineral drugs when inoculating for smallpox. In 1766 the Medical Society of New Jersey was established — the first such provincial society. And in 1772 New Jersey became the first province to require the examination and licensing of physicians. These were perhaps all the distinctions in medicine New Jersey could claim for itself in the revolutionary generation; in reality, medicine in New Jersey was neither better nor worse than medicine in the other provinces. Only the city of Philadelphia had a working hospital, and only Philadelphia and New York had medical schools before the Revolution.

Licensing law or not, in New Jersey, as elsewhere in the colonies, many "physicians by instinct," men and women of inclination and impudence, set themselves up as medical practitioners. Lacking training, they may or may not have used some semiprofessional handbook like Nicholas Culpeper's *English Physician*. Even the great majority of "regular" practitioners, like those who established the provincial medical society, learned their trade through an apprenticeship, usually of four years, under the tutelage of a presumed master physician. The term of apprenticeship was not fixed, however, and the content and quality of instruction varied with the teacher. When medical schools opened in Philadelphia and New York, Jerseymen took advantage of the opportunities, and two of them, Jonathan Elmer and John Lawrence, were among the first ten to receive the Bachelor of Medicine degree in Philadelphia in 1768. By the end of the century, however, no more than forty-one medical men out of

approximately three hundred in New Jersey could claim some formal medical education beyond the apprenticeship at home or abroad. This was the general experience throughout the colonies.

Because of the scarcity or unavailability of physicians, the colonial Jerseyman relied heavily on self-medication. The Jersey housewife had to be the first resort when illness struck her family. Household recipe books filled with prescriptions testify to this basic reliance upon domestic medicine and household remedies.

In part, medicine practiced in the home came from folk remedies, some perhaps learned from the Indians, some borrowed from sources thought to be authoritative. The commonplace book of the Hankinson family of Reading, New Jersey, begun about 1787, was typical. It contained, among sundry "infallible," "effectual," and "Indian Squaw's" cures, recipes like the one that recommended "butternut" bark from the north side of the tree, steeped in vinegar for half an hour, to raise a blister. (Blistering the skin was thought to bring about "a general excitement of the nervous system" valuable for numerous conditions, especially certain kinds of fevers.) The housewife might also have an herb garden in which medicinal "simples" were raised. How many of these were native plants and how many may have been cultivated by the Indians, it is impossible to say.

For medical knowledge the housewife went to a variety of sources. The newspapers frequently carried news of reportedly successful remedies. Almanacs also offered generous medical advice; Timothy Trueman's *The Burlington Almanack for . . . 1771*, for example, contained an eight-page extract of hints from a "Treatise of Health." Of the numerous medical handbooks available, an increasing number of them published in the colonies, John Wesley's aptly named *Primitive Physic* went through at least seven printings in America between 1764 and 1795, including one at Trenton in 1788.

Early in the eighteenth century, moreover, the housewife began to use a variety of British "patent medicines" ordinarily available in drug and country stores. They were advertised for sale even during the revolutionary war—an indication of the privateering successes of American coastal vessels, a willingness to trade with the enemy, and the ingenuity of American drug and bottle counterfeiters.

If the domestic practice of medicine seemed crude and uncertain, what of the professional practice? The doctor should know something about the causes of disease, recognize symptoms and distinguishing characteristics in order to diagnose the illness, and, finally, be able to propose a therapeutic plan. In each of these responsibilities eighteenth century medicine in New Jersey, in America, and indeed even in Europe, left much wanting.

The eighteenth century understanding of the causes of disease was meager. The germ origins of infectious disease would not be understood until a century after the American Revolution, and the glandular and diet-deficiency bases of other diseases would remain unknown for even longer. The eighteenth century physician, following tradition, concentrated on symptoms and their treatment. The theoretical basis of his practice went back to Hippocrates and Galen in Grecian and Roman times: disease existed when there was an overabundance or deficiency of one of the four body humors; the balance of humors had to be reestablished through drugs or other means. When there was an excess of the blood humor, for example, the physician restored the balance by bleeding the patient. Another theory dating to the time of Columbus saw the body as a chemical laboratory and the illness the result of its being too acid or too alkaline. The proper chemical drugs would restore good health.

More modern theories revolved around nervous force and the nerve tone of the body. There were essentially two diseased conditions, one produced by too much tension and the other by too much relaxation; the terminology of the time called them "sthenic" and "asthenic". Since feverish conditions displayed a "sthenic" character, the treatment of most infectious diseases sought to relax tension by purging the bowels, inducing vomiting, and, primarily, bleeding. Generous bloodletting and powerful and dangerous drugs earned "bleeding, purging, and puking" the reputation of a "heroic practice." Benjamin Rush of Philadelphia led the way in this practice in America. For asthenic conditions stimulants and tonics were used.

Doctors also considered disease, especially infectious disease, the result of bad air or "miasma." These "evil" emanations were believed to come from marshes, newly upturned earth, or changing weather conditions. The germ theory of disease, the role of insects in the spread of disease, and similar discoveries would remain

unknown until a century after the Revolution: the work of the eighteenth century physician must be judged in terms of contemporary, not twentieth century science.

Given such difficulties with causes, physicians could only run into trouble trying to recognize symptoms and diagnose disease. One New Jersey physician with considerable revolutionary war experience said, "symptoms are so varied and equivocal, so complex and intermixed, that it is enough to puzzle the most watchful, sagacious observer." The absence of what we consider the basic diagnostic aids did not help this process: the eighteenth century had not yet seen the invention of the stethoscope or blood-pressure-measuring apparatus, the general use of the clinical thermometer, or the highly technical advances of our century in scientific diagnosis.

Another serious handicap was that the physician had few sound therapeutic measures at his disposal. He did have a vast "armamentarium" of remedies from vegetable, animal, mineral, and chemical sources, but only a few of them could be counted on to be effective. He resorted frequently and copiously to bleeding and to such other procedures as "blistering" and "cupping," sometimes it seems, because he knew of nothing else and these were traditional techniques. His surgery was largely restricted to the surface of the body and he knew nothing of anesthesia or sterile procedures. More will be said of eighteenth century therapeutics and surgery later.

This was essentially the state of medicine at the outbreak of the revolutionary war. The civilian physician, given the limitations of his "science," had learned to be practical rather than theoretical. Since he could not be sure of causes, and since cure was often beyond the power of his therapeutics, he concentrated on relieving symptoms and trusted heavily in the healing power of nature. The military surgeon, subject to the same limitations, was, moreover, often ill-equipped and ill-supplied, and his sick and wounded were ill-fed, ill-clothed, ill-housed, and ill-transported; to him, the healing powers of nature seemed feeble and unreliable.

Medical Services in the Revolutionary War

In any war a medical establishment of some kind must prevent

disease, care for the ill, and treat the wounded. This is more than a humanitarian responsibility; the success of armies depends on the fitness of their men. These objectives require basic knowledge of medical and surgical sciences and of the principles of sanitation and health (preventive medicine) as well as an efficient administrative organization, adequate and convenient facilities for the collection and care of the sick and wounded (hospitals, etc.), and adequate instruments, medicines, and other necessities for patients. When the medical service meets each of these requirements it can keep the number of sick and wounded to a minimum by preventive measures and by successfully treating those under its care.

The revolutionary medical services were found to be wanting in every one of these obligations and in the final results.

The Medical Department of the Revolutionary Army

Although conditions in the North improved during the last three years, the medical establishment was inefficient and often ineffective throughout the revolutionary war. First, the Continental Congress never came up with a workable table of organization for the "Hospital," as the medical department was called. Second, the Congress was often too preoccupied with other matters to pay enough attention to the needs of the medical department. Third, rivalries among the top medical officers, politics in Congress, and corruption within the service interfered with the medical department's smooth operation. Fourth, supplies of medical necessities were usually inadequate, and shortages of food and clothing aggravated the problems. Last, there were too few qualified personnel (surgeons, surgeon's mates) available.

The problems were not limited to the Continental Congress. The new states faced similar difficulties, for they too lacked experience with military medicine. On August 17, 1775, the New Jersey Provincial Congress provided that a surgeon be appointed for each of the thirty-three militia battalions or regiments "belonging to the Counties." Less than half of these units could appoint surgeons, and only one had both a surgeon and surgeon's mate, for surgeons were scarce and older practitioners were reluctant to accept such lowly posts. Subsequent legislation sometimes made no provision for surgeons, and in 1778, reflecting the difficulties involved, a revised act provided for a surgeon "when circumstances

will admit." Yet from November 1775 on, each battalion of New Jersey troops in the Continental army had at least a surgeon and usually a surgeon's mate as well.

This hardly sufficed. Ebenezer Elmer of Cumberland County, a junior officer in the Third New Jersey Regiment who spent from June 1776 to March 1777 in northern New York as part of the expedition to Canada, took it upon himself to look after the sick. There were a surgeon and surgeon's mate on the roster of the regiment, and Congress had provided for a director of the hospital of the Northern Department, which had hospitals at Albany and Ft. George. But Elmer's diary makes it clear that his Seventh Company virtually depended upon him alone for medical attention.

Elmer, twenty-three years old at the time, had been an apprentice — that is, a medical student — under his brother. His diary indicates that looking after the sick fell upon him not as a duty but as an extra, and probably self-imposed, responsibility.

Almost as an afterthought to the heavy casualties at the battle of Bunker Hill, the Continental Congress established a "Hospital for the Army" on July 27, 1775. It was headed by a director general and chief physician appointed by Congress and assisted by four surgeons, twenty surgeon's mates, one apothecary, one nurse for every ten men, and sundry other functionaries. Using available buildings and planning separate structures, the department undertook to provide "general hospitals," at relatively stable locations and "flying hospitals" close to battle areas.

This medical establishment ran into difficulties from the start, for Congress established overlapping jurisdictions and failed to establish lines of authority and responsibility. Two months after setting up the Hospital of the Army under Dr. John Morgan of Philadelphia, Congress established a Hospital for the Northern Department under Dr. Samuel Stringer of Albany. Rivalry between these directors hurt the service. This became especially evident in the fall of 1776 in the gross inadequacy and even complete absence of supplies of medicines on the northern front. The First New Jersey Battalion at Ticonderoga, for example, reported that it had "No Jallap, Rhubarb, Salts, or Ipecac."

Congress failed to establish lines of authority in still another direction. The surgeons and surgeon's mates of the regiments of state troops had a separate organization of medical services and

managed the sick and wounded of their own outfits. They originally held their posts by authority of their county committees, regimental commanders or state governments rather than the Continental Congress. Many of them were undoubtedly incompetent, uncooperative, and dishonest (they sold medical discharges, for example). General Washington referred to them as “very great Rascals” whose recalcitrance did “Injury to the Sick.”

Congress wrestled with the problem time and again, and finally congressional resolutions and general orders from the commander in chief subordinated the regimental hospitals to the director general. Washington issued a standing order that the regimental surgeons make their returns of casualties and supplies to the director general or his deputy. Ebenezer Elmer, for example, while stationed near Piscataway complied with this order when the Continental army was encamped in Middlebrook (modern Bound Brook) in 1777.

Washington also tried to elevate the standards of the medical service by requiring the examination of surgeons and surgeon’s mates. “None but those who are conscious of their inability will decline the examination,” Washington believed, but his proposal met considerable difficulty. Finally he took the matter to Congress, which — illustrative of its sensitivity when questions of state powers were involved — recommended to only six of the states, including New Jersey, that they appoint examiners to certify to the competence of the men who presented themselves as surgeons. New Jersey considered the matter but, on November 30, 1776, rejected a bill that would have established such an examining board. In 1782 Congress finally established a Continental examining board.

Obviously, there was good reason for concern over the quality of the surgeons. Henry H. Schenk of Millstone seems to have been appointed surgeon of militia in 1776 at the age of sixteen. Ebenezer Stockton left his studies at the College of New Jersey (now Princeton University) for a post of surgeon’s mate in the general hospital in 1777. Both Schenk and Stockton became respected physicians, but neither could claim appreciable experience or knowledge of medicine and surgery at the outset.

Perhaps even more important than the relationships between the Continental and regimental surgeons was the organization of

the Continental establishment itself. Congress floundered, trying a number of expedients. In one reorganization, that of 1780 and 1781, New Jersey physicians took prominent posts in the medical department. John Cochran was appointed chief physician and surgeon and soon moved up to director general. Charles McKnight, a New Jersey-born graduate of the College of New Jersey was one of three chief hospital physicians. William Burnet, Newark patriot, was first a hospital physician and then a chief hospital physician. Moses Bloomfield, Moses Scott, and George Draper were named hospital physician and surgeons. Thus, in 1781, the chief medical officer and two of the next five in rank* were Jerseymen, as were three of the fifteen hospital physicians and surgeons.

The various reorganizations of the medical service went neither smoothly nor reasonably. A serious and unpleasant struggle took place in New Jersey as a result of conflicting jurisdictions that again were established by Congress. In July 1776 Congress established a "Flying Camp Hospital" (the Flying Camp was a mobile force originally composed of New Jersey, Pennsylvania, Maryland, and Delaware troops) under William Shippen, Jr., an archrival of Director General John Morgan. A few months later Shippen was placed in charge of "an hospital for the army, in the State of New Jersey," and Morgan was placed in charge of a hospital "for the army posted on the east side of Hudson's River." Morgan refused to give up control of the New Jersey hospitals he had established and believed Shippen responsible only for the hospitals of the Flying Camp. The dispute between Shippen and Morgan, which reached the commander in chief, the Board of War, and Congress, finally resulted in Morgan's replacement by Shippen. (Morgan, after a long battle to clear his name, finally received congressional vindication.) After Shippen had headed the medical establishment for a few years, his lack of attention to responsibilities and his alleged misappropriations led to his court-martial at Morristown Headquarters in 1780. Although acquitted by the court, he lost favor with Congress and resigned on January 3, 1781.

Personal feuds, favoritism, high-level corruption, disorganization, the conflict between Continental and state authority, and the inability of Congress to devise an effective

*These statistics and similar ones cited hereafter exclude the Southern District of the Medical Department of the Army.

organization made the medical department administratively ineffective. Moreover, it lacked competent medical personnel and suffered from recurring shortages of medicines, supplies, and food, as well as large numbers of casualties. With all these problems in addition to the primitive state of medical knowledge, one can only marvel at the success of the American cause.

The Hospitals of New Jersey

The Hospital of the Army of the United States established general hospitals wherever room could be found: a single building or a series of buildings ranging from barns, private houses, and soldiers' huts to college and church buildings or those built or remodeled for the purpose. These and the flying hospitals were supplemented by the regimental hospital, run by regimental surgeons and their mates in anything from a tent to a church. These housed the sick and were also the centers for regimental medical services and personnel.

For the most part, hospitals were improvised facilities. They usually lacked beds and other amenities. Each man brought his own blanket to spread on straw on the floor. Each usually drew ordinary rations: hard bread, salt beef or pork, and a tot of rum, at least in the early years of the war.

The hospital had no particular equipment. The surgeon often used his own instruments, and a regimental hospital's medicine chest, if it had one, might have limited contents. "Went up to the medicine chest, which is about four miles from our quarters, to make a return of medicines and instruments to the Director General, and bring down some for the sick," wrote Ebenezer Elmer when he was stationed near Piscataway in April 1777.

One hospital building in New Jersey was specially planned for its function, the famous structure designed by Dr. James Tilton and "employed in the hard winter of 79,80, when the army was huddled near Morris Town." (A replica of the structure has been constructed at Jockey Hollow to specifications in Tilton's *Economical Observations on Military Hospitals*, 1813. However, his experimental hospital was probably built at Basking Ridge rather than Morristown). Tilton's hospital, planned like an Indian hut, had

a four-inch opening in the roof and no chimney. Patients lay on the earthen floor with their heads to the wall and their feet to a fire built in the middle of the ward. One window only, left open at the south, ventilated the ward. "The smoke contributed to combat infection, without giving the least offense to the patients," Tilton wrote. He was "well satisfied with the experiment."

New Jersey as "Cockpit of the Revolution" had many hospitals. There were well-known general hospital facilities at Hackensack, Newark, Morristown, Princeton, Trenton, and Middlebrook; there were flying hospitals, regimental hospitals, and various improvisations at Fort Lee, Paramus, Mendham, Basking Ridge, Pluckemin, Elizabethtown, (modern Elizabeth) Perth Amboy, New Brunswick, Piscataway, Somerset Court House (modern Millstone), Westfield, Burlington, and Bordentown.

The war reached New Jersey with the defeat of the American forces on Long Island and New York. The sick and wounded needed quarters, and Washington, two months or more before his arrival (November 13, 1776) at Fort Lee, ordered Director General Morgan to prepare to move the casualties out of New York. Morgan selected Newark and Hackensack as sites for general hospitals. Newark, he reported on September 12, had the advantage of the availability of water transportation, for only "four miles of land carriage were required," and it had numerous convenient houses. Hackensack had sufficient artisans to fit up a church, factory, and a storehouse "or two" to accomodate from four to seven hundred men.

At Newark, Morgan placed Dr. William Burnet, the local leader, and Dr. Isaac Foster of Massachusetts in charge of the hospital. He apparently overcame the reluctance of the local inhabitants: with Dr. Burnet's help he got the use of the Anglican and Presbyterian churches, the courthouse, and the academy for the hospital. Altogether there was provision for one thousand men. When the sick and wounded landed at Weehawken, Hoboken, and Paulus Hook (modern Jersey City), however, they were left without transportation, for the fleeing militia had commandeered the wagons reserved for the casualties. It took ten days, Morgan reported, to put the hospital on "a safe footing."

At Hackensack Dr. John Warren was placed in charge and three hundred men were promptly brought in, even though at first

“neither bread flour or fresh provisions” were available. Morgan had accomplished a great deal.

By now Congress had placed Shippen in charge of “an” hospital in New Jersey and Morgan of “a” hospital east of the Hudson. Shippen, director of the Hospital of the Flying Camp since July 15, was supervising hospitals at Perth Amboy, Elizabethtown, Fort Lee, New Brunswick, and Trenton. He reported 338 sick and wounded on November 1, 1776. (Shippen also reported that there were no regimental hospitals in New Jersey, although there was at least one, at Paramus). Morgan kept responsibility for the general hospitals he had established in New Jersey until November 28, 1776, when a Congressional resolution limited him to the care of sick and wounded east of the Hudson and gave Shippen complete control to the west.

Not long after Fort Lee fell on November 21 the hospital at Newark had been evacuated and the men sent to Morristown. But there was no rest for the weary: under British pressure the two thousand sick and wounded were sent to Pennsylvania, particularly to a new hospital at Bethlehem. Hackensack, too, was abandoned; the sick and wounded, “sent to the country,” dispersed in many directions. A large group wound up at Fishkill, New York. So with the hospitals of the the Flying Camp. As each post came under pressure, the sick were moved forward. At Elizabethtown, Dr. Thomas Bond got permission to move his patients by boat, but his orders named no destination, and he took them to Philadelphia. On November 30, twenty-two sick and wounded reached that city. On December 4, Washington evacuated the sick at Trenton.

The Philadelphia general hospitals took most of the men. Some were also sent to Bethlehem. New Jersey, largely abandoned to the British, had no important patriot hospital installation.

This changed after Washington successfully attacked Trenton on Christmas night. He was “without any assistance from the Hospital Department” in this venture, and he complained that “In case of need I know of nobody here to take direction. I think it very strange.” Dr. Morgan had held himself ready, but Washington called Shippen, who could not possibly arrive before the battle. When Washington moved to Princeton on the night of January 2-3, 1777, he took no surgeon and did not notify the hospital officers. Either he had too much else on his mind or he

held the medical service in low esteem. At the Princeton battle, however, both Drs. Jonathan Potts and Benjamin Rush were present, and a hospital of sorts was set up in the two Clark farmhouses on the battlefield and in the village. After Princeton, Washington moved his troops to Morristown for the rest of the winter. The British were at New Brunswick and Perth Amboy.

During that winter the sick at Morristown were sent to Philadelphia, Easton, Allentown, Wilmington, Princeton and Bethlehem. The principal hospital was at Bethlehem. When smallpox had broken out at Morristown, Washington ordered the troops inoculated. (Inoculation, at that time was "variolation," that is, the infection of a person with live smallpox virus taken from a smallpox patient. The person inoculated, it was hoped, would gain immunity after a slight case of the disease. "Vaccination," inoculation with the far less dangerous cowpox virus, was not developed until after 1798). Washington also directed Dr. Shippen to inoculate the troops at Philadelphia and all the new recruits. The commander in chief at first wanted the inoculation at Morristown kept "as secret as possible," but later he felt that it would be necessary also to inoculate nearby civilians. The program succeeded, and in the latter part of the war inoculation, not always a safe procedure, was required of all the armed forces.

The spring of 1777 found the American army in the Middlebrook area. There must have been a general hospital, for Drs. Shippen and John Cochran were at headquarters there and reported that the army "enjoys a degree of health seldom to be seen or read of."

There were also regimental hospitals in the vicinity. Ebenezer Elmer had returned home from New York State and in April, 1777, had become surgeon's mate in the Second New Jersey Regiment. A year later he was promoted to surgeon, and by 1779 he was known as "Dr." Elmer. He had numerous sick under his care at Piscataway, and he managed to send eighty-six of them "in two wagons" to Westfield, to which town he seemed to transfer his activities. There was another regimental hospital at Mendham, for on June 17 an order from Washington sought to provide female nurses for it.

The American army skirmished occasionally with the British in the New Brunswick area. The British withdrawal from the state forced Washington to move northeast to anticipate any British

thrust up the Hudson River. When it became clear that the enemy was approaching Philadelphia by sea instead, Washington and the army moved into Pennsylvania. The battles of Brandywine and Germantown followed.

The revolutionary forces suffered a serious defeat at the battle of Brandywine. An estimated six hundred newly wounded were sent to already burdened Philadelphia hospitals. Hospitals at Burlington, Bordentown, and Trenton took some of the wounded from other battles in the area. Soldiers incapacitated but not seriously hurt at Brandywine went directly by open wagon to a hospital under Dr. Bodo Otto at the Trenton Barracks. Dr. Tilton wrote that "the sick and wounded flowed promiscuously without restraint" into the general hospital in Nassau Hall at Princeton; the hospital became infected with jail fever and suffered a "great mortality."

The sick and wounded did not remain long at any of these hospitals, for the advancing British forced the evacuation of Philadelphia. Again the casualties were piled into springless, open wagons, "with clothing insufficient to cover their meager bodies." They went to hospitals at Bethlehem, Ephrata, Lititz and elsewhere in Pennsylvania. A report of the director general on November 24 indicated 101 sick, wounded, and convalescent at Burlington, 214 at Trenton, and 279 at Princeton (a total of 594). But by mid-December these hospitals had been discontinued. Princeton may have been abandoned after Washington advised Dr. Shippen, on December 12, that he could not "think of Princeton, under the present situation of affairs, by any means a proper place for the sick." He did not want them so precipitously moved as to endanger them, however: "we must keep the sick always in the Rear of the Army, or they will be subject to Captivity," he told Shippen. This was consistent with Washington's early practice of sending the casualties ahead of the retreating army, using the fighting force as a shield between the sick and the enemy.

The horrible winter and spring encampment at Valley Forge (1777-1778) removed New Jersey from the theater of war until June 18, 1778. On that day the British left Philadelphia, and Washington set out across New Jersey after them. Although the British managed to escape to New York, the battle of Monmouth on June 28 was something of a victory for the Americans. The old

C H A P. DLXVI.

*An ACT to regulate the Practice of Physick and Surgery
within the Colony of New-Jersey.*

Passed Sept. 26, 1772.

Preamble.

WHEREAS many ignorant and unskilful Persons in Physick and Surgery, to gain a Subsistence, do take upon themselves to administer Physick, and practise Surgery, in the Colony of *New-Jersey*, to the endangering of the Lives and Limbs of their Patients, and many of His Majesty's Subjects, who have been persuaded to become their Patients, have been great Sufferers thereby; for the Prevention of such Abuses for the Future,

Physicians
and Surgeons
to be examin-
ed;

SECT. 1. BE IT ENACTED by the Governor, Council and General Assembly, and it is hereby Enacted by the Authority of the same, That, from and after the Publication of this Act, no Person whatsoever shall practise as a Physician or Surgeon, within this Colony of New-Jersey, before he shall first have been examined in Physick or Surgery, approved of and admitted by any two of the Judges of the Supreme Court for the Time being, taking to their Assistance for such Examination such proper Person or Persons as they in their Discretion shall think fit; for which Service the said Judges of the Supreme Court as aforesaid shall be entitled to a Fee of Twenty Shillings, to be paid by the Person so applying; and if any Candidate, after due Examination of his Learning and Skill in Physick or Surgery as aforesaid, shall be approved and admitted to practise as a Physician or Surgeon, or both, the said Examiners, or any two, or more, shall give under their Hands and Seals, to the Person so admitted as aforesaid, a Testimonial of his Examination and Admission in the Form following, to wit,

Fee.

To all to whom these Presents shall come or may concern,

Testimonial
to be given.

KNOW Ye, That We whose Names are hereunto subscribed, in Pursuance of an Act of the Governor, Council, and General Assembly of the Colony of *New-Jersey*, made in the Twelfth Year of the Reign of our Sovereign Lord King GEORGE the Third, entitled, *An Act to regulate the Practice of Physick and Surgery within the Colony of New-Jersey*, have duly examined of
Physician or Surgeon, or Physician and Surgeon, as the Case may be, and, having approved of his Skill, do admit him as a Physician or Surgeon, or Physician and Surgeon, to practise in the said Faculty or Faculties, throughout the Colony of *New-Jersey*. In Testimony whereof We have hereunto subscribed our Names, and affixed our Seals, to this Instrument, at this Day of
Annoque Domini 17

Penalty on
practising
without.

2. AND BE IT FURTHER ENACTED by the Authority aforesaid, That if any Person or Persons shall practise as a Physician or Surgeon, or both, within the Colony of New-Jersey, without such Testimonial as aforesaid, he shall forfeit and pay for every such Offence the Sum of Five Pounds; one Half thereof to the Use of any Person or Persons who shall sue for the same, and the other Half to the Use of the Poor of any City or Township

"An ACT to regulate the Practice of Physick and Surgery within the Colony of New-Jersey." This law of 1772 required medical practitioners to undergo formal examination and licensing, and specified penalties for

Township where such Person shall so practise contrary to the Tenor of this Act; to be recovered in any Court where Sums of this Amount are cognizable, with Costs of Suit.

3. PROVIDED ALWAYS, That this Act shall not be construed to extend to any Person or Persons administering Physick, or practising Surgery, before the Publication hereof, within this Colony, or to any Person bearing His Majesty's Commillion, and employed in his Service as a Physician or Surgeon. AND PROVIDED ALWAYS, That nothing in this Act shall be construed to extend to hinder any Person or Persons from bleeding, drawing Teeth, or giving Assistance to any Person, for which Services such Persons shall not be entitled to make any Charge, or recover any Reward. PROVIDED ALSO, That nothing herein contained shall be construed to extend to hinder any skilful Physician or Surgeon from any of the neighbouring Colonies, being sent for upon any particular Occasion, from practising on such Occasion within this Colony.

Proviso respecting those now in Practice,

bleeding, &c.

and Physicians, &c. of other Colonies.

4. AND BE IT FURTHER ENACTED by the Authority aforesaid, That every Person now practising Physick or Surgery, or that shall hereafter be licensed as by this Act is directed, shall deliver his Account or Bill of Particulars to all and every Patient in plain English Words, or as nearly so as the Articles will admit of; all and every of which Accounts shall be liable whenever the Patient, his Executors or Administrators shall require, to be taxed by any one or more of the Justices of the Supreme Court, or any one or more of the Judges of the Inferior Court of Common Pleas of the County, City or Borough wherein the Party complaining resides, calling to their Assistance such Persons therein skilled as they may think proper.

Bills to be in plain English,

and taxed if required.

5. AND BE IT FURTHER ENACTED by the Authority aforesaid, That every Physician, Surgeon or Mountebank Doctor, who shall come into or travel through this Colony, and erect any Stage or Stages for the Sale of Drugs or Medicines of any Kind, shall, for every such Offence, forfeit and pay the Sum of *Twenty Pounds*, Proclamation Money; to be recovered in any Court where the same may be cognizable, with Costs of Suit; one Half to the Person who will prosecute the same to Effect, the other Half for the Use of the Poor of any City, Borough, Township or Precinct where the same Offence shall be committed.

Penalty on Mountebanks &c. on public Stages.

6. AND BE IT FURTHER ENACTED by the Authority aforesaid, That this Act, and every Clause and Article herein contained, shall continue and be in Force for the Space of five Years, and from thence until the End of the next Session of the General Assembly, and no longer.

Limitation.

several kinds of malpractice. From Acts of the General Assembly of the Province of New-Jersey . . . , Compiled and published . . . by Samuel Allinson (Burlington, 1776), pp. 376-377. Courtesy New Jersey State Library, Archives and History Bureau.

game of watching the British in New York resumed, and Washington fanned out his troops in northern New Jersey and southern New York State. The enemy, however, as it had been doing for years, kept stabbing at the region that is now Essex and Union counties.

The winter of 1778-1779 found Washington's New Jersey Brigade at Elizabethtown and seven others at Middlebrook. The artillery was stationed at Pluckemin. Washington later wrote to Lafayette that the troops at Middlebrook were again in "Hutts" but "in a more agreeable and fertile country, than ... Valley Forge. . . they are better clad and more healthy, than they have been since the formation of the Army." The hospital returns showed 101 deaths at the encampment between February 20 and May 29, but in comparison with Valley Forge the year before, where 2,094 men had died between January 12 and May 30, Washington had reason to be pleased.

During the next winter, from December 1, 1779 to June 1780, Washington maintained his headquarters at Morristown. Thereafter he moved northeast into New York State and Connecticut, watching events in New York City and welcoming the French fleet and army. Finally he turned south, to meet the British onslaught against the southern states, and eventually defeated the British at Yorktown.

During this next winter and spring (1779-1780), the army's most important general hospitals were at Basking Ridge and Pluckemin, where Washington ordered the sick moved from barns and into huts evacuated by the artillery. At Pluckemin, too, public buildings were used as hospitals. A third hospital — the "Pennsylvania Hutts" — opened when the Pennsylvania troops moved out of the encampment. Another general hospital was at Trenton, a flying camp hospital was probably in New Jersey part of the time, and there were regimental hospitals elsewhere. The sick at Paramus who could be moved were sent to the Pennsylvania "Hutts." Only those "whose cases were very bad" remained at Paramus with a surgeon to look after them.

On December 31, 1779, an "imperfect" hospital return showed that in all the hospitals of the army in the area, 226 of the 911 sick or just under 25 percent were in the general hospitals of New Jersey and the Flying Camp Hospital. In February, March,

and April 1780, the hospital at Pluckemin showed more admissions each month than any other general hospital in New York, New Jersey or Pennsylvania. In March Pluckemin had 38 of the 46 admissions in all eight hospitals; in February and April, Pluckemin and Basking Ridge had more than half of the total admissions in all eight hospitals. (Trenton averaged only about ten patients each of these months.) At the end of June 1780, the three Morristown hospitals were caring for 265 patients and had discharged an additional 52 during the month.

The winter in Morristown was the most severe of the century. The cold was relentless and the snow constant and deep. To add to the woes of the sick, hospital stores ran out. "Our stores have all been expended for two weeks past," Dr. Cochran wrote from Morristown on March 18, 1780. There were at least six hundred regimental sick and lame he said, "most of whom require some assistance, which being withheld, are languishing and must suffer." Cochran planned to notify Washington of the situation but with a cynicism justified by past performance, he added that Washington could only notify Congress, which would refer that matter to the medical committee. The latter would "probably pow-wow over it awhile, and no more be heard of it."

Two months later a congressional committee inspected the Morristown hospitals and reported them "destitute of those necessities which are indispensable for the sick. They have neither wine, Tea, sugar, Coffee, Chocolate or spirits." The committee expressed the wish that "orders may be given for an immediate supply as the army grow more sickly every hour."

Yet fatalities at Morristown that winter were fewer than at Middlebrook or Valley Forge: from December 8, 1779 to June 3, 1780, only eighty-six persons died. This improvement suggests that the army medical service had learned much about sanitation and preventing the spread of disease; that competent and effective leadership was available; and that the soldiers had become veterans, inured to war and possibly immune to common camp disease. There was one other significant change: surgeons and surgeon's mates were more readily available than in the past.

How long the sick remained at Morristown is impossible to estimate. The troops were again spread over northern New Jersey and southern New York State. In September, 1780, Apothecary

General John B. Cutting had his "store" in Paramus where regimental surgeons were directed for their supplies, and a flying hospital was located somewhere in the area. However, the return of the Medical Department for July 23, 1781, shows no medical officer stationed at any post in New Jersey at that time. The war had moved elsewhere.

Writing on September 9, 1780, to a member of Congress, Washington made it a point to praise certain medical officers, including Cochran and Tilton. The reorganization of the medical service was then under consideration, and Washington had had "a hint. . .that the new arrangements might be influenced by a spirit of party out of doors, which would not operate in their favor." The commander in chief knew that politics were interfering with the medical department.

The Diseases of the Army

It is estimated that for every death from wounds in the American forces in the revolutionary war nine died of disease. Disease was a constant camp follower and in the Canadian expedition, for example, half of General John Sullivan's eight thousand men were reported ill on June 14, 1776.

The army surgeon had to deal with numerous diseases, but the worst were smallpox, dysentery, and the "putrid fever" (known also as camp fever, jail fever, or hospital fever.) All were infectious (caused by some organism that invaded the body) and all were highly contagious. A soldier infected with any of these was never a lone case: the diseases ran rampant through camp and hospital. The sick and wounded, wrote Dr. Tilton, "are crowded so as to produce infection; and mortality ensues too affecting to describe . . . Many a fine fellow have I brought into the hospital for slight syphilitic affections, and carried out dead of a hospital fever."

The diseases could not be confined to camp. In at least two instances in New Jersey soldiers on leave or returning home brought the camp diseases with them.

Smallpox, a painful and often fatal disease, disfigured those victims fortunate enough to survive. It was a constant problem to the armies in all the states. The struggles and failures of the Canadian expedition resulted in part from smallpox among the troops.

Washington accused the British of spreading smallpox with "a malicious assiduity" in Boston as they were leaving in 1776. Congress shared Washington's concern with smallpox at Morristown. In November 1777 Washington reported that one thousand of his men were under inoculation while only three thousand were fit for duty.

The names "camp fever," "jail fever," and "hospital fever" all refer to typhoid fever or typhus — two diseases not then distinguished — which flared up among men forced to live close together in unsanitary conditions especially when they were poorly nourished, ill-clad, and inadequately sheltered. (Typhus is carried by lice; typhoid is carried in contaminated fluids and foods and passed on by human "carriers.") This disease was also known as "putrid fever" because it putrefied tissues and made the skin erupt. Delirium, severe headache, and a dry, black, crusty tongue accompanied the fever.

Hospital fever hit New Jersey hospitals especially hard. Dr. Tilton contracted it at Princeton and narrowly escaped with his life. Five other surgeons and all the orderlies and nurses came down with it, and at the hospital in Bethlehem, which he visited on his way home to recuperate, Tilton found that it had killed many more. Where there were hospitals and unclean men there was hospital fever.

The third of the common diseases was dysentery, a disease which constantly drained the bowels. This disease is caused by an organism found in contaminated food and drink and spread by human wastes and filth. "The patient would often be able to move about, with little or no fever, his skin remarkable dry and dusty," is the way Tilton described the effects of the illness. It was an "intractable" disorder, and "multitudes melted away, as it were, of this miserable complaint." Benjamin Rush, however, believed that it caused few deaths in the military hospitals of New Jersey.

Dysentery followed the soldiers wherever they went. The Canadian expedition met it in 1776. That winter there were about one hundred sick in Elmer's regiment, and Elmer said that the disease "seems to baffle all medicine." It became less frequent as winter grew colder, he noticed, but in its place "inflammatory disorders of a very complex nature" struck the troops. Deaths mounted among troops ravaged by smallpox and dysentery.

Among the many other diseases suffered by the American troops were bilious fever (where the patient was jaundiced, or vomited or excreted bile), the itch (another vermin-borne disease), intermittent fever (malaria, for which Peruvian bark was specific), venereal diseases (for which one might be charged for treatment), rheumatism and pleurisies, and nostalgia. The last Dr. James Thacher described as “perplexing instances of indisposition occasioned by absence from home...or homesickness...The Recruits... become dull and melancholy, with loss of appetite, restless nights, and great weakness. In some instances they become so hypochondriacal as to be proper subjects for the hospital.” Thacher suggested psychological cures for this psychological illness — the raillery of old soldiers, constant activity in drills and camp discipline, and the excitement of forthcoming battle. As Major General Philip Schuyler once said, “Of all the specifics ever invented there is none so efficacious as a discharge, for as soon as their faces turn homeward, nine out of ten are cured.”

The Casualties

The return for the hospitals at Pluckemin, Basking Ridge, and the Pennsylvania “Hutts” at the end of the month of June, 1780 summarizes the disorders encountered: wounded, 76; chronic diseases, 39; convalescent, 34; rheumatism, 32; venereals, 23; intermittent fevers, 13; ulcers, 12; dysentery, 8; pulmonic affections, 7; inflammatory fever, 6; bilious remittent fever, 5; smallpox and measles, 5; diarrhea, 3; nervous malignant fever, 1; jaundice, 1; total, 265.

These statistics reveal the high number of wounded men, even when there were no pitched battles. The figure in this instance represents casualties of the battle of Springfield. New Jersey troops were very much involved in that battle, and of the 55 New Jersey men admitted to the hospitals that June, 28 to 38 were wounded rather than sick. Of the 76 wounded men in the hospitals at the end of the month, 34 were from New Jersey units.

The low figures for the three most serious diseases, putrid (here called malignant) fever, smallpox, and dysentery probably reflect the fact that a serious effort was made to keep these more

infectious diseases out of the general hospitals by confining them to the regimental ones. All the regimental hospitals in the area held a third more cases than all the general hospitals in February 1780 and almost twice as many in March.

Ever-present casualties and sickness were a military as well as a medical problem. At one time only half of General Sullivan's troops were fit for duty in the Canadian expedition. Just before Washington's retreat across the Hudson into New Jersey his army showed 7,610 sick to 15,104 fit for duty. Of those who had already crossed to New Jersey there were 1,223 sick, and 3,531 fit. Before the battle of Trenton, Washington had 10,804 Continentals and 1,400 militia under his command. Of these, 5,319 were sick or on detached service—45 percent of his fighting force. In July 1777, just before the campaign on the Delaware, a congressional committee found that there were 3,745 sick.

The early years of the war saw heavy casualties. By one estimate, almost twenty thousand lost their lives in 1776. General William Smallwood's Maryland Regiment of eleven hundred that marched through Philadelphia in June 1776 mustered only sixty on January 3, 1777. Later figures showed some improvement. The November 1777 returns for the general hospitals in New Jersey showed just under 600 sick and wounded. In December 1779, the New Jersey general hospital and the flying hospital held only 226 patients, with about 500 patients in regimental hospitals. In March 1780 all the general and regimental hospitals in New Jersey, Pennsylvania, and New York held a total of 1,023 patients of which 670 were in regimental hospitals and 124 were in the general hospitals in New Jersey.

More important than the number of patients was the low rate of survival. One estimate was that 90 percent of all the deaths during the war resulted from disease, 10 percent from battle wounds. Twenty percent of those who volunteered and fought died within a year, 90 percent of them in hospitals. Statistics for the British and Hessian troops were somewhat better; among the British, disease accounted for 84 percent of deaths and among the Hessians, 77 percent. This reflected the facts that their prisoners, unlike Americans taken prisoner, were not confined to crowded jails and ships; that their troops were better clothed and often located in cities where better housing was available; and that better

sanitary and preventive measures prevailed — there was little typhus or smallpox among them. The British had a death rate from wounds and disease both of 14.6 per thousand, while the American rate has been estimated at 20 per thousand.

The Care of the Sick and Wounded

Once in the hospital, the casualty might or might not get good medical attention, depending on the surgeon's qualifications and availability. During the campaign in northern New York, Ebenezer Elmer went to the hospital "to see the sick as there is no doctor here now." Elmer found it "troublesome" to look after the sick and still attend to all of his regular military duties, but on October 5, 1776, he noted in his diary that he had again "visited the sick in the old lousy hospital which presents such a scene of wretchedness that one could hardly bear to behold the abject souls therein confined." Early in 1777, after trying with limited success to send the sick by sled to Ticonderoga or Albany for better attention, Elmer lamented, "The men died so fast for some time that the living grew wearied in digging graves. . . in this rocky, frozen ground." (When Pennsylvania troops tried to preempt for their dead graves dug by New Jersey troops, altercations broke out.)

The military hospitals came in for harsh criticism. Colonel Anthony Wayne characterized the hospital as a "house of carnage." Dr. Benjamin Rush referred to hospitals later as "sinks, cesspools of human life." Dr. James Tilton contended that hospital arrangements "surpassed all other nations, in the destruction and havoc. . . committed by the hospitals on their fellow citizens." In December 1777 Governor William Livingston of New Jersey found conditions in the military hospitals so appalling and the mortality rate so high that he pleaded with Congress to do something about them before Washington became "a General without an Army."

The soldier had problems even before he reached a hospital. Medical attention was not readily available on the battlefield. At the battle of Brandywine the wounded who could be moved started in wagons (horses and litters for those of high enough rank) for the hospitals of Philadelphia and New Jersey, and the severely wounded lay on the field or were collected in whatever buildings were at hand. The British sometimes looked after American wounded, but at Brandywine the wounded seem to have been

unattended for three days before American doctors, under a flag of truce, were permitted to look after them.

Once the wounded or sick soldier found his way into a hospital, he faced an even more ruthless danger than the battlefield: contagion. Even without understanding what contagion meant, everyone recognized that the hospitals suffered most from overcrowding. Early in his career as director general, Dr. Morgan, pleaded with Washington that overcrowding "would certainly engender a Malignant pestilential fever, that would threaten the Ruin of the Army." Dr. Tilton believed that crowding "produced" infection. And Dr. Rush ascribed the fevers to "too many patients being crowded together and . . . being deprived of means of cleanliness and of suitable aliments." A rule was promulgated that only the wounded and chronic sick were to go to the general hospitals; the infectious cases were to be kept in the regimental hospitals. The rule was difficult to enforce and hardly alleviated the overcrowding in the regimental hospitals.

If the patient escaped the fevers rampaging through most hospitals, what attention could he expect? Unlike the soldier of Elmer's company, he would find a surgeon, a surgeon's mate, and perhaps orderlies and nurses at the hospital. Straw mattresses lay on the floor or in bunks. He brought his own blanket, at least at the beginning of the war. To provide them with a special diet, the sick and wounded were taken off the regimental ration lists and the funds ordinarily allotted for their rations were transferred to the hospital to be used to provide, where possible, milk, vegetables, barley broth, hard biscuits, meat, rice, butter, coffee, tea, and wine. But this was the ideal rather than the reality: a congressional committee report points out the absence of such provisions at Morristown.

At the outset of the war Congress neglected to provide for medicines and other medical supplies, and when Dr. Morgan took over as director in Boston he found hardly enough capital drugs for one regimental medicine chest, let alone a twenty-thousand-man army. By the summer of 1776, however, he was able to equip fifty complete medicine chests for regimental surgeons. Thereafter the apothecary general prepared the medicine chests and had them delivered to the hospital. Each regimental surgeon was supposed to be supplied with a chest of medicines and instruments known as the

“Apothecary Ration,” but supplies were frequently short. In 1778 the commander in chief had to order the director general to supply the regimental surgeons with medicine chests. Four months later new standardized field boxes were distributed among the surgeons in the Valley Forge area, but there proved to be “not enough medicines...to keep the regiments supplied.” Moreover, certain items, like cathartic salts, were especially scarce. (It was suggested to the commissary general that he could obtain “any quantity at the salt works in the Jerseys.”)

After Valley Forge, matters improved. Regimental surgeons received fresh supplies of medicines, and some of the general hospitals were equipped with considerable apparatus for making up medicines. The regimental surgeon and his mate also had the responsibility of preparing medicines. Ebnezer Elmer, new surgeon’s mate, recorded in his diary that “Dr. Howell came up and after putting up a quantity of medicines, we rode to Westfield to visit our sick.”

Therapeutics

Of the vast array of medicines used by the eighteenth century physician, the very few that were clearly effective became known as “capital” remedies. These included Peruvian bark (known also as Jesuit’s bark, and “the bark”), useful and specific for malarial infections and widely but erroneously used for almost any fever. The bark (later found to be a source of quinine) was the only safe specific remedy against infectious disease until the late nineteenth century. Mercury, commonly prescribed as a strong cathartic in the form of mercurous chloride or calomel, was also effective against infections, but it was dangerous. Opium was effective as a pain killer and as a sedative; its addictive nature was not yet a concern. Jalap and rhubarb were vegetable drugs used as stomachics (stomach strengtheners) and purgatives. Tartar (antimony and potassium tartrate) and the plant ipecacuanha were used as emetics. Epsom salts and Glauber’s salts were also used as cathartics. Ground cantharides (Spanish flies) were used in blistering plasters. Camphor caused perspiration and was believed effective in treating venereal diseases. Camphor and nitre (saltpeter, potassium nitrate) were considered effective for cooling and calming fever and delirium.

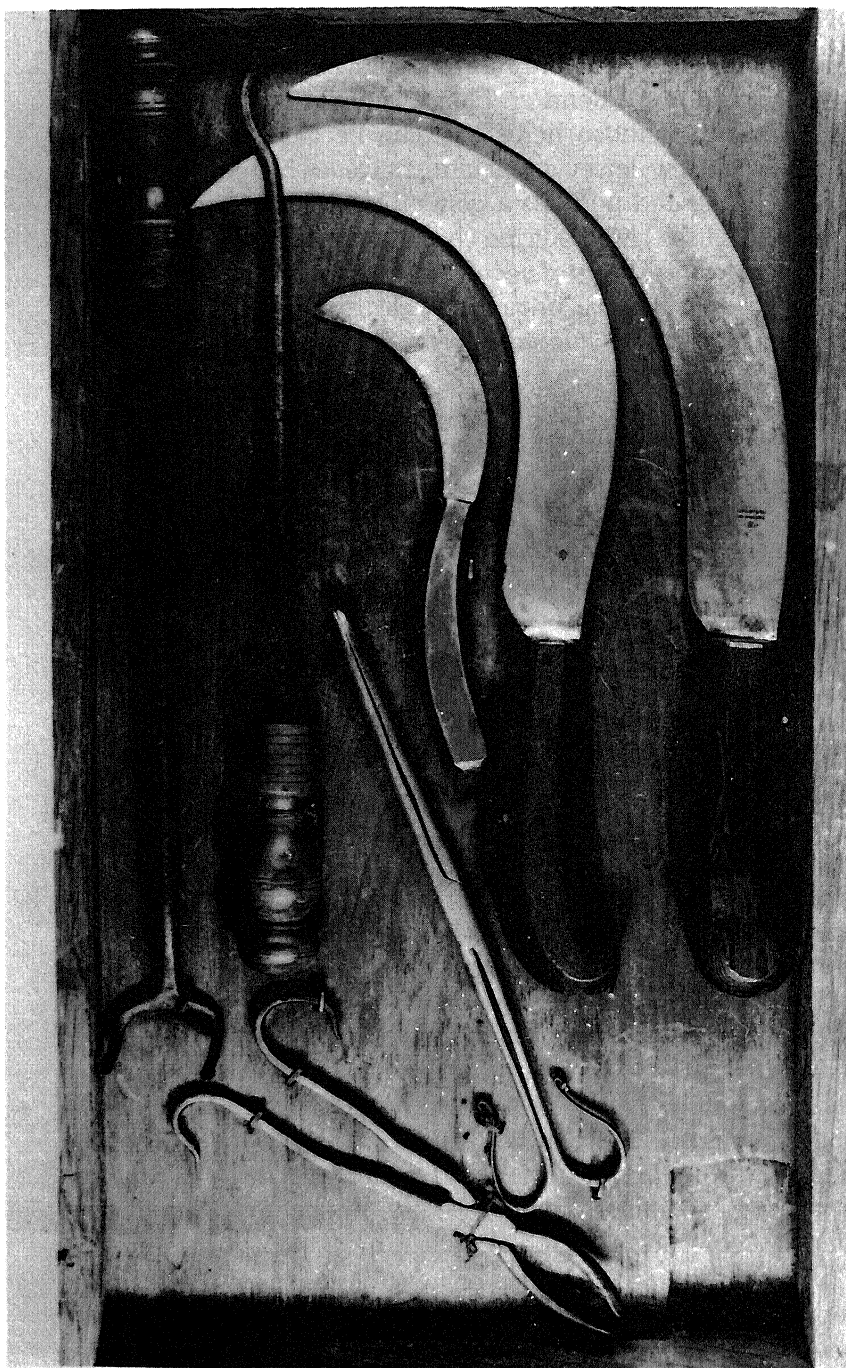
At the outset of the war, and later as well, as has been noted,

these capital remedies were not readily available. Indeed in 1776 near Ticonderoga, Ebenezer Elmer lamented that he “had no medicines except those herbs that can be gathered here.” Near Piscataway in New Jersey a year later, however, he had a regimental medicine chest and perhaps a general hospital apothecary supply depot for his use. The medicine chests made up in 1780 contained as many as twenty drugs of vegetable origin, three of animal origin, and twenty of chemical origin, as well as fourteen compounded remedies. The capital remedies remained the most needed and administered, however.

It is difficult to credit the drug therapy of the American Revolution with any measure of success. The drugs were often so powerful as to weaken the patient. There is no better statement of the ineffectiveness, if not the danger, of this therapy at the time than Dr. James Tilton’s concession that no medicines seemed to “have more than a palliative effect. . . The only expedient I ever found effectual for their relief was to billet them [the soldiers] in the country, where they could enjoy pure air and a milk diet, or to furlough them to their homes, if within reach.” There, he might have added, absence of medication and freedom from the infectious hospital joined with the healing power of nature to give the sick man a good chance of recovery.

Often the first step in the treatment of the sick was not medication but bleeding the patient. Blood was taken — by cutting into a vein with a lancet — in considerable quantities, with what seems alarming frequency, especially when the patient was feverish and had a “full” pulse. Ebenezer Elmer bled the sick on the way north, including Indians he was called upon to look after. All the physicians, many more distinguished than Elmer, advocated bleeding. It was easy to open a vein, especially if the surgeon or mate did not know what else to do or had no medication available. In the eighteenth century more people, it is said, were killed by the lancet than the lance; this was undoubtedly true during the American Revolution. There is little doubt that bloodletting hastened George Washington’s death in 1799.

Another therapeutic practice was “blistering.” This was done by applying some blistering material at the site of the problem and other parts of the body. (Washington, in his last illness, was blistered at the throat and at the extremities.) Blistering and bleeding often



Surgical field case of the American Revolution. Courtesy Armed Forces Institute of Pathology.

went together. The popularity of blistering is indicated by the demand for Spanish flies in all medicine chests. Ground up and made into a plaster, these beetles irritated the skin so badly that it would blister.

Still another kind of therapy was “cupping,” or temporarily attaching cups to the body, usually at the back. A small faggot thrown in as the cup was applied would burn up the oxygen inside and create a vacuum whose suction would attach the cup to the skin and bring the blood to the surface. Cupping was thought to be helpful in colds and chest congestions. The technique was probably used infrequently in military hospitals, for it required special equipment and skill, but at Morristown Washington came down with a quinsy “so severe that cupping was resorted to.”

Surgery

Surgery in the eighteenth century consisted of little more than removing external growths, setting broken bones and amputating limbs; surgical exploration of the body cavities did not develop until the nineteenth century. Moreover, surgeons had no effective anesthesia. They used opium and liquor, if available, to deaden pain and dull the senses. At the site of the Continental army encampment at Morristown, a bullet has been excavated that plainly shows a man's toothmarks. “Biting the bullet” was indeed a poor substitute for anesthesia, but modern anesthetics were not introduced into surgery until the 1840s. Similarly, not until the 1860s and 1870s were asepsis (providing sterile conditions) and antisepsis (preventing and combating infection) introduced into surgery.

In the revolutionary medical establishment the “surgeon” — who performed medical as well as surgical tasks — and his mates treated wounds, set fractured bones, and amputated limbs. They sometimes trepanned as well, cutting out a piece of the skull to relieve pressure in concussions. Surgical work usually required an operator and two assistants, the latter to hold the patient in position.

During the Revolution gunshot wounds were made by large round musket balls which caused considerable damage within a range of 100 yards. Some bayonet wounds had to be dealt with and where the enemy included Indians, wounds from tomahawks, knives, and clubs also had to be treated. Cuts might be closed

by bandages, sticking plasters, or, in certain cases, stitches. For bullet wounds, the surgeon first had to dig out the bullet and restrain the bleeding by pressure, bandages, or ligature (tying the blood vessels). Antiseptic dressings were unknown, although Dr. Charles Gilman of Woodbridge, a major in the Continental army, did make an important discovery in this connection. By accident, when he had "had too much rum," he spilled some of the liquor on a painful festering wound he had received. Two days later he was delighted to discover that the wound was healing. All wounds thereafter were covered with rum-soaked cloths, but we do not know how far beyond Major Gilman's post the discovery was put to use.

Crudely set bones in simple fractures frequently left the wounded with permanently crooked limbs. Compound fractures of the joints, and shattered bones usually called for amputation. This procedure required considerable skill, for sawing the bones was only one part of the operation.

Surgical operations presented many problems other than the surgery itself. The absence of anesthetics meant that many soldiers, especially the weak and emaciated, might die from shock, pain, and fright. To minimize these dangers the surgeon might cover the ears of the patient and dose him with opium and rum. Next was the problem of bleeding. Speed in operating was perhaps more important than care in cutting, and sharp tools were essential. Finally there was the problem of infection. Without asepsis and antisepsis each activity — sawing, suturing, splinting, trepanning, probing, or plastering — might lead to fatal infection. For a long time the grim joke in surgery was that the operation was a success but the patient died — from postoperative infection.

The need for skillful surgeons was keenly felt. Probably few found time like Ebenezer Elmer while in northern New York, to read Le Dran's *Chirurgical Works*. Military surgeons seem to have made wide use of Dr. John Jones's *Plain Concise Practical Remarks on the Treatment of Wounds and Fractures . . . for the Use of Young Military and Naval Surgeons in North America*, which appeared in 1775 and 1776. The general order from the commander in chief on December 12, 1777, points up the importance of surgery: Washington "desired" all regimental surgeons to attend a "course of lectures on Anatomy and operations of

Surgery” beginning in February.

Prevention

It would be a mistake to believe the medical leadership and staff completely ignorant or unobservant. They could not know the role of bacteria and lice, but they were well aware of the need for good clothing, proper diet, and personal cleanliness in the maintenance of health. And they were painfully aware of the dangers of overcrowded hospitals. In 1778 the War Board directed Benjamin Rush to republish as a pamphlet his *Directions for Preserving the Health of Soldiers: Recommended to the Consideration of the Officers of the Army of the United States*, which was filled with incisive and very sound advice. It covered dress, diet, cleanliness, exercise, and sanitation in encampments, pointed out that vegetables were necessary to proper diet, that spirituous liquors were injurious to health, and that personal cleanliness and clean clothing were essential. His rules about changing the straw of the soldier’s bed and exposing his blanket daily to the sun, had they been enforced, might have saved countless lives.

Moreover, important steps were taken to minimize disease. The constant clamor for clothing and blankets shows that their importance in maintaining good health was recognized. Better construction of huts, building sinks and drainage ditches, and regular sanitary policing at the Middlebrook and Morristown encampments helped account for health conditions far superior to those at Valley Forge. In this connection a significant general order issued at Morristown on March 8, 1780, read: “The Hot Season of the Year approaching all possible attention is to be paid to Cleanliness in the Interior and environs of the Camp, Sinks are to be Dug without Delay; every fair day the Windows and Doors of all the Hutts should be kept open the greatest part of the Day, and Bedding and Straw and Bunks frequently aired.”

Other evidence proves that principles of sanitation were applied even if few understood why. Washington made sure that the first American troops which entered Boston had had the small-pox or the inoculation, and at Morristown he recognized the necessity of seeing that both civilians and soldiers were inoculated.

Even if little could be done about it, the danger in overcrowding hospitals was recognized. From the start special effort had been made to separate infectious disease victims from the wounded and chronic sick, a bone of contention between the regimental and the general hospitals.

Unfortunately, all these good intentions were not, perhaps could not be carried out. If only Inspector General Friedrich von Steuben's *Regulations for the Order and Discipline of the Troops of the United States* (1779) had been enforced! "When a soldier dies," one rule stated, "or is dismissed from the hospital, the straw he laid on is to be burnt, and the bedding well washed and dried before another is permitted to use it." How strange it seems that such simple procedures did not prevail.

Conclusion

Clearly, the medical service of the American army in the Revolution made no enviable record for itself. Given the state of medical knowledge, the lack of experience in military medicine, the struggle for power and prestige in the new nation, and shortcomings of the army in manpower, supplies, housing, and transportation, it is remarkable that American care for the sick and wounded was as good as it was. It was but little worse than care given by the British and the Hessians; indeed, European hospitals during wars of the eighteenth century showed essentially the same horrible spectacle.

The Revolution hardly advanced the practice of medicine. The "heroic" resort to bleeding, purging, and puking continued unabated for many years. Surgery, however, benefited from one happy discovery: the success in military hospitals in saving limbs where amputation was delayed, by design or otherwise, probably caused doctors to amputate less readily. In professional relations, while the British system separated the two fields, the Revolution helped to perpetuate the practice of medicine and surgery by the same functionary. Our medical practitioners today are still "physicians and surgeons" although only one or the other may be the major activity of a practitioner. In pharmacy, the success of the apothecaries general in the Revolution helped free the United States from its dependence upon foreign drug makers.

Perhaps most important, however, were the lessons the Revolution taught about military medical organization, hospitals, and sanitation. Dr. James Tilton, who gained his experience mainly in the hospitals of Trenton, Princeton, and Morristown, became surgeon general of the United States during the War of 1812 and published his *Economical Observations on Military Hospitals* in 1813. This included a comprehensive survey of military medicine which indicates how much the revolutionary experience had taught. Tilton recommended that the medical service of the army be freed of the complexities which had undermined it during the Revolution by eliminating distinctions between various kinds of hospitals and creating a unified medical corps. The tract was also a polemic for sanitation, cleanliness, and preventive medicine, amply illustrated with revolutionary war experiences. The new United States had learned some important lessons the hard way.

For Further Reading

The major, more-or-less contemporary works on medicine in the revolutionary war, those of John Jones, Benjamin Rush, and James Tilton, have been described in the text. Ebenezer Elmer's interesting journal, spanning the Canadian expedition and his New Jersey service, can be found in the *Proceedings of the New Jersey Historical Society*, first ser. vol. 2 (1847) pp. 95-146, 150-194 and vol. 3 (1848-1849) pp. 21-56, 90-102.

An overall view of the history of medicine in the United States, which, though discursive and unbalanced, contains a good deal on the revolutionary period, is Francis R. Packard's *History of Medicine in the United States* (Philadelphia: J. B. Lippincott Co., 1901; reprinted, 1931 in 2 vols. by P. B. Hoeber, New York). There are three histories of medicine in New Jersey. Stephen Wickes's *History of Medicine in New Jersey and of its Medical Men* (Newark, 1879) stops at 1800. Important for its biographical sketches, it also contains interesting material on the revolutionary period. David L. Cowen's *Medicine and Health in New Jersey: A History* (Princeton: D. Van Nostrand Co., 1964) contains nothing on the revolutionary war but describes the practice of medicine in the eighteenth century

and later. Fred B. Rogers and A. Reasoner Sayre's *The Healing Art, A History of the Medical Society of New Jersey* (Trenton: The Medical Society of New Jersey, 1966) covers more than the society's history and includes an interesting section on the revolutionary war. The papers of the First New Jersey Medical History Symposium, which include essays on Drs. Cochran and Bryant, are published in the *Academy of Medicine of New Jersey Bulletin*, December, 1970, pp. 18-34.

The main sources of information on the medical aspects of the revolutionary war are J. M. Toner's *The Medical Men of the Revolution* (Philadelphia, 1876) and Louis C. Duncan's much more comprehensive *Medical Men in the American Revolution* (Carlisle Barracks, Pa: Medical Field Service School, 1931). James E. Gibson's *Dr. Bodo Otto and the Medical Background of the American Revolution* (Springfield, Ill.: Charles C. Thomas, 1937) adds some interesting information. The best account of the difficulties and controversies of the medical establishment of the revolutionary armies appears in Whitfield J. Bell, Jr.'s *John Morgan Continental Doctor* (Philadelphia: University of Pennsylvania Press, 1965). This is a well-written and fully documented account, by far the outstanding work of this group. George B. Griffenhagen's *Drug Supplies in the American Revolution* (United States National Museum, Bulletin 225, Washington, D.C.: Smithsonian Institution, 1961) contains a wealth of information.

Only one important study of medicine in revolutionary New Jersey has been made: Richardo Torres-Reye's *Morristown National Park, 1779-80 Encampment: A Study of Medical Services* (Washington, D.C.: Office of History and Historic Architecture, Eastern Service Center, United States Department of the Interior, National Park Service, 1971).

Finally a recent and comprehensive guide to the book and periodical literature on the subject is David L. Cowen, *A Bibliography on the History of Colonial and Revolutionary Medicine and Pharmacy* (Madison, Wis.: American Institute of the History of Pharmacy, 1975).

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