

CHAPTER 11

"The physician saves a life [in typhoid-pneumonia] no less surely than the surgeon who performs a successful operation in the nick of time, yet . . . advances in surgery, especially those made during the present century . . . have been so brilliant, rapid, startling, that they have at times quite overshadowed the quieter progresses of internal medicine."

— Dr. C. R. P. Fisher, President's Address, 1899

The period from 1880 into the twentieth century was "surgery's day," and electricity, as well as anesthesia and surgical cleanliness had a share in it. In the 1850's, the operating room was often the dirtiest room in the hospital. Dr. John Bruyère of Trenton described the sawdust strewn on the red-painted floor to catch blood, and the surgeon wearing garments already soiled and stiff with stains from previous operations. Before the advent of anesthesia, surgery was accompanied by horrible moans, shrieks, entreaties, and curses, he added, so that it was indecent and unwomanly for a female to be present. As anesthesia and antisepsis made hospitals and surgery more civilized, nursing became a profession of refinement and honor.¹ Women then took over many of the chores to assure and maintain basic cleanliness in the operating rooms and for the convalescing patient.

Nurses' Training

The need to train women in the proper care of the sick became apparent almost simultaneously at the Paterson General and the Orange Memorial Hospitals. A professional nursing school had been opened at Bellevue Hospital in New York City in 1873. In New Jersey, Paterson took the lead with the first school of nursing in the state, organized on February 13, 1882 with one student. A year later, the school employed Miss Clara Weeks as superintendent. To her other duties she added the writing of the first text for nurses. Entitled *Textbook of Nursing for the Use of Training Schools, Families and Private Students*, it was adopted throughout the country.

The first two nursing students trained by Miss Weeks, with the assistance of the medical staff, were graduated from the Paterson General Hospital School of Nursing in 1884. In 1891, an organized course of instruction was established, calling for two classes a week taught by physicians, plus weekly cooking lessons and daily instruction by the superintendent in the wards. By January 1, 1965, there had been 1,264 graduates from this school.

Original minutes of "The Board of Managers" of the Orange Memorial Hospital provide other details of the early history of nursing. On June 5, 1882, the Board agreed to employ "a female with an assistant who is anxious to avail herself of the opportunity afforded by the hospital to fit herself for a nurse and is willing to come without other compensation for the first six months than her board and lodging and the instruction she will receive. It is hoped this will be the beginning of a training school to fit women for this most useful and truly feminine work."

Dr. Thomas W. Harvey, Sr., then a youthful member of the hospital medical staff, presented a special report to his colleagues on the need for a training school for nurses and proposed that one be established in connection with the hospital. The suggestion was accepted on July 3, 1882. The Committee on the Training School planned a two-year course to include demonstration and practice "in every branch necessary to a thorough and trained nurse."

Candidates were to be between the ages of twenty and forty, strong and healthy with no physical defects, and of good moral character, able to read and write well. If they were acceptable after a month of probation, they were required to sign a contract to remain in school for two years, adopting the dress of the school. For the first three months the pupils were to receive no pay; then \$6 for each of the following three months, and \$12 a month for the remainder of the course. Lodging, meals and laundry service were to be provided for the students. In their second year they were to be sent out on private cases, with the hospital receiving the payment for the services the nurses rendered.²

Occasionally in succeeding years a medical man protested that nurses in the sick room assumed too much authority, but no one doubted that women's role as professional medical assistants had begun. Early in the twentieth century, far-sighted Dr. Edward J. Ill of Newark recommended to his colleagues that the state Society members join in encouraging nurses to form their own society for self-improvement and urge them to do post-graduate work in the hospitals of highest repute. "Just as we educate her and just as we set the example, so will she do her work," he said.

With such approval, New Jersey nurses approached The Medical Society of New Jersey in 1902, asking — and receiving — the Society's blessing for an organization of qualified professional nurses.

Surgery's "day"

In the first half of the nineteenth century, surgeons had little more knowledge than Hippocrates of the chief causes of postoperative danger, such as suppuration, septicemia or tetanus. There was no clinical thermometer, no hypodermic syringe, little knowledge of blood-saving or how to do it; no use of the microscope in diagnosis. Only a few had learned how to ligate arteries or to treat ordinary wounds in a conservative way.

Appendicitis was almost unknown until it appeared — like an epidemic — about 1860, affecting nearly 40 per cent of the population, mostly young persons. It occurred far more frequently in America among persons of comparable intelligence and social position than it did in Europe.³

At the beginning of the "outbreak," doctors were reluctant to operate for appendicitis, and instead used leeches, put the patient on a diet of corn mush, and applied more of the mush, or flaxseed, as external poultices.

Dr. George H. Balleray of Paterson, in an address in 1897, said that knowledge of the pathology of appendicitis had been derived from the observations of practical surgeons in the operating room rather than from pathologists at the post-mortem table. He credited François Méliér of France with identifying typhlitis and perityphlitis as the "morbid process which always originated in the appendix."

Colleagues of Dr. Balleray regarded him as one of the most successful surgeons of his day. It was said that while illness was never a joyful thing to contemplate, his arrival at a sick room acted like a ray of sunshine, a tonic as valuable as any medicinal ministrations. When his red beard was seen approaching, it was said, the patient was already half cured.

Dr. Balleray rejected the earlier appendicitis treatments with cathartics saying, "If the case proves to be one of acute perforated appendix, with incipient diffused general peritonitis, the abdomen should be opened *immediately*, along a median line, the appendix excised, the abdominal cavity thoroughly flushed with a hot saline solution, a glass drainage tube inserted and the wound closed. Drainage is absolutely necessary in these cases as the peritonitis is always septic."⁴

Discussion had rarely been livelier than since the advent of the new surgical techniques. Before a speaker had folded his notes away in a vest pocket, several physicians in the audience were waiting to be recognized and to add a personal experience or ask a question. Dr. Walter B. Johnson, surgeon at the Paterson Eye and Ear Infirmary who would be state Society president in 1904, reported on intubation of the larynx; Dr. William Pierson, Jr. of Orange — another who would be elected president — summarized experiences in surgery of the liver and gallbladder; Dr. John G. Ryerson of Boonton reported his studies of appendicitis outbreaks; Dr. David St. John of Hackensack related his success in the removal of malignant tumors of the breast; Dr. Daniel A. Currie of Englewood had repaired a vesico-vaginal fistula; Dr. Martin Tygert of Carlstadt had removed a uterine fibroid; and Dr. Daniel Strock of Camden performed surgery for hernia without the necessity for drainage.

Dr. J. C. Applegate of Bridgeton exhibited ingenuity in the treatment of an extra-capsular fracture of the thigh, using a method he thought other physicians might want to try. It involved a nine-year-old boy who had slipped through a railroad turntable while it was in motion, fracturing and shattering the bone. Dr. Applegate found a second lad of nearly the same size, placed him on his back with his thigh flexed at a thirty-five degree angle, and molded a piece of surgical felt to his hip, extending it from the ribs to the knee. When dry, the mold was removed and adjusted to the injured boy, and his thigh was placed on a wedge-shaped sandbag. Extension was made over a pulley with a weight from five to eight pounds, to overcome muscular contraction and keep the knees on a line. Additional sandbags were used for counter-extension, and after ten weeks, union was perfect and the shortening of the leg so slight as to be unnoticeable.⁵

There were other techniques to share, too. Some thought sutures with silk were as safe as those made of catgut, kangaroo tendon or any other material. Either silk gut or silver wire was advocated by Dr. Horace G. Wetherill of Trenton because neither left a stitch-hole abscess or had the capillary action of silk, which could carry infection or pus into organs such as the kidney or liver.

Dr. Dowling Benjamin of Camden, head surgeon at Cooper Hospital, soaked the best A and E violin strings in oil gaultheria for twenty-four hours, then kept them in alcohol or an antiseptic solution until he was ready to use them. He recognized the importance of sterilizing his hands before operating

and endorsed the Weir method of scrubbing with green soap, then rubbing hands and arms for five minutes with a mixture of chlorinated lime and washing soda, in equal parts. As to the recent innovation of wearing gloves to operate, he added, "If you do not know where the assistants have had their hands, rubber gloves are safer."⁶

A few years later, Warren County reporter Dr. J. H. Griffith of Phillipsburg remarked that the late 1860's, when Italian professors introduced anti-zymotic treatment to neutralize blood poisons by use of bi-sulphites, marked the beginning of the use of "mild, elegant and effective antiseptics" which had added so greatly to the resources of the practitioner of the 1890's.⁷

Few spoke of the operating rooms of that earlier time, redolent with carbolic spray and with the patient's wound also doused with the powerful germicidal solution. But the effectiveness of an antiseptic, however crude, within fifteen years brought a 60 per cent reduction in the death rate from blood poisoning following surgery.⁸

The germ theory of disease

It was the germ concept introduced by Pasteur and Lister that had the greatest influence in revolutionizing surgery and the treatment of disease. In 1857, the French chemist Louis Pasteur first established on a scientific basis the microbiologic concept of disease. The eminent Britisher, Joseph Lister, in Scotland in 1865, applied the Pasteur discoveries to achieve antiseptic surgery.

Pasteur studied anthrax and rabies and developed the principle that pathogenic properties of micro-organisms can be attenuated by repeated animal passage. German bacteriologist Robert Koch, at about the same time, discovered other pathogenic bacteria and isolated the tubercle bacillus and cholera vibrio; two other Germans, T. A. E. Klebs and Friedrich Löffler, discovered the bacterium of diphtheria, and a fourth, A. L. S. Neisser, demonstrated the gonococcus.

French physician Claude Bernard introduced the artificial production of disease by means of chemical and physical manipulation. His book, *Introduction to the Study of Experimental Medicine* (1865), was a classic in physiological research.

The possibility that several diseases could be transmitted to man from animals stimulated interest in animal pathology and spurred the founding of the first private school and hospital of veterinary medicine. It opened at the University of Pennsylvania in 1882.

Dr. Theobald Smith (1859-1934), who spent much of his life in New Jersey, has been called "the Pasteur of American medicine." In collaboration with Dr. Daniel E. Salmon, he proved that animals could acquire active immunity from killed bacteria. From such discoveries came protective vaccines against typhoid-paratyphoid fevers and cholera.⁹

Dr. Smith's genius in demonstrating the existence of a bovine type of tubercle bacillus made possible a more effective attack on tuberculosis in both humans and cattle.

Almost precisely two centuries after New Jersey had been described as a land flowing with milk and honey — and too healthy to support a regular doctor — the milk had turned sour.

Not only did improper handling cause it to sour — quite literally — within a few hours after delivery, but much milk also was found to carry the tubercle bacillus. Until after 1909, tuberculosis in its various forms continued to cause more deaths each year than any other disease in the United States.

Doctors demand pure milk

The fight for clean, wholesome milk was led by Dr. Henry Leber Coit, with the backing of The Medical Society of New Jersey. It resulted in a pure milk program that was later adopted by the rest of the nation and many foreign countries. The program remains in effect today, essentially unchanged since Dr. Coit first presented it to the Practitioners' Club of Newark in 1892.¹⁰

Dr. Coit was born in Peapack in 1854, the son of a Methodist minister whose death, twelve years later, caused the boy and his widowed mother to move to Newark. There he worked in a drugstore, sometimes sleeping under a counter at night, and continued his education until he was graduated, valedictorian of his class, from the College of Pharmacy in New York in 1876. Seven years later, working sometimes as a chemist and sometimes as an instructor at the College of Pharmacy, he received his M.D. degree from the College of Physicians and Surgeons of Columbia University. In 1886, he and his bride began their life together in Newark. It was while his first-born son lay dying of diphtheria and the desperate father sought pure milk for him that Dr. Coit's life work on behalf of children was determined.

Like everyone else at that time, he was familiar with the horse-drawn wagon bearing two big milk cans. If the supplier catered to the "upper class," there were spigots on the cans where the housemaids filled the pitcher or bucket. On streets further down the economic scale, the lid was slid off the top of the can and the milk ladled out at a few pennies a pail. The milk handling at the farm was often worse than the delivery service.

Added doubts as to the wholesomeness of the milk occurred when it was discovered that waste barley malt from breweries was fed to cows to increase their milking capacity. Refuse from starch factories made a further cheap but non-nutritious "filler" food.

At first, Dr. Coit thought proper laws would result as soon as the legislators were informed of the need. Before long, however, he saw that the full strength of organized medicine would be necessary to combat the commercial interests who wanted no change in their profit ratio.

In 1890, he offered a resolution to the state Society for a comprehensive inquiry on the relation between improper feeding and care of cows, and milk proven to be harmful and often fatal. Two members from each county society were appointed to determine the influence of the diet and care of cows on the content of their milk and also to investigate any resulting sickness in humans who used such milk.

Dr. Coit was named chairman of the committee, and when the county reports were coordinated, it was apparent that prompt legislative measures were essential. "The importance of an unlimited supply of pure and wholesome cow's milk — and the present deplorable scarcity of any that measures up to the standards set by the physicians — call for the most stringent and



The campaign for pure fresh milk, properly processed and handled, was begun by Dr. Henry Leber Coit (1854-1917) of Newark in the final decade of the nineteenth century. The tremendous reduction in tuberculosis and the improved health and life expectancy for babies are directly traceable to his valiant and successful efforts.

efficient laws," he said. With concerted action from the medical profession, Dr. Coit believed it would be possible to greatly reduce the mortality from tuberculosis and the fearful havoc among infants.

"A baby consumes about 500 quarts of milk during the first year," he said, "and a very slight variation in the chemical constituents of milk may cause fatal disturbances. A direct relation is at once established between the character of the food supply and infant mortality. Another important use of cow's milk is in the dietetic management of the sick."

The dangers in milk from ill-fed cows were two-fold. First, bacilli acquired through atmospheric contamination resulted in putrefactive change, causing fermentation and spoilage; second, certain pathogenic bacilli, particularly bacillus tuberculosis, could be communicated to milk before it was drawn from the udder.

Sanitarians and veterinarians joined The Medical Society of New Jersey in recognizing a close relationship between human and bovine tuberculosis.

At this time, the dairy business in New Jersey was showing steady growth. In 1890, the United States census listed the annual output in New Jersey

from 161,576 cows at 256,015,812 quarts, and there was evidence the figures were climbing higher each year. Dairying had the look of an industry even then, with the investment throughout the nation estimated at over \$2 billion — almost double the amount invested in banking and other commercial enterprises of the period.¹¹

Dr. Coit found little fault with existing laws if they were properly enforced. In 1875, through the efforts of the newly formed Board of Agriculture and the help of public health officers and physicians, a law had been passed to prohibit the sale or keeping of adulterated milk. In 1878, another law prohibited the sale of skim milk unless sold in cans so marked. Three years later, previous laws were supplemented by a more comprehensive one providing that milk be considered pure only when it was the product of a healthy cow and when nothing had been added or taken away. This eventually became the basis for public health measures which today require the supervision of inspectors from the State Department of Health and of Agriculture to safeguard the consumer and assure him of "pure milk from healthy cows."¹²

Unfortunately, adequate statutes are of no value until they are implemented, sometimes by appropriations, and properly enforced. Dr. Coit and The Medical Society of New Jersey were determined to achieve both.

Safer milk for babies had the strongest public appeal. When Dr. Coit later became founder and first president of the New Jersey Pediatric Society, he repeated the thoughts he and other physicians had often expressed during the early days of the fight for pure milk:

"The gift of children," he said, "is the most precious gift of God to mankind. It is the natural right of every child born into the world to remain and grow to years of efficiency. Conservation of child life is a question of vastly more importance to the American people and vital to the integrity of the nation than the conservation of minerals, rivers or forest preserves."¹³

The standards set by Dr. Coit and his fellow physicians, still basically unchanged, included requirements that the milk have good keeping quality, uniform quality and percentage of butterfat, uniformity in the curd, both in quality and digestibility; a constant percentage of combined mineral salts, and absolute freedom from pathogenic bacteria.

These specifications were for all milk intended for human consumption, whether the user was an adult in good health, an invalid, or a baby weaned from mother's milk.

Certified milk

For the product that met all the requirements, Dr. Coit planned the blue-ribbon designation of *certified milk*. He introduced the plan to fellow physicians in 1892. It was based upon the establishment of a Medical Milk Commission and a contract between the Commission and participating dairymen who would produce milk that met chemical, bacteriologic and veterinary standards, and with medical supervision of dairy hygiene and the health of employees.

The Medical Milk Commission originated by Dr. Coit has spread to states and cities throughout the United States and Canada and to other foreign countries. In 1907, the American Association of Medical Milk Commissions

and the Certified Milk Producers' Association were founded. They in turn promoted pasteurizing and, later, Vitamin D enriched milk.

Dr. Coit and the Medical Society were instrumental in procuring a law in 1909 that defined and safeguarded the term *certified milk*. The original contract drawn by Dr. Coit included rules and regulations governing the construction of buildings, the quality of the water supply and placement of the cows, including their feeding and cleansing; care of the barns; collecting and cooling the milk and preparing it for shipment or delivery; and the personal health and cleanliness of the employees.

Apologizing for the extent to which he seemed to have investigated the operation of farming, dairying and marketing, Dr. Coit explained that such study was necessary to keep health standards high yet practical.

The dairyman who proved the physicians were not just wishful dreamers was Stephen Francisco, owner of the Fairfield Dairy at Caldwell. Other milk producers followed his leadership, including Henry W. Jeffers, Sr., at the Walker-Gordon Farm at Plainsboro. Their pioneer efforts in the production of *certified milk* led to other dairy products of high quality, often recommended for special diets. The Walker-Gordon rotolactor milking process, introduced in 1930, with exceptional precautions in the cleansing of cattle and handling of dairy products, is a practical demonstration of proper techniques. A model has been reproduced for international exhibitions, and the Plainsboro farm annually draws thousands of visitors.

The concept realized

In 1892, Mr. Francisco produced the first bottle of *certified milk* and the first commercial milk to be dispensed in individual bottles. Twelve years later, the first milk cartons made of paper were introduced. Mr. Francisco's first bottle, tied with blue ribbon, was personally delivered to Mrs. Coit, whose encouragement and loyalty had been an important factor in the program. It was Emma, the two-year-old daughter of the house, who became the ultimate consumer and symbolically the goal of the entire program.

The small touch of fanfare was little enough accommodation for a public press that many doctors credited as an important factor in achieving better public health. The understanding and promotion of the cause by the *Newark Evening News* was mentioned in Medical Society meetings.

In 1902, newspapers praised Nathan Straus, the department store tycoon, for establishing pure milk depots in New York City and providing pasteurizing plants in foundling hospitals on Randall's Island, where the infant fatalities dropped from 51 to 18 per cent within the first year after the milk plant was established. What was not generally known was that it had all been prompted by Dr. Coit and his efforts to obtain pure milk. Mr. Straus read accounts of the New Jersey Medical Society's efforts for better milk and consulted Dr. Coit on ways to provide cheap pure milk for the poor of New York City. The milk depots and pasteurizing plants followed.¹⁴

In the years after initiation of the controlled milk program there was occasional friction between farmers and law enforcement officers. Entire herds of dairy cattle were found infected with tubercle bacilli and ordered slaughtered. In the early days, with no appropriations established for such

a purpose, the state compensation was small, and the farmer or dairyman bore a heavy loss as his part in the ultimate achievement of pure, wholesome milk for all New Jersey.

Dr. Coit's strong interest in children, intensified by these early endeavors, directed his career. He became the first practicing pediatrician in Newark and one of the earliest to devote all his efforts to this specialty. His concern for proper milk naturally led him to devise new formulas for infants requiring artificial feeding.

In 1896, he was a prime mover in the foundation of Babies' Hospital of Newark, later re-named Coit Memorial. This was only the third such hospital in America, the others being in Philadelphia and New York.

Dr. Coit continued active in his county, state and local professional organizations, recognizing in them the essential strength for achievement of better safeguards for the public health.

In 1916, when New Jersey experienced its most severe epidemic of poliomyelitis, Dr. Coit, then sixty-two, worked untiringly to care for the victims. Long before President Franklin D. Roosevelt, himself a polio victim, introduced the March of Dimes, Dr. Coit organized a Citizens' Relief Committee to raise funds for prolonged care for patients and to train Newark nurses to carry out physiotherapy for sufferers from this crippling disease. His own reserve of strength was seriously impaired, however, and he died of pneumonia early in 1917.

The work of Dr. Coit and his Committee on Milk was soon supplemented by reports from physicians in all parts of New Jersey. Dr. G. H. Franklin of Hightstown was convinced an epidemic of diphtheria had its origin in infected milk. After careful checking he found that while six dairymen supplied the town, all the cases of diphtheria were on one milk route covering all parts of the town, including the "best families" where sanitation was excellent. When Dr. Ezra M. Hunt, head of the State Board of Health, stopped the sale of the suspected milk, the epidemic practically ceased.

Dr. John L. Leal of Paterson produced evidence that milk was a carrier not only of tuberculosis and diphtheria but also typhoid, cholera, scarlet fever and other infectious diseases.

By 1898, Dr. Richard Cole Newton of Montclair, opening a discussion on "Milk as a Food and as a Means of Contagion" urged the Medical Society to add amendments to the state's sanitary legislation requiring that all milk vendors obtain a license swearing to certain conditions in the herd and in the milk handling. The license would be revoked if a dairyman failed to give notice of sickness among his cattle, members of his family or his employees. Dr. Newton also called for legislation to stop the sale of the carcasses of cattle dead from disease, or accident, or in too poor condition for regular butchering.

Better education of the public was necessary and it had to be achieved through the medical profession. Much of the credit for the current high milk standards must go to the pioneering of the Medical Society members.

"The number of deaths among children under five years of age is one of the recognized tests of the degree of civilization attained by a community," a spokesman for the State Board of Health declared in 1902. "It also indicates to some extent the degree of efficiency which has been attained in the local sanitary administration."

New Jersey communities were beginning to measure up, and while Dr. Coit and other medical men were helping assure life itself for more babies, Dr. Charles J. Kipp of Newark and colleagues concerned with eye disease were striving to make life happier and more productive.

Dr. Kipp reported in 1884 on the prevention and treatment of purulent conjunctivitis, insisting that precautions be taken immediately — in less than half an hour of birth — to save a child from ophthalmia if the mother was infected with gonorrhoea. He acknowledged differences of opinion on the effectiveness of silver nitrate and described the strength of the aqueous solution he used and his method of applying it.

Through his term as state Society president in 1886, and in the years following, Dr. Kipp reiterated the probability that 20 per cent of the blindness in early life could be prevented by prophylactic measures.

Prevention of eye diseases

In 1895, the diligence of Dr. Kipp's committee for the prevention of blindness, and the special efforts of Dr. Walter B. Johnson of Paterson, won the signature of Governor George T. Werts on new legislation. The law was particularly aimed at midwives and required that if either or both eyes of an infant became inflamed or swollen within two weeks of birth, the fact must be reported to a local practitioner or local health officer, in writing, within six hours of its occurrence. Those who failed to comply were liable to a fine of up to \$200, imprisonment up to six months, or both.

Long ago the Medical Society had learned that it takes more than laws to accomplish better health measures for the public. So with customary thoroughness, the members voted for a suitable circular to be printed and distributed to every physician, midwife and professional nurse in the state, giving the methods recommended by the Society for the prevention of purulent conjunctivitis. The Society also urged the State Board of Health to publish and distribute "Credé's Method of Disinfecting the Eyes of the New Born," and recommended that the State Board of Medical Examiners refuse licenses to midwives who were not familiar with or did not carry out the Credé procedure.

It was a decade for protecting the health of children, but since precautions against blindness are vital at any age, Dr. Johnson recommended that attention also be given to preventing industrial injuries to eyes. He suggested that placards urging caution be placed near grindstones, in bottle shops and machine shops, and that workmen be advised that for accidents to their eyes, it was unwise to rely on poultices, washes and other uncertain measures.

The legislation for prevention of blindness in the newborn placed Dr. Kipp considerably in advance of his time. A quarter of a century later, cities began to adopt the legislation he had advocated.¹⁵

German-born Dr. Kipp had come to America in 1854 at the age of fourteen. He was graduated from the College of Physicians and Surgeons in New York just in time to volunteer in 1861 in the defense of the Union. For his "meritorious and faithful service on the field," he was breveted lieutenant colonel.

Beginning his practice in Newark in 1869, Dr. Kipp organized the first eye and ear clinic at St. Michael's Hospital in 1870 and served as its head for ten years. He was also connected with St. Barnabas, and other Newark hospitals. In 1880, with the help of William Clark, Sr., Robert F. Ballantine and Frederick J. Frelinghuysen, he founded the Newark Eye and Ear Infirmary. Dr. Kipp remained its consulting surgeon during the remaining thirty years of his life.

Mr. Frelinghuysen recorded in the minutes of the Board of Trustees that the founding came "through the instrumentality of Dr. Kipp, and he brought with him a body of personal friends who undertook the work because they were assured of being associated in a beneficence with a man preeminently qualified by his magnificent ability. No greater monument to these abilities could be raised than the immense work the institution has done for so many years. The hundreds and thousands who have been healed by his hand bear testimony to his untiring skill."¹⁶

As with many physicians, Dr. Kipp's death was directly related to a last professional act. He performed a long and delicate operation to restore the sight of an indigent patient. Leaving the hospital exhausted, Dr. Kipp contracted a fatal pneumonia.

The doctor's bag

In the 1880's, as surgery approached the modern era, the general practitioner was striving to keep abreast of scientific advances. As an aid, the *Medical and Surgical Reporter* provided a list of the articles recommended and necessary for the physician entering private practice. In the symbolic black bag he was to have:

1. A bottle of compressed tablets of bichloride of mercury, readily soluble and much more reliable and convenient than carrying the solution.
2. A soft rubber bag fountain syringe, capacity of one gallon with six or eight feet of hose and adjustable tubes.
3. Violin strings (available from any music dealer) in four different sizes. These to be prepared by saturating in oil of juniper for twenty-four hours, then kept in a bottle of stronger alcohol and saturated in the standard solution when required for ligatures, sutures and capillary drainage.
4. Cheesecloth (available at small price in all dry goods stores). This to be saturated in the standard solution and used for compresses and bandages.
5. Absorbent cotton, saturated in the standard solution and dried.
6. An ounce or more of iodoform for dusting. This could be carried in an ordinary pepper box, or, better yet, in one of the cheap insect-powder guns sold in all drug stores.

While their professional publication gave attention to the doctor's black bag and what it should contain for treatments in private practice, many physicians were increasingly concerned in the prevention of diseases affecting large numbers of patients. Public health measures were an obvious answer.