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## ADDRESS.

### THE PATHFINDERS.

Delivered to the Graduated Class of the Barnes Medical College, St. Louis, Mo., March 17, 1896.

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HOT SPRINGS, ARK.

*Gentlemen of the Graduated Class:*—I have been requested by the faculty of Barnes Medical College to address a few words to you in parting. I feel the importance of the occasion, and if I shall say anything which you can carry home with you and which will enable you to be better physicians or truer men I will have done much. You have passed your final examination for the degree of M.D.; upon this I congratulate you and trust the future may bring to you, all that your mind can picture of success or your heart crave of sympathy.

You have only made a beginning; have simply learned the alphabet of your new life. We have tried to teach you *how* to study; how to use the tools of your new calling; have simply laid the foundation; upon this you must build a superstructure of hay, wood or stubble, or a structure of solid materials which will weather the storms of adverse fate, or come through the fires of criticism unscathed; then I say, your life work is just begun; remember the battle is not necessarily to the swift or the brilliant, but success comes rather to the painstaking, laborious one, who knows no such word as fail, and who is willing and anxious to work, contented, if he does well whatsoever his hands find to do.

Think not there are no more worlds to conquer; that the wonderful strides in the arts and sciences of medicine and surgery during the last twenty, yea, ten years, leaves no field for you to investigate. Some one of you may be an Alexander to lead the hosts of sanitary science along new fields and beside pleasant pastures. Few thought two months since of the possibility of photographing through opaque objects, and yet to-day, the world is familiar with the "X" ray of Roentgen, and its possibilities in medicine and surgery, as they loom up before us, are fairly dazzling. Here is a Pathfinder indeed; and we believe the time is not far distant when we shall see our friends as we talk with them over the telephone, whether they be in the next house, the next town, or as far from us as St. Louis from New York. New worlds are lying out all around us waiting a conqueror who shall show us the way.

"Then be up and doing,  
With a heart for any fate;  
Still achieving, still pursuing  
Learn to labor and to wait."

There are two classes of men in life. The artist who plans, who leads the way, and the artisan who follows and does the work planned for him by the leader. These two comprise the working classes of humanity. Of the first class or

### THE PATHFINDERS

I propose to speak a few words to you to-night, hoping thereby so to stimulate you in your work that some one among you may develop as a leader among men.

It is an easy matter for any one to follow the king's highway from place to place. It is comparatively easy for one versed in woodcraft to find his way out of a great forest and into the homes of civilization; or for the mariner with his compass to steer his course over the trackless sea. We can all follow where the Pathfinders lead. That was a beautiful character of Cooper's, "The Pathfinder" or old "Leather Stocking," with his unerring judgment of men and nature; always pushing out beyond the outposts of civilization, whether that was in the forests of New York, along the shores of the northern lakes or on the boundless prairies of the great West! And there are such men in the profession of medicine—leaders whose look is ever forward—and behind whom follow the great mass of the profession; many times ignorant of the hard work and sufferings and triumphs of him who was the pioneer along a rough and rugged road, now smoothed for the easy going of the less laborious ones. I would not have you understand that the work of the artisan is less honorable than that of the artist who plans the beautiful structure. Both are alike praiseworthy; and while it is given to a few to be leaders of men, yet we may all be workers.

"And departing leave behind us  
Footprints in the sands of time."

The poetess Ella Wheeler Wilcox has written:

There are two kinds of people on earth to-day,  
Just two kinds of people, no more, I say.  
Not a sinner and saint for 'tis well understood  
The good are half bad, and the bad are half good;  
Not the rich and the poor, for to count a man's wealth  
You must first know the state of his conscience and health;  
Not the humble and proud, for in life's little span,  
Who puts on vain airs is not counted a man;  
Not the happy and sad, for the swift flying years  
Bring each man his laughter and each man his tears.  
No, the two kinds of people on earth I mean,  
Are the people who *lift* and the people who *lean*.  
Wherever you go, you will find the world's masses  
Are always divided in just these two classes.  
And, oddly enough, you will find, too, I wean,  
There is only one lifter to twenty who lean.

The dead level of mediocrity we may all attain; it is the floor upon which we were born and upon which most of us will fret and work out our earthly existence. We are the artisans who do the drudgery of

the world, and I would not complain of mediocrity, for to the many, to the artisans, must the world look for the accomplishment of its vast problem of labor. Though we may belong to this class, let us love our work. If you do not love this profession you have chosen—love it enough to give your life enthusiastically to it, then let me urge you now to give it up, before it is too late, and find something to do which will command all the love and energy of your souls.

Enthusiasm, fanaticism if you will, moves the world. The enthusiasts are the Pathfinders for the world. "Youth without fire leads to an old age without warmth." Then while the warm blood of youth permeates your hearts, plunge headlong into your work. "Whatsoever your hands find to do, do it with all your might," and thus only may you hope to attain to an old age warmed by the thought of a life well spent. He who is without enthusiasm in his calling is a finished being, and is simply waiting for the inevitable, which shall take him over to the great majority.

I do not propose to go over the whole field of medicine and give you an outline of all its leaders, but to call your attention to a few of the men who have led us into the broad fields and green pastures of modern medical knowledge.

It has not been many years since the practice of surgery meant great agony to the patient. He had to be held, while the sharp steel severed nerve and muscle and bone. Think of the awful suffering of the wounded who had to have an extremity amputated, or a dislocated one restored to place! Think of the dreadful agony of maternity! And all these pains alleviated by a few whiffs of chloroform or ether!

My friend, Dr. Ghent, of Texas, tells of a woman who was a patient of his under these trying circumstances for her fifteenth time. He administered chloroform, and when she came to herself and found a lovely little boy in her arms burst into tears. She was so sorry that she could not go back and have them all over again under the benign influence of this God-given pain destroyer.

Yet the production of anesthesia for surgical operations we owe to an obscure country doctor in the backwoods of Georgia, Dr. Crawford W. Long. The pains of surgery and maternity annihilated and all things made possible to the surgeon by his ability to do thoroughly and without shock to the patient anything operative which should be found necessary!

CRAWFORD W. LONG.

In the brief time allotted to this address I can not go into all the details of the ether controversy. Dr. Luther H. Grandy, of Atlanta, Ga., in an article published in the *Virginia Medical Monthly* for October, 1893, gives its details. From the papers before him, supported by sworn testimony of those who witnessed the operation, it is clearly proven that Dr. Crawford W. Long removed a tumor from the neck of Mr. James Venable while anesthetized with ether on March 30, 1842. Dr. Long's ledger is produced and from it an extract is taken which shows Mr. Venable's bill for 1842, and reads as follows:

JAMES VENABLE, DR.		
Jan. 28,	Sulphuric ether..	\$0.25
March 30,	Ether and excising tumor	2.00
May 13,	Sulphuric ether..	.25
June 6,	Excising tumor..	2.00

Dr. Long, and later on Dr. J. Marion Sims, published the details of this operation.

On July 3, 1842, Dr. Long amputated the toes of a

negro boy for disease, doing the operation under ether anesthesia.

On Sept. 9, 1843, he extirpated a tumor from the head of Mary Vincent.

On Jan. 8, 1845, he amputated two fingers of a negro boy; two witnesses state that one finger was removed while the negro was anesthetized, and the other one when he was awake, just to show the bystanders that anesthesia was possible.

Dr. W. T. G. Morton, of Boston, gave ether for Dr. J. C. Warren in the Massachusetts General Hospital on Oct. 16, 1846. This was in a public hospital and was heralded over the world by the profession at once, and ether was soon in universal use.

While it is true that the young village doctor of Jefferson, Ga., was the first to use ether for the painless performance of surgical operations, he did not publish the fact until after Morton and Warren had written of their work. Priority of work lies with Crawford W. Long, priority of publication with Morton. Both deserve praise and honor. The timidity and retired, obscure position of the young country doctor prevented him from publishing his discovery to the world, but it was known to his neighbors and friends.

Boston, Mass., has erected a monument to Morton. One stands in Paris commemorating the discovery of the unknown country doctor in the backwoods of Georgia, and the State of Georgia has decided to place his statue in the hall of the immortals at Washington, D. C.

At a later period chloroform supplanted ether in many surgical operations and the profession is largely indebted to Sir James Y. Simpson, of Edinburgh, Scotland for popularizing its use.

Recently there was gathered to his father's house and to "Our Father's house" another man who lived and died in a small town in the mountains of Georgia, and whose name will go sounding down the corridors of time with honor,

ROBERT BATTEY.

Dr. Battey's operation has been merged into Tait's, but he deserves great honor and praise for his bravery in devising an operation for the relief of suffering women. He was as modest as he was gentle and brave, and to know him was to love him for his personality.

The profession was forty years learning the lessons Bernutz and Goupil tried to teach them, and to

LAWSON TAIT.

is due the credit of compelling it to recognize the value of their teachings. They uncovered for us the pathology of certain diseases, and later Neisser and Næggath taught us their etiology, and as long as time shall last these men will stand out among the Pathfinders of this generation which has furnished so many leaders.

PASTEUR.

Pasteur, by his investigations, ascertained that fermentation was produced by living microorganisms, and that chicken cholera was an infectious disease and could be prevented by vaccinating the flocks with an attenuated virus. He also demonstrated that pebrine, a disease of silk worms, which was destroying the silk industry of France, was microbic and contagious, and hence preventable. He applied the same enthusiasm to his effort to discover the cause of anthrax, as it affected sheep. He found the source of

the disease, cultivated the germs, attenuated them, and by using the weakened germs and their ptomaines protected the flocks of France from destruction. Following up his idea for vaccination for infectious diseases, he has saved many lives from that frightful malady, hydrophobia; and the artisans in the profession have but followed Pasteur's lead in all the work which has led up to the antitoxins of diphtheria, pneumonia and other contagious diseases.

#### LISTER.

Resting back on Pasteur's work on the cause of fermentation lies the source of the inspiration which filled the soul of Joseph Lister of Edinburgh, and lead him to the experiment which culminated in the triumphs of modern antiseptic and aseptic surgery.

We call the details of modern surgical work Listerism, and correctly we do it, for Sir Joseph was the Pathfinder who led the way, when all the world was buried in the darkness of ignorance. The fact that we may to-day invade, with impunity, any organ of the human body; that thousands of lives are annually saved, that suffering has been lessened, is all due to the labors of these two men; first Pasteur, then Sir Joseph Lister. When the profession fairly learned that suppuration was not "laudable," that surgical inflammation was preventible, and that it was produced by microorganisms, then the pathway was opened for the hunt for the causes of those diseases which were not surgical. And one by one they have yielded up their secrets to the keen eye of the microscopist, aided by Koch and his method of staining tissues to be examined. Robert Koch became a Pathfinder, and when in 1882, he announced that he had discovered the cause of tuberculosis, the world fairly went wild. Since then, what mighty strides have been made in uncovering the sources of many of the scourges which afflict mankind! Consumption, typhoid fever, diphtheria, yellow fever, cholera, leprosy, the infectious diseases, puerperal fever, tetanus, all inflammatory diseases, *et id genus omne!* Malaria has recently yielded its hematozoon to the labors of Laveran, and we predict that the infecting microbe of each of the contagious diseases will be isolated before many years, and all this work, and all the lives saved by modern aseptic and antiseptic surgery, have been made possible by the enthusiasm of Pasteur, the loving, devoted Frenchman, and of Sir Joseph Lister, the laborious Scotchman.

#### MC DOWELL.

In the early part of this century, there lived in the backwoods of Kentucky, an obscure practitioner who was as brave as Julius Caesar; a man who had "courage of his convictions," who dared to lead where, for long years no man was brave enough to follow. And from the pioneer work of that country doctor in the little Kentucky village, has grown up a host of ovariologists; wherever the operation of ovariectomy is performed and a woman's life saved, there is erected a monument to the name and memory of Ephraim McDowell, the Pathfinder in the field of abdominal surgery. All honor to the obscure, brave and undaunted country doctor in the wilds of Kentucky! And yet, while living, he was abused and maligned as a murderer. When dead, the whole world of medicine and surgery honor his memory.

#### SENN.

Less than fifty years ago, there was born in a canton in Switzerland a little boy; his parents brought

him to this country, and he grew up to robust manhood in the west; secured a good English education, struggled hard with poverty to secure his medical degree; obtained it with honor, and became an interne in the Cook County Hospital of Chicago, Illinois. A few years ago he took up the suggestion Sims made in 1878, and on dogs demonstrated that abdominal section, ligature of bleeding vessels and suture of wounded viscera, was not only feasible, but entirely practicable. After a great deal of painstaking work and careful experimentation he laid before the professional world the result of his work.

To-day the labors of Nicholas Senn are bearing fruit the world over, and while it is possible that in certain cases the Murphy button may supplant the decalcified bone plates in the intestinal surgery of the future, yet for all time, Nicholas Senn has written his name on the surgical history of the world. And whenever in the future, human life is placed in jeopardy, by wounds of internal organs, whether on the battle field or in the street brawl, and is saved by either of these or any other device, that life will be a monument, first to Sims for suggesting it, and next to Senn for showing the world how to do it.

The warm hearted friend, the enthusiastic, laborious physician, the brilliant operator and orator, the generous donator to the profession of the largest private medical library in the world, Nicholas Senn, will go down to posterity as the Pathfinder in intestinal surgery.

#### HAIG.

And we venture to place another man in this category of Pathfinders. When the profession realizes that all the cases of migraine or sick headache, diabetes, many of chronic Bright's disease, the cases of so-called idiopathic epilepsy, Raynaud's disease, the cases of so-called neurasthenia and hysteria, all cases of mental depression and consequent suicide, many of the forms of neuritis and the neuralgias and many of the skin diseases, as well as all forms of rheumatism and gout, are but expressions of that dreadful poison which each of us make every day and hour, viz., uric acid; I say, when we realize that all this mass of suffering, probably more than from all other causes put together, is produced by poison of endogenous manufacture, we will have cause to be thankful that personal suffering, with frequent attacks of sick headache, drove Alexander Haig, of London, to investigate uric acid and its protean manifestations.

Future generations will be freed from much suffering by following in the pathway Haig has cut out for us in the dark field of preventable human suffering.

#### SIMS.

In a little village in South Carolina, in 1836, a young man hung out his shingle for the purpose of practicing medicine. In a month or two the leading man of the village called on him and said: "Marion, have you had a case yet?" being answered in the negative, he was told to go up to the man's house, that the baby was ill. The young doctor went and found a very sick child. He thought the child had cholera infantum; told the family to send to his office in one hour and he would have the medicine ready. To his office he went, and got down from his bookshelf "Eberle on Children," the text-book of that day, and began to read up on cholera infantum. As the time drew near for Jennie to come for the medicine he was no more enlightened than when he began to read. One pecu-

liarity of Eberle's bkoo was, that there was a prescription on nearly every page. Well, in the young man's bewilderment he did not know what better he could do than to fill the first prescription, and he did it. In after years I heard him tell about it, and he remarked that "he turned a page on that baby every day, and filled the next prescription." When he got along toward the end of his prescriptions, the baby was ready to be transplanted as a rosebud to paradise, but the doctor did not know it. He had never seen death. He had heard the best of lectures, but had never seen sickness; there was no clinical teaching of medicine then. He paid a final visit to the child, and while sitting beside it and watching the little sufferer, suddenly it stopped breathing. Immediately the doctor picked the baby up, lowered its head, and lifting its legs in the air shook it, thinking the child had fainted and that he would thus get some blood into its brain and revive it. The old woman, who had come in to see the child and incidentally to size up the young doctor, placed her hand on his shoulder and said, "Doctor, you need not shake that baby; it is dead!"

It was a pitiful sight to see the young village doctor who had never seen sickness and death, called to prescribe for a sick child; pitiful to see him go to his books and after an hour's reading, fill the first prescription; pitiful to see this doctor "turn a page on that baby every day;" sadder to see him stand by the child's dying couch and utterly fail to realize that the icy fingers of the grim monster were laying their relentless grasp on its heart strings; and sadder still, as the fleeting breath suddenly ceases, to see him raise it up, lower its head and shake it, in a vain endeavor to shake the blood into its lifeless brain; and pitiful to hear the old woman, who had no faith in young doctors, say, "Doctor, you need not shake that baby; it is dead." What more pitiful sight than this? He who goes forth to save life, utterly unacquainted with death!

See this village doctor again. An accident to a woman suddenly reveals to his brain the way to successfully relieve suffering motherhood of a fearful disease, vesico-vaginal fistula, which had, from all time, been incurable, and which renders its victim a hopeless recluse, forever shut out from society. See him again, when he essays to practice those steps which a revelation from heaven has told him is the way to relief, fail utterly to accomplish a cure; again he tries and again he fails! But he believes first in himself, and knows he is right and must succeed. Again and again failure follows fast on failure. He had gathered together from among his acquaintances six women afflicted with this trouble. He supported them entirely at his own expense. He inspired these women with the belief that he could cure them. At first his professional friends assisted him in his operations; but at last they gave it up, and making assistants of his patients, he continued to operate on them; and for four years he kept at it, knowing he must succeed when he had eliminated all his errors. At last about the end of the fourth year, and on one of the women, the thirteenth operation success crowned his efforts. With success came failure of health.

See him again, broken down in health, go to New York to recover it and to tell the story of his successful work in the relief of the surgical diseases of women. See him thus broken in health, and after showing the profession in New York how to do this work, rejected by this profession and the very men to whom he had

loaned his instruments. See him struggling with poverty and distress, the spirit all taken out of him as he feels in his heart that "Man's inhumanity to man makes countless thousands mourn." Alone, without money and without friends, in that great city! Not only without friends in the profession, where his warm heart expected them, but facing their opposition and finding it everywhere, he turned! He says his condition drove him as near crazy as it was possible for him to be and not lose his mind entirely.

See this enthusiastic, warm-hearted man, broken in health, in spirits and in purse: persecuted by the leaders of the profession he went to teach, and God knows they needed it! See him with his wife and children in distress, and his good wife cutting up her new dresses to make her children look respectable at school! But while in the depth of despair he found a friend at last. It is said, you know, that the darkest hour is just before dawn. And whom do you suppose that friend was? Henri L. Stewart, a newspaper reporter! Through him he reached the medical profession who were not connected with medical colleges, as well as those who were, and then the noble women of New York; and his great enterprise was founded. "The stone which the builders rejected, the same has become the head of the corner."

Struggling, in want, rejected by the profession of New York, and absolutely given no opportunity to show that he could cure a hitherto incurable disease! See him in Europe, with all the leading surgeons sitting at his feet, like Saul of Tarsus at the feet of Gamaliel! Invited to operate in the hospitals, congratulated by them on his success, given private cases on which to operate, his name spreading over the whole of the old World! Verily, a prophet is not without honor save in his own country. And while in the midst of these triumphs, on October 18, 1861, he writes his brave, devoted wife that he would not say *that* day was the happiest of all the days of his life, but that it was the proudest save three others. The first of those three other days was the one on which she gave him a rose bud through the garden fence (which rose bud he kept to his dying day); the second when she gave him her hand in marriage; and the third, the first anniversary of the founding of the Woman's Hospital of the State of New York.

From utter failure with the sick child of the village tailor, he became the successful and beloved physician for the crowned heads of Europe, who were glad to decorate him with medals. It is said of him, that there was no capital in the old world in which he could not have all the patients he could attend to in twenty-four hours after his arrival. And to-day, thousands of loving mothers owe their relief from suffering and restoration to the companionship of their kind, to J. Marion Sims!

While the little village of Lancaster, South Carolina, claims him, and Montgomery, Alabama, gave him to the world, yet, he belongs to humanity, and for all future time, the name of Sims is immortalized. Not only will suffering and injured motherhood for all time owe him a debt of gratitude, but until Sims in 1878, advocated before the British Medical Association, that all persons wounded in the abdomen should have their wounded viscera sewed up, and the bleeding vessels ligated, surgeons dared not invade the peritoneal cavity in this class of injuries.

This beautiful city has honored herself by erecting in her borders a well equipped school of medicine

named in his honor. The first hospital ever erected in the world for the treatment of diseases of women, was done by the energy and labors of this man, and stands to-night in the city of New York commemorating his life and work; and that city has also erected a monument in bronze to his memory. It was my privilege to know him personally, and a nobler, gentler, lovelier, braver man never lived than J. Marion Sims, the village doctor, the physician for the crowned heads of Europe, the reliever of woman's suffering! All hail to his God-like character and beloved memory! Here was a Pathfinder whose life and labors you may be proud to emulate, and I commend him to you as an example in every and any walk in life. Through darkest Africa and Asia, over the entire continent of America, and from the frozen steppes of Russia to the sunny, vine-clad hills of Italy, all future generations of women will owe him a debt of gratitude.

Having thus briefly referred to some of the leading men of this country, I beg permission, gentlemen of the graduated class, to conclude my remarks by the briefest allusion to the prospects which are before us. The Science and the Art of Medicine are not yet complete; there are many arduous labors to be performed; there are many brilliant triumphs yet to be achieved, and I doubt not the several members of this youthful, yet brilliant company, will be found in the front rank of that grand army who are to-day laboring to advance the bounds of our theory and to multiply and perfect the resources of our practice.

To the cultivation of true science, to the alleviation of human suffering, to the divine business of going about doing good, and to the leaving of our beloved profession something richer and better than we found, it is the goal toward which we should set our steadfast feet. The accomplishment of these high aims implies on our part, a lifetime of laborious days, and nights devoid of ease, of unwearied patience, of constant mental and physical exertion, of utter self-abnegation. The way is rugged, but the reward is sublime!

## ORIGINAL ARTICLES.

### TREATMENT OF FIBROIDS OF THE UTERUS.

SURGICAL ENVIRONMENTS, OPERATING ROOM, STERILIZING INSTRUMENTS, LIGATURES AND HANDS.

PATIENTS, PREPARATORY AND AFTER TREATMENT. DRAINAGE.

BY FRANKLIN H. MARTIN, M.D.

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The environments of a patient who is about to submit to a surgical operation for a fibroid of the uterus must be made surgically clean. These environments include operating room, bed, sterilizers, instruments, ligatures and operators' and assistants' hands and clothing.

#### OPERATING ROOM.

In a private house a room should be selected which has direct light through one or two large windows; a room which can be stripped of furniture, hangings and carpets. It should be convenient to the bedroom of the patient, or better the bed can be placed in the room in readiness for use when the operation is finished—the operating room constituting the bedroom. The woodwork of this room should be thoroughly

scrubbed with soap and water, and the walls and ceiling carefully wiped free of dust. The room should be thoroughly aired by opening the windows and a reliable means of heating should be at hand in order to render it dry and to keep it at a temperature of 80 degrees F. when required. The table, which is selected for the operating table, and the stands for instruments and dressings, together with all receptacles or slop tubs and basins should be carefully scrubbed and then conscientiously wiped with a 1:500 solution of chlorid of mercury. All tin, iron or porcelain basins should be boiled for one-half hour in a wash boiler or other large boiler, as a means of sterilization.

The bed, if possible, should consist of a hair mattress which has recently been purified by steam. In a hospital a large steam sterilizer should be provided where hair mattresses can be sterilized frequently. The bed should be completed with dry sterilized sheets, blankets and pillow slips. If there is no sterilizer at hand the bedding can be sterilized by boiling in water one-half hour, and drying in a pure room, and ironing with a hot iron by an intelligent attendant or nurse. Gowns, towels and aprons should be sterilized in the same manner as the bedding, provided there is no regular steam sterilizer at hand.

In an institution the operating room should have floor and walls of such material that they can be thoroughly washed with antiseptic solutions and provided with a central drain which will allow the cleaning of the walls and floors with water direct from a hydrant through a hose. The drain should be reliably trapped, or better, drain directly in to the external air. For convenience, a perfectly fitted operating room should have several anterooms, including a preparatory room where the solutions are prepared, the water sterilized, and where the heating apparatus for the sterilizers and the sterilizers themselves are located. This room should have washable walls. There should also be one or more anesthetizing rooms, and finally there should be convenient dressing and wash rooms for the surgeon and his assistants. The private operating room which I use at the Woman's Hospital is shown in Fig. 1. It has direct side light and a large skylight. Its walls and floors are of marble. It is lighted at night entirely by incandescent electric lights, gas being impracticable where an anesthetic is necessary; these lights are in abundance, so that an operation can be performed equally well at night or day. The preparatory room is adjacent. This is shown in Fig. 2. It is entirely in marble. The battery of Boeckmann's sterilizers is shown in the foreground. In the farther end are two large tanks in which the water is sterilized for the operation, one being filled with cold sterilized water and the other with hot water. They are connected with the operating room by large faucets which pass through the wall. Directly off from this room is an anesthetizing room, and adjacent to this are two dressing rooms with washing utensils. In the operating room is a spectators' rail which separates the operator, assistants, nurses and all operating paraphernalia from those who may be invited to witness operations.

*Sterilizers.*—In a private house, in emergency cases, an ordinary copper or tin wash boiler may take the place of the most elaborate sterilizer. The gowns, towels, gauze operating sheets and all large articles used externally can be thoroughly sterilized by boiling for thirty minutes. For sterilizing instruments, silkworm gut, silk and other smaller articles a smaller