The romance of medicine and other addresses / by William D. Haggard.

To Wm Turner

From

H. Rider Haggard

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THE ROMANCE OF MEDICINE AND OTHER ADDRESSES

BY

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[1927]

TO

MY WIFE

AND

SON

Foreword

I may be absolved from the fear of writing a book lest mine enemies destroy me. The following pages have during the last fifteen years been written and published as separate scientific papers and addresses on phases of preventive medicine in a semi-popular vein. They have been selected from some three score articles and thus put together in permanent form as a memento to friend and colleague and as a record of the activities and achievements in medicine and surgery as gauged by

THE AUTHOR.

NASHVILLE, TENNESSEE
DECEMBER THE EIGHTH
1 9 2 7

Contents

The Romance of Medicine*

"Taught by art divine the sage physician eludes the urn, and chains or exiles death."

The story of medicine enthralls the imagination by its infinite charm and arouses admiration for its victories in the battles against disease.

Its romance is so compelling that men cannot be unmoved by its blessings, when they realize with us its splendor. The records of the discoveries of medicine are more fascinating than fiction; their marvelous benefits are as if in response to Jeremiah's lament, "Is there no balm in Gilead, is there no physician there?"

The price of these great benefactions is beyond all the rubies of the world; it can never be computed and it can never be paid. In the Middle Ages the average life of man was twenty-odd years. Now the span has been increased almost threefold. Compute if you can the growth in economic value of a human life extended to this lengthened expectancy and worth an ever-increasing yearly wage. Compute the value given by bestowing these benefits to all the nations of the world. If you can estimate these things, only then will you have totaled the economic wealth contributed to mankind by this incomparable service. And in the precious years that have been added to the span of life, countless days of unhappiness and suffering have been eliminated. Innumerable ills have been parried from the feeble flesh of man. What a glorious thing it is when the piteous procession of men and women beg of you to be allowed to live a little longer on any terms, that you can succor them by the knowledge of Nature's secrets that are your heritage from the studies of the scholars of all times.

Wonderful as the past has been, the last fifty years of medicine have witnessed more achievements of a miraculous character than the five preceding centuries. This is the golden age of medical advancement. Discoveries of transcendent import have trooped on us in bewildering profusion. Allusion to some

*President's address before the American Medical Association at the Seventy-Sixth Annual Session, Atlantic City, N. J., May, 1925.

will suffice to give a glimpse of the glamour by which all are pervaded. The last century gave us ether and chloroform, by which, as Oliver Wendell Holmes said, "the fiercest extremity of suffering was steeped in the waters of oblivion and the deepest furrow in the knotted brow of agony has been smoothed away forever." Antisepsis has revolutionized surgery and made possible the present proud perfection of that most brilliant of all the arts. Mathematically, it has reduced the death rate from all amputations from 65 per cent, in Paris in 1861, to 4.5 per cent in Pennsylvania today. Among its many almost incredible feats is now recorded a successful effort to cut the narrowed valves inside the heart itself, and allow the blood to flow unobstructedly again. Although the heart is only one inch from the surface of the body, twenty centuries of surgery rolled by before the scalpel could travel that inch.

Medicine is the only profession that is literally and altruistically devoted to professional suicide. It endeavors chiefly, not alone to cure, but to prevent disease, and thus to banish from mankind pain, suffering and ultimate death from maladies of the flesh. But what it cannot prevent it must cure. What it cannot cure it must palliate. Angina pectoris, the merciless, is now being attacked surgically and the heart-pang relieved in certain cases by severing the sympathetic nerves in the neck that transmit the unendurable pain.

The discovery of the germ of tuberculosis, "the Captain of the men of Death," was the beginning of the annihilation of the Great White Plague and is a more important victory for mankind than resulted from the Fifteen Decisive Battles of the World. Already the death toll has been reduced from 160 per hundred thousand in 1910 to 97 per hundred thousand in 1922. But the fact that even today every third minute on the clock's dial marks a death from tuberculosis, challenges us to still greater efforts. It is now largely a social problem. As the contagion for the most part comes from the lungs and mouth, we must teach everybody not only to burn expectorations, but to avoid this contagious material in every possible way. We must prevent, rather than be faced by the necessity of attempting later cure.

That the spirochete was the actual cause of syphilis, the great Black Plague, was discovered by Schaudinn in 1905. Miraculously enough, in the next year Ehrlich discovered that his six hundred and sixth experiment with arsenical compounds gave the present arsphenamin, with power to stay its ravages.

A romance in medicine to grip the admiration of the world is the subjugation of typhoid fever. In the Boer War, typhoid destroyed 8,000 British soldiers, while only 7,000 were killed by all the enginery of Mars. In the World War, as a result of antityphoid vaccine, which was given to each of our 4,000,000 American soldiers, and increasing knowledge of sanitation, only 1,083 cases of typhoid fever developed, with only 158 deaths. If the ratio between enlistments and deaths from typhoid in the American Civil War had been maintained in the World War, there would have been some 226,000 cases, with 62,694 deaths. This conquest of typhoid is one of the greatest benisons of modern medicine.

Most dramatic among medical victories in the conquest of yellow fever, the scourge of the Spanish Main, "the pestilence that walketh in darkness; . . . the destruction that wasteth at noonday." An epidemic of this in 1793 took the lives of 10,000 people in Philadelphia in three months and kept the Southern states in consternation with the recurring seasons. Its devastation prevented the genius of France from building the Panama Canal across a zone which for four centuries had been called "the white man's grave." The indomitableness of Roosevelt was matched by the genius of Gorgas, the master of yellow fever, who made of the charnel-hole of Panama the healthiest spot on earth. Thus occurred the union of the oceans through the canal.

In the opening year of the twentieth century, Reed, Carroll, Lazear and Agramonte proved, through the peace-time bravery of American soldiers, who bared their bodies for the fateful experiments, that a mosquito transmits yellow fever. While experimenting with death-laden *Stegomyia,* one of these army surgeons was bitten on the hand and sacrificed his own life in the consuming passion to save his fellow man. No man hath greater love than this. As Agramonte said of him, "One more name, that of Jesse W. Lazear, was graven upon the portals of immortality." Is it immodest for us in recounting this heroic self-sacrifice to

have the pride of guild and to regard proudly the noble deeds of our profession?

In the last decade, many diseases of the heart, kidneys, gall-bladder and other organs have been shown to be derived frequently from the foci of infection around the teeth, in the tonsils, in the sinuses of the nose, and in other structures. This great discovery has enabled the physician to administer in many cases the most effective of all treatments, the removal of the cause. Rosenow has taken the infectious material from the vicinity of stone in the kidney and, by implanting it in a cavity drilled in the healthy tooth of a dog, has been able to produce stone in the dog's kidney in 85 per cent. of the cases. By injecting into the veins of a rabbit's ear material taken from an infected appendix, from ulcer of the stomach, and from inflammations associated with gallstones, Rosenow has also been able to reproduce the disease in the organ from which it was obtained. This experimentation seems to show the specificity of certain micro-organisms for regularly attacking the same structures, under definite conditions. We know, for instance, that the agent in infantile paralysis gains access through the nasal cavity and lodges in the anterior horn of the spinal cord. Prevention or even eradication of diseased foci thrice arms the physician of today for the throttling of many insidious diseases or, if they have gained headway, for their amelioration or cure.

The discovery of radium by Madame Curie, close on the discovery of the roentgen ray by Roentgen in 1896, was not only a triumph in wresting another secret from the physical world, but has furnished a most necromantic weapon for the cure of certain forms of cancer and for its palliation in hopelessly neglected cases.

The use of safe drugs for local injection in rendering surgical operations painless is now like a performance in a world of magic. Antitetanic serum to prevent lockjaw is the king of preventive serums. Practically every battle casualty in France was potentially infected with lockjaw. Every wounded man that came back from the front had the letters A.T.S. (antitetanic serum) pasted on his forehead. The universal use of the serum mercifully prevented the terrors of lockjaw.

The transfusion of blood into the veins of those who from injury or disease are sickened into the whiteness and coldness of death quickly brings back the glow to the cheek and the red-lipped promise of reclaimed life. This boon was made possible by the discovery by Moss, of the four types of blood; the use of an untyped and dissimilar blood-group donor is most dangerous.

We physicians and the whole world are daily debtors to the innumerable instruments of precision, to the blood pressure apparatus, the basal metabolism rate machines, and the newer instruments for administering gases, that render anesthesia almost totally devoid of danger.

What is more astounding than the revelation in the last few decades of the part played in our bodies and lives by the wonder-working ductless glands? They send weird and powerful hormones as chemical messengers to command the functions of the body. The thyroid gland presides over our growth; its absence makes the gnomelike grotesque idiot, the cretin. Administration of the life-giving thyroid extract veritably restores the dead in mind and brings dwarfed bodies back to blooming youth. Compared to these realities, legends of old-time restoration of the dead are but interesting myths.

It seems incredible that the pituitary gland at the base of the brain, weighing only 2 grams, will, when diseased, cause the prodigious growth of a giant, and when its secretion is deficient produce the enormous fat deposit of the pathologically obese.

The greatest romance of the last few years in medicine was the discovery of insulin by Banting. The wizardry of rescuing the diabetic patient by this remarkable discovery is truly a marvel.

Goiter is largely due to a deficiency of iodin in food and water. While it can be successfully removed, with an infinitesimal death rate, it should be prevented in childhood by the administration of iodin in small quantities to children twice a year. These wonder-working ductless glands largely determine personality. Individuality seems, after all, to be largely the product of the chemistry of our bodies.

Passing from the intangible to the practical, we may note that the solution of the pellagra problem seems nearer with the in-

creasing belief that pellagra is a deficiency disease, possibly from a shortage of vitamins, and seems to be caused by faulty protein food mixture and is greatly benefited by fresh meat and milk. These and other contributions of medicine to the relief of humankind are more thrilling to the man of science than all the wars of selfish kings.

I am not an unqualifying eulogist of the profession of medicine; I am but telling the plain, unvarnished truths that constitute the romance of our great calling. Like every sublunary institution, that of medicine is subject to evils, many of them common to it and other professions, and many others which pertain to it alone. We are prone to be overenthusiastic about each new advance; on the other hand, many of us are as unable to evaluate the worth of a fresh discovery as was Joseph Bell (the original of Sherlock Holmes) to recognize the solemn significance of antisepsis, as advocated by Lister, albeit he was his daily colleague in the wards of the Glasgow Infirmary.

It may not be regarded as romantic, and therefore within the realm of this paper, to recall that the cause of typhus fever is the bite of an infected body louse; but when one thinks of the terrifying epidemics on sea and land which have been stamped out by this knowledge and by sanitation, our medical accomplishment rises, not only to the romantic, but to the sublime. Likewise the most fatal of all infections, plague, bubonic and pneumonic, is transmitted to man by the flea that has bitten the infected rat. The extermination of the rat prevents it and Haffkine's vaccine cures it. Rocky Mountain spotted fever has been shown by Ricketts to be transmitted by the wood-tick.

The most threatening cloud of chronic disease in the South, hookworm, has been dissolved by the wand of Aesculapius. Through the labors of physicians and the beneficence of the Rockefeller Institute, the weakened, anemic, shiftless "poor white" has, by the use of thymol, been freed from the parasite. There is yet so much to discover. It requires a vision and endless, patient, animal experimentation. Claude Bernard said that whenever he left his laboratory he put on the cloak of his imagination in order to know where next to look, through experimentation, for Truth. The microbic causes of smallpox, of measles,

of mumps, of chicken-pox and of the much-dreaded encephalitis (so-called sleeping sickness) are as yet undetected. And many chronic diseases are still eluding an accurate analysis and a cure. Lest we be vainglorious, let us hasten to remember that there is as yet no specific for pneumonia, which, with the other acute respiratory diseases, destroys more lives every day than any other one ailment.

Cancer, the most pitiless of all maladies, is our rebellious and still elusive foe. It has not yielded up its murderous secret. We know all about its life history except the very beginning. It is regularly curable in its first stages, in most cases by surgery, in many by radium, and in others by the roentgen ray; but its bacterial causes, if such there be, still elude the patient investigator. The honor and benefit of this great discovery is more to be desired by the physician than the wealth of Midas, the wisdom of Solomon or the glory of Napoleon.

The fiery serpent that bit the children of Israel when they wandered through the wilderness was possibly the guinea-worm, which enters the body as a water-flea, develops, and ultimately lies coiled under the skin, from 1 to 6 feet in length. It formerly was coaxed out by winding it on a stick, little by little each day. Then the zoologist found that it seeks water in which to lay its eggs, and will naively crawl out if the affected leg or arm is simply submerged in water for a few hours.

The mysterious is so simple when revealed by science! And so our learning advances little by little. Each of the myriad of discoveries for the protection of man against his environmental enemies is almost akin in comparative magnitude to the body of a single tiny coral polyp in the great structure to which it contributes. Thus we rear the eternal structure of the Temple of Medicine.

Periodic Health Examination

The real romance of present-day medicine is to prevent or to discover early the degenerative conditions of the great organs, the heart, kidneys, liver and brain. All the saving in life has been in the prevention of infant mortality and in the control of

contagious diseases. Eternal vigilance of every individual by his physciain is the price of lengthened life in the middle aged.

As civilization can be measured by the statistics of public health, so sanitation is an expression of humanitarian impulses coupled with intelligent and expert application of medical knowledge to the community. Preventive medicine has made phenomenal progress in recent years. Particularly is this exemplified in the unsurpassed efficiency of the American army, from the point of view of health, during the World War. It was the cleanest army the world has ever seen. There were required more than 35,000 of the flower of American medical profession to make and keep it fit to fight. None but the regular practitioners of medicine were permitted to touch the bodies of the precious soldiers in cantonment or advanced sector; but the noncombatants were constantly attacked at home, as always, by bizarre methods of treatment, so called, of a type which, as Barnum said, the American people love.

Community health is much in advance of the prevention of illness in the individual. Physicians have been so busily occupied in the care of the acutely sick that they may have had little time and have given scant attention to those who are in apparent health. People in great numbers have been amazed, when resting securely in the supposed enjoyment of perfect health, to find that an examination for life insurance revealed some entirely unsuspected malady, such as Bright's disease, diabetes or heart disease, that could and should have been easily detected long before. One third of the people who die from heart disease or Bright's disease, die before they are 50 years of age. Even apoplexy shows 15 per cent of its mortality under 50. These three conditions cause more than one fourth of all deaths. By early detection and eradication of the causes of these fatal lesions, many unnecessary deaths can be prevented.

What does it profit a person to neglect his physical condition and the wonderful mechanism of his body, the temple of his immortal soul? All other machinery is thoroughly overhauled at regular intervals. Boilers are frequently inspected, lest they explode. We all, physicians and laymen, have ignored the tremendous importance of a periodic and thorough physical examination.

We have thus neglected our patients and even ourselves. In Shakespeare's Cymbeline, the bard sagely remarks, "By medicine life may be prolonged, yet death will seize the doctor, too."

Have a thorough physical examination on your birthday! It should be a real survey of a man's physical as well as mental status. Why should not a yearly inventory be made by one's physician of his habits, environments, occupation and dietary? If this plan could become universal, it would be the best post-graduate course in physical diagnosis that our profession as a whole could take.

From the economic side, there could scarcely be a better and closer relation between the physician and his clientele. The actual care and completeness of the examination would be in such startling contrast to the inadequacy and makeshift examination by the irregular practitioners and cults that it would be an education to patients who are not now privileged to understand really the difference between a competent, regularly graduated high-type physician and the man who without adequate preparation masquerades under the guise of a doctor. The humaneness of the thing would appeal to the patient who needs us to tell him how to keep well. We will utilize our skill in anticipating future disability. We shall be promoting the ever-widening field of preclinical medicine, and shall at last come into our own, because in the interpretation of our findings and the laying down of rules of health and conduct, we shall at last be carrying out the original meaning of the word "physician," which is teacher. We must learn to deal with the brutally healthy man who never thinks of anticipating disease and forgets what a tremendously intricate and wonderfully made machine he so wofully neglets. He is very confident, yet his apparently superb stamina sometimes plays him false by throwing him entirely off his guard and making him an easy prey for some insidious disease stealthily to take hold on him. The proverb says, "Honor a physician before thou hast need of him."

It is estimated that the number of cases of sickness in this country in a year is thirteen and a half million, costing the nation a billion dollars. It is astounding to think that there are 225 million days of sickness a year in the United States. If it were pos-

sible, by nation-wide effort, to reduce the amount of sickness by 25 per cent., the total economic gain yearly would be around a quarter of a billion dollars. How can one estimate the worth in anguish relieved and death postponed? Prevention runs as a thread of gold through the fabric of medicine. Every time we prevent illness we not only preserve that one individual as a productive force, but also one or two persons who would be required otherwise to care for him. The military maxim that it is better to wound an enemy than to kill him is based on this idea.

The people should be taught that in truth there can no more be different "schools" of medicine than there can be different schools of physics, or of mathematics or astronomy. There is nothing under the sun which is of proved value that has not and will not be used by the profession in the treatment of disease. All of chemistry, of sanitation, of serums, of massage, of treatment by radium, of surgery, and of application of drugs are at our beck and call. All are utilized in the treatment of diseases. Sane men will not follow a charlatan. But if any trustworthy guide, be he physician or layman, proves that a given remedy is of value in the treatment of diseases, we will utilize it and will honor him. We should not be compelled, however, as Zinsser remarks, to eat an entire artichoke in order to get a tiny bit of really edible substance. There are, regarding healing, many decidedly fractional truths. As to some of them, the term "half truth" is an unwarranted exaggeration. "Nay," said Lord Bacon, "we see the weakness and fragility of men in sickness, as they will often prefer a mountebank or witch before the learned physician, and therefore the poets were clear sighted in discerning this folly when they made Aesculapius and Circe brother and sister, both children of the Sun."

All nonmedical agencies are enthusiastic endorsers of health examinations. Life insurance companies quickly saw a great saving in the postponement of the termination of premium periods by early detection and correction in their beginnings of chronic and fatal maladies. And the persons insured also gain, for they have their lives conserved and their longevity prolonged. Social health agencies promptly recognize a probable reduction in the cost to the public of care of the indigent sick, a wonderful in-

crease in well-being and freedom from painful and distressing illness, and a consequent great contribution to human happiness. Yet periodic health examinations are primarily a practicing physician's direct obligation. Nothing is better calculated than they to bring about the continuity of the long-established and mutually confidential relation of the medical profession with the community it serves. To be successful, however, the idea of health examinations would require a real campaign, with the laity cooperating.

Let us have a drive for the prevention of illness by making a survey of the apparently well and devising an inventory for right living and for properly planned hygiene for the needs of each individual case among our apparently robust patients—a drive to treat the incipiently sick while they can be cured.

We will treat the mind as well as the body. It will give the opportunity to ask that most important of all questions in the investigation of the chronic case; viz., "Are you happy? If not, why not?" Can any one give more sympathetic and sane advice about the abstruse mental and emotional problems of life than the resourceful, experienced, tactful physician? Is his not the buoyant, commanding personality by virtue of the peculiar oracle-like relation which he sustains to his patient to be the scientific and sympathetic Samaritan?

> "Canst thou not minister to a mind diseased,
> Pluck from the memory a rooted sorrow,
> Raze out the hidden troubles of the brain,
> And with some sweet oblivious antidote
> Cleanse the stuff'd bosom of that perilous stuff
> Which weighs upon the heart?"

A health week should be established nationally by all the health agencies of this country, with the cooperation of every one of the 90,000 members of the American Medical Association. The press can be counted on to do its part, which is as essential as it is unfalteringly interested and helpful in all health movements. A manual for the examination is being prepared by the American Medical Association. Examination blanks can be obtained from the headquarters, making for completeness and uniformity. A copy of the examination might properly be given

the patients for their information, and one kept by the physician as a permanent record. Last, but not least, is a well considered interpretation of the patient's needs, physical, occupational and mental; and comprehending advice may finally be given to meet his peculiar needs. While it is primarily a technically complete head to toe physical examination, it is more a stock-taking of the patient's physical condition and an annual audit for health guidance.

Kipling tells of a legend in which the gods stole the godhead from man, who was at that time a sort of deity. They agreed to hide it. The wisest of the gods, Brahm, hid this tiny, unstable light of the stolen godhead where man would never dream of looking for it—inside man himself. That has ever since been Brahm's secret and will always be until man himself discovers it. Can the physician not help him to find his lost godhead?

Medical Education

The stupendous advance in medical education in the last fifteen years reads like a romance. The United States contained 160 good and bad medical colleges, more than twice as many as the rest of the world. These schools have been reduced to eighty strong schools. The course has been doubled in the last three decades. More than one-fourth of these schools are departments of state universities. Enormous endowments have made medical education the pampered favorite of private munificence. The medical schools of America can proudly take their place in the sun.

The supply of an adequate number of sane, resourceful, dependable physicians should have the solicitude of the profession as a whole, as well as of the medical educators. The fear has been expressed that we are overtraining our students, that the specialties are so fascinating and their teachers are so enthusiastic that too much time is devoted to them in the undergraduate years. These years should, in truth, be given to basic preparation. The student must in the four years in the medical school encompass all the broad, fundamental principles of medicine. The man who is going to become a specialist should wait until after his hospital interneship and preferably some years in

general practice before he takes up specialization. A specialty should be a postgraduate study, not a part of a student's first preparation.

The laboratory side also should not be overcultivated. Fundamentals should be stressed, but recondite experimental work omitted in the undergraduate course. Relatively few students are going to be purely research men, and comparatively few are temperamentally fitted for that service. It is impossible really to make of an undergraduate an expert in any of the laboratory sciences. An excess of laboratory instruction, to the deprivation of needed bedside work, will not best prepare the student for the treatment of the sick.

In this desirable correlation between the pure sciences and the clinical subjects, the student of anatomy and pathology should be brought in his first two years into contact with the patient, so that he will appreciate the relationship of his studies to the problems of disease. Much more interest would be evinced in chemistry and bacteriology if every student were early to be given a glimpse of its wonderful relation to the patient. Then later, when the purely clinical work is taken up, it is not wise to abandon the study of biochemistry and physiology. Regarding clinical work in England, the Council on Medical Curriculum has advocated the continuation in the clinic itself of anatomy, physiology, pathology and chemistry, as these apply to the problems of medicine and surgery there presented. In this country our clinical and pathologic conferences have been the source of greatest inspiration.

The new medical school of Vanderbilt University is entirely housed in the hospital, thus linking up the wards with the laboratories in an integral and intimate way. We feel that it will be a distinct gain. It will afford an unparalleled opportunity for the simultaneous study of the medical sciences and the patient. The pathologic department will be a guiding center. Fresh tissue and not merely postmortem of terminal processes will be studied. It will concentrate on the causes as well as the development of disease. With the close relation of the dispensary and the hospital, the pathologic department, where all the problems of the patient can be brought and where all the men can work as undergradu-

ates, as internes, as residents and as members of the staff, it ought to foster a spirit of investigative interest in the patient that will be stimulating to the completest possible training.

Our British cousins speak of the American methods as encyclopedic theory, and say that our effort in diagnosis is to make such a thorough study of the patient's state that no cell remains unturned. The student must be taught, as urged by President Hadley, to distinguish between the possession of information and the power or habit of thought. There is no substitute for thinking. Knowledge is proud that he has learned so much; Wisdom is humble that he knows no more.

A physician who gets a good start on a limited original training may go further than his more erudite brother, but he will always be happier and more efficient if he is interested in the humanities. The student must not be allowed to get so interested in the disease that he forgets the patient.

The question of entering the student into practice at an earlier age is important. It is impossible to devote to preliminary preparation less than two years of college work in biology, physics and chemistry, and it is impossible to eliminate anything from the four year medical course. The hospital year is essential. The only chance to curtail the length of time would be by saving one or two years in the high school. This can be done by the four quarter school year and no compulsory vacation at an unchangeable time, thus saving one or two years for the student with medicine as his goal.

Specialism

One of the greatest romances in the art of medicine has been the amazing growth and perfection of the specialties. A man with an adequate training and a wide knowledge of disease, who devotes his entire time and thought to the problems of one department of medicine or one group of organs, can arrive at a surpassing degree of excellence. Some of the most intricate processes of relief for disease and injury are practiced by the specialists with an almost uncanny degree of dexterity. The removal of foreign bodies from the lungs by the bronchoscopic method amounts to legerdemain. The skill that is amassed by employing methods

of precision over and over again becomes truly miraculous. The accumulative experience begets wisdom and judgment and a choice of the methods that are the most effectual. The development of the specialties has been possible by the focusing of original and brilliant minds on problems that are beckoning for solution. Specialism is so alluring that it is impoverishing the personnel available for the laboratories and decimating the ranks of the general practitioner. It is astounding what the country doctor, unaided by the panoply of present-day instruments of precision, accomplished by the use of his five senses and that other very essential sense—common sense. "All but eternal doom was conquered by their art."

One of the drawbacks of specialization is that it loses for the physician the personal touch and close contact with the family and with the acutely ill. The family physician has with the family during illness a personal, intimate, sacred relation which the specialist can never enjoy. The general practitioner must retake his former position of importance. The grander domain of internal medicine must remain steadfastly the soul of medicine, the center of the color standard.

The Family Physician

The family physician has ever been the bulwark of medicine. "He shall heal the nations and defraud the tomb." His has been the labor of love as well as a superb endeavor to combat disease and rout it from its citadel. He is confronted with the most desperate conditions and has with rare resourcefulness risen to his responsibilities. The intrepidity of the country doctor in the management of the emergencies of accident and disease, the perils of childbirth, and the mastery of conditions under the most adverse circumstances is unparalleled. His calling exacts, as Kipling said, the utmost that man can give—full knowledge, a steadfast hand, exquisite judgment and skill of the highest, to be put forth not at any self-chosen moment but daily at the need of others. He knows how to gild the gloom of affliction's couch with the silver lining of Hope.

The pagans believed that the physician came from the god of music, since it was his province to keep in tune the harp of a

thousand strings. The physician has been eyes to the blind, feet to the maimed, deliverer of the poor; he has caused the widow's heart to sing for joy, and has gained the blessings of him that was ready to perish. He has been the Good Samaritan, and has imitated the benevolent miracles of the Great Physician.

Who will write the epic of the family doctor? Would that a Shakespeare could weave his deeds of bravery, his tender sympathy, his discretion and tact, his cheerfulness and courage, his devotion and fortitude, into an immortal sonnet.

Oliver Wendell Holmes apostrophized the spirit of service:

> Charity is the eminent virtue of the medical profession. Show me the garret or the cellar which its messengers do not penetrate; tell me of the pestilence which its heroes have not braved in their errands of mercy; name to me the . . . practitioner who is not ready to be the servant of servants in the cause of humanity, . . . and whose footprints you will find in the path to every haunt of stricken humanity.

Yours is a glorious privilege of "inscribing your memories not on perishable marble but in the living affections of your fellowmen." The war trump, the muffled drum, the measured tread of armed men, and the musket shot pealing over the grave honor the death of the soldier, but the physician who meets his death battling for Truth in the great arena of Science passes often to an inconspicuous grave, mourned only by the few who knew his worth.

At the southern entrance of St. Paul's Cathedral stands a statue of Sir Astley Cooper, by Bailey, a beautiful commemoration of the unrivaled surgical reputation of this great surgeon and of his fame as a teacher. Who will erect a monument in bronze or stone to the family physician? Would it not be fitting to perpetuate symbolically the vision of his service and the splendid part that he has played in the pioneer civilization of this country? We have commemorated our statesmen, scholars and warriors. What of the man whose life is spent in the interest of humanity, for preserving their lives instead of the ruthless destruction of their bodies? An unknown British warrior lies in the

crypt of Westminster Abbey to commemorate the spirit, the bravery and the sacrifice of his fellows. Above him is inscribed:

> They buried him among the Kings because he had done good toward God and toward His house.

The French have immortalized their unknown soldier under the Arc de Triomphe, typifying the unparalleled fervor, fearlessness and patriotism of the poilu; and we in America have enshrined our unknown soldier at Arlington. It is time that a monument be erected to the unknown family physician—generations of them—in grateful acclaim of their unfaltering love of duty and ineffable devotion to suffering humanity.

Tumors of the Small Intestine*

Tumors of the small intestine are rare surgical conditions but persent many problems of extreme interest. While the diagnosis is nearly always shrouded in mystery, nevertheless the perfection of surgical measures enables us to make the attack on these growths very satisfactorily from a technical standpoint. These growths are, in the preponderating number of cases, malignant and, therefore, enhance the responsibility of the clinician in divining their character early and in advising surgical measures with promptitude. While the results have been far from satisfactory, nevertheless it can be shown that our attitude should not be entirely characterized by pessimism.

The benign growths include adenomas, lipomas, fibromas, myomas, angiomas, cysts, lymphangiectasis and that rare condition described by MacCallum, the multiple cavernous, hemangiomas of the intestine.

Of these, the adenomas are the most frequent. They may be polypoid in character. The fibroma causing a movable tumor often results in obstruction. F. S. Watson reports a successful resection of a tumor of this type, 2 by 3¼ inches in size.

The subserous lipomas are next in frequency. A very great many are never recognized and are symptomless.

Stetten collected reports of seventy-seven cases somewhat equally divided between the large and small intestine with an average age in the patients of 47 and occurring in both sexes equally. They are usually single, sometimes multiple, and vary from the size of a pea to a child's head, but on an average are about as large as a walnut. They may protrude into the lumen as polyps and, of course, have no tendency to malignancy. If of sufficient size they may cause obstruction; intussusception occurred in about half of the cases in which symptoms were noted. These tumors cause 8 per cent of the invaginations according to Treves.

Cysts of the small intestine are usually congenital in contrast to those of the large intestine in which inflammatory processes in

*Read in the Section on Surgery of the American Medical Association, at the Sixty-Third Annual Session, held at Atlantic City, June, 1912.

the mucosa, following dysentery, are probably causative. In the small intestine cysts seem to result from the persisting relics of the irregular obliteration of the omphalomesenteric ducts. They vary in histology from the simple mucous cysts to the dermoid. They are often negligible in size but if large may produce irregular recurring attacks of partial obstruction. The benign growths rarely become large enough to be felt through the abdominal wall.

MacCallum described a case of cavernous venous tumors situated chiefly in the submucosa throughout the small intestine which seemed to have been rarely observed before, only five similar cases being found in the literature. A man of 54 complained of digestive disturbances which lasted for some months. He died of acute alcoholism. Post-mortem examination showed hemangiomas of the intestine. They were small, fairly firm areas which showed through the mucosa as blackish purple patches, about forty in number.

Of the malignant growth, carcinoma occurs twenty times as often as sarcoma. Sarcoma is more prone to attack the small intestine and carcinoma the large. The small intestine is free from acute flexures and transitional functions and contains liquids. It is not, therefore, subject to the traumas that we recognize as the greatest cause of carcinoma throughout the body. We now appreciate that the prevention of chronic continuous irritation is of vast importance in the prophylaxis of cancer. By the same token it is not improbable that the malignant growths in the small intestine have their precancerous stage which should be looked for just as assiduously as it is in other localities. It has been observed in my own cases that enteritis and colitis are the conditions precedent to the development of malignant neoplasms. They bear the same relation to malignant neoplasms that chronic ulcer does to cancer of the stomach. It behooves us, therefore, to be on the alert for irregular pain, mucus and blood in the stools and constipation, alternating with diarrhea. If, perhaps we can recognize irregular peristalsis or possibly a neoplasm it may still be in the precancerous stage and may probably be in the incipient or curable stage. Carcinoma is apt to produce a stenosis; sarcoma produces dilatation of the intestine as an aneurysma!

sac. Carcinoma is more likely to occur at an earlier age in the intestine than in any other cancerous site. In 41,834 autopsies in Vienna, 343 carcinomas of the intestines were found; seven in the duodenum; one in the jejunum; ten in the ileum; 164 in the cecum and colon; 162 in the rectum. According to the statistics of Froehner, 47 per cent of 128 cases were sarcoma; 22 per cent carcinoma. While the latter are usually single, 44 per cent were said to be multiple.

Cancer in the duodenum is exceedingly rare. Ewald says only three occurred in 1,148 cases of cancer of the small intestine, yet Syme, of Melbourne, resected a case successfully, as did also Küttner. Brill from a large number of cases from various sources found 2.5 per cent in the small intestine. In the jejunum not a single case was found out of 63,462 post-mortems, but Keyser collected reports of eleven isolated cases, including one of his own, the average age being 43.9 years.

They are usually of the cylindrical-cell type and have their origin in the follicles of Lieberkühn. In six cases with operation, reports of which were collected by Lecene, only one patient remained permanently cured.

Sarcoma

Sarcoma is usually situated higher in the intestinal tract than carcinoma. In 21,000 autopsies in Vienna sarcoma of the small intestine was found only three times. It is more prone to occur nearer the cecum. It occurs twice as often in men as in women, but the average is less than in cancer.

Corner and Fairbanks collected reports of 175 cases of sarcoma of the intestinal tract; twenty were in the ileocecal region; eleven in the large intestine; seven in the rectum; fourteen in the esophagus; fifty-eight in the stomach and sixty-five in the small intestine. Of this latter number, 60 per cent caused obstruction. They presented all the microscopic varieties, the round cell being the most frequent, but the spindle cell being the most favorable from a prognostic standpoint. The lymphosarcoma, originating in the submucous lymphnodes, early involves the muscular layer which becomes paralyzed, resulting in dilatation.

In a patient under 15 sarcoma should be suspected, carcinoma

usually occurring after the age of 40. The tumors are of a very much larger growth and are often movable. When the tumor occurs in the right iliac region one has to eliminate chronic appendicitis, retroperitoneal abscess, tuberculosis, actinomycosis and chronic intussusception.

Balzer estimated their duration from about two weeks to three and one-quarter years. The fatal termination occurs usually in the first nine months, although Rutherford describes one which endured for two and one-half years.

Symptoms

The higher in the intestinal tract the situation of the tumor, the more pronounced are the symptoms. It may run a latent course, produce indefinite symptoms or, finally, stenosis, ending in complete obstruction. These conditions may all occur at identical situations in different cases. Heredity offers no valuable information, although traumatism was mentioned in two cases: metastasis resulted in three-fifths of the patients. The diagnosis, as Rheinwald says, is made in most cases of autopsies *in vivo* or *in mortuo*. Extraordinarily large tumors are usually sarcoma and curiously are quite painless. The rapid course with emaciation and marasmus indicates sarcoma.

Anderson found no cases in the literature in which the diagnosis could be made.

The chronic or recurring cramping, colicky pains are quite suggestive, however, and when severe without inflammatory symptoms, associated with distention and vomiting, active and visible, peristalsis eventuates into acute obstruction. The early symptoms are evasive and often are associated with loss of appetite, nausea and vomiting with epigastric pain. If this is sudden it is a warning. Distention may occur from implication of the peritoneum, interference with blood-vessels, from pressure, tympany, the size of the growth and, finally, from perforation. In advanced cases effusion, either serous or chyle-like, hemorrhagic or suppurative, is present. Blood may be found in the stools. Indicanuria and albumin sometimes occur. The short duration of the disease is characteristic.

In the Massachusetts General Hospital, of seventy-seven pa-

Resection of 42 inches of the ileum for sarcoma in boy of 9. Ileocecal anastomosis. Recovery. Patient alive and well at the end of seventeen years.

tients with cancer of the intestine operated on by various surgeons from 1890 to 1900, 28 per cent died in the first week, 19 per cent in the first four weeks, 18 per cent within the first half year, 5 per cent between the first half of the year and the whole year, 11 per cent between one and two years, 5 per cent between two and three years, and 3 per cent are still alive. Thus less than 30 per cent lived longer than six months after operation.

Anderson reported the case of a patient on whom resection was done for a sarcoma and who was alive after eighteen months, but he knew of only one other patient that lived over a year.

Corner and Fairbanks take a more optimistic view, particularly in reference to the early cases and found six examples, in their collection, of cure lasting from one to nine years. Among the children under 10 years of age in a group of fifteen case-reports collected by Van Zwaluwenburg only one succumbed to operation; two are alive and well one year after operation; one is well six months afterward.

Moynihan collected reports of operations on forty patients, twenty-five of whom recovered.

Erdman removed 48 inches of the jejunum and ileum for sarcoma complicated by small metastasis of the stomach which was excised with recovery.

Varley removed 6 feet 5 inches in a boy of 6 with operative and physiologic recovery.

The following case presents a number of interesting features in its clinical course, surgical features, pathologic findings and result.

History.—The patient, W. K., aged 9, referred to me by Dr. Donoho, of Hartsville, Tenn., complained of frequent colics and presented a right-sided movable abdominal tumor. The parents and one brother and sister were living and well, but the mother and another brother had had suppurative cervical glands. The grandfather and one aunt had had tuberculosis, but there was no history of cancer. During his second summer the patient had a very severe attack of gastro-enteritis which lasted three months and was attended with considerable blood, very frequent stools and great emaciation. He had a diarrhea every summer thereafter for five summers, but was apparently well in the winter. Two years before admission he began to have attacks of abdominal colic, rather mild at first and relieved spontaneously. A little later they were more severe, lasted longer and exhausted most of the household remedies and, finally, before he came for treatment, they required morphin for relief. At first these colics occurred every month and gradually increased in frequency until they came every few days. The stools were observed to be smaller in caliber during

the previous six months. During this time the boy was obliged to eat soft diet as solid food would cause an attack of pain. Castor oil was invariably administered with these attacks of colic and later it was necessary to give it daily. For the last five months an appreciable swelling in the right iliac region appeared with each attack of cramps and vomiting; the latter was always associated with paroxysms, which came on suddenly and persisted with some severity. This swelling was extremely sensitive, but disappeared as relief was obtained from purgation or morphin. Between the periods of cramping the patient seemed to be quite well and active, although he had lost considerable weight as the result of the restricted diet.

Examination.—A movable tumor in the right iliac region was prominent and easily discerned. His physician who had seen him only during the attacks of pain had only observed this in a tranquil interval some days before. It had evidently been in existence, however, for some weeks. The tumor was only slightly dull on percussion, non-sensitive and movable within moderate limitation. The chest was normal; there was no elevation in temperature and the urine was normal. The enlargement was at first thought to be tuberculous, not only on account of the history, but on account of the further fact that he used almost an exclusive milk-diet, which came from a cow that had lately died after presenting cough and other evidences of tuberculosis. There was no ascites, however, and a tuberculin test was negative. Operation was advised for a neoplasm of undetermined origin.

Operation.—An incision through the right semilunaris revealed the growth in the ileum some 5 inches in length and about 2¾ inches in circumference. A group of glands was situated immediately underneath it and extended far enough into the mesentery to overlap the blood-supply of a number of inches distal to the growth. The omentum was adherent at the apex of the neoplasm. After its division and clamping of the mesentery, the mass was removed, together with the glands, which also necessitated the removal of a number of inches of small intestine that were not involved. The entire specimen measured 42 inches. (Fig. 1.) The terminal ileum was removed flush from the cecum which opening was closed, and at a higher point a lateral ileocecal anastomosis was made with linen suture. Microscopical examination showed small round celled sarcoma. (Figs. 2 and 3.)

Result.—The patient made a rather slow, but good, recovery. During the first few months the bowels moved several times a day, but during the last year they are normal in amount but rather soft. The patient weighed, at the time of the operation, 45 pounds; at the end of two years he now weighs 66½ pounds, is apparently free from recurrence and in the full enjoyment of boyish vigor.

The Qualifications of the Surgeon*

Almost incredible progress has been made in surgery during this wondrous age. The amplification of its uses would be a source of consternation even to our immediate forefathers.

The ever-widening scope of diseased conditions amenable to the beneficences of surgery has brought into requisition a large number of men and a high degree of excellence. No vocation, in fact, demands a higher type of endowment than that of the surgeon.

Can there be any more brilliant achievement than the conquering of the inveterate sufferings, the fatal wounds, or the deadly diseases that lie ensconced in the intricate and almost inaccessible recesses of the human body? It is a hazardous invasion and requires the utmost skill and intrepidity. Any man who has the capabilities and varied faculties that go to make a successful surgeon could so much more easily succeed in some other avocations. He must be a great scientist and a great student whose studentship must continue. Finney has well said: "The science of surgery will always overshadow the art, and unless one is well-grounded in the principles of true scientific surgery, it must degenerate into something of a trade or a sort of sleight-of-hand performance." When the arduous scientific side is mastered, the surgeon must also become a great artist. In pure art all that is essential is the spark of genius. Application does the rest. The surgeon, in addition to being a scientist, must needs be a highly trained technician. Above all there should be the great heart and impulses of the man.

Celsus, the illustrious Roman, declared that a surgeon should have a firm and steady hand, a keen eye, and the most unflinching courage, which can disregard alike the sight of blood and the cries of the patient. This applied to the physical and temperamental needs of the man during the infliction of great pain on the conscious patient.

Now we have blessed anesthesia by which "the fiercest extremity of suffering has been steeped in the waters of oblivion and

*The Oration on Surgery read in the Section on Surgery of the American Medical Association, at the Sixty-Fourth Annual Session, held at Minneapolis, June 18, 1913.

the deepest furrow in the knotted brow of agony, has been smoothed away forever." (Oliver Wendell Holmes.) Surgery is concerned not only with grave wounds and injuries, but with myriads of diseased conditions, from those of the new-born babe to those of extreme old age. Women and children are especially in need of its beneficences. The surgeon should, therefore, be a man of the broadest and tenderest sympathies, and one whose kindliness and gentleness are unfailing. "Be ye wise as serpents, gentle as doves." The era of extreme delicacy in the handling of tissues and gentleness of manipulation has come. These are perhaps after all the most important principles of anoci-association.

Can any one fathom the responsibilities of the surgeon? There is scarcely a time in his busy life when he is not confronted with some exceedingly disquieting and all-absorbing case, and no long space of time but measures some appalling disaster that embitters the great service to which his life is consecrated. That great and sound man, Maurice Richardson, whose recent death has bereaved not only New England, but the entire guild of surgeons throughout the world, measured up more than any man of his time to the enormous responsibilities of a surgeon's life. He said in all sincerity:

> The surgeon reviewing his active years of practice cannot but be impressed by the responsibilities of his profession. He recalls the frequent misgivings with which, on the strength of his fallible opinion, he has advised and performed operations; the excitement of a critical operation and the deep breath of thankfulness when he has succeeded in averting some grave complication; his forebodings become realities; the too often useless struggle against overwhelming odds; the distressful death; the severe self-criticism and biting regrets. And is not the surgeon, appreciating his own unfitness in spite of years of devotion, in the position to condemn those who lightly take up such burdens without preparation and too often without conscience?

The first great requirement of the surgeon is a conscience. It should be his constant mentor and the great arbiter of those momentous decisions which come daily to those who combat disease and death and whose efforts are so far-reaching in the preservation of life and in the science of humanity.

In no spirit of vaingloriousness be it said that American surgery at its best represents the very highest type of that art in

the civilized world. The surgeons of this country, who are in their prime to-day, represent the pioneers of the new surgery. They are the first generation of men who were educated in the antiseptic era. Their experience has been unprecedented. Much of the newer work has been created by them and has practically all been evolved since their student days. They have been pathfinders. They have had all of the hardships of the early settler. Ambition, resourcefulness, hardihood, adaptation and a devotion worthy of their great calling have made of the active and seasoned men of to-day the brilliant, but practical, intrepid and cautious American surgeons. Taught in the hard school of experience, is it not the duty of this courageous band to plan for the education of the future surgeon? Has not the time come in the evolution of our art when certain requirements should be made; certain qualifications demanded; certain training prescribed to the end that loftier ideals may be established, more perfected and efficient work accomplished and for the fame of American surgery an inextinguishable lamp be lighted?

There is no denying that much of the surgery being done is extremely ill-advised and miserably executed. I am keenly alive to my own shortcomings, and in spite of a fair degree of opportunity and a number of years of more or less diligence, realize how far short I fall of the ideals herein to be expressed. My house is one of such complete transparency that I hesitate to cast a stone. The criticisms, however, are intended as purely constructive.

The increased amount of operative work at this day and the ready acquiescence of individuals who know what has been accomplished enables many general practitioners untrained in surgery and many young men without the leavening experience of general practice to essay the perilous role of the surgeon.

Hospitals make the same preparation for all operators alike. With aseptic precautions and rubber gloves many men are able to invade the abdominal cavity and tissues within the body without actually destroying the life of the patient. The mortality, while very much greater than it should be, is not absolutely forbidding, but the morbidity is really incalculable and the results are aften valueless if not permanently disabling.

Comparatively benign invasion of structures is only the beginning of surgery. Any house surgeon should be able to do this. Cure with a minimum of risk and a maximum of results should be the end and aim. As Finney has said, "None knows better than the experienced surgeon how far-reaching are the possibilities for good or evil lurking behind every surgical procedure." Therefore, the indication should be exceedingly clear, the need great and all of the safeguarding and exacting conditions fulfilled. The unnecessary operation is the crying shame of present-day surgery. These are performed by the operator, not by the surgeon. There is a vast distinction between an operator and a surgeon. There are many of the former but few of the latter class, comprehending as it does men of saneness, probity and judgment. How difficult is the acquisition of surgical judgment! Judgment is the queen of mental attributes in the ordinary affairs of life; but how all-important and responsible is the exercise of that judgment, even if acquired, when brought to bear on the health, the limb and life that is so trustingly and confidently placed in the hands of that man who alone can restore it!

Would that another Senn could arise and rebuke us for our furore to do surgery. It would indeed require the stentorian voice of a great leader to stem the tide of the unnecessary surgical operations of our day. Is it not a castigation when a humorous periodical says, "If you go to the doctor's office sufficiently often, you will be operated on?" This is the result of many contributing factors; bad judgment, inexperience, an overweening desire to do surgery, the ease and facility with which all of the drudgery can be avoided in the hospital, the surgical exploitation of the neurasthenic and, lastly, let it be sorrowfully said, the commercial spirit which has raised its hydra head in all its monstrousness among us. Would that it could be cast out! It must be! yea, it will be, and largely by the individual and united efforts of the members of the Section on Surgery of the American Medical Association.

Nebraska has passed a law making it a penal offence for a commission to be offered or accepted, or for fee-splitting to be practiced in any form. Every state should have such a law,

unless the profession can clean its Augean stables within its own ranks.

The most dangerous operator is not the enthusiastic beginner, because he will learn; not the antiquated back number, because he will die; but it is the occasional operator, the general practitioner without special training and the young man whose only preparation consists in the ordinary undergraduate work of the average medical college.

As the Nestor of surgery in this country, Halstead, that great teacher, has said, in his memorable address on "The Training of the Surgeon," the interne "suffers not only from inexperience, but also from overexperience. He has in his short term of service responsibilties which are too great for him; he becomes accustomed to act without preparation and acquires a confidence in himself and a self-complacency which may be useful in times of emergency, but which tend to blind him to his inadequacy and to warp his career."

Unfortunately, a great deal of serious surgery is attempted by men with the most meager opportunities and the frailest ability. It is as cheap to prepare to be this kind of a surgeon as to follow any other line of medicine and it is attractive not only to the purely ambitious, but to the avaricious. It is not a question of the patient's well-being, but the commercial value of the patient; one might almost say the commercial value of human life.

It is an exceedingly difficult matter for any one of us to appreciate our limitations. Is it not a fact that the surgeon in one field who takes cases in a remote field with which he is not familiar is more guilty than the practitioner who occasionally does some simple form of surgery, although not quite so well trained to do it as the surgical specialist?

Dr. Stuart McGuire has said, "No conscientious surgeon should undertake an operation without asking himself whether he has the skill to do the work satisfactorily."

The great middle class are the greatest sufferers from surgical delinquencies. The poor are safeguarded by their poverty, which necessitates their going to the charity clinics. These are as a rule competently manned. The rich are protected by their knowl-

edge and cultivated habit of seeking the best. It is the large middle class, who are able to pay moderately for what they get and who think one doctor is about as good as another, that get the most indifferent service.

The multiplication of the small hospitals in the smaller cities and towns has undoubtedly ministered to many sufferers in a satisfactory manner. After all, the size of the town does not matter, but the size of the man does. If one man in a community can by natural aptitude, innate ability and good training establish or be put at the head of a well-ordered hospital, the character of the work will be high. Such a man will command the cooperation of his confréres. It is a distinct mistake, however, to encourage four or five men in a town where there are from six to twelve practitioners to believe that each one can do the surgery that may come to him. They do not or cannot have a sufficient number of serious cases to make them all competent, even granting they have the ability and previous training. It is a mistake for a young man to go out with his one year's experience in hospital work and give out the statement on his cards and otherwise that he is to do surgery exclusively. If young men are permitted to enter surgery without experience or training and to say that they will displace their elders, still other young men will come on and displace them, so whether the surgical work comes early or late it will last only for about the same period of time. The objection to adequate preparation on the ground that the surgeon will be an old man before he starts is not valid.

As Halstead says:

> The faults of our system of educating surgeons begin almost at the bottom and continue to the very top. I am considering only the training of the best men, those who aspire to the higher career in surgery. On graduation they become hospital internes, but their term in the hospital is only one and a half, occasionally two years, only a little longer than the term of hospital service required in Germany of every applicant for the medical degree, and not so long, on the average, as that required of each medical graduate of the University of Tokio.

The foundation for improved conditions in our profession must be in more efficient education. In less than ten years the Council on Medical Education of the American Medical Asso-

ciation has done a prodigious work. The Council found that in this country there existed 166 medical colleges, which was one less than existed in the remainder of the civilized world. As a result of the investigation, classification and publication of the work of this council, sixty-five of these colleges have been merged to make stronger ones, or have become extinct. Many of this latter type were a disgrace. There are about 112 medical colleges in the United States now. When we realize that there are only twenty universities in the German Empire, it is obvious that in America we have an oversupply, and a further reduction, in the light of modern educational demands, is inevitable. Already the large majority of low-grade colleges are not fully recognized by some twenty-four state licensing boards.

Stupendous improvements have been made. The four-year course is universal. A four-year high-school course is the minimum requirement for entrance. All of the better colleges have adopted in addition a pre-medical year of chemistry, physics, biology and a modern language, which goes into effect in January, 1914. Thirty-two medical colleges require as a minimum for entrance two or more years of college work in addition to the four-year high-school course. There will not be an increased college requirement, because that would keep the man too long and he should not be over 24 or 25 years of age when he begins his life work.

The next and much-needed advance is the compulsory or fifth year spent as a hospital interne. The council on education is now preparing data for this work. While the council has, of course, no legal function, still, if it can do the investigative and standardizing work for the hospitals in this country that it did for the medical colleges, it will do great good. In connection with the Council, the Carnegie Foundation for the Advancement of Learning signified its willingness to help. A munificent endowment has been set aside for this work. It will consist of an intensive investigation of the hospitals in the thirty-five most populous centers, together with the inspection of all the hospitals in this country. They will be classified somewhat similarly to the Colleges. The basis of classification being the number of beds, the amount of endowment or appropriation for their support, the

equipment and laboratory facilities, the methods of organization and willingness to furnish proper training for medical students. At present there are a total of about 3,000 internes. The combined graduating classes equal about 4,500 students. This still leaves about 1,500 graduates for whom hospital interneships should be provided if the interneship year becomes compulsory. As about 1,400 hospitals, having approximately 3,500 beds, have no internes, it seems that this matter could be easily arranged. I have referred to this matter only from the interne's standpoint, but it is apparent that the good accruing to the hospitals themselves, the general uplift from more detailed information as to their needs, and a constructive policy for betterment are benefits almost incomparable.

Even now over one-half of the high-grade colleges placed 70 per cent of their graduates in hospital positions last year. Some such arrangement as withholding a license to practice until after the hospital year has been satisfactorily completed would be very desirable. Let final examinations occur at the end of the fourth year, but licensure should not be completed until the hospital service is finished.

Every hospital should require the most promising of the internes to continue their service into the second or third year as house surgeons. This not only gives the capable man longer training, but also is a protection when the house staff changes; it is a great help to the new internes; a stimulus to their best efforts and the only way to keep up the traditions, methods and *esprit de corps.* Whenever possible the large hospitals should inaugurate the system of having a resident surgeon, choosing the exceptional man, whose tenure should be indeterminate. This increased opportunity for surgical training and the prolonged inspiration of his chief would afford the best facilities for a great surgical career.

Quoting again from Halstead:

> It is a grave mistake, it is a shame, to check suddenly the advance of these superior young men, who are tense with enthusiasm, who rejoice in the work to which they hope to be able to dedicate their lives. It is from these men, we must not forget, that our teachers of surgery are made.

The foundation in Washington last month of the American College of Surgeons, which has for its purpose the elevation and standardization of surgery for the benefit of the profession and the protection of the people by the granting of a fellowship to all men whose surgeonship is established and the conferring of the title F. A. C. S., which will indicate to the public and the profession that its possessor is well qualified to practice this branch of the profession as a specialty, seems to give form to the movement for increased requirements and the maintenance of a higher standard. The college is to be independent of all societies, continental in scope, democratic in spirit and eventually to comprise all of the men in the United States and Canada who are properly qualified and so to designate them.

It is to be presided over by a board of governors, elected by the college. A board of regents, chosen by the governors, acting as trustees, will from time to time establish requirements for the granting of fellowships. All surgeons of prominence having had five years in the practice of surgery, or one of its specialties, who are of unquestioned moral character, measured by the standard of the college, and who are vouched for by the committee on credentials, are eligible to fellowship without examination.

Ultimately, the college will formulate prescribed requirements, with examination, for the younger men who are candidates for the fellowship. Already the founders represent every large city in America; all of the medical universities; all of the general and special surgical societies; all of the important hospitals and clinics, and a large number of independent surgeons throughout the continent.

It seems that this movement is of transcendent importance. If all of the good men who are properly qualified become Fellows of the American College of Surgeons, and those who morally and educationally are unfit to do surgery are not accepted, it will be a crystallization of the high ideals for which the American Medical Association has always stood.

Every man who expects to practice surgery as a specialty should be required to act as chief assistant to a master surgeon for at least three years, and better five. It will be objected that

this is too long, but the goal is not for those who soon weary of study and protracted preparation. Apprenticeship is far more essential in surgery than in any of the arts in which it is universal. A man is obliged to act as apprentice a specified number of years before he is allowed to pilot a lumber scow. Who asks to see the pilot's license when a surgeon is needed to pilot the frail bark of life through the treacherous "waters that separate the island of Time from the mainland of Eternity"?

We need a system of requirements and a course of training, and they surely will be realized, that will make of the first youths of our land what their abilities and ambitions entitle them to be, will attract to surgery the very best material and will make of the rank and file well-equipped and conscientious surgeons.

As suggestive the following outline of requirements is formulated:

1. A full four-year medical course in a high-grade medical college or university, leading to the degree of M.D., after adequate high-school and the special one-year premedical science course in college. It is especially desirable that, in addition to thorough fundamental and laboratory training in anatomy, physiology, pathology and bacteriology, such schools provide ample, practical instruction in dispensary and ward classes in medicine, surgery and the specialties, with practical midwifery and post-mortem work.

2. Compulsory hospital interneship in a good general hospital, with adequate laboratory facilities, for at least one year and if possible two years.

3. Certain high-grade colleges maintaining or controlling exceptionally good hospitals should be encouraged to give a one-year graduate course in surgery after two or more years' hospital work, or after three to five years of general practice leading to the degree of master of surgery, which in addition to practical hospital work should thoroughly teach gross pathology, operative surgery on the cadaver, perfected technical work on the viscera of slaughtered animals, and experimental surgery on the lower animals. The student should be brought into close touch with the research laboratory. This would fill a great want. So many well-prepared and ambitious young men after being in practice for several years and doing some surgery with more or less success, are anxious and clamorous to take additional work, to which they are willing to give the required time and for which they are willing to pay. They importune many individual surgeons to take them as private assistants. The strictly postgraduate schools have been of considerable value to such men, but as a rule the courses are not long enough.

4. In addition to a compulsory hospital interneship before licensure, a specified number of years of general practice, or extra years in a hospital, should be required of those who would make surgery a specialty. No man can become a good surgeon without the illuminating experience of general practice.

5. Before taking up surgery, a man should be required to serve at least three years as assistant to an established surgeon.

6. The requirements need not be quite so exacting for the aural or ophthalmic surgeon, but should embrace as a minimum at least two years' hospital work, one year in general and one year in special work, the latter to follow at least two or three years in general practice.

7. It would seem desirable that a prescribed course of study and training somewhat in conformity with the foregoing should be followed by examination and conferring of a distinctive title to distinguish the surgeon from the internist.

8. The establishment of certain legal requirements for the practice of surgery, to be enacted into a uniform state law, or if possible into federal law, providing for special examination and licensure. Such a law was introduced into the Illinois legislature at its last session and embodied most of the suggestions herein set forth.

In the making and maintaining of a high degree of surgeonship, the value of travel and studying the work of the great clinicians of our country, as well as those of Europe, cannot be too forcefully urged. Kocher has been the traveler of Europe, and the men who have the greatest clinics of America are themselves the greatest observers of the work of others.

The obligation of the profession in medicine, as well as in surgery, is a very sacred one. It must be our constant endeavor, by the unwritten laws of custom, by the force of speech, by ethical regulation in the profession, by educational betterment and by statutory enactment, to safeguard the traditions and ideals of the profession and fulfil our highest obligation in caring for the lives, the health and the happiness of the people of this country.

A Review of One Thousand Operations for Appendicitis*

This paper is based upon an operative experience of somewhat over a thousand cases of appendicitis—viz. 1,133. The appendix was also removed 228 times in the course of other intra-abdominal operations, but they are not included in this series. For purposes of analysis the last five hundred and sixteen (516) cases from May 1, 1911, to May 1, 1915, are most available, inasmuch as the records of our early work, both hospital and private, are not complete enough for a critical and instructive study. These five hundred and sixteen (516) cases occurred numerically in the last four years, respectively, as follows: 87, 114, 138 and 177. They were practically all operated on in one hospital. Of this number, two hundred and fifty-one (251) were subacute, chronic or interval cases, with one death. This was due to a pre-operative skin contamination, which should have been avoided. In addition to this there were twelve (12) deaths in the acute cases, a mortality of 2½ per cent for the entire series. They were all of the perforative or gangrenous type (Fig. 1), with spreading peritonitis, and were mostly of third, fourth and fifth-day duration.

There are too many cases of delay in the early hours of the disease. It is an operation that should be done to-day! Not, "to-morrow, if he is not better." Only one of my cases that was operated on in the first thirty-six hours failed to recover.

All the cases presenting themselves with the diagnosis of peritonitis from appendicitis were operated on save four. While they were not strictly from the operation, yet, inasmuch as they had appendicitis and came in the hospital alive and went out dead, they have been included in the statistics.

Counting all of the cases that came under my observation at the hospital, irrespective of the cause and time of death, and whether too desperate for operation or not, the total number of deaths is seventeen (17), or a mortality of 3.2%.

"The hospital reports of the last year show that the average mortality in appendicitis cases by all operators in all stages of

*Reprint from *Southern Medical Journal*, November, 1915.

the disease, in these respective hospitals is about 10%." (Preface to Vol. General Surgery Practical Medical Series, 1915.) This is four or five times too high, and is the death-rate of delay.

There has been no death in our series of acute appendicitis in which the disease was still confined to the appendix. It is, therefore, about as safe to remove the appendix in the beginning of the attack as it is in the interval or in the chronic cases. The question, therefore, arises, what does it profit the patient to defer operation in any case of acute appendicitis where it is available and to accept the general death rate of over 3 per cent where it should have been practically nil?

"The fate of the patient lies in the physician, who sees him during the first day of his illness."

Murphy says "it can be laid down as a law, if a case of appendicitis has pus outside of the wall of the appendix at the time of operation it has been improperly treated up to that date. A properly treated case of appendicitis is always operated on before pus gets beyond the boundary of the appendix," and adds with naive irony, "if the patient is rescued by late operation he is under no special obligation to the physician who permitted his life to be jeopardized."

With the many desperate complications which murderously threaten our patients from advanced and unchecked peritonitis, are we justified in postponing operation simply because it is well known that interval operations are attended with an infinitesimally lower mortality? This series, as those of many others of much larger scope, show the uniform safety and practical parity of results in the early acute cases, as in the so-called interval cases that have been obliged to go through the hazard of an attack without operation.

This group represents every grade of severity including the moribund and about every possible complication; the duration of the disease varying from ten hours to three weeks.

In it are included four cases of tuberculosis of the appendix, three of whom were of the ileocecal valve, which required resection of the head of the colon, together with the appendix without mortality. One was complicated by a stone in the ureter, which was accidentally discovered most fortunately in the intra-

abdominal exploration and removed without drainage with recovery. There was one case of inflammation of Meckels diverticlum, which was removed.

With these exceptions, while there was a number of mistaken diagnoses, they have since been tabulated under their respective revised diagnoses. The chief one of these was chole-cystitis with or without stones of which there were several examples, and a small number of right-sided tubal and ovarian inflammations; one case of ectopic gestation and one case of peritonitis from a duodenal ulcer. I have been able to revise the diagnosis of appendicitis in three instances of early typhoid fever in which operation was not performed. I have also demonstrated several cases of pneumonia, mostly in children, diagnosed as appendicitis.

Do not fail to sit the patient up and examine the back of the chest. One of the p's in appendicitis may stand for the initial letter in pneumonia.

The most frequent mistake in the diagnosis of the cases of appendicitis which I have seen has been the diagnosis of intestinal obstruction. There are undoubtedly many cases which are extremely difficult to discriminate. There was one in which, on account of the tumor and subsequent peritonitis, with temperature and leucocytosis, we were led into the error of operating with a preconceived idea of appendiceal abscess on the fifth day of the disease, but which really required resection of six feet of semi-gangrenous intestine, with recovery.

It is well known that the majority of cases of beginning peritonitis have obstructive symptoms from paresis of the intestine, but there is no real mechanical obstruction. The supreme sign in this differentiation is the absence of temperature in obstruction in the first twenty-four or thirty-six hours of the disease and the invariable presence of temperature in appendicitis during the same period.

It is almost a routine practice to remove the appendix when in the abdomen for the relief of other pathology, if the condition of the patient justifies it. In no instance has the removal of the appendix been the cause of death, and, in fact, in only one case has death occurred from any cause in our series where the appendix was coincidentally removed at the same time, showing

that it has not been superimposed on an operation of gravity and that, moreover, it does not add appreciably to the risk.

It is encouraging to find that over one-half of our last 500 cases have, however, been operated on during the quiescent period. The first half of these one thousand cases would probably not represent one-fifth that were operated on between attacks. Kocher has described this operation as "the treasured jewel of operative surgery." Patients themselves are now so easily convinced of the wisdom and safety of submitting to surgical treatment under these ideal conditions that many of them apply to the surgeon themselves without any insistence from their regular medical adviser.

Whether as cause or effect, enteroliths in the appendix is a very frequent finding. In 138 consecutive cases occurring in one year there were 28 enteroliths, or about 20%. A large number of acute perforations are due to compression necrosis at the site of the stone. In abscess cases it should be carefully looked for. If left behind a sinus persists. If it is not extruded from the appendix the sinus is likely to be permanent. In only one abscess case where the enterolith was found, and the appendix was not removed has it been necessary to re-operate.

In chronic cases with frequent mild attacks, and with a persistent tenderness, little continuous temperature (99 and a fraction) several small shot-like stones are often found. Sometimes a single stone becomes of considerable size. (Fig. II.)

One of the most satisfactory recollections of our early work was the relatively large number of abscess cases that were operated on successfully from the tenth to the fourteenth day. Many of them had become adherent to the abdominal wall, and they were uniformly all cured by simple incision and drainage. We are seeing relatively few of these cases now, inasmuch as they are, unfortunately for the surgeon, referred at a time when this completed localization has not occurred, and therefore, have either been operated on at a notoriously dangerous period, namely, the third, fourth or fifth day, or, thanks to the teaching of Ochsner, have been in many instances carried through this period, either to abscess formation or to a more favorable period for operation and occasionally to complete resolution.

There is a feeling among some members of our profession that they can discriminate between a so-called catarrhal and a severe inflammatory form of appendicitis. With an increasing experience I find myself very loath to make such a refinement in differentiation. As Moore has said, "the time to decide whether a case is catarrhal or gangrenous is after the surgeon has removed the specimen." We have had many sad fatalities where dependence was placed upon such precise but futile efforts.

The next most serious error in our profession in the treatment of this disease, as we have observed it, is the very great tendency to administer purgatives. This is the most dangerous possible thing that can happen to a patient with appendicitis. Deaver says "purgation kills more than the knife." Anatomical and physiological rest is most desirable, with or without operation. It is well known that the peritoneum has wonderful powers of self-protection. The appendix is most favorably situated for sequestration. It is surrounded on three sides by the limiting parieties and on the inner side the mesentery and the powerful omentum makes the most intelligent and effective effort at protection of the outlying areas. When the saving adhesions are about to be formed the all-too-ready purgative is administered and the resulting peristalsis rudely disturbs nature's wonderful craftsmanship and facilitates perforation, separation of adjacent viscera and dissemination of the deadly contents. The purge is the submarine to nature's allies. Deaver has shown that in 97.5 per cent of the cases drastically purged the appendix and peritoneum were visited with the severest possible pathology, and asks in consideration of such appalling results whether the mortality in appendicitis under such circumstances is medical or surgical, and says the time will come when a man who uses a purgative in appendicitis will lose his standing in the profession, as well as his patient. Five fecal fistulae in one hundred cases in the Children's Hospital had been purged and 79 out of 256 cases gave a history of purgation before admission, showing the very great and harmful frequency.

Ochsner says "the giving of cathartics of any kind during acute gangrenous or perforative appendicitis at any time during

the attack has undoubtedly destroyed more lives than surgery has saved in this disease."

Next in danger to cathartics is the administration of food. It may be laid down as an axiom, therefore, that the entire abstinence from any and all forms of nourishment or drugs by mouth is the most desirable possible medical effort, whether the patient is to be operated on or not. To illustrate not only the great harm which they do, but the almost incredible value of its withholding, Ochsner says he has yet to see any case of appendicitis or peritonitis die where absolutely no food or drugs were given by mouth.

We have noticed that practically every one of our cases showing perforation and gangrene, with local and general peritonitis, has invariably a purgation history.

A fetish that is cherished by some of our confreres is the ice-bag. For the relief of pain it has some usefulness; but as a curative measure, where it is from three to six inches from the appendix, it seems ridiculous. It is preferred, however, to incrustation with antiphlogistine.

In making the diagnosis we have depended very greatly upon the orderly appearance of, first, the epigastric and periumbilical, or generalized abdominal pain; second, the nausea and vomiting; third, the tenderness and rigidity, and, fourth, the temperature. We have found considerable aid in the almost invariable symptoms of leucocytosis. It has varied in our cases from 10,000 to 20,000. It is extremely rare to find any case of acute appendicitis that does not show from 8,000 to 15,000. It is also a fairly regular index in its higher mountings of the presence of suppuration. Where other symptoms of severe peritonitis exist, with a low leucocyte count, it shows a lack of resistance on the part of the patient and a very severe type of infection.

The cessation of pain does not necessarily mean a recession of the symptoms. It may indicate death of the appendix by partial or complete gangrene. Dead tissues are painless. Perforation, too, for a time may give temporary relief from pain only to have a return with more agonizing intensity and spreading peritonitis.

Our present practice may be summarized to operate as early

as possible in the disease, within the first twenty-four hours, if possible; in the second twenty-four, if we must; in the third twenty-four, if the condition of the patient seems to warrant it, and thereafter, in practically all cases who have had the damage that purgatives and food give and whose symptoms yet indicate that operation may be beneficial.

The modern conception of the operation is to remove the products of disease with as little possible disturbance to the protective mechanism of the peritoneum as possible.

With more perfected methods of anaesthesia, especially the nitrous oxid and oxygen, the rapid operation, avoidance of irrigation and as little sponging as is possible in the evacuation of pus, with adequate drainage of the pelvis, the Fowler position, the proctocysis by the seeping-in method, described by Murphy, with the plain water advocated by Trout, we have been able to save cases that were hitherto lost by too strenuous efforts at cleansing the peritoneum. In these advanced cases it may be said, "the more thorough the operation the more quickly the patient dies."

Among the complications in our series we have had five cases of intestinal obstruction while the patient was yet in the hospital. Four were treated by enterostomy, with three recoveries. The other one was relieved by separation of adhesions. Another occurred three weeks after leaving the hospital with operative recovery. There were twelve cases of fecal fistulae, some of them undoubtedly from necrosis from the drainage tube. All closed spontaneously but two. There were five cases of post-operative pleurisy, with effusion. Three were purulent, two of whom recovered.

In one case a sponge was left which gave rise to a fistula for many weeks. Irrigation, no matter how long employed, always came back, even at the last, with a little cloudiness which finally led me to reopen the wound and discover the small piece of gauze. In several instances we found the appendix had sloughed off and came out with the purulent material, but this must be relatively rare, and when considered from the standpoint of the patient's deliverance from his disease by this method, is a romance.

The appendix was left in the abscess cases in forty (40) instances; eight (8) of these were reoperated upon. One had a stone in the appendix, with a sinus through it which acted like a sequestrum. It is not wise to remove the appendix where it adds to the jeopardy of the patient. When the abscess is 10 or 14 days old and is adherent to the anterior abdominal wall, and nature has been successful in walling the process off, it is, as a rule, unwise and unnecessary to attempt removal. It is better to have a live patient with his appendix left behind than to persevere in removing it with added hazard.

Surgery of the Spleen, Adrenals and Retroperitoneal Space*

The spleen which is the largest of the ductless glands lies in the left hypochondrium and has the shape of a tetrahedron with its long axis lying in the same direction as the tenth rib. The peritoneum almost completely invests the gland and two portions of this membrane, the gastrosplenic and the lienorenal ligaments, attach the hilum of the spleen to the fundus of the stomach internally and the anterior aspect of the left kidney inferiorly. The phrenic aspect is larger than the colonic or renal and adapts its shape to the concavity of the diaphragm by which it is separated from the ninth, tenth and eleventh ribs. The deepest pocket of the pleural cavity and the thin marginal portions of the left lung intervene between the outer aspect of the spleen and the parietes. It comes into close contact with the left kidney, the stomach and splenic flexure of the colon which contribute to its support. On the concave gastric surface is the hilum, which transmits the vessels and nerves. Immediately posterior to the hilum rests the tail of the pancreas. The spleen is about 5 in. long and 3 in. wide. It therefore has to be considerably increased in size to be palpable. It has a dark blue or purplish color, due to the pigment of degenerated red cells arrested within its tissue. It weighs about 150 gm. The splenic artery is very large, being a branch of the cœliac axis and permits all the blood in the body to pass through the spleen in a short time. The nerves are from the solar plexus and the splanchnic sympathetics ramify in its capsule. There are no filaments from the spinal cord as the spleen is one of the primitive organs of the body and existed possibly before the development of the central nervous system.

The absence of the spleen is compatible with health, for the gland is not essential to life. After removal the bone marrow and lymph nodes take on its function. It is an organ of internal secretion controlled by hormones acting through its blood stream.

Its mysterious function, having to do with the production of

*Section XI of *Binnie's Treatise on Regional Surgery*, 1917.

the white blood cells in embryo, apparently ceases at birth after which it removates the erythrocytes. When diseased, it reverts to its primitive function as characterized by an enormous proliferation of the white cells and a wholesale destruction of the red corpuscles with great increase in its own size.

Diseases of the Spleen which may Demand Surgical Intervention.—1. Primary splenomegaly, splenic anæmia and Banti's disease. 2. Pernicious anæmia. 3. New growths. 4. Cysts, true and false, the latter usually following hemorrhage into its substance. 5. Wandering spleen when painful, adherent or with twisted pedicle. 8. Malarial hypertrophy, if unaffected by specific treatment or when ruptured. 7. Abscess, usually of embolic origin. 8. Tuberculosis, if primary and causing tumor. 9. Injuries.

In pernicious anemia, massive quantities of whole blood should be transfused 24 or 48 hours before splenectomy and after a hemolytic test has been made. This may be repeated until the patient is brought into a safely operable condition.

The chief contraindication to operations on the spleen is leukemia. A blood examination is always imperative in making the diagnosis. No case of removal of the spleen for leukemia has ever outlived the disease which has uniformly continued to a fatal termination. The other non-surgical enlargements of the spleen are associated with (1) pernicious anæmia; (2) splenomegalic polycythemia; (3) typhoid fever and (4) kala-azar.

"Differential Diagnosis of Splenic Tumors."—Splenic tumors may be almost of any size, even filling the greater part of the abdomen. In most cases, however, the enlargement is greatest in the left side and the spleen, unless fixed by adhesions, moves with respiration. The enlarged spleen is so closely applied to the abdominal wall that it is impossible to insinuate the hand between its upper margin and the costal border; it has a sharp inner border which is almost always interrupted by one, two or three notches. Splenic tumors always grow forward, they never produce fullness in the loin. The dullness in percussion extends up to the sixth rib or higher in the mid-axillary line. The colon is first displaced downward and later lies behind the enlarged spleen, so that any resonance due to it will be in the flank or

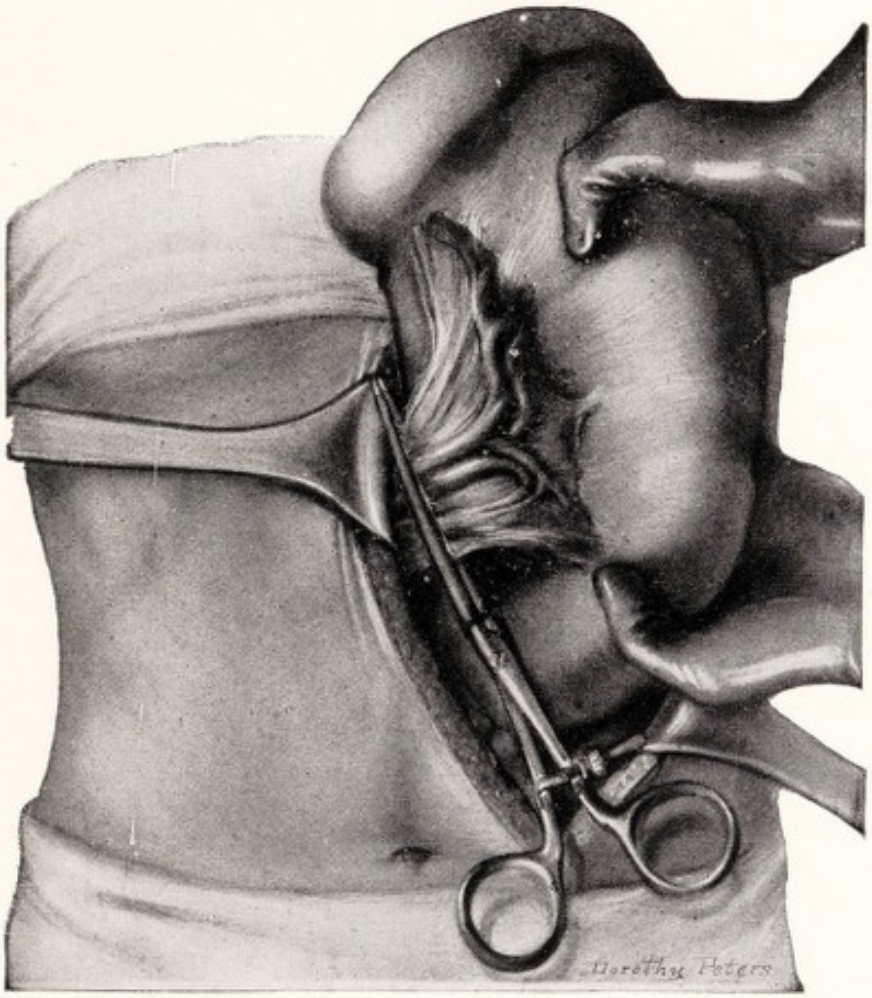

Fig. 1.—Spleen lifted out of body. (Mayo.)

loin. In many cases of splenic enlargement the blood examination aids in making a diagnosis" (Ashhurst).

Splenectomy.—The operation for removal of the spleen may be extremely easy when there is a completed mesentery allowing the spleen to wander, or the operation may be so very difficult from perisplenitis, with inseparable adhesions, as to compel its abandonment.

The usual incision is to the outer side of the left rectus muscle from the costal margin downward until ample exposure is effected. The Bevan incision in the outer half of the left rectus muscle with the inner angular prolongation across the rectus, kept about an inch from the costal arch and used as a catch for a catspaw retractor is recommended by Mayo.

If diagnosis is uncertain a median incision is preferable and, if necessary, the left rectus muscle can be subsequently divided transversely (Payr).

A transverse incision parallel to the costal border is sufficient when the splenic tumor is small.

When the abdomen is open, the hand can be passed under the diaphragm and any frail adhesions may be gently separated. Great care should be employed as the capsule is very thin and the spleen extremely friable. If adhesions are firm or dense, they should be separated cautiously between ligatures, as hemorrhage from this source is the greatest danger and, coming from the dome of the diaphragm, may be very difficult to control. The spleen should be turned over if possible, and delivered through the incision to render the vessels more easily accessible. It is a good plan to hold it in a gauze sponge to facilitate its control. A large hot gauze pack should be inserted in the space from which the spleen is dislocated. The cardiac end of the stomach and splenic flexure of the colon are brought out on the surface with the gland. The gastrosplenic omentum is thus made taut and its anterior leaflet divided between two or three forceps or ligatures. The left gastroepiploic vessels and the vasa brevia lie on the posterior layer of the gastrosplenic omentum. They are easily seen, pushed aside and avoided. The posterior layer can then be divided between clamps and tied.

John Gerster has suggested preliminary ligation of splenic artery at cœliac axis or superior border of pancreas.

The lienorenal ligament being put on the stretch can be identified below and its anterior layer grapsed and divided between forceps at a point in front of the blood-vessels. The splenic artery and vein are thereby exposed. This vascular pedicle is secured by a rubber-covered stomach clamp or a lower kidney forceps, similarly protected, 3 in. from the spleen, if possible. Care should be taken not to include the tail of the pancreas. This, however, has been done accidentally and unavoidably without serious injury. The clamp controls the hemorrhage temporarily until ligation can be completed. The pedicle is firmly tied close to the spleen in three or four sections with strong catgut. The tumor is then removed. The clamp should be loosened gradually so that any hemorrhage seen can be controlled by additional ligatures. The margin of the pedicle can be whipped over by a running suture. Any deep bleeding should be controlled with the snaking catgut suture in a small needle and with a gauze pack, if necessary.

If any accessory spleens are seen in the pedicle they should be preserved, unless the operation is for malignancy.

The mortality of splenectomy has been computed at from 18.5 to 27.5 per cent. Mayo says it should not be above 10 per cent., however, and in 58 operations at his hands there were only 5 deaths.

Splenopexy.—When a vagrant spleen, otherwise normal, is encountered it can be fixed in position by one of the following plans.

Rydygier's Method.

An incision is made in the left linea semilunaris. If necessary a transverse incision at right angles can be added. The principle is to make a pocket in the peritoneum of the lateral parietes in which the spleen may be marsupialized.

An incision is made through the peritoneum on a level with the normal habitat of the spleen between the ninth and tenth ribs. The peritoneum is separated from the lateral wall by the fingers until a pouch is made large enough to receive the lower half of the gland. The upper flap can be raised similarly. When

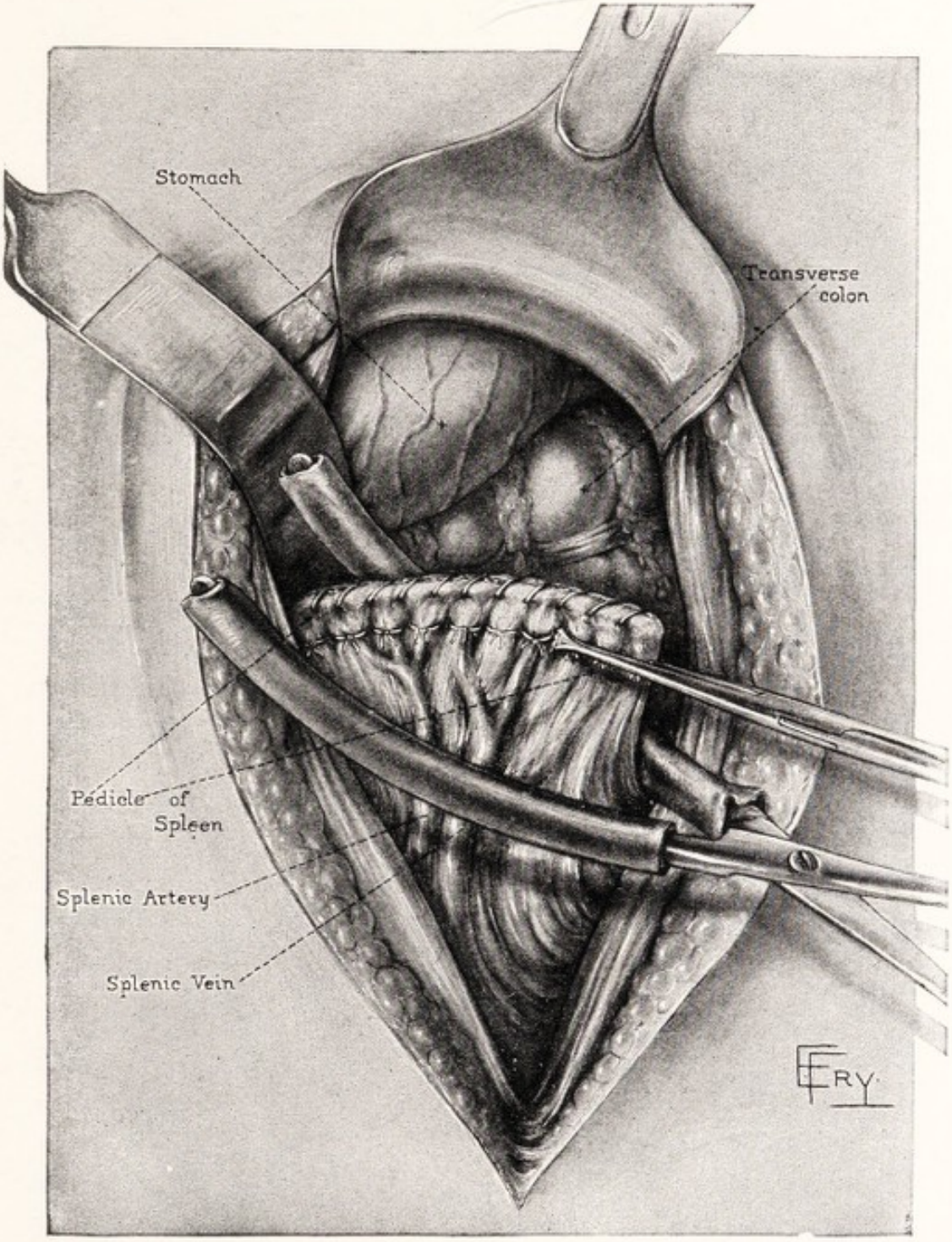

Fig. 2.—Pedicle tied in sections. (Mayo Clinic.)

the spleen is deposited subperitoneally the margins of the peritoneum should be fixed to the gastrospelnic omentum by interrupted catgut sutures. Considerable difficulty is experienced in separating the peritoneum from the under surface of the diaphragm. If so, the peritoneal envelope below can be made sufficiently large to accommodate the entire spleen by bisecting the peritoneal covering of the pouch and then closing it over after the spleen has been deposited.

If the pedicle is short it can be controlled by having two forceps on it, the groove made by the proximal forceps holding the ligature while the pedicle is steadied by the distal forceps.

Bardenhauer's Method.

With the patient on the right side an incision is made from the last rib to the crest of the ilium and, when the peritoneum is reached, it should be pushed off the parietal wall for a space large enough to accommodate the spleen between the abdominal wall and the detached peritoneum. The opening in the peritoneum should be sufficient to permit delivery of the spleen, which when found, is drawn through the peritoneal aperture. The margins of the incision should then be closed over the pedicle of the spleen and the abdominal wall over the gland in its transplanted position. The wandering spleen can also be anchored in its position by surrounding it with gauze which is led out of the partly closed incision. The gauze is allowed to remain six or seven days, or until aseptic adhesions are formed which are designated to hold the spleen in position.

ADRENALS

The Adrenals.—The adrenal capsules are two small ductless glands belonging to the chromaffin system situated under the diaphragm in close relationship to the spine and opposite the eleventh and twelfth ribs. The right suprarenal is crossed by the superior vena cava and lies in contact with the liver behind the foramen of Winslow. It rests upon the "anterior and inner aspect of the upper end of the right kidney" (Cunningham).

The left adrenal gland is behind the stomach and covered by the peritoneum of the lesser peritoneal cavity. The pancreas and vessels supplying the spleen cover the lower surface.

The posterior aspect in its upper portion lies against the left crus of the diaphragm while below it rests on the inner border of the left kidney from which it is separated by a considerable quantity of fat. The aorta, inferior phrenic and renal arteries each send a branch to supply the gland.

The secretion, andrenalin, suprarenin, or epinephrin, is the natural stimulant to the blood-vessels, heart and muscular system. It apparently has an important share in body growth, especially in the development of the genitals.

Tuberculosis is estimated by McCosh to comprise 80 per cent of the pathological changes in the adrenals. When it (Addison's disease) is unilateral the tuberculous gland should be removed.

The most common neoplasms of the adrenal bodies are cysts. A number of these have been successfully removed. Adenomata and other benign neoplasms as well as primary sarcoma and carcinoma are very rare, but have been encountered.

Adrenalectomy.—This operation is most infrequent and extraordinarily difficult. The incision is made obliquely below and following the course of the last rib downward and inward toward the umbilicus. This gives a fairly satisfactory exposure. Cystic tumors are apt to be adherent to the kidney, colon and other neighboring organs. If the kidney cannot be freed or pushed down it may be removed, as most of the growth necessitating adrenalectomy involve the kidney also. The adhesions are very numerous and difficult to separate, and in some cases the mass is peeled off the vertebræ and aorta. If the pedicle cannot be secured by ligature an artery forceps may be left on for 48 hours. The dangers of the operation are shock, hemorrhage, injury to the sympathetic plexus or adjacent hollow viscera.

RETROPERITONEAL SPACE

Retroperitoneal Space.—The retroperitoneal space is a comparatively large area of loosely constructed connected tissue. While it is bountifully supplied with lymphatics, they are seldom involved surgically.

Tuberculous lymphadenoma is the most frequent condition. It is usually mesenteric and occurs in young life. When lympho-

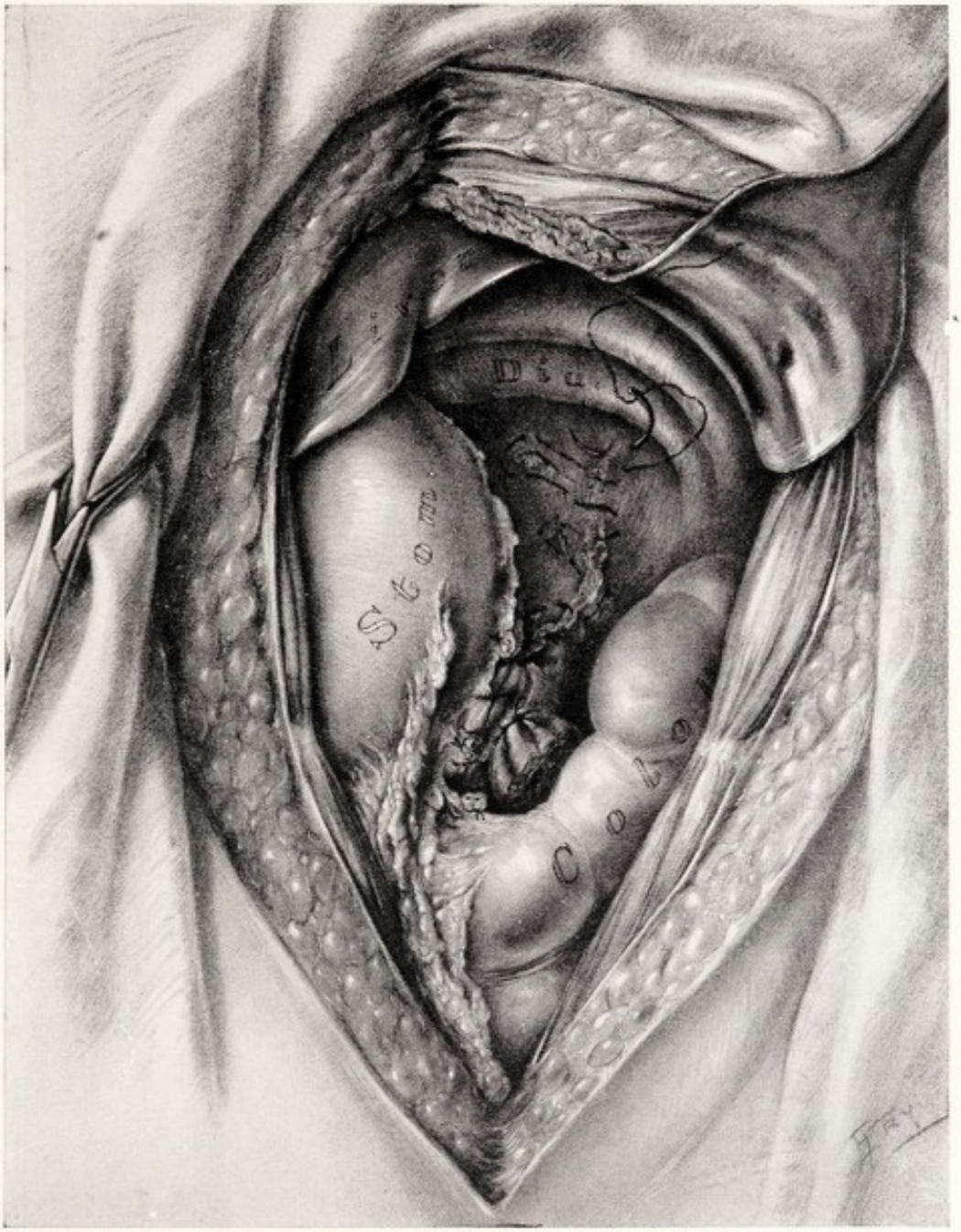

Fig. 3.—Snaking Suture under diaphragm to control bleeding. (Mayo, Annals of Surgery.)

mas are very large, operation may be indicated, if hygienic and X-ray treatment have failed. Connected segments of the intestine may have to be removed. Enucleation of a single or a few nodes can be effected without resection. Hemorrhage is controlled and the peritoneum sutured without drainage.

Abscess of the retroperitoneal lymph-glands may require evacuation and drainage. The glands lying near the ileocæcal valve are most frequently attacked.

Lymphadenitis from the various intra-abdominal sources of infection as well as from the extremities may cause retroperitoneal abscess. It is best approached by an extraperitoneal incision made just above and parallel with Poupart's ligament. When it points in the loin, the lumbar incision is made.

Carcinoma more frequently involves the subpyloric and retropyloric glands, or glands of the greater and lesser curvature, as metastases from cancer of the stomach.

Cancer of the uterus usually invades the lumbar nodes.

Cancer of the testicle involves the ileolumbar glands during the early stages of the disease. Adjacent retroperitoneal glands demand removal, with the primary focus, when possible.

Lymphosarcoma is the most frequent primary retroperitoneal neoplasm.

Lipoma is found most frequently under the mesentery of the large or small intestine. Enucleation endangers the blood supply of this segment of the bowel and should be carefully safeguarded. Keep behind the prerenal fascia, which separates the tumor from the important blood-vessels. When accessibly situated and not too large, if the tumor is firmly grasped in both hands of an assistant and its coverings put on the stretch, simple division of the capsule will, by pressure aided with dry gauze dissection, allow the tumor to be expressed from its capsule with surprising ease.

The Medical Profession and the Great War*

The Southern Surgical Association, the presidency of which your exceeding generosity most graciously conferred upon me, has for nearly a third of a century been intensely and diligently seeking to perfect methods and men in the science and art of surgery.

Each year we have come together with gladness and joy, enthusiastic in the achievements of the hour, and intent upon the advancement of our professional ability to relieve our fellow beings of their pain and disease. Since last we met the alarums of war have been sounded. Our great nation has joined the embattled legions of our Allies overseas in self-immolation for the preservation of the peace and liberties of the world. The impulses of our profession have been kindled, our responsibilities and problems have been inconceivably augmented. Some millions of our bravest and best beloved are consecrating their lives to the stupendous task of making the world free. They will be exposed to the inevitable diseases and mutilations which it will be our duty to prevent, to assuage, and to repair.

The world is bathed in blood and tears. Its peace has been devastated and destroyed with the pitilessness and terror of an Alpine glacier.

This war is a clash between the ideals of democracy and autocracy. We now know that it was inevitable. The issue is between two political and social principles, which cannot longer dwell together on the earth. Our enemies believe that might makes right; we believe that right makes might. It takes first rank with the most magnificent events in all history. It will not change maps, but individuals. It will make them free. It is portentous; it is almost sacred in its intent. When the end shall have been attained, it will lift a mighty people upon a higher plane for their development; the great nation, thrice-panoplied, that now faces the world. It knows not, that the stupendous struggle is for their liberty, as for that of all the nations on the globe. It is for this that we are sending our brothers, our sons,

*Presidential address before the Southern Surgical Association, St. Augustine, Florida, December 11-14, 1917.

and ourselves to take our stand in this gigantic issue, upon the outcome of which the future of all mankind will depend.

Commercial Germany would have made a peaceful conquest of the world, but industrial Germany had no voice. Imperialistic Germany cunningly planned the most unpardonable and deliberately cruel of all wars. They would none of arbitrament. As Van Dyke said, "The Barabbas of war was preferred to the Christ of righteous judgment." Those who loved peace were forced to fight for it or to give it up forever.

We must play our appointed part in the world, consecrate ourselves to our principles and policies, put aside self-seeking, distraction and the very peace which we have imagined for ourselves in order to give it unto others. The page on which the history of this most holy of wars will yet be written will be illumined with the great white light of our pure and unstained desire to benefit the cause of humanity.

Was there ever a war before where the victor desired no spoils? Should the lofty disinterestedness of our cause and the superiority of our might give us the victory, there would be no vindictiveness or economic vengeance reeked upon our enemies. Our loftiest aims and most sacred ideals have been crystallized and formulated by that great seer, that incomparable patriot, and immortal statesman, Woodrow Wilson, Prime Minister of the World.

If our nation lives up to its own plighted word, it will gain for itself new honor and imperishable fame. If our sacrifice establishes on a big scale, and securely, those great institutions and opportunities which make men free, then the contest rises to the sublime.

Our enemies are not willing to be responsible for this war. Although inaugurating it, they disavow their initiative and summon their scientists and philosophers to prove it.

It is not the Teuton or the Oriental who is the enemy of civilization. Militarism is the enemy. From the Straits of Dover to the very gates of the Garden of Eden itself grim-visaged war has raised its bloody head.

It is into this "hell of iron" that the youth and flower of American manhood must fling itself. They must join in the com-

radeship of arms and the exaltation of spirit with their intrepid and fearless British cousins and with the heroes of clear-eyed France, torch-bearer of the nations.

It was of a poilu that Henri Barbusse wrote:

"Each one knows that he is going to take his head, his chest, his belly, his whole body, all naked, up to the rifles pointed forward, to the shells, to the bombs piled and ready, and above all to the methodical and almost infallible machine guns, to all that is waiting for him yonder, and is now so frightfully silent, before he reaches the other soldiers that he must kill. They are not careless of their lives, like brigands, nor blinded by passion, like savages. It is in full consciousness, as in full health and full strength, that they are massed there to hurl themselves once more into that sort of madman's part imposed on all men by the madness of the human race."

It was a manly young fellow, like one of these, who, when brought mutilated to the dressing station by the stretcher-bearers said, "I offered France my life and she took only my arms." A young English soldier mortally wounded was seen suddenly to leap into the air and with his last breath cry out: "Are we downhearted? No!"

Are the best physicians and surgeons of our country too skillful, or too gentle, to be permitted to minister to the fine fortitude of such splendid bravery? No, the faithful sons of Esculapius have never faltered! As Sir Berkeley Moynihan has said: "We are, as a profession, by intellectual descent and by solemn adoption, the heirs of the men who have made our race great and famous."

It will always be an inspiration to us to remember that the first American to carry the Stars and Stripes to our stricken Allies after the fateful April 6, 1917, was a surgeon, bearing also a Red Cross, a member of this Association, Major George W. Crile.

It is a benison to our profession, that the first officer in the uniform of our country to yield up his life was also a physician, Lieutenant Fitzpatrick, who was struck by a shell that exploded while he was standing in the door of the Washington University Base Hospital.

The personal and material sacrifices which our guild have made and are making are not equaled by any profession or class. We rejoice in its contemplation, and take inspiration from the fact that only through the efforts of the medical profession has the prosecution of the war been possible. It would, as our distinguished Fellow, C. H. Mayo, has said, have been terminated long ago through the same causes which have terminated all wars in the past, through disease and infection.

In the momentous hours of history some individual with transcendent attributes seems to be raised up. The essential to preserving an effective fighting force is primarily vigorous and immaculate sanitation, scientific and uncompromising prophylaxis. Who could have been more opportunely fitted for this task than the man who conquered the deadly and pestilential Canal Zone—the brilliant Southern scientist and knightly soldier, Surgeon General William C. Gorgas? He has summoned about him many score of our best sanitarians, surgeons, internists and specialists who have unstintedly given of their time, knowledge and labor. He has sent nearly two thousand medical officers to our needy Allies. He has builded, equipped and manned hospitals, from 500 to 1,000 beds each, in nearly one-half hundred cantonments and camps, caring for cities of from twenty to seventy-five thousand soldiers. He has organized courses of special training in the great centers for his medical officers, that, in addition to the training camps for the Reserve Corps, have intensive special training in the great centers for his medical officers, that, in addition to the training camps for the Reserve Corps, have become the greatest and most comprehensive post-graduate courses in the world. He has dispatched base hospitals, not only for our own expeditionary forces, but out of his abundance has loaned to the other nations, and yet the manifold activties of the Surgeon General's office, while incomputable, have only begun.

The distressful epidemics that ravaged our armies in the Spanish-American War were deadlier to our soldiers than all the bullets fired in the Antilles. Preventive medicine, especially as applied to armies, has made tremendous progress. Witness our unparalleled feat of mobilizing, last year on the Mexican border;

more soldiers than have bivouacked since the Civil War; more men than belonged to any one command during that sad conflict; more men than were enlisted against Spain; and instead of marking the border with lines of tombstones, we brought back the 100,000 national guardmen with a net gain of over a million pounds. There was scarcely a case of typhoid fever and the usual infectious diseases were banished as if by magic. At Chickamauga, in 1898, there were thousands of cases. During the three years of the present war the British with her millions of men engaged have only lost 292 men from typhoid fever.

Typhus fever has been denied access to the battleground of the far-flung Western front. We will see to it that it will never gain a foothold in our army camps.

Tetanus is almost completely prevented. So far as lockjaw is concerned, the bullet is as harmless as the sting of a bee. And now from the Rockefeller Institute comes another discovery, an antitoxin for the gas bacillus—by Dr. Carol W. Bull. You will honor him as a Southerner, and I will acclaim him as a Tennessean.

The Medical Reserve Corps now numbers nearly fifteen thousand physicians, who have volunteered and been commissioned. This very remarkable mobilization in eight months, of over one-sixth of the active practitioners in this country, has been made possible by the far-seeing and highly proficient labors of the medical section of the Council of National Defense. It is due to the patriotism and superlative organizing capacity of one of our Fellows, Franklin H. Martin, who associated with himself another of our Fellows, Frank F. Simpson, and these two with indefatigable effort, beginning nearly a year before war was declared, organized every state and rendered physicians available and effective. This is the first time our profession has been given its due meed of recognition, in being honored by representation on the Advisory Commission of the Cabinet, a recognition long merited and signalized by an appointment most felicitous.

Through the further elaborate activities of the Medical Section of the Council of National Defense and the far-reaching organization of the American Medical Association, most elaborate plans have just been perfected by the creation in each state of

medical advisory boards to re-examine certain registrants in the re-classification of nine million men, which is now beginning. It is not too much to say that the physicians and surgeons were perhaps better organized and mobilized than any other newly-created fasciculus of our great structure of preparedness.

Through the endeavors of medical men, sanitation has become so perfected that the only danger to the soldier is the bullet, and if he is not killed outright the superior methods of treating war wounds deprive them of many of their dangers. The excellent work of Carrel and Dakin in putting antiseptic management of war and industrial wounds on a higher and more wonderful plane of usefulness is a contribution to humanity of stupendous moment.

If medical men have been of indispensable value in this war, who will compute the improvement in the management of every type of injury to the human body? Dr. Crile declares that "more progress has been made in the surgery of the chest and abdomen, in the treatment of wounds, of infections, of hemorrhage and exhaustion, more knowledge has been accumulated of splints, of apparatus and of every applicable mechanism in the three brief years of war than in the past generation."

Apart from the humanitarian aspects of the war, it will be regarded, in the eyes of future generations in its end-result as has been said, as The War Beautiful. The French Revolution with all its terrors quadrupled the scope of civilization; the American Revolution with all its sufferings was of all wars the most constructive; the Civil War with its bitterness cannot now be but looked upon as essential and evolutional. One cannot be unmindful of the millions of lives already sacrificed, nor of thrice these millions, who have been wounded and maimed. In comparison we must consider the lives sacrificed in peace by preventable disease, by unnecessary industrial accidents and deaths, by enforced poverty, by the evils of alcohol, by prostitution and by wanton manslaughter. If, as the result of the supreme and essential sacrifices of this war, we necessarily or voluntarily safeguard human life—men, women, mothers and little children—the saving will exceed the waste.

Already this war has emancipated men from the slavery of alcohol—the greatest curse and blight upon humanity. The gain

in food products will be incalculable. The tilling of the soil will be raised to the nth power, which will make for home-building. National safety will oblige essential reforms of our tenement system; our slums; of capital, that it should not get more than a reasonable and just profit; of labor, that it receive its full and fair reward. It will insure equal opportunities for women; it will signal the end of fabulous fortunes. The wealthy classes will be quickened into keener appreciation of citizenship. Statesmen will be recruited from men of parts, instead of from politicians. In lieu of luxurious indulgence, abstemiousness will be the fashion. The creed of physical fitness will be embraced, universal military training will probably become effective, for physical reasons, if not for martial needs.

The social disease which has heretofore been considered the inevitable pestilence of armies is being fought with every imaginable agency—education, recreation, diversion, protection, isolation, prophylaxis, penalties, and court martial. Many thousands of young men will, for the first time on a wholesale plan, be taught the whole truth by all sorts of real men, and purity made a cult, a win-the-war asset. After the war the idea will permeate all strata of society and be a real understandable and liveable benefaction.

It will disseminate throughout America the practice of personal hygiene by uncounted numbers of young men. The beneficent results to accrue to us and to posterity will almost make the war worth while.

When our soldiers reach France, it seems that they become exalted with the purpose of victory; they have lived the clean life and believe in it; they have been known to avoid all temptations in the great cities during furloughs. It is army experience that a sober man seldom seeks impure associations. Our American youth will learn reverence for authority, discipline, obedience—immediate and implicit. For the duration of the war the intensive high-minded instruction will be inculcated into the minds and lives of young Americans will work a veritable physical and moral rebirth of this nation.

As the by-products of industry are the most important, so the fierce necessities of war make many collateral advancements.

Great progress in many branches of manufacture has been brought about. We will of necessity make our own dyes and our own chemicals of all sorts.

To effectively educate five hundred million people, in the brotherhood of mankind, could not have been accomplished without the lessons and results of this war, costly as it is.

When the carnage has ended, the world will have drained itself well-nigh dry. Much of its best and most precious blood will be spilled. Its liquid capital will have been used up. It will be the privilege of this nation to bind up the war's wounds and to slake the white heat of hatred; to be in the vanguard in the colossal work of reconstruction and of rehabilitation. Enormous problems will present themselves when our army disbands. Years will be consumed in demobilization. Restoration of our soldiers to the pursuits of peace in an equitable manner will be a nation-broad duty. The conduct of even so gigantic a war as this is comparatively simple to the colossal task of making the world over again when it shall have ended. But the re-education of the crippled, the maimed, the sightless and the salvaged after the war is a voyage across uncharted seas into another world. No longer will we attempt to salve the wounds of heroism with alms, or allow a mutilated patriot to eke out a pitiful existence as best he may; rather will it be our splendid aim to re-educate that unfortunate so as to give him a trade, or a profession more lucrative, more independent and ennobling than he had before.

For nearly a century and a half our nation has wrought into prominence those principles both of government and of right for which the philosophers have dreamed since the Rennaissance. Our federation of states is now the greatest, the wealthiest and the most powerful exemplar of democratic institutions in Christendom. It has been shown that the only way to make the world safe and secure is to entrust it to accredited representatives of the people and not to confide it to dynasties or diplomats, however great.

This is a war for the creation of a new international world; a war for a new intranational world. Human liberty, justice and the honorable conduct of an orderly and a humane society are the ideals of life which must prevail.

A combination of events has forced the United States into the position of leadership. We have demonstrated that race antagonisms tend to die away and disappear under the influence of liberal and enlightened political institutions. Consider our large Babel-tongued population, all living in peace and harmony; as years pass they are melted in the crucible of democracy and are molded into Americans with all the strength and freshness of a nascent re-creation. Our democratic institutions have shown their ability to amalgamate and to emancipate every type of human being which has thus far come under our flag. It is the alchemy of the nations. Why should not each nation in Europe establish for itself a place in the sun of unity, which may come when the war clouds have been swept away? Who knows but coming out of this dread conflict in which the civilized world has been plunged will issue, as Nicholas Butler Murray has said, the United States of Europe!

In the end, each of the nations of the earth will deposit in a world's federation some portion of its sovereignty for the perpetuation of peace and the furtherance of good will to all.

It has been touching to see in this country the spirit of generosity, of sympathy for the afflicted, the distressed and the stricken in the uttermost parts of the world. Although denounced as get-rich-traders, the American people have been lavish with their millions and have given their lives and their endeavors to carry food, clothing and succor to the starving Belgians and the other desecrated nations of bleeding Europe. We have played the Good Samaritan on a huge scale. Never in all history has there been such a generous outpouring of tenderness to those who needed help, irrespective of race, station or belief.

In this beneficent work the representatives of the healing art have had their share. As for the Southern Surgical Association—to its lasting honor—your President wishes to record that out of two hundred members, fifty of whom are disqualified by age or obvious disability, seventy have given their services to their country. They are soldiers brave and fearless; yet they are gentle and harmless as doves. That great anatomist, physician, and

author, Oliver Wendell Holmes, has beautifully said of our ministration:

As life's unending column pours,
  Two marshaled hosts are seen;
Two armies on the trampled shores
  And death flows black between.

One marches to the drum beat roll,
  The wide mouthed clarions' bray,
And bears upon its crimson scroll—
  Our glory is to slay.

The other marches in silence by the stream,
  With sad, yet watchful eyes,
Calm as the patient planet's gleam
  That walks the clouded skies.

Along its front no sabres shine,
  No blood red pennons wave,
Its banner bears the single line,—
  Our glory is to save.

Sarcoma of the Stomach*

With Report of a Case and an Analysis of 107 Cases Operated Upon

Primary gastric sarcoma is one of the rarest surgical diseases. There is but one example of sarcoma of the stomach in 840 specimens of sarcoma in the Berlin Pathological Institute. Sarcoma was present in only 4 of the 921 cases of gastric cancer operatively and pathologically studied by Smithies. Tilger cites 4 cases in 3,500 sarcomata. It occurred six times in 13,387 necropsies (Hosch). In 27,250 abdominal sections at the Mayo Clinic in 5 years (Masson), there were 8 sarcomata of the stomach, and of 2,067 malignancies of the stomach (1908-1920), 13 proved to be sarcomata, or 1 sarcoma to 159 carcinomata of the stomach.

In 1847, Bruch recorded the first case of gastric sarcoma. Forty years later, Virchow operated on the first patient. In 1900, Fenwick studied 60 cases in the literature and concluded that 53 of them were authentic. Since that time many other cases have been published, the majority being necropsy specimens.

In 1912, Gosset added 16 cases to Zesa's collection and reported them together with his case, making 61. Of this number, 39 were exogastric and 22 were endogastric. Of the later, 13 were resected, with 5 deaths. Of 3 living, 1 lived 4 years and 1, 6 years. Of the 29 gastrectomies of the exogastric type, there were 10 deaths, totalling 42 resections, with 15 deaths (35.7 per cent). Eight survivors lived from 3 months to 7½ years. Three patients were living after endogastric operations, 1, 4, and 6 years respectively.

In 1914, Flebbe was able to collect 157 cases. Those cases based solely on necropsy findings are not included in this paper as they are rather of pathological interest and throw no light on the progress of surgical treatment. I have been able to find in the literature 93 cases of sarcoma of the stomach which came to operation, in addition to 13 unpublished cases at the Mayo Clinic and 1 of my own, making a total of 107 operative cases and a total of 244 authentic cases of primary sarcoma of the

*Presented before the Southern Surgical Association, New Orleans, December 18, 1919.

stomach. Probably a much larger number has been operated on, reports of which are not now available.

The personal case herewith appended was a leiomyosarcoma. There are two other similar cases in this series and also two cases that are classified as leiomyoma malignum, which for all practical purposes is sarcoma. In fact, Balloch, writing on benign tumors of the stomach, quotes Fenwick as follows: "We have not been able to find a single case in the whole literature where a large fibroid tumor of the gastric wall was above suspicion of malignancy."

Sarcoma of the stomach may occur at any age in life. The youngest case was that of Finlayson, a boy of 3½ years and it has been known to occur in a man of 85 (Gosset). Although sarcoma has been thought to be a disease of young life, it more frequently involves the stomach after the fortieth year of life. Of the 107 cases which I was able to collect from the literature, the age was given in 61. The youngest was a boy aged 3½, the oldest a woman aged 74.

AGE INCIDENCE

	Cases
Under 10 years	2
Between 10 and 20 years	4
Between 20 and 30 years	3
Between 30 and 40 years	12
Between 40 and 50 years	14
Between 50 and 60 years	12
Between 60 and 70 years	11
Between 70 and 80 years	3

One patient was spoken of as an old man. The sex was given in 66 patients and of these there were 33 females and 33 males. One case gave a history of symptoms coming on shortly after a fall in which she struck the pit of her stomach. One case came on 2 months after receiving a kick in the abdomen by a mule (McWhorter).

The size of the tumor varies within wide limits from the size of a bird's egg to the case reported by Baldy in which the tumor filled the entire abdomen. From a histological standpoint, the tumor may be any one of several varieties. Round-cell, spindle-cell, mixed-cell, lymphosarcoma, myosarcoma, fibrosarcoma, angiosarcoma, and endothelioma (Clendenning). These

Fig. 1.—Gross Specimen of Sarcoma of Lesser Curvature of the Stomach.

tumors are apt to undergo degeneration. They may become cystic from hæmorrhage, sometimes calcareous; hyaline and myxomatous changes may also occur. There is some tendency to ulcerate. On the other hand the tumor may show no signs of ulceration but may appear as a smooth or nodular mass. From its gross appearance, the round-cell sarcoma is the type most apt to be mistaken for cancer. It usually infiltrates and most often involves the pyloric end. It rarely produces pyloric stenosis, however, in contradistinction to carcinoma. This type, through infiltration and thickening of the walls of the pyloric portion, sometimes renders the walls of the stomach stiff, depriving the lower half of motility, thereby causing obstructive symptoms. This type of sarcoma seems to be more malignant and to metastasize more rapidly. The spindle-cell sarcoma is apt to be circumscribed and often pendunculated. In its growth it may present itself externally beneath the serosa or internally beneath the mucosa. In the latter instance it may resemble a polyp. These tumors are the type that grow to a very large size. They have been mistaken for an ovarian cyst or a floating kidney, and very readily since in many instances they may produce no gastric symptoms whatever. This type of tumor is slow to metastasize. It is the best type to deal with surgically and offers a far better prognosis than other types. Sarcoma may involve any portion of the stomach; in a few cases the entire stomach was affected. The growth is relatively slow (in one case 3½ years), but may be quite rapid.

"A sarcoma of the stomach may be, according to its cell origin, a leiomyosarcoma, a fibrosarcoma, a lymphosarcoma, or an endothelioma. There is little doubt also that some or many of these so-called large, round-celled sarcomata are of muscular origin" (Ewing). Any one of these like sarcoma elsewhere, may have either round cells or spindle cells, the former, as is well known, being the most malignant. A lymphosarcoma is most likely to metastasize, whereas an endothelioma is least likely to. A leiomyoma is the slowest growth, but as a rule occurs at a later age than lymphosarcoma or fibrosarcoma. The grafting of sarcoma, whether round or spindle-celled, upon leiomyoma of the stomach is, according to Warner, doubtless identical with a simi-

lar process in the uterus. Probably neither is malignant in the beginning.

The microscopic diagnosis was given in 76 cases. There were:

12 Spindle-cell sarcomata
17 Lymphosarcomata
8 Round-cell sarcomata
8 Fibrosarcomata
4 Sarcomata (only)
5 Myosarcomata
2 Small round-cell sarcomata
3 Large round-cell sarcomata
2 Leiomyomata (malignant)
2 Leiomyosarcomata
3 Myosarcomata
4 Mixed-cell sarcomata
1 Cystic sarcoma
1 Angiosarcoma
2 Fuso-cellular sarcomata
1 Hemangio-endothelioblastoma
1 Myxofibroma

Among these 61 cases the posterior wall was involved sixteen times, the greater curvature ten times, the pylorus gave origin to the tumor in 7 cases, the tumor was diffuse in 8 cases, the lesser curvature was involved seven times, and the anterior wall four times. The fundus was the site of the growth in 2 cases. The entire stomach was involved in 3 cases. The stomach was described as being reduced to a band in one. The greater portion of both sides of the stomach was affected in 1 case. The tumor was described as being near the pylorus in 1 case, and in another the tumor was attached to the stomach omentum and the transverse colon. In one case the pylorus was spoken of as being normal, the tumor involving other portions of the organ.

Sarcoma is said to metastasize in 40 per cent of the cases. In this regard it is not nearly so malignant as carcinoma. It is prone to metastasize in the skin. This feature has been considered of diagnostic significance. However, Leube found a case in which there was carcinoma of the stomach and sarcomatous nodules in the skin. Sarcoma springs from the muscularis and submucosa and not infrequently dissects its way between the mucous and muscular layers. Ulceration may occur through the mucosa. Perforation is apt to occur. This is especially true of the round-cell sarcoma which is said to perforate in 10 per cent of cases.

Lymphosarcoma may be a primary or a secondary lesion, or it may be a manifestation of Hodgkin's disease and not primary sarcoma. A stenosed pylorus has been found in about 7 per cent of the cases.

The diagnosis of sarcoma of the stomach before operation is often impossible. There may be no gastric symptoms whatever. This condition, like all other forms of malignancy, produces rapid loss of flesh, anæmia, weakness, and later cachexia. Only an operative diagnosis is possible. Hæmorrhage from the stomach and blood in the stools is a frequent occurrence, especially in the round-cell variety, although in sarcoma as a rule it is not as frequent as in carcinoma. Ulcer of the stomach may be considered, especially if there is a history of indigestion. The rapid wasting may suggest carcinoma. But sarcoma, unlike ulcer or carcinoma, does not give a long history of dyspepsia and in sarcoma there are less likely to be symptoms of obstruction. There is more apt to be a palpable mass in sarcoma. Vomiting occurred in 20 per cent of the cases. Pain comes early and persists. The tumors are often large. In Cantwell's case the tumor weighed 12 pounds. The pedunculated variety which projects into the lumen of the stomach may produce intermittent obstruction and vomiting. Pain after food may simulate ulcer, but the long history which is so characteristic of gastric ulcer is absent in gastric sarcoma. Benign tumors of the stomach may undergo sarcomatous degeneration. One case report in the literature had had a tumor for years, which was thought to be an ovarian cyst. Operation revealed a sarcoma of the stomach wall. The tumor must have originally been benign with recent sarcomatous change. However, every palpable mass in the stomach region should rest under the suspicion of malignancy. The rapid development of anæmia and debility, with loss of weight and cachexia, with early, rather severe, and more or less persistent pain the epigastrium and the absence of any long standing history of dyspepsia, and obstruction (pyloric) is very suggestive of sarcoma. A palpable mass and bloody vomitus together with melæna is all the more suggestive. Vomiting of blood in a young person, with or without severe pain, and a palpable epigastric tumor without obstruction is suggestive of sarcoma. If the tumor mass is large in a middle-aged

person and not associated with the usual symptoms of carcinoma of that size, sarcoma should be considered. With the increasing employment of radiography as a routine in stomach disorders, relatively few cases of this condition, as rare as it is, will escape detection as an anatomic lesion requiring operation. This diagnostic means, as in carcinoma, if employed early will be of value and the too well known classical but hopeless advanced symptoms formerly enumerated as diagnostic should not be waited for, but early exploration should be invoked.

Mortality. The outcome was given in 64 cases. Twenty patients are recorded as having died, 3 as having recurrence, and 41 patients recovered and were reported well at varying times after operation, the longest cure being a case of Rupert's, a lymphosarcoma, who lived 7 years. Overton's patient is alive 10 years after operation; Krause's patient 7½ years; Kimpton's 5 years and 10 months, and 1 of Mayo's patients was known to be alive 4 years after operation. This patient had a spindle-celled sarcoma. The other 3 were of the round-celled type.

Author's Case

Case 8140. Miss R. H., age 17, a school girl, came for vomiting of blood and melæna. There was a history of a very copious gastric hæmorrhage occuring over a year ago and lasting a few days. It was arrested for 2 days, then recurred, and was almost fatal. It was preceded by headache for a month. Blood was noticed in the stools for a week before the vomiting of blood. Three weeks after the hæmorrhage, a small tumor apparently the size of a lemon was noticed in the apex of the epigastrium. It was palpable for about a month and then it could not be made out again. The melæna returned 2 weeks ago and reappeared 1 week before admission and was associated with weakness but never any pain. She was quite pale and very weak.

X-ray examination showed what appeared to be a perforating ulcer of the lesser curvature about the size of a cherry, reported as an extruding defect on the lesser curvature. Hæmoglobin was 40 per cent. Red cells 2,150,000. Blood transfusion was followed in a few days by abdominal section under gas, showing an apparently malignant growth on the lesser curvature, size of a child's fist, bluish, nodular and irregular in size, springing from the stomach with little or no extension to the glands. It was quite favorable for resection.

After a second transfusion, the hæmoglobin rose to 56 per cent and the red cells to 3,000,000. Partial gastrectomy including tumor was performed March 17, 1919, by the Polya precolic method. The post-operative progress was satisfactory for the first few days, when slight vomiting increased, persisted and became uncontrollable in spite of repeated lavage and continuous proctoclysis, and so forth. By the seventh day vomiting was incessant, prostration was extreme and the general condition critical.

There was no evidence of peritonitis. The vomiting was considered as mechanical, and re-operation was reluctantly decided upon. It was obvious that interference would be very hazardous as her pulse had become very weak, and 140; the patient appeared quite desperate. Seven hundred cubic centimeters of citrated blood were given, her pulse came down to 96, and she vomited but once after the transfusion. The hæmoglobin after transfusion was 70, red cells 3,780,000. The plan of re-operation was happily abandoned. The explanation of the vomiting is probably acidosis but the proof is lacking. The vomiting was regarded so certainly as obstructive that the routine examination for acetone was not ordered. The day after transfusion, acetone was absent. The patient made a complete recovery and is now quite well.

Pathologic report by Dr. Rosson. Miss R. H. Date March 23, 1919. Serial No. 2873. Referred by Dr. Haggard. Source of specimen: Tumor from stomach. Time received: March 17, 1919.

Gross pathology. Specimen consists of a part of the stomach extending from the pyloric region upward for a distance of 10 centimeters along the greater curvature. Attached to the lesser curvature is a soft, nodular, apparently cystic tumor (Fig. 1). The greater portion is dark colored, as though the cystic spaces contained blood. The surface of the tumor also shows adhesions to the serosa of the stomach separate from the main point of attachment. Projecting into the lumen of the somach are several fairly firm, smooth, nodular masses. A large one blocks the pylorus (Fig. 2). These are covered with mucosa and on section are greyish-red and cellular, resemble thyroid gland on section. The mucosa of the stomach shows several small, gelatinous nodules.

Microscopic pathology. Sections were taken from the nodules which projected into the stomach. The mucosa shows no change. The greater portion of the submosa intervenes between the tumor and the mucosa. The tumor consists of a very cellular tissue with very few definitely formed intercellular fibers. The cells are principally of the embryonic, connective-tissue type. There are also numerous smooth muscles. There are a few lymphocytes. Some of the connective-tissue cells are oval in shape, others are more spherical. There were only two mitotic figures found. The tumor is evidently not growing rapidly.

Diagnosis. Fibromyosarcoma.

"The sections of tumor of the stomach which you sent me I would interpret as leiomyosarcoma.

"The tumor tissue is composed of rather small spindle cells with small hyperchromatic nuclei, and cytoplasm which is rather opaque and eosinophile. The cells are arranged irregularly, but in some places they are grouped in small clusters often about a minute blood vessel. This feature is occasionally seen in cellular uterine myomata. The stroma is very scanty except about the outskirts of the tumor. There are no signs of necrosis. I should not expect this tumor to metastasize, nor to recur locally if completely removed, but its cellular character deserves the histological designation as sarcoma" (James Ewing).

Douglas, in an excellent review of the subject, added 3 personal cases to the former collection of Forni (1914) and Medina and Egana, together with 18 cases from the literature, aggregating 92 operative cases. In addition to these, I have analyzed 13 unpublished cases from the Mayo Clinic (2 of these were quoted

by Douglas as reported by Huntington, as personal communications) and 1 additional case each by McWhorter, Pagenstecher, Basch and the writer, making a total of 107 patients operated on. Pagenstecher's case was referred to by Douglas as a necropsy, but it appears that an exploratory laparotomy had been done 12 days before death. Of the 107 cases, 80 had partial gastrectomies or resections of the tumor and part of the stomach wall. Twenty-seven had explorations or gastro-enterostomies. Of 58 partial gastrectomies 15 died, a mortality of 25 per cent. Of 10 exploratory operations 8 died in the hospital; 1 was reported to be in poor health after 4 months, and the remaining 1 was not heard from after 2 months.

The 13 cases of sarcoma of the stomach operated on at the Mayo Clinic between 1908 and August, 1920, are herewith briefly abstracted.

Case 18165. Woman, age 38, had noted an abdominal tumor for the past 3 years. She had nausea and lack of appetite with gaseous eructations for 2 months. She had 3 1-day periods of gastric pain. At operation a tumor 20 centimeters in diameter was found arising from the greater curvature of the stomach. Partial gastrectomy was done and the patient made a good operative recovery. Diagnosis: fibrosarcoma. Patient died 6 months after operation.

Case 53972. Man, age 62, during a period of 4 years had three attacks of pressure and pain in the epigastrium. Nine months previous to examination he had a 3-days' attack of nausea and vomiting with slight hæmatemesis. At exploratory operation a lesion was found located at the fundus of the stomach and there were extensive metasteses. Small section of the gland was taken for diagnosis. His immediate recovery was good but when last heard from, 4 months after operation, he was in poor condition. Diagnosis: sarcoma.

Case 82074. Man, age 44, for 4 weeks has had pains in the epigastrium and had noticed an abdominal tumor for 1 week. At operation a tumor was found involving the greater curvature and also the transverse colon. The origin of the tumor was doubtful. Partial resection of the stomach was done and the patient made a good recovery. Four years later he reported as well. Diagnosis: spindle-cell sarcoma.

Case 182060. Boy, age 16, for 4 months has had continuous pain in the left side with indigestion and gas an hour after eating. At operation a tumor was found on the posterior wall of the stomach. The tumor was excised. The patient made a good recovery, but has not been heard from since. Diagnosis: lymphosarcoma.

Case 188936. Man, age 62, for 6 months has had an occasional pain in the epigastrium. Exploration was made for diagnosis and a lesion was found involving the lesser curvature and pyloric end of the stomach. Partial gastrectomy was performed. The patient made a good operative recovery, but has not been heard from since 2 months after operation. Diagnosis: lymphosarcoma.

Case 204520. Woman, age 44, for 7 years has had annoying epigastric pains with moderate gas eructations. No tumor was found on examination. At operation the posterior wall of the stomach was involved, and a Polya resection was done. Good operative recovery. Diagnosis: myosarcoma.

Case 205800. Man, age 53, for 30 years has had bloating and indigestion with an exacerbation for 3 weeks previous to examination. No tumor was made out on examination. The pylorus was found to be involved at operation and an anterior Polya resection was done. Good operative recovery, but patient died at the end of 4 months. Diagnosis: lymphosarcoma.

Case 265434. Man, age 42, for 4 months has had epigastric distress with gas eructations and slight vomiting. At operation the lesser curvature was involved and a subtotal gastrectomy was done. The patient died 3 weeks after operation. Diagnosis: lymphosarcoma with glandular involvement.

Case 282682. Man, age 66, has gradually weakened for 2 years. He vomited a pint of blood 1 month before operation. He had noticed an abdominal tumor for 1 year. Through the abdominal wall the tumor felt very much like a spleen. At operation the tumor was found originating from the lesser curvature. Partial gastrectomy was done. The patient reported well 9 months after operation. Diagnosis: mixed-cell sarcoma.

Case 509588. Woman, age 40, had noticed an abdominal tumor for 1 year. For 7 months she has had attacks of abdominal pain, nausea and vomiting; but never any blood in vomitus. A tumor was found involving the pylorus. A partial gastrectomy was performed. The patient made an immediate good recovery. Diagnosis: myosarcoma.

Case 289467. Woman, age 62, for 8 weeks has had epigastric pain with distention of the epigastrium without gas. She had a poor appetite. At operation a lesion was found involving the lesser curvature and the posterior wall of the stomach. A partial gastrectomy was performed. The patient died 7 days after operation. Diagnosis: lymphosarcoma.

Case 190100. Man, age 46, complained of pain in the chest with periodic distress in the stomach and occasional vomiting. He had lost 20 pounds. A lesion was found involving the lesser curvature and a partial gastrectomy was performed. The patient recovered. Diagnosis: lymphosarcoma.

Case 316187. Man, age 47, for 1 year has had gas eructations with gnawing epigastric pain after meals. The lesser curvature was involved. A partial gastrectomy was performed. Recovery. Diagnosis: lymphosarcoma.

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Goiter Clinic*

Gentlemen of the Assembly: I have been given a group of goiter cases to present for your consideration this morning. It seems like carrying coals to New Castle to speak of goiter in Cleveland where so much has been taught the world by David Marine and George Crile. This region is the center of the goiter belt. Dr. Lind and Dr. Pomeroy have provided some very striking examples of the type of cases that we commonly meet and with which we have to deal. You recognize, of course, the various groups of goiter that are so constantly in evidence, and I have chosen to present to you first this morning the type known as the toxic adenoma, because I believe that is the bete noir of the diagnostic difficulties in this condition.

Toxic Adenoma

You know a woman with goiter gets accustomed to it and she doesn't pay very much attention to it. Finally, however, she becomes ill with various symptoms, nervous, cardiac, and whatnot, but very infrequently is the goiter thought of as the cause. Why? The average age of a toxic goiter patient is forty-two years. Plummer has estimated that the symptoms for which they apply for treatment do not appear until an average period of fourteen years has elapsed. No wonder the patient has forgotten the goiter; no wonder the doctor overlooks the goiter as the etiologic factor in the symptoms which she presents.

Young people can have toxic adenomata that have previously been quiescent, stimulated into pathological activity by some infection. I recollect that a college girl who visited our state as a bridesmaid had tonsilitis, streptococcus infection, middle ear infection, was taken acutely ill within two weeks with severe abdominal symptoms, great prostration, vomiting, red skin, rapid pulse, jactitation, great abdominal distress and tenderness. I was asked to see her with the idea of doing an abdominal operation. The pulse rate was 200. I recognized that she had too much general symptomatology for any abdominal complaint.

*Clinic before The Inter-State Post Graduate Medical Assembly of North America, Cleveland, Ohio, November 1, 1926.

The goiter, she said, had been present eight years. It had not been noticed. She did not have peritonitis. I was satisfied that the abdominal condition was not the pre-eminent thing. Much to our distress the girl went on and died. Post mortem showed no abdominal lesion. She died from acute thyrotoxic fever, acute hyperthyroidism. The goiter had been quiescent for eight years. The toxic symptoms were present only two weeks as a result of her acute infection of a streptococcic type.

Cases of that sort are rare, but the cases of the type that I am going to present to you now are very frequent, so that when a woman with goiter presents cardiac symptoms or nervousness or weakness or what-not, she must come into the court of inquiry to show cause why she has not a toxic adenoma. They all have the serious symptoms that the frank exophthalmic case has, but as a rule they do not have the exophthalmus. If they did, any one could make the diagnosis when the eyes are bulging so that he who runs may read. But remember that it is more murderous than the exophthalmic because it is insidious, it steals upon the patient and it steals upon the clinician, so that when we come to operate upon the patient it is a worse risk than the frank exophthalmic. Such patients are ambushed.

The case that I want to present first is a woman of fifty-one who has been treated for a number of years for diabetes. Her main symptoms now are weakness, breathlessness, nervousness, and voicelessness. That is a temporary and recent, transitory affair. The diabetes which she is said to have had for so many years is at the present time not apparent.

She is a Charity Hospital case. She has only 106 milligrams of urea, and she has no sugar thrown down. She drinks enormous quantities of water. She has a ravenous appetite, but if she has diabetes now, she also has a toxic adenoma with all of the symptoms.

The tremor is not so marked. The goiter is very evident. The eye symptoms are quite characteristic. It looks like a frank exophthalmic. The goiter, she says, has been in existence only about a year, so that technically speaking I would regard it as an exophthalmic, but the diagnosis she comes here with is a toxic adenoma. Of course, it doesn't make a great deal of difference

Toxic Adenoma. 16 years duration. 2 years toxic symptoms. Basal metabolic rate +36%. Cured by thyroidectomy under local.

so far as our treatment is concerned; she does have practically all of the eye signs—the full fishy eye, the staring eye, the infrequently winking eye, the bulging eye, and she shows, as she looks down, a little too much of the sclera.

I am looking for the sign known as Mobius's symptom, one eye looking one way and one the other on attempts at convergence. But those are all apart from the important factors of the case.

Her basal metabolic rate is plus forty-eight per cent. She has to be handled with a great deal of care. She is here in a rolling chair and she must go back in a taxicab.

The treatment of this case is a very delicate matter because it is like treading on a basket of eggs to manage it. If she did not have her toxic symptoms, her rapid pulse, her great prostration and weakness, the enucleation of that adenoma would be like taking out a lipoma on the back, but just to approach those cases excites them. Her pulse now will run up to 160 just from this exhibition, showing the great sensibility of the organism to the excessive secretion of the thyroid that acts literally as a poison to the system.

The thyroid is the most wonderful gland in the body. The thyroid is like the accelerator on your car; just step on the gas and away you go. So the thyroid turns on the gas and gives the patient all of the rapidity imaginable, so much so that it is like letting your engine race all night. No wonder the mechanism wears out. No wonder it is a body-wide disease. No wonder that it steals upon us and finally destroys life unless it is very skillfully maneuvered.

It is an easy thing in the beginning, but in the end we recognize the great difficulty of handling these cases. Many of them cannot stand anything at all, and it is really pitiful to see the effort they make. They are game enough, they will try to get up on the table although they will fall and faint. A neurasthenic won't even try to get on the table. It is a very good differential point. The neurasthenic is unwilling; he could do it if he thought he could. The exophthalmic case will try, even though he falls.

I could best illustrate the danger of this case by referring to the toxic effect upon the heart. Exophthalmic goiter expends it-

self upon the nervous system. The patients have the tremor and the extreme restlessness; they have all the vasomotor changes, the red face, and sweating.

I will just for a moment stop to introduce another group of cases coming back to the management of this type, together with the exophthalmic, because they are practically the same thing. These three little children are aged twelve, eleven and seven. These ages represent a game we have in the South known as craps. Seven-eleven are the winning numbers; twelve is the losing one.

Adolescent Goiter

There is no goiter in the family, and still all three of them have a small adenoma. You could hardly call it the goiter of adolescence because they are not adolescent, but it is the goiter of the goiter belt here on the Great Lakes where there is no iodin; it has been leached out of the soil.

Iodin is all these children need. In Switzerland last year we noticed the ubiquity of goiter; there is no iodin. As soon as they put them on iodin the goiter melts like the snow that is on their Alps.

You remember the wonderful work that was done here in Akron in this state. All the school children who wished it were given sodium iodid every spring and every fall for two weeks; they were given two grams. Out of 2,000 odd cases no goiter developed, and as strikingly the control cases, 2,000, had five times as much goiter as the cases that were given iodin. In other words, the ones that did have it all melted away, so that in this state, as in Switzerland, it is the part of wisdom to administer iodin to every child whose parents are willing to submit to it, every spring and every fall, to prevent the disease.

There was a fear that it might possibly cause toxic symptoms, that it would stimulate a goiter to toxic manifestations. Not so. That was a myth. In Zurich, where there is such a tremendous incidence, they have almost controlled the appearance of goiter by the administration of two grams of sodium iodid in divided doses over two weeks, spring and fall.

In New York State there is a slogan, "No diphtheria after

Extreme exopthalmic goiter. Benefited by ligation. Thyroidectomy declined 4 years. Hemisection followed by reduction B. M. R. to +26%. Then second half removed successfully.

1927." We ought to say no goiter after 1937 in the goiter belt at least. If it becomes a fixed policy of school boards to give iodin to school children, goiter will fold up its tents like the Arabs and silently steal away.

We have here a school girl of sixteen. Here goiter is self-evident, more to her than to us, really. One can feel the thyroid enlargement. She is perfectly well, she has a normal pulse, no tremor, and she comes to ask whether or not anything should be done for the goiter.

This is the type of case that the man who has taught the world more about goiter than any other living man, Charles Mayo, says will get well with treatment, without treatment, and in spite of treatment. When I was a lad in my father's office, I gave the goiter girls galvanism and they got well in spite of Galvani and myself.

Would you operate on this girl? No. It is rare that you have to operate upon a goiter of this type before twenty. If she had a definite encysted adenoma, yes, because, it is a tumor, really. It is not a general parenchymatous enlargement of the thyroid as this girl has, and you can hull it out like a tangerine out of its skin. One per cent of all these adenomas undergo malignancy and they are all of the fetal type, so most adenomas should be removed for that reason.

If a girl at twenty-five has a definite tumor in the thyroid, she runs a twenty per cent chance to have toxic symptoms develop later in life. An adenoma is all right to enucleate, but a parenchymatous enlargement should be left alone but should be given iodin. It will disappear. You can feel very confident about that in the great majority of cases. If it does not disappear, it means that you have small adenomata that go on and increase because they are encapsulated, they don't get the benefit of the iodin, it is hard to get anything in them, it is hard to get the secretion out again, and as a consequence, later some cases, failing to be cured in girlhood, after twenty develop a definite adenoma that is very easy of enucleation.

I want to show you a contrast to the hyperactivity of the thyroid. A case of myxedema. The thyroid, of course, in adolescence is a sexual gland; it manifests itself; it is just a work

hypertrophy; it is just full of unstable colloid. It will shrink down when treated with iodin.

Myxedema

This lady is thirty. She has had two children. She complains of headache, of loss of axillary and pubic hair, and has a basal metabolic rate of minus thirty per cent. She has been taking thyroid extract, five grains three times a day; her headache has disappeared, she has lost weight, she has had a cold but has gotten over it with this treatment, but she has had no other improvement, and has had no return of axillary hair.

She presents the lethargic type of lack of thyroid, a little fleshy, short hand and short fingers, little pads of fat about her. She lacks thyroid. She is running without any gasoline. She has not even that gallon in the emergency tank.

This is the case that we used to give thyroid extract, a very good preparation, but it is not like the active principle itself, thyroxin, that Kendall discovered. Thyroxin will work miracles with these cases. Of course, thyroid extract we did well with. Iodin we did a little better with, thyroxin still better. This patient will have to have it for a considerable period. We don't know just why her thyroid has become inactive. She is not like the type that is born without a thyroid, the cretin, the little fellow who has no thyroid secretion and as a consequence the other glandular secretions, particularly the adrenals, all in unbalance. They have a runaway adrenal. Adrenalin does to the patient's capillaries of the brain just what a ligature would do; it ties a ligature around every capillary in his body, his brain is stunted, he is a little idiot, he sits on the floor; there is no activating principle that seems to be the dominant factor in life.

The myxedema that comes on later in life does so much better than cretinism. We have tried everything for the cretin. Thyroxin is best. Transplantation of glands doesn't seem to do any good to the younger people who can handle it. It seems only to have effect on the senile when certain glands are transplanted and have more effect on the head than upon any other part of the body.

Multiple adenoma, non-toxic. Removed successfully by Dr. W. O. Floyd in our Clinic. These are the growths that in five per cent of cases ultimately become toxic if not removed and are not curable by iodin.

We took the thyroid out of the mother and slipped it somewhere under the skin of the cretin. Nature absorbed it, of course, like any other foreign body. Kocher contrived to put it in a place where it could not be absorbed. He made an opening in the tibia as you plug a watermelon, put the thyroid in, it was absorbed quickly.

But with thyroxin both the myxedemas and the cretins can be wonderfully improved.

The myxedema patient is slothful, quiescent, dormant, but she will be waked up by that most remarkable of all glands in the body, the thyroid.

Exophthalmic Goiter

I wish to show you the real problem that the physician and the surgeon face with thyroid over-activity. Here is a typical case of exophthalmic goiter that has been cured. This patient is twenty-eight. Four months ago she noticed she was losing weight. She lost twenty-seven and a half pounds. She was nervous, irritable, she had stabbing pains in the heart. Her husband noticed her eyes bulging a month ago.

She has the classical eye sign, the bulging eye, Kocher's sign of seeing too much white of the eye, lagging of the lower lids on looking up, von Graefe's lagging of the upper lids on looking down, a small, fine tremor that you can see. That is not always of the hand alone. Before the ladies began wearing the little tight cloche hats and had beautiful plumes to beckon us on, you could look into your reception room in the morning and by the wave of the plumes on the hat your diagnosis could almost be made. They vibrate so much that the little blue or pink bows flutter on the lingerie.

This patient's basal rate was at one time seventy-eight. Under Lugol's solution it decreased markedly. Dr. Lind was able to remove this goiter, and you see the trifling scar, the small point here. About all we ever get to do for a goiter after that is to pick off that little scab about the twelfth day.

The pathologist's report is as follows: There are several areas showing almost no acini filled with colloid; these regions show very small acini, or only a few cells without formation of

acini. There is a small amount of colloid in the stroma between the acini. Other fields show larger acini, partly empty, partly filled with colloid. The acini are lined by one layer of cuboidal cells; only few alveoli are lined by more layers, and some of the alveoli contain a large amount of epithelial cells. No inflammatory cells in the stroma can be seen.

This leads one to speak of the classical symptoms of exophthalmic goiter, namely, the goiter, exophthalmus, tremor and tachycardia. She has all four. A basal metabolic rate will check up on our clinical findings and give a fair idea of what the patient can stand. Never operate upon the patient that is very acutely ill. Operation for exophthalmic goiter is not an emergency operation. You must detoxicate. Patients will die from a ligation under local with exophthalmic goiter if they are, like the Leyden jar, charged to such an extent that an explosion will occur. Patients have been known to die in the rolling chair going to the operating room. Any great fright or excitement will run the pulse up to 180 or 190. So you have to handle them with the greatest, with the utmost, care. I don't think anybody can handle them with the grace that has been shown here in Cleveland by Crile and his associates in stealing the gland with their consent but without their knowledge. It is not absolutely necessary to do that, though it is very helpful, it is a beautiful thing to do, but many clinics cannot do it. There has to be some sort of spiritualism in a clinic of that sort, dominated by one of the great geniuses and carried out with an exactitude by sympathetic admirers.

Years ago we gave iodin to anybody who had a thyroid enlargement. Kocher and others called our attention to the fact that if an elderly woman had a goiter for some years and she was given iodin, in all likelihood she would develop toxic symptoms with tremor, fast pulse, loss of weight, and the like. They called it iodin Basedow, the made-in-Germany name for hyperthyroidism, Graves' disease.

I think the greatest mistake that we make at the present time is to give iodin to people who have had goiter for a long time. It stimulates the gland to unbridled pathological activity.

Extreme exophthalmos persisting one year after successful thyroidectomy for neglected exophthalmic goiter. Exophthalmos in the right eye was so extreme that panophthalmitis had developed and the eye had to be removed. Left cervical sympathectomy indicated if the exophthalmos, which is the last symptom to disappear, persists.

Exophthalmic goiter. Complete dislocation of eyeball. Cured by replacement, temporary suture of lids and thyroidectomy. (From British Medical Journal.)

Never give iodin to a woman who has had goiter for a long time.

When we learned that, we were so afraid of iodin that we would not give it to anybody except these little children, but Plummer has presented a most remarkable piece of clinical work —it is comparable to the work in insulin—with iodin in the preliminary treatment and preparation for operation in exophthalmic and toxic adenoma.

In exophthalmic goiter we have a faulty secretion. The iodin seems to supply a different quality of secretion. In toxic adenoma we have pure hyperthyroidism; in exophthalmic goiter it is a dysthyroidism. That is why in toxic adenoma if you give iodin you have an increased hyperthyroidism. In exophthalmic goiter you have a purer quality of thyroid secretion induced by the iodin. It seems that one of the radicals, the iodin radical, is gone. You supply that on the molecule. As a consequence, the patient is greatly improved in a short period.

You can give a woman with a basal rate of eighty or ninety, ten drops of Lugol's (compound tincture of iodin) for a week or ten days, with rest in bed and her rate will go down to forty-eight or fifty, her tremor will disappear, her excitement and restlessness will go, her pulse will quiet down from 150 to sometimes even eighty, and then if the surgeon will take time by the forelock and operate at the period of the greatest improvement, he will get a most beautiful result. The patient without the iodin, operated before that, will have a very stormy convalescence. It takes the place of the ligations of the superior thyroid arteries. When we had a patient so bad that we knew we could not get away with a thyroidectomy, we would ligate one thyroid under local and then later the other; the patient would go home, and the pulse would quiet down, and then in 2 or 3 months do the thyroidectomy. Iodin will do the same thing in a week or ten days' time as a rule, and it has almost done away with ligations. But it is not a treatment to be kept up indefinitely. It is not a medical treatment, it is not a curative treatment. That is the mistake that we are making. It helps them very much in the beginning; if we keep it up it loses its influence.

So if you give patients iodin too long they will not respond

to it when needed as a preparation for surgery. You cannot then go back and get them in the good state that they were before. It takes a much longer time to re-prepare them than it would have done originally.

What else will iodin do? If that girl who died in two weeks from acute hyperthyroidism could have been treated with iodin she might have been rescued. We would have given her fifty drops of iodin, or a hundred if you like, a day and I believe she would have gotten by. I have seen cases almost as bad get over a crisis under the iodin treatment.

Plummer said he used to have on an average of fifteen medical deaths a year that would die on the train, in the hotel, or before they could ever get to the surgeon. Now with the use of iodin he has only one or two a year. It really is a most wonderful thing. It is like necromancy. You can hardly realize it if you have not observed it. It is a life-saving plan in the crises.

This patient has had a beautiful convalescence. She has had no trouble, and I don't know anything more satisfactory than the permanent cure of exophthalmic goiter or toxic adenoma, provided somebody has not let her sin away her day of surgical grace so that a body-wide disease has affected the heart and the kidneys and the nervous system to such an extent that chronic change that is insuperable renders the patient inoperable.

Some of the Surgical Lessons of the War*

In the life of but few medical men have such ghastly, horrible, suppurating wounds been seen as in the great war, that was so happily and victoriously concluded. Surgeons had perfected the antiseptic and aseptic prevention of suppuration, and to many the pestilential wounds of the pre-antiseptic period were unknown. In the very beginning the medical officers were confronted with a totally new experience—an almost unbelievable degree of septic wounds. To say that they were met successfully is a very great tribute to their ingenuity, skill and conscientiousness. The new and extensive plan of wide and complete excision of all injured and potentially infected tissue, devised for war wounds by the French, to prevent gas infection, and called by them *debridement,* was the brilliantly radical and life-saving discovery of strictly war surgery.

Perhaps the next most striking surgical development of the war has been the Carrel-Dakin method of handling suppurating wounds. Its principle will live, whether the antiseptic solution is modified or not. It consists in the instillation at one or two-hour intervals of a given amount of fresh antiseptic fluid to the entire infected area without changing the dressings. The object is to obtain rapid destruction of the pathogenic microorganisms, and to keep an accurate chart of their bacteriologic count until they number less than one in a given field. When this is attained, wounds of great extent can be closed with assurance of successful union.

The neutral hypochlorite of soda (Dakin's solution) has been the one most extensively employed. It has been almost universally used by the French, and also by the American Expeditionary Force. I saw its administration on a very elaborate scale at my station at Evacuation Hospital No. 1, where it was almost the exclusive method of treating infected wounds. It had been used continuously there in a very large number of patients from the beginning until its close after the armistice. The various surgeons and teams which were trained there carried its use to other centers, and it was also universally used by those of the medi-

*Read at the Tennessee State Medical Association, at its annual meeting in Nashville, April, 1919.

cal corps, who learned its use here on this side in the courses established by the Surgeon-General at the Rockefeller Institute, which were presided over originally by Carrel himself. While organizing these courses for the Surgeon-General, we endeavored to have at least one officer from every Base Hospital and other smaller units to take this training. Tuffier, the dean of French surgery, is quoted as saying: "I can sterilize any wound by this treatment." Chutro, who had a clinic of three hundred military beds in Paris, asked for the worst cases that could possibly be sent to demonstrate its efficiency. The British Commission, which was sent to France to study this method, in their report say that in this clinic, and four other large military hospitals, they saw recognizable pus in only two cases. It was used there to the exclusion of all other antiseptics at all stages of the disease. In Tuffier's clinic there was displayed prominently in each of the wards this legend: "Tout blesse qui suppure a la droit d'en demander la raison a son chirurgeon," which means, "All wounded who suppurate have the right to demand the reason of his surgeon."

Some objection has been urged against it, but this commission, after analyzing each of them, says that all objections are of small moment when compared with the proved advantages of the Carrel method of treatment. The British were the last to champion this method, as they had devised many treatments of their own, which were more or less satisfactory. Among them the antiseptic paste of Morison, known as "Bip," was very efficacious. It is composed of one part of the subnitrate of bismuth to two parts of iodoform and a sufficient quantity of pariffin to make a soft paste. It is applied in a thin layer over the wound until it becomes clinically sterile when closure by suture can be effected satisfactorily. As this communication is to call attention more especially to the newer principles which seem most probable of enduring the test of time, I will not go into the detail of any treatment. Indeed, the most important fact growing out of the management of war wounds is the increased interest which has resulted in the endeavor to conquer suppuration. The daily bacteriological count is a great and important step that should be perpetuated. Other chlorine preparations, such as dichlora-

mine T, has had its advocates and has had a certain amount of usefulness. The principle, however, of continuous antiseptization and careful bacteriologic control as taught by Carrel is the essential thing in the conquest of septic wounds.

Traumatic Shock and Hemorrhage

The phenomenon of shock is still unexplained. It is as mysterious and elusive as ever, in spite of the great number of observations and experiments that have been made. Of one thing, however, we are sure, and that is the typically low blood pressure that always attends shock. This is associated with stagnation of blood in the capillaries and is recognized as exemia, "drained of blood." The blood in the capillaries differs from the blood in the vein by as much as two to two and a half million red blood cells per c. m. increase. This blood in the capillaries is really lost blood so far as the circulation is concerned and when real hemorrhage is added it is not returned to the heart in sufficient quantities and force to keep up the blood pressure. If the hemorrhage is severe the oxygen carrying power is defective and an increased amount of lactic acid is produced which unites with the sodium of the sodium bicarbonate in the blood and carbon dioxide is given off and decreases the alkali reserve, thus causing acidosis. The rapid pulse and rapid respiration increase as the acidosis increases and before death "air hunger" is a very conspicuous symptom. It can be relieved, however, very promptly by intravenous injections of three per cent solution of sodium bicarbonate, and the blood pressure can be thus restored to normal. If the blood pressure is reduced to seventy millimeters the alkali reserve falls; if it gets as low as sixty millimeters it falls still faster and acidosis becomes more grave, so that it may be said that a critical level of oxygen supply is reached when the blood pressure gets down to eighty millimeters of mercury. In fact, if the systolic pressure gets below ninety for longer than an hour and a half with no improvement after the administration of morphia to insure rest, and the use of warmth and the free administration of fluids by mouth, by rectum and subcutaneously, whole blood should be transfused into the circulation. If the pressure gets as low as fifty or sixty, we should not wait on these resusci-

tating measures, but transfuse at once; and if that does not suffice there are some cases which are so grave that additional transfusion of five to seven hundred cc. of blood will have to be employed. We must, therefore, watch our cases of traumatic and post-operative shock very closely and use the blood pressure apparatus constantly. That is a very definite guide and is extremely accurate. In the shock rooms of the evacuation and other front line hospitals the application of artificial heat in a thorough and definite manner was the sheet anchor. Hot drinks, in other than abdominal injuries, and morphine were depended upon. Saline solution under the skin is helpful in mild cases. It is of little value in the veins, as it so rapidly oozes out. If the condition is grave enough to require intravenous injection, whole blood should be employed, if possible. In the absence Bayliss showed that six per cent solution of gum acacia in normal salt solution would add to the viscosity of the blood, remain in the capillaries, and raise the arterial blood pressure. It is not, of course, ideal, as one dislikes to introduce any foreign substance in the blood current, but it is preferable to letting the patient die, as we have so often seen, for the want of something that would permanently raise and maintain the blood pressure. In the transfusion of blood some simple apparatus, like the one devised by the army, should be employed. The main thing about transfusion is to stick to one method. It has been shown that the citrate method is the simplest. It is important that there should be no hemolysis between the donor and the recipient. If possible, donors should be selected and classified into the four groups of Mall in every community and in close touch with hospitals. With citrated sera of Groups II and III a small drop of blood from the patient's ear can be tested against this to show to which group the patient belongs. Then it is simple enough to choose a donor who belongs to the same known group. In the absence of these the hemolysis test should be employed. By the interested and active utilization of these principles many cases of traumatic and post-operative shock and hemorrhage that have hitherto been lost, can be saved. If shock is allowed to continue, or continues in spite of intelligent efforts for a certain period, the

damage resulting to organs and tissues is such that there is no recall.

The Abdomen

The war has not added anything strikingly new to the well known surgical principles in the treatment of gunshot wounds of the abdomen in civil practice. On the contrary, the very satisfactory experience of civil surgeons has been brought to bear in the war game and changed entirely the attitude of the military surgeons. It will be remembered that in the Spanish-American war the difficulties besetting operations near the firing line were so great and the results were so unsatisfactory that Senn and others issued the edict that no operations should be performed. The same practice was carried out in the Boer war, and to a less extent in the Balkan and Russo-Japanese wars. At the beginning of this war, however, the surgeons from civil life insisted on utilizing the same principle of early exploration and thorough operation in all cases where possible, and finally established this as the line of procedure. It has been established for many years that operations to be successful should occur approximately in the first eight hours. If it has been longer than twelve hours the mortality is very much higher, and if it is over twenty-four hours a successful issue is correspondingly decreased with the increase of the time. That does not mean that no patient after twenty-four hours should be operated upon, because it has been the experience of many surgeons to save patients by operation with gunshot wounds in the abdomen where thirty-six hours have elapsed. It is good surgery to operate in doubtful cases where the question of penetration cannot be definitely decided. If the patient is seen early, even in the absence of symptoms, it is better to "look and see" than to "wait and see." No irrigation should be employed. The advantages of washing out contaminated blood is counterbalanced by the exposure of the intestine and the resulting shock. Likewise no drainage is employed in the sense that the loins or pelvis should be drained. Of course, as Colonel Wallace says, it is permissible to put a small drain near a suture line that is not trustworthy. He reported an experience of nine hundred and sixty-five cases, with a total mor-

tality of 53.9 per cent. Considering the great severity of the type of injury, this result under the very trying circumstances of war is quite satisfactory. It, of course, is not to be compared to superior results obtained in civil practice where gunshot wounds are at once brought to hospitals, and operated upon early in good condition and under ideal environment.

The Lung

The most dramatic surprise of the surgery of the war is in the management of injuries to the lung. It is in direct contrast to civil practice. Bullet penetrations of the lung in civil life that do not die outright get well in the majority of instances. A war casualty usually contains infected foreign bodies, including projectiles, pieces of bone, clothing, etc., and the wound should be treated by excision of the infected and devitalized tracts in the lung just as it would be in the soft parts. Hitherto surgeons were very chary about opening the chest, except in empyemata. The immediate mortality in thoracic wounds from trauma, shock and hemorrhage on the firing line was very great. In the front line hospitals 28 per cent of chest wounds in the battle of the Somme died. In wounds of the lung that were treated by *debridement* of the wound of entrance, cleaning the pleura with a light swab of ether and closure of the chest wounds only one in a hundred died from empyema where operation was immediate. We need not be afraid of the pneumo-thorax as formerly. It can be overcome when the patient is operated on under local anesthesia by requiring him to forcibly exhale while holding the nose. If under ether, after the closure of the chest wall is properly and completely made, the air may be aspirated. Even if this is not done it will disappear of itself in six or eight days. If empyema occurs after primary closure it can be dealt with secondarily. It seems almost uncanny to see a large thoracotomy wound held widely apart by retractors as an abdominal incision would be and the lung exteriorized, as the French call it, and drawn up carefully lobe by lobe, as one would lift up the liver in operating upon its deeper ducts. The foreign bodies can be palpated, incised and removed and the lung accurately sutured and replaced in the thorax. It is still a very grave procedure. In the

most urgent cases at the front two-thirds were saved by Duval, even when they had severe hemorrhage and asphyxia. When those that were not urgent were included, the mortality was only 9 per cent. The total mortality rate, however, of lung wounds, based on upwards of three thousand cases, was about 20 per cent.

Empyema, as a sequel to broncho-pneumonia following measles and empyema as a post-influenzal complication, was the most serious thing that confronted the military, as well as civilian, practitioners during the war. While no great stride was made in its management, still it must be remembered that never before have we had to contend with such a virulent type of infection and such a large per cent of cases complicated with the streptococcus. One fact has been demonstrated—namely, the wisdom of late versus early operation in empyema. In many of the severe cases, death ensued in twenty-four hours and seventy-two hours, showing it to be largely a systemic affair that could not be benefited by simple aspiration or drainage of the pleural cavity. Cases that pursued a less flamboyant course were commonly tapped every second or sixth day, averaging three or four times, bringing the case to the end of the third week, when the sero-fibrinous fluid had changed into a frank creamy pus. Then thoractomy under local anesthesia is attended with very satisfactory results. The advantage of antisepticising the pleural cavity by the Carrel method was brought out very strongly by the Empyema Commission, and also by the medical officers of the A. E. F. Never again will practitioners generally be backward about early needling of the pleural cavity in suspected empyema. The use of the x-ray has proved particularly efficacious. In simple pleurisy, the shadow is S-shaped, but if there is consolidation it prevents a clear shadow. It is important that the patient be raised up on a back rest or some device for a few minutes to allow the fluid to gravitate to the bottom of the pleural cavity. The x-ray is not infallible. Nothing will ever take the place of the assiduous clinician who is constantly examining the chest. The late operations preceded by repeated aspirations gave 16.2 per cent mortality. The early operation not preceded by aspiration gives 61.2 per cent, whereas empyema not operated upon gave 86.4 per cent. Many excellent devices are used for the

drainage of the pleural cavity. The double-barreled tube is very simple. Dakin's fluid by intermittent drainage by aspiration and instillation with a pair of bottles is better. A 14 F catheter inserted through a trocar and canula introduced between the ribs worked very well, particularly as the thick fluid can be dissolved by Dakin's solution and thus do away with the impediment of drainage that we formerly obtained without the use of this simple method. The importance of slowness of the evacuation of fluid was demonstrated in the recent epidemic. With the improved method the persistence of sinuses was shortened and many cases were closed after sterilization with Dakin's solution at the end of fourteen days. The old obliterating operations, like the Eslander and the Schede, have been done away with.

Joints

One of the most important lessons growing out of the war is the improved results in wounds and injuries of the knee by immediate mobilization. It is just the opposite of the systematic immobilization that we practiced in civil life for so many years with so many ankylosed joints as the result. We are indebted to Willems, who had charge of the Belgian military hospital at Bourbourg, for this lesson. He begins moving the joint as soon as the patient comes out from the anesthetic. It must be extended and flexed to the maximum, and it should not be supplemented by passive motion. In shell wounds he follows out the usual practice of excision of the injured and infected soft parts down to the capsule of the joint, cleanses the joint carefully with ether after removing all foreign bodies, and if it is perfectly aseptic, closes it and then begins mobilization. I had the opportunity of seeing a number of cases treated in this fashion near the front line that were very satisfactory. These men were up and about in a few days, using their legs or joints freely. At first the patient is given a jointed Thomas splint and after walking on that for several days it is taken away and he uses only a cane. Cases where parts of both cartilages were destroyed, but where the crucial ligament was still intact and as much as half of the articular surface preserved, were restored with resection.

When injuries were not too extensive they were given a trial before resection was resorted to.

The principle of mobilization is most useful in purulent arthritis. The pus is evacuated by a bilateral arthrotomy with immediate motion of the joint, which causes the pus to be expressed and makes the drainage very complete. One can actually see the pus exude as the joint is moved, and it is then realized that after all it is most complete, and the only way of adequately draining a joint. Irrigation is done away with and it is unnecessary. Pain and temperature rapidly subside. As soon as the secretion begins to dry up, and the joint is limited somewhat in motion, the wound should be at least partially closed. The large joint, like the knee, gives the best result, the elbow next. Of course the small joints, like the wrist and ankle, are not so satisfactory. In a hundred knee cases treated by Willems, eighteen of which were associated with pus in the joint of a streptococcus type, there were no deaths and no amputations and only two stiff joints resulted, in one of which the ligaments were gone and the popliteal artery was thrombosed. This principle is going to be permanently utilized in joint surgery and infections of the larger joints.

Amputations

It is probable that over 400,000 arms and legs have been amputated in the war. It has been impressed upon all that the longest possible stump for leverage be made, no matter at what point the amputation must be. Inasmuch as most of the wounds were infected, the circular method was employed and really is preferable to the flap as far as the wearing of apparatus is concerned. In civil practice we have permitted too much time to elapse before the man is gotten up and about. In the future as a result of military surgery we will insist on our patient beginning to move the leg or arm, while healing is taking place. In thigh amputations the member must be taken off of the pillow two or three times a day so that no contractures can occur. As soon as the wound is healed massage is used, followed by proper exercising, baths, movement, etc. When the patient is able to leave his bed, some simple weight-bearing apparatus, like a plaster paris cast of the stump attached to two metal rods, is put on and the

patient taught to walk. In this way crutches are done away with, and the morale is improved. Instead of a long invalidism and many months of loss of time, incapacity for work is greatly shortened and re-education is begun promptly. The net gain to this improved plan of handling amputations is very practical in industrial surgery.

The Guillotine amputation, when the member is simply cut off without any effort at flap formation and the bone sawn flush with the soft parts, was extensively employed in septic cases to minimize the area of the cut surface, but was long and tedious to heal, and should never be used in civil practice.

I cannot do justice to the importance of the subject of plastic surgery where the most appalling defects, like the destruction of the lower portion of the jaw, have been restored by co-operation of the dental surgeon with his splints and the skill of the plastic surgeon. Likewise, the severe mutilations of the face and nose and mouth have been an inspiration for the most delicate restoration. Moreover, the surgery of the peripheral nervous system is going to be almost rewritten; with over 1,700 peripheral nerve injuries which are being handled at the present time by our medical corps tremendously valuable lessons for the future must be learned.

The vascular system, too, has had its share of trauma, and while in military surgery ligation was employed rather than suture, at the same time many of the more chronic defects, like arterio-venous aneurysm, will be cared for by arterial and venous suture. While Consultant in Surgery at the Mesves Hospital Center for a short time I saw six cases of arterio-venous aneurysm.

Fractures

Fractures from battle casualties are nearly all compound. Surgeons had the opportunity to master the technique of the Thomas splint. It is the ideal apparatus for transportation and as a permanent dressing allows traction and alignment to be kept up perfectly and the wound of the soft parts gotten at easily for dressing. (A moving picture of the minute application and versatility of the Thomas splint was here shown.)

The Blake splint is a distinct addition to the surgical armamentarius. The Balkan frame is a splendid means of suspending limbs and providing for traction. It adds greatly to the comfort of the patient and has many very accurate adjustments and can be made by any carpenter from designs furnished by the Surgeon-General's office. It can be applied to any and all fractures requiring confinement to bed, and has its greatest usefulness in compound fractures and in multiple injuries. Used in connection with a portable x-ray apparatus, the management of fractures becomes a most exact and satisfactory experience.

Newer Phases of the Cancer Problem*

The age-long scourge of cancer engages the surgeon in unequal combat. It will not keep the terms of the armistice. It is the only medieval problem left unsolved, and is the most unfortunate heritage of the medical profession. Our results have been most forbidding. The laity has gotten the impression that cancer is a blood disease, that cutting makes it worse, and that nobody is ever cured. This adds to our difficulty and we, in turn, by attempting to extend relief to advanced and neglected cases, bring discredit upon the possibilities of surgical therapy in this disease. If it were possible to decline every questionable risk on the ground that it had been delayed too long, people might obtain the correct impression of the wisdom and necessity of obtaining early relief.

During the two years of war more than twice as many noncombatants were destroyed by its ravages in this country as soldiers and sailors were killed in action and died of disease. These numbered 80,000. Cancer is said to be on the increase at the rate of 2.5 per cent a year.

Of 907 surgical cases in my clinic during the year ending March 31, 1920, 76 were operable malignant growths, twelve had x-ray treatment only and were mostly recurrences operated upon elsewhere. Thirty-seven had radium treatment alone, were practically all inoperable, and seven were declined as hopeless. Thus 132 were malignant—14 per cent, or about one in seven.

Cancer has been described by MacCarty as an attempted hyperplasia of germ cells. It is the epithelial cell plus some unknown quantity, whether chemical, mechanical or infectious, that causes a lawless proliferation of cell life. The individual cell no longer carries out its community existence, but turns Bolshevik and enters upon a cell cannibalism. Ewing states that chronic inflammotary disease seems to pass gradually into malignant neoplastic disease. He cites the frequency with which epithelioma follows lupus, and the occurrence of sarcomatous changes in lymph nodes during chronic tuberculosis disease.

The infectious theory has not been established, although the

*Oration on Surgery, Southern Medical Association, Fourteenth Annual Meeting, Louisville, Ky., November 15-18, 1920.

work of Smith on plant cancer is very interesting. Crown gall is the cancer of plant life. It is a typical tumor formation and is caused by bacteria. The bacteria develop only within the cells and in this way they force the cell to divide very rapidly and thus form a growth composed of small, unripe embryonic cells. The bacteria themselves are not visible within the cells. The tumors can be inoculated into other plants and similar tumors result. They spread in the same plant and produce secondary growths, sometimes a considerable distance from the primary tumor. The peculiarity about them is that they are always connected with the primary growth by long strands, often thin and thread-like. The tumors may be large and fleshy and often decayed from poor vascularity. They produce a condition in the plant similar to the cachexia in the animal, and ultimately destroy the life of the plant.

While the specific cause, if it is infectious, is still unproven, there are many known factors that contribute to its occurrence. All of the most frequent cancer sites are in areas and organs most subject to continued irritation: the skin, the mouth, the pyloric end of the stomach, which is the grinding end, the large intestine, twenty times as often as the small intestine, which contains liquid instead of semi-solid contents, the rectum, the uterus and the breast. These all receive physiologic as well as pathologic trauma. Moreover, there are certain ever-present relationships between cause and cancer in the body, namely, infected gums and teeth in cancer of the jaw, degenerating moles, warts, nevi and keratoses in cancer of the skin, the imperceptible smoker's burn in cancer of the lip, the uneven or sharp tooth impinging upon the tongue in carcinoma of the tongue, the dirt of the chimney sweep's cancer of the groin, etc. The local lesion is an inviting area for cancer to develop. It has been indubitably shown to be the sequel of such clinical irritants as gastric ulcer, gall-stones, kidney stones, chronic mastitis of the breast, and the erosion of a lacerated and chronically infected cervix. It requires only some additional cause to stimulate these lesions to pathologic and unbridled activity.

Cancer occurs almost exclusively in the mucous cavities that are acid or become pathologically so from disease, such as the

streptococcus infections in the gums of a diseased mouth which makes an acid medium, the stomach, the large intestine, as contrasted to the alkaline contents of the small intestine, and the vaginal acid content.

A most practical suggestion in the irritative theory of cancer of the two great areas of the body, namely, the stomach and breast, have been pointed out by W. J. Mayo. First the probability of cancer of the stomach being caused by too hot drinks that first cause ulcer, which, as is well known, is related to cancer. Second, the fact that cancer of the breast is rare in barbaric tribes where the breasts in women were uncovered, whereas they are woefully frequent in civilized countries where the breasts are hampered by the corset.

The most hopeful fact of the prevention of cancer, therefore, is to appreciate, recognize and deal with the so-called pre-cancerous lesions that are so prone to invite the development of new growths. It does not mean, of course, that every lesion would degenerate into cancer, but it is certain that if they were cured or removed cancer would not eventuate.

If as many exploratory operations were done for indeterminate symptoms suggestive of cancer as are done for the nebulous symptoms of the ubiquitous neurotic, a great saving of life would ensue. Cancer kills many more than appendicitis ever did in the pre-operative days. It should be the mission of every medical man to educate his colleagues, his clientele and the public in general as thoroughly in cancer as in appendicitis. Urge all patients with suspicious symptoms to have timely and frequent examinations to show cause why they have not cancer.

It remains for our profession to take stock of our dereliction and attempt to profit by the disastrous experience of delay. The Pennsylvania Cancer Commission, studying 400 cases, found that in superficial cancer the patient had noticed the disease on an average of one year and two months. In one-half of all cases there had been some form of chronic irritation or the so-called pre-cancerous condition. They found that the physician had known of the existence of the lesion in superficial cancer on an average of one year. In cases of superficial cancer only 68 per cent were operative when first seen by the physician and only 48

per cent of the deep-seated cancer. In a considerable percentage the physician first consulted failed to make any local examination and in from 10 to 20 per cent gave mal-advice.

If one-third of the cases of cancer occur in the stomach and one in every fifteen men over forty years of age die of cancer, we have the appalling realization that every forty-fifth man dies of cancer in the stomach. Of this number, how few are operated upon or even diagnosed until the advent of hopelessly late symptoms, and this in spite of the fact that nearly half of them, 40 per cent (C. H. Mayo), had a good history of chronic ulcer, which should have been diagnosed as such and operated upon. The Balfour cautery method of destruction of gastric ulcer followed by a gastro-enterostomy gives only 1 per cent mortality. Moreover, the x-ray can determine the existence of cancer of the stomach in 95 per cent according to Carman. It should become a routine examination in cases of painful digestion. Our diagnostic acumen should be concentrated on these cases. Our operative skill is greater than our diagnostic ability. A partial gastrectomy can be done with a mortality of 10 per cent in the best trained hands. We should be stimulated to better efforts because the results are increasingly good. The percentage of cures at the Mayo Clinic of three years' duration are 37.6 per cent and of five year cures 25 per cent. The Billroth operation perfected by Mikulicz, Hartman and Mayo with closure of the excised end and an independent gastroenterostomy is a very satisfactory operation. The Polya method of uniting a part of the cut end of the stomach stump to an opening into the jejunum fourteen or sixteen inches from the duodenum in front of the transverse colon is easier, more quickly concluded and enables one to remove more of the stomach with less traction. As an indication of progress 39 per cent were operable in 1915 contrasted to 16 per cent in 1910 (Bloodgood).

The uterus furnishes 29 per cent of the carcinomas. It rarely occurs in the nullipara and seldom before thirty-five years. I once had the melancholy experience of observing three women in adjoining rooms in a hospital with inoperable cancers of the cervix, all under twenty-nine. The middle-aged woman should heed irregular and profuse bleeding or the slight spotting after any-

thing that would irritate the cervix. Bleeding occurring after the menopause means cancer almost invariably. If the cervix is not involved a careful curettement should obtain specimens for microscopic examination. A watery discharge is a danger signal. Fortunately metastasis is not rapid and many more cases could be saved if the early warnings were heeded. The safest time for operation is before the diagnosis is too certain. A well-secured specimen for interpretation by a competent pathologist gives the best diagnosis. Two-thirds of the cases occur at the junction of the vaginal and cervical mucosa, one-third within the cervix. Intractable erosions and lacerations should be repaired, and the specimen even in clinically benign cases where a trachelorrhaphy is done, should be sent to the laboratory, not only for the patient's benefit, but to furnish the pathologist with material for study. Cancer of the body of the uterus is well known to be the most favorable of all deep-seated malignancies on account of its slow growth and the absence of lymphatics and the ease of removal of all organs involved. Enlargement and metrorrhagia should make one suspicious. A bimanual examination that elicits copious bleeding indicates that the tumor is not a fibroid, but most likely carcinoma. Seventy-five per cent of the cancers of the body of the uterus stay well after panhysterectomy. Malignancies from fibroids occur usually on the endometrial wall opposite where the bulging growth impinges upon it and not in the tumor.

I have twice seen cancer develop in the cervix left in three and four years, respectively, after an abdominal hysterectomy, one for fibroid and one for a complicated intra-ligamentous cyst. The latter remains well ten years after secondary removal.

Aside from our own surgical problems our duty should be to teach the women of the world that the menopause should be a decrease of menstruation and not an increase; secondly, to teach every woman the importance of a thorough physical examination in the presence of any abnormality. If it were possible to have every woman under competent medical supervision during the change of life, many lives would be saved by discovering the existence of cancer and the institution of radical treatment.

Any growth in the breast should be looked upon as an acute disease. Bloodgood says:

"If all lumps in women over twenty-five could be removed within a few days after they were first felt, one-half would be benign and of the other half, 85 per cent would be permanently cured."

The average for cancer of the breast, according to MacCarty, is 47 years and for benign tumors 33 years. An adenoma under thirty years of age can be removed with great assurance that it will be benign, but over thirty it is potentially malignant.

In examining the breast both the glands should be palpated. The flat of the hand should be used and the breast palpated between the extended fingers and the chest. A great deal of confusion can arise by taking a part of the breast between the fingers and the thumb. When flattened out the slightest deviation can be detected. If a lump can not be felt pain alone or discharge from the nipple should not demand an operation. As the result of efforts to teach women the danger of tumors of the breast a much larger percentage are coming for operation that are benign. In a certain small percentage the surgeon will do a radical operation on border-line cases perhaps that may be thought by some pathologists to be non-malignant, but it is certain that such cases will never die of cancer.

In over 1,846 cancers of the mammary glands, MacCarty has never seen the condition unless it has been associated with a definite chronic mastitis. In over 1,819 specimens of chronic mastitis he has found histologic pictures that present changes with the demarkation to and including the picture of early carcinoma.

The surgeon should, in the absence of a frozen section, be able to determine by the naked eye the malignancy of the majority of growths. If not, it is relatively safe if the entire tumor is extirpated to completely close the incision until a careful pathological examination can be made and then to remove the breast. I have a number of five-year cures in which this course was pursued.

It should be unnecessary to warn against operations where the supra-clavicular glands are involved and in the majority of cases an x-ray of the chest should be made to show any possible metastasis.

Crile obtained 80 per cent of cures of three years' duration in cases confined to the breast, but only 21 per cent of cures where skin, lymphatics and muscles were involved.

The Halsted, Meyer or Rodman operations are attended with a very low mortality and very little disability.

In a short period of a few weeks seven cases of cancer of the colon came to my clinic, five with complete obstruction, three of whom died. One of the napkin-ring type was discovered at the hepatic flexure during an operation for gall-stones. Another obstructive case had been under hospital care for two months without a diagnosis and without an x-ray examination. In complete or even partial obstruction delay for x-ray should not be made. All cases of obstipation, colics and a tumor discernible at one time and not at another, should demand an x-ray and an exploration. Ninety-eight of the intestinal cancers occur in the colon and only 2 per cent in the small intestines. I have reported resection of 42 inches of small intestine and mesenteric glands (sarcoma) in a boy of eight years with no recurrence after nine years. The colon holds cancer for a long time on account of its few lymphatics. Even when necropsy shows death due to perforation, peritonitis or obstruction, the disease is still local in 50 per cent of the cases. The percentage of operable cases has increased 50 per cent. The mortality has decreased 50 per cent and the percentage of five-year cures is over 50 per cent (54 per cent according to C. H. Mayo). The Mikulicz two-stage operation is very safe and should not be lightly discarded. Bevan has recently described a standardized technic for handling these resections that is satisfactory and efficient.

It would seem that a structure so accessible to palpation and obstruction as the rectum would easily yield up its secret of a cancer. My associate, Dr. W. O. Floyd, reported in 1914 five of our cases of complete and permanent obstruction from cancer of the rectum that had never been diagnosed until the fatal obstruction occurred. The patients mistake it for the bleeding, pain, etc., of piles and do not apply for examination. The error on the patient's part is not the only error. It is significant that 15 per cent of cases of cancer of the rectum have been erroneously operated upon for hemorrhoids. Inspection after physical ex-

amination and proctoscopy following an enema should be routine examination for hemorrhoids.

It is estimated that two-thirds of the cancers of the rectum occur in the recto-sigmoid, one-fourth below the peritoneal reflection and one in sixteen in the anal canal. The Harrison Cripps perineal resection, after first purse-stringing the anus and without opening the bowel, is suitable for the low-lying variety. For the more highly situated group, a colostomy followed in two or three weeks by a Kraske is the best method.

The one great advance in the treatment of cancer in the last century is the introduction of radio-active substances. The most rational and efficient means of treating malignancy today is by the combined or selective method of surgery, x-ray and radium. The application of each of these procedures requires special duty and training and necessitates the co-operation of the surgeon, the radiologist and the roentgenologist.

The rays given off by radium and x-ray act primarily on the nuclei of the cell and inhibit their power of proliferation before the vitality of the cell is impaired. Embryonic cells and those which are undergoing active proliferation are the most susceptible. A small amount of radiation stimulates the cells, but more retards the malignant growth. They become less malignant, although they may not diminish in size or disappear. By further increasing the quantity of radiation the injury becomes more pronounced, the cells are completely destroyed, leaving the healthier cells intact, and so slightly injured that they will completely recover. The rays produce a change in the blood vessels with a degeneration of the endothelial cells in the intima. The lumen of the vessels retract, finally become obliterated and the tumor can not obtain nourishment. The lymphatics undergo sclerosis, thus reducing the size of both the lymph nodes and vessels, which in turn inhibit metastasis. An inoperable cancerous mass, after being rayed, changes its type, becoming more scirrhous and less malignant. It is unknown whether checking of the growth and improvement of the general health of the patient is due entirely to histologic changes in the tissue. It has been held that radium has a secondary biologic property. The rays split

up the cancer cells which are absorbed, giving rise to the formation of protective ferments or substances which antagonize the progress of the disease (Schmidt).

Most malignant cells are about two to five times more susceptible to the destructive action of the rays than normal tissue. It is thus possible to produce retrogression of malignant growths and lymphatic glands some distance from the surface without destroying the skin or mucous membrane.

Radium has its limitations. When properly applied it is the most efficient form of radiation we have today for a depth of two or three centimeters. But where deep penetration is desired or large areas are to be rayed, massive Coolidge tube irradiation is the method of choice.

Post-operative treatment of carcinoma of the breast, where the lymphatic supply is greater than in any other organ in the body, requires x-ray. However confined to the superficial tissues this may be, no one can absolutely foretell how far the "microscopic growing edge" of cancer may extend. Halsted found that notwithstanding the present-day extensive operation, death from metastasis occurs in 23.4 per cent of cases even with microscopically negative axilla. When axillary lymph nodes are probably enlarged the chances of operative cure are diminished to one in five. In the past many, many roentgenologists have given a few treatments over the line of incision, axilla and supraclavicular glands. This is incomplete if it omits the suprascapular and anterior pectoral on the other side, internal mammary, subscapular, paravertebral and inguinal groups. The ideal method would be to ray the widest area of lymphatic foci with the least effort on the skin.

Cancer of the breast should have preliminary course of x-ray over the tumor and the lymphatics leading therefrom. The breast should be removed within a week and post-operative x-ray treatment should be given over the wound and all the lymphatics at the end of three weeks. This should be repeated at intervals of a month or more for five or six times. If recurrent nodules develop, radium should be skilfully applied and the general area and mediastinum should be thoroughly treated by the x-ray.

Sarcoma will frequently recur under mild treatment after op-

eration, but will disappear under intensive treatment. The best results are lympho-sarcoma, which seems to be just as good when treated by radio-therapy alone as when removed surgically and treated by the roentgen ray. One of our cases recurring after two years, forming a lump in the neck as large as a cantaloupe, receded under x-ray and it remains well now after five years, having had eighteen exposures.

In certain malignancies the skin flap may be left open and the tissues treated directly. Radium may be left in the wound if it is impossible to remove all of the growth.

Efficient radiation makes operation more radical and increases the percentage of cures in early as well as advanced csaes and delays recurrence in all cases.

Radium has done its best work in hopeless inoperable cancer of the cervix and in recurrences after operation. It has even given apparent local and clinical cures in from one-third to one-fourth of the cases. The local effect of radium is striking. The bleeding disappears, the offensive discharge is lessened and becomes odorless; the cancerous mass contracts and continues to diminish. In some cases it disappears entirely in two months. The patient's general health improves and even those who are toxic or taking morphin are almost transformed. Of course, if there is extensive metastasis, any treatment is only palliative.

In the operable cases, pre-operative radiation and post-operative radiation should be associated with radical operation. Schmitz reports thirteen out of every fifteen operable cases living and well after a period of five years where radium alone was used or combined with radical operation, and believes they have a better chance all around with radium to the exclusion of operation. If, however, recurrence comes within nine months they are less amenable to further radiation.

Radio-active substances have proven valuable in the superficial epithelioma which can be cured by one application. It would be desirable if radio-therapy would follow the removal of even the smallest growth, since the smallest lesions are apt to recur and adjacent glands may be infected.

It is bad surgery to treat a local growth without removal of

adjacent lymphatics. Both local and metastatic conditions are most safely handled by operation plus radiation.

Of 320 cases of deep-seated malignancies treated at my clinic in the last four years by these various methods, we find that of those who had recurrences 66 per cent had only one method of treatment, whereas of those who had the combined method, only 33 per cent recurred, which seems to justify the extensive use of radiation in connection with surgery.

The crying urgency, then, is for the diagnosis of cancer in its beginning. It will revolutionize the disheartened attitude now generally held. Formerly we did incomplete operations for advanced and hopeless cancer with the result on the professional and lay mind that is yet so disspiriting. At present we are doing extensive and complete work in delayed but yet operable cases. The results are wonderfully better, but far from being satisfactory. The technical perfection is very high. The surgery of the future will be enhanced in efficiency and beneficence as the prompt recognition of cancer is universal. Countless lives will then be preserved and mankind protected from its greatest scourge.

The Unnecessary Operation*

Well-executed surgical procedures for disabling symptoms due to definite and removable causes are most brilliant and beneficent in their immediate and permanent results. There is a large group of so-called neurotic individuals who have all sorts of real and imaginary symptoms that mimic very closely every variety of organic disease. Operations, when extended to this type, have been followed by the most disappointing results. In the evolution of abdominal surgery, the ovary, the retroverted uterus, the mobile kidney, the functional stomach disorder, the colon, and the gall bladder have in turn been subjected to operation. All were of the neuropathic habitus, many had the stigmata of degeneracy and had operations chronologically on the organs in the order named for practically the same symptoms with slight variations. Surgeons found the futility of such measures and abandoned largely any operative attack upon these organs without very definite and genuine indications. There yet remain well-meaning men who lack discrimination and experience and make the error of attempting to extend operative relief to this unfortunate type of individual upon insufficient clinical data and inadequate pathological criteria. There are regrettably some unconscionable pothunters who will operate on anybody that will hold still. Every hospital should eliminate that kind of man.

For those possessing judgment and honesty, the ubiquitous neurotic whose complaint simulates real pathology challenges his scrutiny and restraint. Metastatic lesions are miraculously cured by the removal of real foci of infection, yet it is being notoriously misapplied and tremendously overdone. The uncured peripatetic "neuro" now commonly relates operations obviously unnecessary upon the tonsils, antra or teeth instead of decorations made by numerous abdominal incisions as formerly. The general surgeon with a wide experience in handling all types of disease has learned how to triage the neurotic, but the unwary and enthusiastic specialist too often subjects them to unnecessary operations for the cure of bizarre symptoms.

Dysfunction of the abdominal organs constitutes a very un-

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certain land of shifting sands. The neurotic condition is most persistent, resistant, and insistent. The symptoms are so vivid and the complaint is so repeated that many men fail to evaluate them correctly. The chronicity and rebelliousness of these cases make them hard to decline. A humorous publication very significantly says: "If you go to the doctor often enough, you will be operated upon."

There are so many functional disorders of the digestive system, without physical lesions in the stomach itself or the satellite gall bladder and appendix, that it behooves the examiner to be most thoroughgoing. It is inexcusable to overlook cardiorenal and pulmonary diseases, parasites, anaemias, and disorders of the central and spinal nervous system that produce digestive symptoms. The X-ray, fortunately, can isolate practically all of the organic lesions of the stomach. The intangible nervous system that complains so bitterly is our pitfall.

Peristalsis and the secretory processes are not felt or perceived by an individual who is normally innervated. They doubtless transmit sensations to the brain that have to do with the healthful state and certainly with many abnormal states. The neurotic, however, is keenly perceptive of these sensations that are unknown to the normal individual, and in him it amounts to pain. The autonomic nervous mechanism is most delicate and influences us dominantly for good or ill. The vasomotor changes on the surface of the body such as pallor, blushing, and the lesser emotions are such common evidences and yet are so striking and varied as to constitute the film of the novelist in his description of the emotional states, such as fright, pain, fear, or elation. The elder Eastman once said that when a magnet receives a powerful blow on the anvil, it ceases to magnetize; and when the nervous system of a woman receives a terrible emotional blow, it ceases to function properly.

Moreover, if excessive stimulation of the sympathetic system is constantly repeated by worry, doubt, anxiety, and solicitude, the endocrine system which is dominated by the sympathetic is affected, and the condition of the chronic nerve tire with its pitiable manifestations occurs. The smooth-running, physiological mechanism presided over by the sympathetic jangles "like sweet

bells out of tune." It is chance whether the gastro-intestinal function is affected or the vasomotor system, or both.

The sympathetic system controlled man before the central nervous system came into being, and protected him in the primitive state from physical danger. Civilization has lessened the imminence of these dangers, but substituted the more insidious and deadly danger of gruelling strenuosity and the vexatious anxiety of competitive life. The autonomic nervous system in the effort to protect man from his new enemies suffers bolshevism. It then gives rise to the various abdominal symptoms that are spoken of as vagatonia and are, when more widespread, denominated neurocirculatory asthenia. They are often associated not only with abdominal and pelvic complaint, but with pain referred to the head and back. These patients suffer so and their families and friends more so and over such a long time that they think they have organic disease and will not be otherwise persuaded.

Introspection sometimes causes fixed ideation about disease and its seriousness, and requires the most clear-visioned, skillful and sympathetic medical management rather than surgical exploitation. Instead the surgeon is often importuned. The cases are frequently referred by the most accomplished diagnosticians who eliminate every possible source of demonstrable disease by a complete examination, but assume there must be some organic trouble, failing, as they do, in the final analysis to interpret the interplay of the nervous system. The organ, of course, that is blamed the most is the appendix, and while fortunately it can be spared, an unnecessary operation, even upon that organ, is not an unmixed blessing and is often unavailing and discouraging. Seemingly satisfactory results are apparently obtained occasionally, but it must be realized by thoughtful men that they are purely the result of suggestion. Surgery is a very dangerous type of suggestive therapeutics. Chronic appendicitis is so easy to say and still means so little. If it means anything in the history of a patient, it means that it was probably an unnecessary operation upon a neurasthenic. It is never diagnosed in patients with a normal nervous system. Occasionally one will be beguiled into operationg upon these patients and greatly mortified to find a small, cord-like, white, obliterative appendix that

certainly is incapable of producing symptoms. We have little reason for diagnosing chronic appendicitis in the absence of definite acute or sub-acute attacks. Renal and ureteral stone often masquerade as appendicitis. Surgeons are most astute in the elimination and detection of a demonstrable disease. The place they fail is in operating upon people who have no organic disease, but make a noise like they have. It seems that we can diagnose anything the patient really has, but we can't always diagnose that he hasn't anything. It is lamentable that a considerable number of people have had unnecessary operations upon the lowly appendix and other normal organs without benefit. The patient with a throbbing abdominal aorta or blood pressure of 100 should have no surgery that is not imperative. The thin asthenic, ptotic woman may and can have organic disease, but she is the vamp of the diagnostician and the lure of the surgeon.

Tumors of the Breast*

In Collaboration with Dr. H. L. Douglass

A Study of Two Hundred and Fifty-Five Cases

We have collected in our clinic for the eleven years ending Jan. 1, 1922, 255 histories of breast lesions.

In 1910 no benign tumors were operated on; in 1921, 50 per cent of the breast tumors removed were non-malignant. This is a striking illustration of what education has done.

Many women apply for examination who have no lesion at all. This is due to improper palpation by the patient and sometimes by the examiner. Breast tissue, when picked up by the hand, gives an erroneous feel of a tumor; but when the breast is palpated by the tips of the extended fingers, it flattens out over the chest wall, and a lump can then offer definite resistance.

The average age of breast patients was 42.3 years. The youngest patient was a boy, aged 12, with a sarcoma of the left breast. A tumor had been in existence nine years, and involved the whole breast. There was metastasis in the mediastinum, as disclosed by the roentgen ray, and palpable secondary growths in the supraclavicular and infraclavicular glands. The case was inoperable. The oldest patient was a widow, aged 77; this case also was inoperable.

There were only ten males, and their average age was 41.2 years. The youngest patient was 12, the oldest, 59. The latter presented an enormous lipoma of the left breast which was first noticed eight years before. The tumor was about 6 inches (15 cm.) in diameter, and produced no pain except from its weight. The largest number of male patients came in the sixth decade.

The proportion of married women to single women was about four to one, which is the normal ratio.

Thirty-nine per cent stated that they had had no injury or irritation, while 61 per cent said that the affected breast had been subject to acute or chronic traumatism which might have accounted for the new growth.

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The family history was positive for cancer in 29 per cent and negative in 71 per cent of the patients.

Table 1 will illustrate the various types of tumors found in this series.

There were 126 cases of malignancy, or 49.4 per cent of all the patients, thus distributed; carcinoma, 120 cases; sarcoma, three cases; epithelioma, one case; malignant cysts, two cases.

The average age in the malignant cases was 49.2 years, which is about seven years more than the average age for the entire group, including both types of disease. The youngest patient with carcinoma was a married woman, aged 27, with a small tumor about an inch (2.5 cm.) in diameter in the upper and inner quadrant of the right breast. It had been in existence six months. The tumor was apparently not growing, and was symptomless. The patient was treated by excision of the tumor, followed by roentgen-ray exposures. This patient is at present well, five years after the excision. Thus, from our study it is safe to say that a tumor in the breast of a woman under 27 is nonmalignant. If the lump occurs in a woman under 20 and is not growing, it is the only exception to immediate operation, but should be kept under competent and regular observation.

Nine of these patients with a condition diagnosed recurrent carcinoma had an average age of 44.1 years, five years below the average of the primary cases. This bears out the observation that the younger the patients having cancer, the harder they are to cure and the more likely it is to recur.

The malignant group included four males and 122 females. All three sarcomas occurred in males, and the fourth male was a physician with carcinoma of the right breast.

The incidence of cancer was about equally divided between the two breasts. In only one case were the two breasts involved simultaneously. In one-third of the malignant cases there was a family history of cancer, and in two-thirds there had never been a case of cancer in the family. This is fair evidence that heredity plays little part in the etiology of cancer.

TABLE 1—TYPES OF TUMORS

	Number
Adenocarcinoma	83
Recurrent carcinoma	9
Scirrhous carcinoma	18
Encephaloid carcimona	1
Medullary carcinoma	5
Mucous carcinoma	1
Large cell carcinoma	1
Beginning carcinoma	2
Precancerous	1
Epithelioma	1
Sarcoma	3
Recurrent sarcoma	1
Papillomatous cyst	1
Blue dome cyst	11
Malignant cyst	2
Chronic cystic mastitis	19
Acute mastitis	2
Suppurative mastitis	2
Fibro-adenoma	28
Adenoma	9
Fibroma	10
Neuroma	1
Lipoma	2
Scleroderma	1
Dermoid	1
Galactocele	6
Tuberculosis	2
Wart	1
Glandular enlargement	1
Bleeding from nipple	6
No tumor	5
Abscess	4
Intracanalicular fibroma	1
Intracanalicular fibro-adenoma	5
Intracanalicular myxofibroma	5
Intracanalicular myxo-adenofibroma	1
Intracanalicular papilloma	2
Chancre	1
Total	255

The average duration of the malignant tumors before operation was thirty-three months, the shortest period of time being one week, and the longest forty-two years. The next longest was thirty years. Excluding these two unusually long cases, the average preoperative duration was twenty-six and one-half months. The average duration of the recurrent carcinomas before the original operation was forty-two months, which is about fifteen and one-half months longer than for the primary cases. The shortest duration was eight weeks, and the longest, twelve years.

One hundred and three patients were operated on for various types of malignancy. In nineteen others, or about one in five cases that came under our observation, the condition was considered inoperable. Three of these were recurrent. Three others were operated on elsewhere and came to us for irradiation. In one case the type of treatment was not recorded in the history. In 20 per cent there was no palpable metastasis; in 60 per cent there was axillary metastasis only; in 20 per cent there was axillary and other metastasis as well.

There were 108 operations done on 103 patients, of which eighty-seven were complete operations (routine axillary dissection). Five of these patients had recurrence in the opposite breast, making a total of 108 operations. Of these five patients, one died in the hospital from cerebral embolus; two died within a year after the second operation; one could not be traced, and one remains well at the present time, fourteen months after the second operation.

Five amputations were done in very early cases in which there were no evidences of malignancy or of metastasis. There were no recurrences. Three others were done merely as a palliative measure, two of these three being recurrent cases. Three excisions were also performed in very early cases. The remaining three were palliative. Including nine radical amputations of the breast for benign lesions and five done for recurrences in the opposite breast, in the malignant cases, there were 101 complete operations. In two instances the pectoral muscles were not removed. In two instances the wound could not be closed and had to be treated with skin grafts. In two other instances the growth was ulcerated and infected to such an extent that the actual cautery was used for purposes of sterilization and excision. Both of these patients died within two years after the operation.

There were 129 benign lesions of the breast. There were eleven instances of blue dome cysts and one papillomatous cyst. Chronic cystic mastitis occurred nineteen times, acute mastitis twice, and suppurative mastitis twice. The cystic process is most frequent at or about the menopause, and gives a nodular or "cobblestone" feeling, caused by the fibrous tissue that surrounds the cysts. There were four abscesses, or 3.1 per cent of the benign

lesions. There were two cases of primary tuberculosis of the breast, or 1.5 per cent of the benign group. These presented chronic abscesses and multiple sinuses. There were fourteen intracanalicular growths, including two papillomas. Dermoid cyst of the breast occurred once. There was one case of chancre of the breast. The chancre developed near the nipple of the right breast in a married woman, aged 24. This mother had employed a colored woman to look after the child, who was 10 months old. The colored woman infected the child with syphilis, the baby developing a chancre of the lip. The mother allowed the child to nurse, and in this way became infected.

The patients with innocent breast lesions came for treatment at an average age of 36.1 years, which is thirteen years younger than the average among the malignant series. The youngest patient was a youth of 16 with mastitis of the left breast of one year's duration. No operation was performed in these cases. The oldest patient was a married woman, aged 60, who had had an intracanalicular fibro-adenoma of the left breast for about eight years, which was excised.

The average duration of the lesions was fourteen months, as against twenty-six and one-half months for malignant growths. Who can say how many of these benign lesions at fourteen months would have been malignant at twelve and one-half months later?

In the benign group the family history was positive for cancer in 73.8 per cent of the cases, and negative in 26.2 per cent. This negatively proves that heredity plays little or no part in the occurrence of cancer. It is interpreted to mean that the fact that nearly three-fourths of these patients knew of the occurrence and believed in heredity caused them to apply earlier for advice. Only about one-third of the cancer patients knew of any heredity, and they delayed operation more than twice as long as the patients with benign growths.

Practically all women over 25 with single lumps in the breast are advised to have them removed. The frank, movable adenomas are generally removed under a local anesthetic. They present a typical appearance on section, and are encapsulated. The blue-dome cyst is easily recognized and always benign.

These two groups fortunately comprise the majority of innocent tumors.

Nearly all nonencapsulated tumors are malignant, and if all such are submitted to the radical operation, Bloodgood estimates that only 15 per cent will be found noncancerous.

Operations were performed on eighty-nine patients with benign lesions. In two patients, tumors were removed from both breasts at one sitting, and two other patients returned later with an innocent growth in the opposite breast, which was removed in a second operation. In all, then, there were ninety-three operations performed.

The radical operation for the removal of the breast was performed nine times for these benign pathologic conditions: chronic cystic mastitis, four times; fibroma (large as child's head), once; intracanalicular firboadenoma, once; tuberculosis, once; suppurative mastitis, once, and cyst (papillomatous), once.

The remaining forty patients were not operated on. The clinical diagnoses in the benign cases were: chronic cystic mastitis, 6; intracanalicular papilloma, 2; fibroadenoma, 14; acute mastitis, 2; abscess, 1; chancre, 1; glandular enlargement, 1; no pathologic condition, 5; dermoid, 1; scleroderma, 1, and bleeding from the nipples, 6.

In the six cases of bleeding nipples, operation was not performed because there was no tumor and no ulceration; but these patients were kept under surveillance until the discharge ceased with or without treatment.

On the other hand, a number of cases of tumor, symptomless except for a bloody discharge from the nipple, proved to be cancer, and operation was performed.

The clinical diagnosis of the malignant or nonmalignant nature of the breast tumor is not always possible in the early cases. In this series there were thirteen patients with all the clinical signs of benign tumor. In each of these cases the tumor was excised under local anesthesia for microscopic examination, and proved to be cancer. Eleven of these tumors were excised in our clinic, and two operated on elsewhere and referred to us for the radical operation. All of them had the radical amputation performed except one patient, who refused to submit to any fur-

ther surgical effort. The longest period of time elapsing between the local excision and the radical operation was five and one-half months, and the shortest was one day. Only nine patients submitted to radical surgery on the day set by the surgeon, which was, on the average, four days after the local excision. Of these thirteen patients, two are now dead. One patient lived three years following her Halstead operation, and died of a recurrence. The other survived two years, and died of cancer of the stomach. Eleven patients are now living and well. Four of them have survived one year; two have remained well for two years; two for four years; one for six years; one for nine years, and one for ten years.

The two-stage operation is not advised. Immediate radical removal after exploratory incision confirms the malignant nature of the growth and is undoubtedly the ideal method. At the present time a frozen section is done on all questionable neoplasms, and a report made within two or three minutes as to the malignant or nonmalignant nature of the tumor. If malignant, the radical operation is proceeded with at once.

When the surgeon cannot be certain, and a trained pathologist is not immediately available, our experience shows that wide excision of the growth, followed by microscopic study and early secondary operation, is not as dangerous as we have been led to believe.

The patients who presented unmistakable signs clinically of cancer are too advanced for an assured expectancy of permanent cure. By the external or clinical signs of malignant tumors is meant such evidence as skin involvement manifested by bulging and dimpling of the skin, retraction of the nipple, fixing of the skin over the tumor, a "pigskin" appearance and, in the more pronounced cases, breaking down and ulceration. Immobilization of the tumor, an unusual degree of firmness to the touch, and nonencapsulation associated with immobilization are clinical evidences of malignancy. Not only must the diagnosis be made, but the operation must be performed before such manifestations appear in order to bring about a permanent cure. To reach a conclusion while the tumor is most amenable to surgery, microscopic evidence alone is of diagnostic importance. It has been shown that

malignancy exists in tumors that are small, encapsulated and movable, in tumors without any of the external clinical evidences of malignancy.

The laboratory diagnosis was incorrect in four cases in the entire group. Three malignant cases were reported benign, and a benign tumor in a lactating breast was reported malignant.

The malignant series of cases constituted a group in which the pathologic changes were very far advanced. A great many of these cases were well nigh desperate, and in some, perhaps, operation should not have been performed. A frail, wizened woman with a withered, malignant breast firmly fixed to the chest wall will live longer at that stage if not operated on. A study of the group as a whole brings this out in the following manner:

Nineteen were inoperable.
Four others were recurrent.
Ten were ulcerating.
Two patients had local excision elsewhere and came to the clinic for radical operation after undue delay.
Two patients who had undergone local excision in the clinic wilfully and knowingly delayed the radical operation, in one instance one month and in the other five and one-half months.
Three cases were in lactating breasts, which decreases the chances for cure almost to the vanishing point.
Two cases occurred in diabetics.
Two patients had edema of the arm from large metastatic growths in the axilla.

There were no deaths among the eighty-nine patients operated on for benign conditions, and no known recurrences among the 129 patients of the nonmalignant group. There were, however,

TABLE 2—END-RESULTS IN CASES CONSIDERED SURGICAL AND IN WHICH OPERATION WAS PERFORMED

		Per Cent
1910-1916	—5 to 11 year cures	45.7
1917	—4 year cures	50
1918	—3 year cures	58.3
1919	—2 year cures	61.5
1920	—1 year cures	64.2

five deaths in the hospital following operations for malignancy, a primary mortality of 4.2 per cent. One patient died of diabetic coma on the fourth day, after two weeks of the Allen treatment had rendered the urine sugar-free. One died of infection on the

fifth day, one of pneumonia on the sixth day, and two of embolus, one on the second day and one at the end of two weeks. Thus, only one patient died of a preventable surgical complication, which would make the actual surgical mortality 0.8 per cent.

Of the 126 patients with malignant disease, 111 were traced. Of the total number, there are living 47.7 per cent. This, however, includes some of the inoperable cases of recent date. Of the patients operated on and living, three are known to have recurrences.

Patients who were operated on and who died, lived on an average a little more than twenty months.

Patients whose conditions were considered inoperable lived, on an average, nine months after their consultation. Two of these patients had palliative operations and an average postoperative life of only two months, or an existence seven months shorter than those who were left alone. The entire course of the disease from beginning to death, in the untreated cases, covered an average period of twenty-five and one-half months, which is shorter than the preoperative duration given by those patients treated surgically, thus showing the relative virulence of the rapidly growing inoperable tumors.

Summary

1. No malignant tumor of the breast occurred in a woman under 27.

2. The average age of patients with cancer of the breast was 49.2 years.

3. In cases of recurrent carcinoma, the patients were five years younger than in the primary cases.

4. All sarcomas occurred in males, and constituted 2.3 per cent of the malignant cases.

5. In only one-third of the malignant cases was there a family history of cancer.

6. In two-thirds of the cases in which the lesions were benign, the patients gave a positive family history for cancer which probably caused them to apply for examination even though their lesions were benign.

7. The average duration of cancer before operation was twenty-six and one-half months.

8. One case in five was inoperable.

9. Patients with benign lesions had an average age of 36.1 years, which was thirteen years younger than in the malignant cases.

10. The average duration was fourteen months, as against twenty-six and eight-tenths months for carcinoma cases.

11. From five to ten year cures in 111 traced cases of operations for cancer of the breast occurred in 45.7 per cent.

12. The preventable surgical mortality was 0.8 per cent.

The Surgical Significance of Pain*

"There is purpose in pain,
Otherwise it were devilish."

—*Owen Meredith.*

Pain is the chief defense mechanism against injury. It apprises us of many diseased states and accidents. It has been spoken of as the language of disease, but it is often particularly meager, many times greatly involved, frequently misleading, and sometimes perplexingly silent. Pain in some regions is easily recognized as characteristic of definite pathological processes. It is ofttimes bizarre and mixed with many conflicting manifestations. Moreover, it is so greatly modified by the individual as to be deceptive. The hyposensitive type of individual will endure severe pain with little outcry. A highly neurotic subject becomes an amplifier. Ordinary pain in them is increased to the *n*th power and makes them the subject of the surgeon's greatest solicitude. The phlegmatic are notoriously uncomplaining. The stoic minimizes pain that is of serious import. The neuropath in acute lesions suffers great agony and in chronic disease, though he may not suffer, his family suffers.

The cerebrospinal system, a later addition to the nervous system, is the real outpost against injury. The vegetative nervous system which has to do with the primitive processes presides over these essential functions and at times conveys pain in an exaggerated way during the normal events of digestion and elimination. If harmful afferent stimuli pass to the cord over a long period of time, the threshold of response of the nerve cells which receive these stimuli is necessarily lowered and they respond to a stimulus which is much below that which they would ordinarily withstand. Hyperirritability of these cells permits a lesser stimulus than normal to produce a heightened response.

A patient whose sympathetic system is out of tune and who has so-called "nervous indigestion" will complain more bitterly than one who has a real pathological entity like an ulcer of the stomach. The triad of hunger pain, food ease, and night pain, relieved by vomiting or alkalis, made Moynihan say that the

*Introduction to the symposium on Pain presented before the Clinical Congress of the American College of Surgeons, Chicago, October 22-26, 1923.

diagnosis of duodenal ulcer could be made by correspondence. While nothing is more telltale than the explosive upper abdominal pain that goes through to the back in gall-stone colic, at the same time a considerable proportion of cases of gall-bladder disease do not have this frank manifestation. Subscapular pain is referred by the way of the sympathetic through its connection with the fifth or sixth dorsal nerve.

The complications of most diseases obscure the initial pain, but fortunately tenderness, rigidity, and temperature complete the syndrome of infection. Acute perforation of the hollow viscera is manifested by primary, sharp, stabbing abdominal pain quickly followed by the excruciating pain of intense peritonitis.

Acute perforation of the stomach and duodenum is frequently attended with collapse and followed by localization of the infectious material in the right iliac fossa, so frequently that perhaps one-third of the cases of perforation of the duodenum are diagnosed as appendicitis.

The complication of gall stones when the pancreas is infected is denoted by the most severe abdominal pain associated with vomiting and collapse, followed in 24 hours by an elastic, fluctuant, epigastric tumor. At first it is often regarded as acute intestinal obstruction to be later recognized as acute hæmorrhagic pancreatitis, the most dramatic catastrophe in the abdomen.

The well known epigastric pain of appendicitis, localizing itself in the right iliac fossa, is very uniform and familiar when the appendix is in its uusual position to the inner side of the cæcum. The symptoms are usually so frank that the diagnosis is easily made. When the appendix is behind the caput, the mild unreferred pain will not challenge recognition and will allow grave suppuration to supervene before it is detected.

Perhaps the most deceptive pain in the abdomen to the surgeon is abdominal pain in children with beginning pneumonia where the diaphragmatic pleura is involved and mimics appendicitis. This should cause the clinician to be constantly on the alert for this dissimulation and make the wary examine the chest with great assiduity.

The very severe pain in the trajectory of the lower dorsal

nerves extending around the right costal arch, may, in herpes zoster, simulate a mild cholecystitis and the true cause will be discerned only when the vesicular pattern appears on the third or fourth day.

We have learned to look upon abdominal pain with such scrutiny and realize so well its portent that I have seen a diagnosis of intestinal obstruction made from the pain and allied symptoms alone when the inguinal hernia that was the cause of the obstruction had never been observed. While pain is a striking symptom requiring interpretation, it is the collateral symptoms that clinch the diagnosis. We must not ignore the cramp-like spasmodic and persistent peri-umbilical pain of intestinal obstruction. If it occurs after abdominal section, even though the patient is still in the hospital, one should think of adhesive bands causing obstruction. Reoperation is less dangerous than a purgative. Who can differentiate the pain of mesenteric thrombosis from intestinal obstruction? The court of immediate appeal is exploration.

The whole subject of pain must be considered from the neurologic standpoint and is the most fascinating study. From the classical relentless pain of tic douloreux to the plebian painful heel, the immense network of sensory nerves ramifying to every area, associated with every function and distressed by every dysfunction weaves a tangled web. Only by knowledge of the nervous distribution can one correctly interpret the occult origin of pain. Witness the referred pain to the inner side of the knee along the branch of the obturator nerve in hip-joint disease in children.

After all it is the relative significance of pain that we must take into account. Disaster follows on our lack of interpretation of its importance. Excruciating pain in the shaft near the diaphysis of one of the long bones in a child in connection with chill and high fever imperatively calls for the recognition of acute osteomyelitis. It is murderously disguised as rheumatism, and, if not correctly interpreted and promptly treated by early evacuation, acute bone abscess occurs and long continued reparation for the bone destruction and sequestration of delay displays its weary length. The general symptoms are so alarming and overwhelm-

ing that no time should be lost in giving vent to the infection in order to prevent widespread death of the medulla. In such urgent circumstances the bone must be opened immediately even if you have to use a gimlet. This statement will be recognized as the plea of that greatest of American teachers of surgery, John B. Murphy.

Pains in the abdomen are not all due to visceral disease. Tuberculosis of the spine with pressure on one of the spinal nerves can give such pain over the distribution to the abdominal wall as to delude the unskilled observer. The abdomen has been opened for the unilateral referred pain from a carious spine that only required a well fitting brace.

One must think in afebrile abdominal cases of the gastric crises of tabes dorsalis, of plumbism, of the abdominal anginoid attacks in arteriosclerosis.

Pain is a monster that may be so insistent as to compel our greatest interest and yet it may be a gay deceiver. We have learned to be so suspicious of the pain complained of by the neurotic that occasionally their cry of "wolf" is unheeded. The usual pitfall is mortifyingly in the other direction. The constant burning pain over the right iliac fossa that has been diagnosed chronic appendicitis and operated upon elsewhere, often comes to you with the self-same pain unrelieved. By their scars ye shall know them. A case that has never had a bona fide acute attack should make us counsel the patient to get relief of the pain by other than surgical measures. We have it upon very highest authority that there is no closed season for the neurasthenic. They are as sheep in wolves clothing, and even deceive that good shepherd, the family physician.

Pain in these unfortunates may depend upon an abnormal personality rather than an organic abnormality. They need a physician who can "raze out the written trouble of the soul."

He is the best surgeon who is able not only unerringly to recognize the surgical significance of pain, but who also will clairvoyantly divine the significance of non-surgical pain.

Some Debatable Points in the Surgery of the Gall Tract*

In the perfection of the surgery of the gall tracts the most debatable point has been the indication for removal of the gall bladder. Out of 345 cases of gall-bladder operations in our clinic (1919-1923), exclusive of stone in the common duct, 297 were cholecystectomies. Approximately 85 per cent were removed instead of drained. In 70 per cent gall stones were present. The mortality in the combined series was 4.04 per cent.

It is notorious that cholecystotomy in the absence of stones gives very unsatisfactory results. It is estimated by Bancroft that only 50 per cent are cured and in the hands of many surgeons cholecystostomy in the unbenefited is often followed by a secondary cholecystectomy.

The majority of gall-bladder infections with or without stone are frank and satisfactorily diagnosed.

In some cases the symptomatology is not attended with definitely recognizable pathology. In the usual case upon exploration the gall bladder either contains stones that are easily palpated, or the gall bladder is thickened or surrounded by adhesions.

It may have deposits of subperitoneal fat and no stones may be palpated. A normal gall bladder is blue; but a blue gall bladder is not always a normal gall bladder. Under certain circumstances one may have to open the gall bladder to make a diagnosis. Occasionally very small stones are found when it was not possible to palpate them through the gall-bladder wall. Again we find the typical strawberry gall bladder, which requires removal. Characteristic of the strawberry gall bladder is the small, elevated, whitish area caused by a deposit in the mucosa of an ester of cholesterol, which lipoid substance when sufficiently deposited as to be discernible by the naked eye, has a fanciful resemblance to the strawberry seed.

If, however, the lining membrane appears normal, one hesitates about removing the gall bladder and dislikes more to drain it. It is certainly unwise to drain a gall bladder that is not bad enough to take out, in the absence of stones and in the absence

*Address before the Clinical Congress of the American College of Surgeons, New York, October 28, 1924.

of any mucosal change. A section of the wall has been removed by Judd for pathological examination. He refers to occasional cases in which the pathological changes were not recognizable and the incision was closed without removal. A few such cases had continued symptoms, apparently requiring another operation with relief. We can hark back under those circumstances to the old operation of cholecystendysis or immediate closure of the gall bladder. If we make a wrong diagnosis it is not necessary to remove the gall bladder to support the diagnosis. Crile contents himself with making the decision by inspection and palpation. Unless convinced of demonstrable pathology, he does not open, drain or remove the gall bladder.

It is probable that small stones form in the mucosa as a result of these cholesterol deposits. It has been experimentally proved by Drury and others, that "cholesterol precipitation in human bile can be induced or prevented by slightly altering the reaction of the fluid toward the alkaline and acid sides respectively."

The last 100 autopsies in the Mayo Clinic showed diseases of the gall bladder either macroscopic or microscopic in 4 per cent. Hubbard found that in 46 autopsies on bodies in which gall stones were revealed 6.5 per cent died as a result of their presence, from such complications as empyema of the gall bladder, acute pancreatitis, etc. Fifty per cent in which stones in the common duct were found died from the condition.

Focal Infection

Focal infection has made a signal advance in prophylactic medicine as well as in its therapeusis. It has not been indisputably proved. We are prone to give to each new theory more credit than it finally holds. The intriguing theory of Rosenow relative to the selectivity of micro-organisms when they emigrate from their habitat is most far-reaching. From the original focus the gall bladder is believed to be infected and later the infection is relayed to other organs. It is emphasized by W. J. Mayo that certain forms of cardiac diseases are very closely associated if not caused by gall-bladder infection. He refers to the heart lesions of adolescence, which in the presence of gall

stones, are very strikingly relieved by their removal. There is little danger in this type of noisy heart associated with chorea. Mayo said he had never seen a surgical death result in these circumstances. Attention is called to essential hypertension. Hypertension due to many causes is very frequent in women of overweight who have gall stones and they are markedly improved as to their hypertension by operation for the gall-bladder infection and without much danger so far as death from hypertension is concerned. Syphilitic aortitis is believed by him to be frequently associated with angina and when gall stones are present the angina seems to be greatly benefited by operation without much danger in spite of the angina. Willius in the Mayo Clinic noted coronary sclerosis associated with disease of the gall bladder in 24 per cent. The cardiorenal type and the toxic variety of heart disease apparently have no relation to gall stones. The arthritides which are due to focal infection particularly from the gall bladder are most satisfactorily cured by removal of the cause which also may be said of certain forms of muscular rheumatism.

The relationship between gall stones and appendicitis has been stressed by Moynihan, and Mayo has recited very striking examples of simultaneous acute infections and perforation of the appendix and the gall bladder. Surgeons generally agree that if feasible it is wise to remove all appendices with any evidence of pathological change during operation upon the gall bladder.

The relation between gall stone and pancreatitis is well-known and inasmuch as it is the resulting complication and pancreatitis is such a murderous disease, it is a very positive and very valid argument for early operation in gall-bladder infections and calculus. Acute pancreatitis resulting in many cases from stone in the ampulla of Vater allowing retrojection of bile direct through the duct of Wirsung causes the most dramatic syndrome in all medicine. Reginald Fitz has very graphically described it. When an elderly man previously well or an occasional sufferer from indigestion is suddenly seized with a severe, agonizing epigastric pain, associated with vomiting, followed by collapse and within 24 hours with a fluctuant epigastric tumor, acute pancreatitis may be diagnosed. The diagnosis is usually that of intestinal ob-

struction and because of the vomiting, obstipation, and great pain prostration and death will follow, if patient is not relieved. It is not to be understood, however, that the subacute type of pancreatitis even with hæmorrhage, the apoplectic variety, or with fat-necrosis is necessarily fatal, even without operation, although these cases do remarkably well when the gall-bladder stones are removed and the gall bladder drained. The gall bladder should rarely be removed, if there has been any jaundice or other evidence of obstruction in the common duct. The gall bladder may subsequently have to be utilized to sidetrack the bile either to the stomach or to the duodenum.

Relationship of chronic biliary cirrhosis caused by infections of the gall bladder especially following stone in the common duct, as described by Adami is no longer debatable. Moreover, removal of the cause is very beneficial unless too much connective tissue has been deposited around the bile radical to prevent complete cure and cause slight jaundice more or less permanent.

Association of heptatis with cholecystitis. Graham has very beautifully shown that infection of the gall bladder is probably secondary to infection of the liver. Hepatitis comes from the portal circulation and is transmitted to the gall bladder by way of the lymphatic connections between the two organs.

Heyd believes inflammation of the liver leading to fibrous thickening of Glisson's capsule, comes from severe inflammation in the region of portal drainage, most common about the appendix, and "extends from the liver to the gall bladder either through the bile or through the lymphatic channels and the cholecystitis, thus initiated, may subsequently in its repeated exacerbations bring about localized or even general hepatitis by lymphatic extension of the infectious process."

Strachauer suggests that, when one is unable to decide definitely at operation from the physical signs what is the condition of the gall bladder, a small section of the liver be examined under a frozen section and that if evidence of hepatitis with round cell infiltration is present the gall bladder be removed in order to eliminate the vicious circle.

Relationship between gall-stone disease and glycosuria is fairly definite. Diabetic pancreatitis patients can be very sat-

isfactorily prepared for operation with insulin and give a fair degree of assurance that the sugar will permanently disappear in some cases.

The method of determining the liver function with phenolsulphonephthalein, introduced by Rosenthal, is based on the ability of the liver alone to remove the dye from the circulatory blood in a given time.

Under conditions that are normal the dye leaves the blood rapidly but when there is dysfunction of the liver it is retained and is very high for several hours. This degree of retention in the blood gives a very definite indication as to the severity of the disturbances in the liver. A retention as high as 8 per cent at the end of 15 minutes is considered normal. One of the greatest advantages of this test of Rosenthal's is in those cases in which there is no obvious liver dysfunction and there are no clinical evidences of any disease of the liver. This is the type of case in which a liver function test is of great importance as an aid to diagnosis and a guide to therapeutic management.

Some cases of chronic cholecystitis showed a moderately severe dysfunction, about 2 per cent of the dye being present at the end of 2 hours. Cirrhosis gives the highest percentage of retention. It is obvious that there is a real value in this test of liver function.

Charles Gordon Heyd has graphically described three types of deaths that occur after operations upon the gall bladder or ducts and that cannot be explained by surgical trauma or shock, sepsis, gastric dilatation, or kidney insufficiency. These he attributes to hepatic insufficiency. Type one is a case that goes into profound, vasomotor depression at the end of 24 or 36 hours after a cholecystectomy without apparent reason. The patient's skin becomes cold, clammy, moist, and leaky. There is mental stimulation. These cases usually respond to the intravenous administration of glucose, and tap water proctocysis every 4 hours. He interprets this as being due to some pancreatic toxin or ferment following surgical trauma that the liver handles inadequately. Type two is a progressively developing coma which usually comes on 4 or 5 days after a relatively simple gall-bladder operation in the chronically jaundiced individual and

usually terminates fatally with high temperature in 12 to 48 hours. Type three is less frequent and usually occurs in patients with a long history of gall-bladder or duct infection. They pass into a coma immediately after the operation, with high temperature, rapid pulse, and mental excitation, and chemical anaysis shows an alkylosis. Heyd has been able to save his last two out of six cases by the internal administration of dilute hydrochloric acid. We have all seen these desperate, stormy terminations to an apparently successful operation, and at postmortem have been unable to find sufficient evidences to justify any explanation other than liver insufficiency.

X-Ray Diagnosis of Gall Stone

This question has been very thoroughly discussed and still the difference between the most enthusiastic advocate and the most pessimistic is quite wide and even the most conservative shows that about 52.9 per cent positive report of disease is correct in X-ray studies, and a negative diagnosis in 44 per cent in which the pathological evidence was varied from the mild to the most extreme grades of disease, according to Carman and MacCarty. Fewer than one-half of the cases of diseased gall bladders were revealed by the X-ray. They say that about 38.4 per cent of gall stones have been revealed by the X-ray, but that even typical shadows with the denser circle around the periphery may be confused with a dozen or more circular shadows of which kidney stones and calcified areas in the structures near by are the most frequent. The shadow of a pathological gall bladder is still more elusive of determination. Unless the liver and kidney outline can be identified accurately, no shadow should be regarded as satisfactory definition. When these are isolated the third shadow anywhere between the tenth rib and the crest of the ilium may be a diseased gall bladder. However, Carman enumerates fourteen other conditions casting shadows that may simulate the elusive gall bladder such as the upper pole of the kidney, an enlarged caudate lobe of the liver, an unusually broad twelfth rib, food in the hollow viscera, etc. Nichols has shown 75 per cent of stones in the Cleveland Clinic.

The indirect evidence such as deformities of the stomach and

duodenal cavities and of the antrum of the stomach, hepatic flexure, plastic phenomena and filling defects in the viscera, abnormalities of motility, is even more nebulous. However, Case found 88 per cent positive in these indirect signs. On the other hand, George and Leonard say if only one minor type of indirect evidence is present, it is questionable.

X-ray visualization of the gall bladder by circulation injection of the sodium salt of terabromphenolphthalein (Graham and Cole*) is a helpful addition. The dye causes a shadow of the gall bladder reaching its greatest intensity in from 8 to 24 hours and disappearing in 48 hours. Interference with filling, and hence no shadow, suggests obstruction due to gall stones or other pathological conditions. Unvarying size indicates loss of elasticity, mottling of the shadow suggests stones or papillomata.

In 25 cases of gall stones Carman found the dye of conspicuous service in all but two and of 39 positive cases subsequently operated upon, 36 had given definite abnormal responses. Cirrhosis may prevent secretion of the dye and no shadow is cast.

Biliary obstruction when known to exist is contra-indicated on account of the severe reaction with nausea, vomiting, and prostration, like a vasomotor shock continuing sometimes for 8 or 10 hours with a fall in blood pressure. The test requires hospitilization for a day; the films are made at the end of 5, 8, and 24 hours.

Graham has employed it in about 100 cases and Carman in 200 cases. The former (personal communication) says "like any other X-ray examination the most important question is the interpretation of the plates." Carman is of the opinion that, if the reaction following the injection of the dye is overcome, the method will be comparable to the use of barium in the diagnosis of diseases of the gastro-intestinal tract.

Graham thinks that the reactions can be reduced by the use of freshly distilled water in making up the solutions.

History

Nothing is superior in diagnosis to a well-taken and care-

*Graham, Cole, and Copher have gone back to the tetraiodophenolphthalein which they have now been able to purify. It is just as effective as the tetraiodophenolphthalein and much less toxic. It was used in the first work of this kind but on account of being impure was discarded. J. Am. M. Ass., 1925 April 18, 1175.

fully recorded history. Of course, an X-ray demonstration of stones is indisputable, if positive, but when negative means nothing, and often stones are present when too soft to show shadows. Attacks of colic may be followed by a certain type of indigestion between spells or with periods of comparative health. Again there may be stomach trouble as the most conspicuous symptom with occasional gall-bladder attacks or the entire symptomatology may be ostensibly gastric. Intervals of freedom from pain are very suggestive of gall stones, whereas it is well known that in malignant disease the symptoms are either constant or increasingly severe and over a relatively short period with little or no improvement. Deaver in his picturesque way paraphrases the classic description of the gall-stone patient as "fair, fat, and forty with belching," which is, of course, most significant. As scarlitinal infections are to nephritides, so gall-bladder inflammations were formerly thought to be dependent upon typhoid. With the great abatement of typhoid, however, gall-bladder infections are not decreasing.

Acute Cholecystitis

The rarity with which patients ever die from acute cholecystitis when left alone should compel us to avoid operation in the acute stages, which is notoriously dangerous. The exception to this might be in the two extremes, namely, in the very beginning of an acute attack before pathological changes make the operation at all difficult and in the severe gangrenous type in which the gall bladder should be removed. Even these cases, however, are better left until nature isolates the gall bladder by adhesions and an operation can be done secondarily at the end of ten days or two weeks better than it can the first four or five days.

In the preparation of jaundiced patients for operation, the technique of Walters of the injection of 5 to 10 cubic centimeters of a 10 per cent solution of calcium chloride in water injected intravenously every day for 3 days, has a very decided influence in increasing the coagulability of the blood and lessening its clotting time. It seems to be non-toxic and is practically eliminated in a few hours.

The danger of serious and sometimes fatal oozing in opera-

tions on the jaundiced is very greatly reduced, especially if it is combined with blood transfusions in suitable cases. It is not to be supposed, however, that it is an absolute preventive. I have known of two cases in which after this preparation death ensued from hæmorrhage, one on the sixth and the other on the seventh day from removal of a drain in one case and from a small decubitus ulcer on the anterior lobe of the liver where it came in contact with the incision, that oozed fatally in the case of one of my colleagues, filling the abdomen with blood. It is important, therefore, to watch the coagulability each day after operation to supplement the so-called "therapeutic course" in the preparation of the case by subsequent instillations of calcium chloride with or without blood transfusion. The patient is not safe, therefore, from secondary hæmorrhage at the conclusion of the first few days after operation. Crile has reported a case with fatal secondary hæmorrhage in spite of massive transfusion and calcium chloride.

Stone in the Common Duct

While it is possible and becoming more common to operate for stone in the choledochus during the attack, even in the presence of jaundice, it is, however, generally speaking, better to tide the patient over the attack, particularly if the jaundice shows any evidence of subsiding, and operate in the interval. That was the old rule and a very good one. With the improvement in results and especially the ability to prevent secondary hæmorrhage by newer methods with the use of calcium chloride the operation can be performed now with greater safety. It is wise, however, not to remove the gall bladder while a patient has jaundice. Drainage is very essential and the gall bladder is utilized for that purpose together with an independent drain at the site from which the stone is removed from the common duct.

In the bad cases, drain the gall bladder and leave the stone in the common duct as urged by Crile, just as in the two-stage operation we drain the urinary bladder and leave the obstructing prostate. Biliary obstruction with resulting liver insufficiency is similar to kidney insufficiency from prostatic obstruction. Decompression is the primary indication in both.

What Price Health?*

We are living in the Golden Age of medicine. We have seen the great scourges and plagues placed under control. We have witnessed the era of discovery of the cause of most of the infectious diseases. This last year alone has been the greatest in the history of medicine, for it has shown the lowest mortality rate ever attained. The year 1924 was the healthiest year the world has ever known. This is due to the subjugation of the pestilences. We no longer have many thousands of people dying every year from typhoid fever. During the period of 1900 to 1905, the mortality rate from typhoid was 39.5 per hundred thousand, while in 1923 the death rate for a greatly increased registration area was only 6.8. This is one of the many outstanding achievements of modern preventive medicine. It is further gratifying that tuberculosis with its great economic waste is responding to the scientific methods employed for its suppression. There has likewise been in this instance a definite reduction in mortality, and what is even more encouraging is the better understanding of how the eradication of tuberculosis can be more rapidly attained by the protection of the child against mal-nutrition, and by affording better environmental conditions for the development of our children into vigorous and virile manhood and womanhood. In brief, the achievements of modern medicine have added something like fifteen years to the span of human life in the last quarter of a century. One now has a life expectancy of about fifty-five years, but still, this is not enough.

Sir William Osler has said:

"For countless generations the prophets and kings of humanity have desired to see the things that men have seen, and to hear the things that men have heard in the course of the wonderful nineteenth century. To the call of the watchers on the towers of progress, there has been one sad answer, 'The people sit in darkness and in the shadow of death.' Politically and socially and morally, the races improved, but for the unit, for the individual, there was little hope.

"Cold philosophy shed a glimmer of light on his past. Religion in its various guises illumined his sad heart, but neither of them availed to lift the curse of suffering from the sin-begotten son of Adam. In the fullness of time, long expected, long delayed, at last science emptied upon him from

*Address, General Session, Southern Medical Association, Nineteenth Annual Meeting, Dallas, Tex., November 9-12, 1925.

the horn of Amalthea blessings that cannot be enumerated, blessings which have made the century forever memorable, and which have followed each other with a rapidity so bewildering that we know not what next to expect."

Three-quarters of a century ago, chronic diseases, so-called, occasioned only one-sixteenth of the deaths. The other fifteen-sixteenths, was mostly from infections. Now, on account of the great curtailment and prevention of infection, chronic diseases constitute about one-half.

The emphasis which has been placed upon children's health, especially during the first five years of life, has greatly contributed to the increase in the total span of human life. The normal duration of life prior to the age of forty for the average individual has been definitely lengthened and as a result, the economic productivity of the average individual is being increased. And yet, with this improvement of the physical condition of our race, life expectancy after the age of forty has decreased and is really less than it was twenty years ago. This is, certainly, in part due to the great stress and strain of modern civilization with all of its complexity, and this tendency of the twentieth century merits the careful scrutiny of physicians, both as to the effect upon the individual and upon the nation. The problem with which we are daily confronted is the adjustment of the life of middle aged men to their environment and by proper health instruction so to modify this environment, as to promote longevity and physical well-being. It may be truthfully said that the tendency of modern life has assumed almost a hysterical form and it therefore becomes increasingly imperative for the medical man not only to avoid emotional complexes but faithfully to steer his clientele by personal example and precept from this maelstrom of physical disaster.

I am sure that every member of our profession looks with the keenest interest upon the many activities which are being carried on for the improvement of infant life and indirectly the effect which it will unquestionably have upon the normal development of the boy and girl in entering upon the period of adolescence. Today all progressive communities are providing prenatal clinics, maternal and infant hygiene centers, pre-school age clinics and general medical supervision over the child of school age. The

result is that the infant mortality rate in the United States at present in the registration area is only 76 per thousand births. This means that there has been a reduction in six years of the death rate of infants of 24 per cent. The intestinal diseases of childhood have also been placed under control in a remarkable degree by the use of scientific methods which have been advocated by the pediatrician through the official health agencies. The decrease in this group of diseases has been exactly 33 per cent. This is indeed a remarkable gain in the conservation of child life. This merely shows what the possibilities are in the application of the principles of hygiene and preventive medicine. It is, however, to be remembered that infant mortality is three times as great among the poorer classes as it is among those whose income, roughly speaking, is three times as great. It is then evident that if continued progress is to be made, more attention must be paid to economic conditions in maintaining gains that have been made and in bringing about improved conditions for the continued reduction in infant mortality.

So much for the infant and the child, but what about the middle aged man and woman? Their mortality rate is just as high and the expectancy of life for the individual of forty and over is indeed decreasing.

The next step in the progress of scientific medicine should be an attack upon the degenerative diseases, those maladies which too frequently have their beginning in the man or woman of middle age. What is to be the constructive program in the prevention of Bright's disease? In heart disease? In the nephritides and the cirrhoses? What of the pneumonias? The cancer problem? These afflictions still destroy more lives than any other types of morbidity. There is perhaps no one cause the elimination of which would have a more far-reaching effect than the prevention of focal infections which too often exist with the most insidious manifestations.

Sir George Newman, Chief Medical Officer of Health of England, states in a recent publication that no one step could be taken which would have a more definite and far-reaching result in the physical betterment of the race than a more universal observance of a periodic health examination. And with a view of

having greater emphasis placed upon this factor in increasing the period of physical efficiency of manhood and womanhood, the American Medical Association has taken a stand in support of a plan to accentuate the importance of the man of middle life's being overhauled by competent physicians, his infirmities anticipated and the beginnings of disease recognized with the objective of not only increasing longevity but what is of even greater importance, increasing the period of productive capacity, efficiency and happiness.

We realize the too frequent rulings of life insurance companies advising against issuing policies to people of middle age. Fifteen per cent are refused: the man with nephritis, the man with diabetes, the man with the cardiovascular lesions and other degenerative conditions. These are the diseases which we must now endeavor to forestall.

What does it profit a person to neglect his own physical condition and the wonderful mechanism of his body with its anatomic, physiologic and mental potentialities? Is it not true that all other machinery is inspected at regular intervals? The greatest caution is being used in the inspection of elevators, steamships, railway trains and all machinery of industrial organizations with a view of insuring safety for those who use it and in order to get out of it the highest degree of efficiency; and yet, people generally ignore the importance and intrinsic value of having the most delicate and comprehensive of all machinery, the human body, periodically examined and a survey made of its needs.

The advantages to the profession accruing from such a plan are manifold. In the first place, it would afford an opportunity for the practitioner to have in his possession information which would serve as a guide more correctly to advise his clientele. It would indeed be a splendid thing for physicians to advise patients coming to their office for professional advice to have a careful and thorough physical examination, regardless of the apparent insignificance of the symptoms. While this has been a desideratum in the practice among many of our profession, it is evidently far from being universal. Did not Frank Billings, dean of medicine of America, say that the greatest curse in our profession was the

neglect to make a thorough physical examination? He said we too often have a pleasant conversation with the patient and a scrutinizing inquiry, but an imperfect examination.

If such a plan could become universal, it would be the best postgraduate course in physical diagnosis that our profession, as a whole, could take. It would mean that many of us would have to improve our methods and practice so far as the thoroughness of the routine was concerned. It would mean more laboratory work and more exact observation, and not the least of all would be the value of the interpretation of the findings, which brings into play the best judgment and ability of the practitioner. It would establish a system of records which, if not already started by the physician, would prove invaluable.

We must be prepared. If every individual should apply for this health examination tomorrow, it would find the profession generally unprepared, unsold to the idea, and perhaps unsympathetic. A little thought will show that unless the plan is taken up by the regular profession, it can be grossly misused and commercialized.

If preventive medical practice or preclinical medicine, as suggested, is good for all well individuals, and if it can be properly handled only by the profession regularly organized, is it not essential for the doctors, themselves, to be the leaders, and personally to undergo these examinations? How many of us have really had any sort of examination since the war? How many of us have had a thorough examination even in case of illness?

So the slogan is, have a thorough medical examination on your birthday. Some of us, perhaps, do not have so many birthdays as we used to, but this is not the only anniversary that we may celebrate. Nowadays, when the divorce coupon comes with the marriage certificate, one can have the health examination on his marriage anniversary, which will make examinations come oftener.

It is surprising the lack of care we give our bodies and the lack of intelligence we sometimes display in choosing persons to care for the delicate machinery of this, the most wonderful of all mechanisms, the human body, the temple of the immortal soul.

What would you think of a man who would entrust the many

intricate things that go wrong in the engine of a motor car to a person who would profess to remedy anything that was wrong with it by rubbing it on the outside? Still, persons who profess to be intelligent, and who really are in other decisions of life, will sometimes leave the care of the treatment of the disease of their bodies to incompetent individuals who make great pretense, and propose to cure the most complicated diseases by adjusting the spine, rubbing on the outside, or reading out of a book and telling people that the disease they are suffering and dying from does not exist.

Is that not a terrible thing to do for a little child that is strangling from the diseased membranes that clog the throat in diphtheria? It is a hard thing to try to enlighten distressed, though misguided, parents in the agony of their sorrow, and tell them that untruth and dogma allowed their child to die, when intelligent, prompt, scientific administration of antitoxin would have saved its life. It would be cowardly, if it were not due to ignorance, for anybody to attempt to give spinal adjustments, so-called (which really never did, never can, or never will adjust anything), for a ruptured appendix or for a tumor on the interior of the body that is fast becoming malignant.

The real case against the cults, fads, sects, and isms in human sickness is their inability to understand the many intricate causes of disease, its prevention, and its control by scientific sanitation, and the untenable belief of each separate cult that all the diseases, whether of the mind or body, can be cured by a single process, this process differing with each sect. They will treat anybody that will hold still, and one is born every minute. The popularity of the healing cults is due to those of an unstable, impressionable nervous system, which is always looking for some easy way of treatment, particularly if it is mysterious. The individual is unwilling to purchase health by rational means, but wants some mystical or miraculous occult force to be invoked in his aid.

The progress which has been made in scientific medicine, the advancement of medical education and the application of the principles of medical science in the prevention and cure of disease during the past quarter of a century affords a keen sense of

satisfaction. With the continued advancement of modern medicine, there is urgent need for the profession to take a more aggressive stand in the enlightenment of the masses by sound educational publicity. The avenues through which this may best be accomplished are the numerous recognized public health agencies in our country. To this end, there should be closer co-operation between the practitioner of medicine and the public health officer. We should realize that modern health work is the child of the medical profession and is, if you please, a most useful and integral part of medicine. For is it not true that the first duty of medicine is not to cure disease but to prevent it? Regardless of this truth, too often there seems to be a disposition on the part of medical men, doubtless a minority, to look upon public health work as something separate and foreign to our ideals and objectives in the practice of the healing art. I think as the years come and go, we must increasingly appreciate the imperative need not only of maintaining the efficient health organizations that now exist in our respective states but first as citizens and then as physicians primarily interested in the advancement of medical science, we should with unvarying loyalty give a sustaining hand and manifest an intelligent attitude in all constructive public health measures. There is no channel in co-operation with the practitioner of medicine which will provide a more effective means for enlightening the masses of people with reference to the possibilities of modern medicine and the application of the principles of sanitation in the prevention and ultimate control of preventable diseases than the long arms of our profession, the official public health agencies. To this end, the profession should appreciate more than ever the obligations which are placed upon it, and assume a constructive and intelligent relation to the organized health agencies in the prevention and cure of disease and promotion of public health. We should not only manifest a civic pride in such undertakings but should also covet leadership in all such measures and strive to maintain that heritage which has been transmitted to us by the martyrs and heroes of our profession.

The aversion to publicity in medicine is doubtless founded on the feeling that science needs no defense. Yet, it was said of Huxley and Darwin that they had to fight the battle of science

with the public with one hand, while they labored in the laboratory with the other. Progress is a series of battles. It is never won except by the repeated launching of offensives. It must ever be fought for, and with the cudgels of truth. The fight is not for the profession, but after all, for humanity. The world should know that if society is to be saved, it is not by the charlatan, but by the scientist, who is willing laboriously to burn the midnight oil and labor for a generation, to carve a stone that may adorn the temple of science. A campaign of publicity must be dignified, unswerving, and repeated without ceasing—it must be education and re-education. The story of medicine, its heroes, its martyrs, its great discoveries, must be forcefully told. As the earlier teachings of the traditions of our ancient profession have been handed down from generation to generation by word of mouth, so the great accomplishments of present-day medicine, the increasing span of human life, the mitigation of suffering, the inculcation of the laws of physiology, and the fundamentals of health, should be broadcast by those who know. We have a burning message to deliver to our fellowmen, the truth about the prevention of the many ills to which flesh is heir, and the protection of their lives.

Twenty Years' Progress in the Teaching of Surgery and the Surgical Specialties*

Not since the renaissance has such material progress been made as the first quarter of the twentieth century witnessed. Surgery, the high-command of the medical sciences, has contributed its amazing quota. While there have been no revolutionary advances as was asepsis in the quarter century preceding this and anesthesia in the quarter century preceding that, progress has been a perfection and crystallization of the known knowledge and the application to the surgical patient of the best contributions from the sister sciences of physiology, pathology and biochemistry.

The teaching of surgery has been largely recast. The merits of the purely didactic course have been supplemented by widespread clinical teaching, the utilization of small bedside groups, the employment of section work in the dispensary, the introduction of clinical clerkships, the use of student assistants in operative work, and the universalization of the interneship as practically a part of the medical course.

The large, clinical amphitheater operative demonstration has given place to operations before small sections, and although perhaps lacking in the dramatic appeal and inspirational urge of the great masters, has enabled the student to see the actual details of the procedure. Many of the great principles underlying surgical practice were driven home by the amphitheater operator with a fervor that is difficult to duplicate. Many brilliant thoughts and illustrations sprang from the mind of the operator working under these stimulating conditions, which became a part of the student's mental equipment. The intrepidity of the operator, the boldness and mastery of the situation gave a certain confidence and courage to the student worthy of emulation. The minutiae of the operation were lost in the enunciation of the principles, and what the chief lacked in fineness of detail, he made up in the recognition of essentials, the summoning of a large ex-

*Read before the Annual Congress on Medical Education, Medical Licensure, Public Health and Hospitals, Chicago, March 9-12, 1925.

perience and the employment of the known methods that had availed.

The didactic lecture, which lacked the completeness of the quiz and the visualization of the actual clinical condition, was replete in illustration of the subject with the forceful personality of the lecturer, drawing not only on the known facts of the subject presented, but also his wealth of experience. To this was added the glamor of authority. Many of the teachers so forcibly impressed their personality, their mental bias and traditions on the student that it opened for him a new entry to the world of science. He may have forgotten many of the things that were taught, but he was inducted into the scientific spirit and the love for truth and knowledge by example as well as by precept.

It must be remembered that surgery never had an independent position until the eighteenth century and was not regarded as an important branch of science until the beginning of the last century. The student, however, too often felt that it was the most important of the branches in our time, approached it with great awe, and whether he intended to practice it or not looked on it as a major.

The first few years of this century marked the high tide of the German influence in surgery. German clinics were the Mecca of the American surgical student, as France was in the days of Ambrose Pare for the Germans. Their methods of teaching were in a modified way applied in the United States, a university connection was sought by all of the schools which did not have them in the beginning, and thus the fall of the proprietary medical school. The revolutionary changes made in the medical college situation of America, which were carried through by the Council on Medical Education and Hospitals had its decided effect on the teaching of surgery. The advent of the all-time men in the preclinical branches enabled the surgical department to be brought into closer touch not only with anatomy, but also with pathology and bacteriology, with which it is so essentially associated. The teachers of surgery became more interested in embryology and anatomy as applied to their teaching. Then, too, the joint conference of the pathologists and the medical group and the surgical group has had a distinct influence. This had

caused a closer clinical association of medicine and surgery, much to the benefit of both. The combined clinics should be encouraged, so many subjects can be advantageously studied most effectively in that way. The following studies are examples: post-operative lung abscess from tonsil operation, post-operative pneumonia, toxic states of the thyroid gland, diabetic gangrene, the organic lesions of the stomach, diseases of the gall bladder and their sequelae and the surgical complications of infectious diseases. Surgical staffs are working in closer harmony and are correlating their work. Instead of referring a patient to the various consultants, it is better to have them, if possible, see the patient with the section at the time of the demonstration. The ophthalmologist can show the retinal findings in the study of brain lesions, and the roentgenologist his roentgen-ray interpretations. The urological examination is somewhat more difficult. The exhibition of pathologic specimens of the disease under discussion is timely. The surgical procedures indicated either in principle or in the actual operation should be shown in abundance during the consideration of the given subject. Material permitting, every didactic lecture is closely followed by clinical demonstrations. In the establishment of fundamentals of physical practice and their principles, the didactic lecture still has its place in many schools. The assigned subject for recitation is very satisfactorily carried out by the junior members of the surgical staff.

Inasmuch as we gain so much of our knowledge through sight rather than hearing, the bedside clinical demonstration has become the real major in surgical teaching. Sections of twelve or fifteen men can be handled very advantageously in the small lecture room adjoining the wards where the individual patient can best be brought to the group as a more orderly investigation can be made without disturbing the routine of the wards or the other patients. When this is through, the patient can be rolled back to the ward and certain phases of the case can be discussed morely freely. It has become more and more the custom for the chief of the department to give the important part of the introductory subjects, the most essential of the didactic and clinical

lectures, and the section teaching and the supervision of the ir ternes and clinical clerks can be done very satisfactorily by the other instructors. The time that was formerly occupied, rather fruitlessly, in watching long operations, the technic of which could not so readily be mastered, has been shortened.

This unnecessary repetition of the same operation, which is time consuming, in many schools is replaced by selection of the more typical operations, not forgetting that principle is more important for the students than technic, that minor surgery is really major and that a few cases exhaustively studied are superior to many cases superficially observed. The more important operation on the cadaver and the demonstration on the lower animals, thus leaves the operative clinic more for the elucidation of principles and demonstration. It would be a great desideratum if someone could devise an instrument by which a number of men could see the same intravesical picture, as a whole section can now hear, the chest and heart sounds simultaneously through the stethophone. The dry clinic, whether in the amphitheater or dispensary, especially when it is well worked up on a given subject with a variety of examples of the same disease, particularly when it is associated with the end results, is most illuminating. The autopsy work, aside from its general value, is especially useful to the section which has had the particular surgical case under survey and it is becoming compulsory to attend that type of pathological conference.

The surgical specialties that have made such signal advances have been noticeable in teaching. On the whole, it has been splendidly done. If there is any criticism, it would be that it has perhaps been overdone. It is difficult to curb the enthusiasm and the importance of the subject to the teacher of a specialty, and yet we must all realize how utterly impracticable it is to make a specialist during the undergraduate course. The object is to give the student a practical understanding of the underlying principles of disease of the organs treated as a specialty, but not to let him think that it differs in importance from the diseases of any other organs in general medicine or general surgery. If he can be given the practice in the dispensary of recognizing

the abnormal from the normal and drilled in the employment of the practical important use of the instruments of precision and the principles of surgical therapeusis, he will have made a very distinct start. We now recognize that it takes at least one and better two years of postgraduate work certainly to encompass the very important field of ophthalmology and otolaryngology. He may be taught the use of the opthalmoscope but hardly that of the bronchoscope. The short courses in special work have been deprecated and discouraged, but we are not unmindful of the work done by postgraduate institutions in the past. Incomplete as it was, it had a wonderful stimulating effect on the profession and really opened our eyes to the realization of the necessity for larger opportunity for the graduate student. This is being partially supplied but more in the specialties than in general surgery. The making of a good general surgeon is the largest order that special teachers have. It requires longer time. The plan in many institutions of having a resident coming from the more promising members of the house staff and over a long period, two or more years, is sound. The custom of salaries for house officers and resident is most helpful and entirely just. The association in the clinic and even in the private work of the surgeon is essential. We have given up the idea of making a full-blown surgeon of a man at the time of his graduation. Some plan must be evolved to bring students to graduation one or, better, two years sooner. One year should be saved in the pre-collegiate work. The time is coming when a more elastic course will be arranged so that the pace, if not actually made by the drones in the class, does not hold back the ambitious and mental eight-cylinder students for the Fords. On the other hand, the apprenticeship for his life work, for example, in surgery, cannot be too long or too thorough, and we must not be unmindful of the great traditional value, whether for good or ill, of the master mechanic who instructs the apprentice. His methods, his precept, his manner of approach to the patient and his general morale will be impressed on the young surgeon indelibly. Von Walters, in speaking of his teacher, said, "His precept fell like refreshing dew on receptive minds. We owe to him not merely

the facts that we learned, but also stimulation to independent research, the breaking of the fetters that have bound our minds." Johannes Muller made a most immortal tribute to his master when he said, "In any ignoble mood, I should avoid looking at the portrait of my fatherly counsellor, and it is when I recall the noblest experiences of my life that I think at once of Rudolphi."

Billroth in his remarkable work on "The Medical Sciences in the German Universities," written fifty years ago, is very sound and almost prophetic. It applies with very considerable accuracy to our present conditions and needs. He very forcibly discusses the danger of the ablest teacher becoming petrified in the routine of formal teaching. Although a great advocate of presenting material systematically he felt that after all, the personality of the teacher greatly outweighed the matter that was presented. He was a believer in the chief of surgical department, being a man who was in touch with the practical side of professional life, and seemed to realize that contact with the public and with the profession was very essential. He had the view that the clinical teacher engaged in part-time private practice was doing in his special professional line the same thing that a physiologist does when engaged in work in his institute.

It has been the general feeling of many men interested in the teaching of surgery that the surgical teacher, the head of the department, should not necessarily be an all-time man. It has become more and more recognized that the many advantages of the purely academic type of instruction are offset in surgery, which is an art as well as a science, by the withdrawal of the head of the department from the active participation in the life of the community and in its responsibilities and opportunities for service. He could really serve with little or no compensation and allow the funds in the budget for the department of surgery to be given to the younger men, who are so badly in need of them.

A successful teacher and practitioner of surgery is often a man of affairs and can well bring to the department of surgery those qualities which have made him successful. He should be relieved of the routine work and given the direction of the im-

portant phases of the department. This plan is not incompatible with an all-time teacher of surgery who may be allowed to fill that for a reasonable period and then be advanced and be permitted to do private practice. It is not fair to condemn a man to a full-time place for life. It is increasingly difficult to get all-time professors of surgery. The all-time professor of surgery has not solved our problems.

Observations of Some of the Surgical Clinics of the Continent and Notes on the British Medical Association*

Eighteen of the members of the Clinical Surgical Society, comprising an active membership of forty, made their third European pilgrimage in June and July under the presidency of Dr. Chas. H. Peck. The first clinics attended were in Rome. In the Eternal City is the Royal University of Rome, having nine hundred students and graduating about one hundred and fifty students a year. The course is six years, with thirteen years of preparation, of which five are in the primary grades, five in the secondary, and three years in the study of the classics. This graduates men at between twenty-three and twenty-five, and seems to be very satisfactory.

The Polyclinico, where all the clinical teaching is done, is the chief hospital in Rome. It contains thirteen hundred beds, of which about half are devoted to the University Clinic. Professor Alessandri is the chief. He is a splendid Roman, fifty-four, and a very brilliant and resourceful surgeon. The ampitheater is separated from the visitors' seats by glass partitions. The technic is exquisite and elaborate. Many of the abdominal operations are done under spinal anesthesia with 2 c.c. of 2 per cent solution of tulocain, a Bayer product. The high lumbar puncture is made for the upper abdominal operations and the low for the pelvic operations and those upon the extremities. The analgesia is very satisfactory. Two grains of caffein are given hypodermically before the spinal puncture and this is repeated should there be a fall in blood pressure, which seems not unusual, somewhat alarming, but rather transitory. They have had no deaths attributable to the anesthesia and are very well satisfied with it.

While I was seeing spinal anesthesia in Italy, Drs. Floyd and Crutchfield did three gall-bladder operations here under splanchic anesthesia successfully.

We saw on two successive days three hydatid cysts of the liver operated upon. The first was a tumor the size of one's fist

*Read before the Nashville Academy of Medicine, September 15, 1925.

that was visible and palpable and particularly clear in the pneumoperitoneum x-ray. The frequency of hydatid cyst is accounted for by the great abundance of lower animals living near and with some of the people. The solitary cyst was aspirated and a quart or more of white fluid evacuated. The sac was then opened and its inner lining caught with forceps and it was gently, easily and quickly drawn out in its entirety, leaving the external covering adherent to the liver, and no bleeding resulted. The sac was wiped out with 1 per cent solution of formalin and pads wrung out in this solution were packed around the field of operation. The sac was then closed up tightly, the entire operation comprising twenty minutes.

Vaccination against pulmonary infections had been done as a routine in about eighty-five cases, apparently with good results. It would seem that if all surgeons would be more particular about acute, even though mild, respiratory infections and would literally wait from ten days to two weeks before operations, although the patient had to be sent home, as practiced by Densmore in Crile's Clinic, we would have the same striking absence of infections that have been noted here. Terry of San Francisco has advocated a very thorough plan of mouth cleansing to prevent aspiration pneumonia. In addition to the stomach work of Alessandri, to be spoken of later, a striking case was a Mikulicz resection of a giant colon as large as one's arm in a girl of eighteen, in which both ends were temporarily ligatured before resection and most of the abdominal wall closed. There apparently had been a stricture for which a plastic operation on the sigmoid had been done two months previously without relief.

A left calculus pyonephrosis with stone was removed also under spinal anesthesia, the cautery being used to sever the uterer. This was accomplished through the oblique lumbar incision with a gauze drain. It will be remembered that Nitche of London makes a long inguinal incision for complete ureterectomy when the kindey is removed, especially for tuberculosis.

Bastianelli, also of Rome, perhaps is best known to Americans. He has a private hospital of about eighty beds attached to his clinic, very modern, just outside of the old Roman wall.

CLINICAL SURGICAL SOCIETY AT PROFESSOR ALESSANDRI'S CLINIC, UNIVERSITY OF ROME

First row, left to right: Dr. Geo. W. Crile, Cleveland; Dr. Jas. F. Mitchell, Washington; Dr. Chas. H. Peck, New York; Prof. Roberto Alessandri; Dr. Wm. D. Haggard, Nashville; Dr. David Cheever, Boston; Dr. E. Starr Judd, Rochester. Second row, left to right: Dr. John H. Gibbon, Philadelphia; Dr. Eugene H. Pool, New York; Dr. Wm. A. Downes, New York; Dr. Allen O. Whipple, New York; Dr. Emmet B. Rixford, San Francisco; Dr. D. F. Jones, Boston; Dr. Edward P. Richardson, Boston; Dr. Walter E. Sistrunk, Rochester; Dr. Malvern B. Clopton, St. Louis.

He did a number of gall-bladder operations with very satisfactory technic, paying particular attention to allowing the clamp on the cystic atery to protrude at least half way of its length beyond the duct, so that the tying could be very easy and very much safer.

In cancer of the rectum he felt that the sphincter could be saved more frequently than formerly, especially in women. Where the sphincter cannot be preserved, Bastianelli prefers to make the anus as near the natural opening as possible. When the sphincter is saved, the anal mucous membrane is separated as in a Whitehead operation. The sphincter is severed posteriorly to give more space. The tumor is then removed up as high as the peritoneum and the end of the bowel pulled down and sewed to the levator anal muscle and finally at the skin juncture, allowing at least two fingers' breadth to protrude through the anus when the sphincter is resutured behind. He always precedes the operation by cecostomy eight or ten days before and makes a general abdominal exploration at the time, noting also the length of the sigmoid. The cecostomy must be complete so that all the feces can escape.

American surgeons are not convinced that preservation of the sphincter gives as thorough a removal and as good outlook for permanent cure as the permanent inguinal colostomy followed by a Kraske at a second sitting.

The most beautiful technic we saw anywhere in Europe was at the Orthopedic Clinic of Professor Putti at Bologna. He is an artist to his finger tips, not in the ordinary sense, but in the sense that Michael Angelo was with his chisel. Putti, too, used chisels of special curves with great dexterity in an arthroplasty of the knee where ankylosis had occurred from general sepsis. A circular incision was made with convexity up above the patella and its tendon cut obliquely from before, backward and downward, to give a larger and firmer line of suture than in the division with end to end suture. The joint was opened with the least possible amount of trauma and the lower end of the femur gently rapsed smooth with a horse-shoer's file. A smooth shepherd's crook retractor in the intercondyloid notch held the femur

up with ease. The incision for the fascia lata had the towels fixed in apposition before the actual incision was made to prevent contamination. A large piece was removed bodily and placed between the ends of the bones and sutured in a hinge fashion. The fitting was of the greatest nicety and the sutures few. Operating under the tourniquet adds to the semblance of art as practiced on marble, but every other feature of the technic was equally finessed. The immaculateness of the linen, gowns and caps was as though they had been freshly ironed and the operating theater and every appurtenance was of the most perfected character. A ship's clock was attached to the anesthetist's table by an arm. All the instruments were made by the special shops attached to the hospital, which employs nearly one hundred men for the making of appliances, not only for this hospital, but for others throughout the peninsula who require corrective apparatus. Many post-operative cases of arthroplasty were shown, in which it was impossible to tell which had been the stiff knee as the patient walked.

The hospital had been an old monastery built in the eleventh century. It had been bought by a fund left by a surgeon, Rizzoli, and added to by returns from the hospital, making it the most artistic and perfectly equipped hospital that we saw. A picture of the library with its wonderful friezes and old paintings of the monks which were on the walls that had been restored, gave one an impression of an art gallery. Professor Putti is the chief of the hospital, having been assistant chief for nine years.

Bologna was one of the earliest schools of anatomy and the site of the old university with its dissecting ampitheater where Vesalius and the old anatomists taught was very inspiring.

Goiter

In Switzerland and the Austrian Tyrol goiter is endemic. The early belief that it is largely due to the deficiency of iodin in the drinking water has been borne out and generally accepted. At one time some doubt was cast upon this theory by the work of McGarrison, an English army surgeon, who found microorganisms in certain springs that were notoriously productive of goiter. The explanation may be that it was lacking in iodin

although abounding in micro-organisms. It is well known that the water of certain springs in Switzerland produced goiter with such regularity that men drank from these springs to escape army service.

There are a great many cretins in Switzerland. So many that they have five government institutions for their care, numbering approximately one hundred and fifty each. Cretins are not simply deprived of the thyroid gland itself, but perhaps, as explained by De Quervain, who came from Basel to take charge of Kocher's old clinic at Berne, it may rather by a dysfunction of the thyroid, as has been experimentally produced in rats. The basal metabolic rate of the cretins average —8%, whereas ordinary goiter is either normal or —.6%. In cretins without goiter the rate is —11%, and in very bad cases it occasionally is —20% or —30%, whereas the average in exopthalmic goiter before operations is plus 35%. Cretins with goiter grow to a nearly normal height, but frequently are unable to talk intelligently, whereas cretins without goiter are little dwarfs but are usually able to talk. This is accounted for by the small persisting remnant of the thyroid.

Kocher years ago showed the danger of the administration of iodin to middle-aged persons with adenomatous thyroids. So many of them developed hyperthyroidism, presenting all the symptoms of exophthalmic goiter except the exophthalmus, that they called it "iodin-Basedow." This has been confirmed by many observers and it is computed that a considerable percentage of patients with adenoma, in middle age, to whom iodin is given for any length of time, will develop toxic symptoms. Iodin, of course, is extremely useful in the goiter of adolescence. It may also be given with profit to school children twice a year to prevent goiter. It is not nearly so useful after twenty years of age and becomes increasingly dangerous with each decade. Plummer has in the last few years proven the efficacy of iodin administration for a short period before operation as a preparatory measure. Ten drops of compound tincture of iodin, Lugol's solution, in grape juice every night will within a week or ten days markedly decrease the basal metabolic rate. It is particularly

noticeable in ameliorating the nervous and gastrointestinal symptoms of exophthalmic goiter. It is dangerous in exophthalmic goiter if given for any length of time. Iodin is extremely useful in reaction with thyro-toxic fever after operation for exophthalmic goiter and many cases can be rescued by its administration which without it would die. In the crisis of exophthalmic goiter with marked prostration, great vomiting and temperature, with impending death, the patient can be almost regularly reclaimed if large doses of iodin are given, perhaps forty to one hundred drops daily for a few days. It is well known in the Tyrol that it is not useful as a routine treatment for goiter, the great majority of which are adenoma of the nodular type and is very prone to produce toxic symptoms which render that disease even more dangerous than frank exopthalmic goiter.

The technic for goiter operations in the Swiss clinics is very careful and deliberate. Each vessel or group of vessels in tissues is ligated separately and cut between ligatures. No hemostatic forceps are used to grasp the goiter tissue, except rarely. The curved right angle blunt-pointed ligature carrier is employed. De Quervain and Roux frequently tie the inferior thyroid separately and most expeditiously before beginning the enucleation. The removal of the gland is nearly always begun below instead of above, as we are accustomed to do.

Most of the operations are done under local anesthesia and sometimes para-vertebral anesthesia, one-half per cent novocain with one minim of adrenalin to each c.c. preceded by pantopon two hours before operation. Usually both lobes are removed, except the upper part of the left lobe. There is no goiter in the Dolomite region of the Alps and it has been noticed that in our country no goiter develops in limestone regions, as they are the result of deep sea deposits and probably contain shells and iodin which are set free by erosion and are present in the drinking water; whereas in granite countries where there is no erosion there is little or no goiter.

Instead of the closing scissor-like type of artery forceps, they use almost universally the sliding type. Several of the operators and particularly those who had been to America, said they felt

somewhat embarrassed about doing goiter work when Crile and Judd and Sistrunk were present.

THORACOPLASTY

We were greatly interested in the cases of extensive thoracoplasty for pulmonary tuberculosis. The selected cases were those in which the opposite lung was good, the patient was young and in good condition, and had not been benefited by employing nature's method of compressing the lung as in pleurisy with effusion by nitrogen gas. We saw examples of this in Ranzi's Clinic at Innsbruck and also in Roux's at Lausanne. A number of patients were presented who had had the operation and were quite well.

Roux performed such an extensive resection for us under para-vertebral anesthesia in a young woman. It was the most masterly exhibition of dexterous surgical technic I ever witnessed. All of the ribs on one side were excised except the last one. There was little or no loss of blood, only one artery forceps being applied and that did not have to be ligatured. The periosteum was quickly and most easily removed by a very large type of periosteome, the resections varying from seven to three inches from below upwards. When the operation got up as far as the wing of the scapula, its tip was raised up and away from the patient's body by a blunt hook attached to a sterilized rope passed through a pulley in a frame over the table. The scapula was bodily lifted sufficiently far from the patient and without pain to enable the operator to resect with ease even the first rib. The operation was completed within thirty minutes. The object, of course, was to collapse the lung on that side and thus starve out the tubercular process. It is only employed in specially selected cases.

The Sun Cure of Tuberculosis at Leysin

Professor Rollier entertained us at luncheon at one of the many chalets required to house approximately a thousand patients for the sunshine treatment for tuberculosis and the so-called Sun School in the snow-covered mountain of Switzerland. It is a

truly wonderful institution and the results in tuberculosis are phenomenal.

Children predisposed to tuberculosis, clad in nothing but breech clouts, spend all of the school days out of doors even though surrounded by snow, and as a result are very much inured to it and are as black as Mexicans. They have all sorts of outdoor sports and altogether are a most hardy looking group.

Clad in a similar manner, the patients in beds, lie out on balconies in the sun for a certain number of hours each day until they are as brown as berries. It is especially applicable in treatment of lesions of the bones and joints. Very little osteomyelitis is seen. The differentiation is by x-ray and other methods. The average time for cure of tubercular lesions is about two years. Practically no operations are done except for the occasional evacuation of a tubercular abscess. Orthopedic and corrective apparatus is used very skillfully for tractions, immobilization, posture, and for correction in connection with the treatment. The case is constantly watched with the x-ray as well as clinically and one can quickly visualize the progress of the case and the behavior of the lesion. The disease is not only cured but we saw many cases with their x-rays and photographs of movable knee, hip, and other joints that were not only cured but had almost perfect function. The most striking cases were those of Pott's disease with kyphosis. After the progress of the disease was stayed, the deformity was overcome by the very simple device of allowing the patient to lie on the abdomen with padded blocks under the chest to overcome the kyphosis. It is perfectly surprising to see the changing of these grave deformities into very satisfactory, straight spinal columns that were healed, as proven by the x-ray and the general condition of the patient. I have used the sunshine method in a modified form as best one could here ever since Rollier's work on heliotherapy appeared and can personally testify to its very great possibility in our own work. While they do not use it for pulmonary tuberculosis as much as for that of bones and joints, I have seen many striking cures here, one in particular, where the case was complicated by laryngeal tuberculosis and with the aid of Dr. Cullom and the

sunshine, the patient is now well of both lesions at the end of seven years.

Stomach Surgery

The continental surgeons practice the Bilroth No. 1 resection of the pyloric end of the stomach with direct union of the cut end to the duodenum very much more frequently than is done in Amercia. It is very much more philosophic than the indirect method of restoration of the canal, absolutely does away with the ulcer bearing area, with the mechanism of the excess acid secretion and very largely with the occurrence of secondary marginal or gastro-jejunal ulcers. The chief objection that caused it to be given up primarily was the danger at the so-called suture angle on account of the inequality in size of the end of the stomach and the end of the duodenum. That form of suturing, however, has been largely made safer by various plans so that it can no longer be urged as an objection. Inasmuch as the majority of ulcers of the stomach occur on the lesser curvature which require resection anyhow, the entire stomach can be very greatly mobilized by going high upon the lesser curvature and tying the coronary artery near the celaic axis allowing the stomach to be sutured to the duodenum without tension. This is very ingeniously arranged for by the operation of Shoemaker of The Hague and by the use of his clamp which mechanically plans for the suturing to taper the lesser curvature down to a small opening approximately the size of the duodenum. The duodenum itself can be mobilized and brought easily a considerable distance over to meet the stomach.

We planned to go to Innsbruck largely because of von Haber who has done about 1,700 resections of the stomach for gastric and duodenal ulcer with a four per cent mortality. After our itinerary had been arranged he was called to the University Clinic at Gratz. Professor Ranzi, one of von Mikulicz's associates at Vienna, had taken charge of the university and the clinic. We were very much interested in the stomach work and also that of Chiari, a former assistant of von Haber, who carried out the technic of his chief with celerity and safety.

In carcinoma or with ulcer in the center of the stomach, par-

ticularly if it is adhered to the pancreas, it is not always possible to do the Bilroth No. 1 and under those circumstances we saw several of the continental surgeons do a sleeve resection in preference to either the Bilroth No. 2 or the Polya. Most of the men added an eteroanastomosis to the resection, which makes for added safety.

Paris

In Paris we were greatly charmed with the work of de Martel, Pauchet, Faure and Gosset. The latter is the chief at the Hospital Saltpetier, the clinic that was built by Doyan and Segond in a hospital that although several centuries ago was a prison for women, from which the famous Manon Lascaut escaped and on whose picturesque life the opera of that name is founded. This hospital also has had many famous physicians, among them the immortal Charcot.

The technic at Paris was very beautiful and in very great contrast to the war surgery that we saw at the hands of the French under very adverse circumstances. Practically all of the Parisian surgeons, and continental for that matter, use the Reverdin needle. Gosset sterilizes instruments by hot air instead of water. Although in use nine years, they were bright and perfect as when first used.

In spite of the many splendidly executed large resections which we saw for duodenal as well as gastric ulcer, the feeling that for the average duodenal ulcer, gastroenterostomy is the best operation, giving ninety per cent permanent cures with a mortality under two per cent and the incidence of marginal ulcer being only two or three per cent. However, for ulcer of the lesser curvature and where the stomach can be mobilized, the Bilroth No. 1 appeals so strongly that it will probably be utilized more and more.

One of the most remarkable surgical feats that we saw at all was in de Martel's clinic—a cerebello-pontine tumor removed from a young woman under local anesthesia in a sitting posture. The motor saw quickly exposed the tumor which was very readily hulled out, leaving the capsule, occasioning no bleeding. The patient was asked from time to time to incline her head slightly

to the right or left. The entire operation was completed within half an hour, the patient left the room smiling, and it was altogether the most magical piece of surgery that we had ever witnessed.

Zurich

Among many most interesting postoperative results shown us by Professor Clermont at Zurich, we were especially impressed with a case of a diverticulum of the lower end of the esophagus in a woman who vomited solid food but no blood, had been treated a year for ulcer said to be cancer, on account of her chachetic look. The operation was made by an abdominal incision and the intra-abdominal part of esophagus had tape passed around it and the diverticulum was literally pulled through the diaphragm and resected. The esophagus was closed by three layers of sutures and a temporary jejunostomy performed. The method of approach seemed most ingenious and the result very remarkable. Another case of carcinoma of the cardiac end of the stomach was approached by an incision below the left costal margin and a resection of practically all of the stomach from the esophagus nearly to the pylorus, was done with end to side anastomosis of the esophagus to the small remaining portion of the stomach, also followed by a temporary jejunostomy. This patient made a splendid recovery in spite of a subdiaphragmatic abscess that had to be opened and is eating five meals a day and gaining weight.

In the resection, Clermont stressed the point that we could take the first three centimeters of the duodenum. Otherwise on account of the lack of circulation, trouble happened as the first portion is supplied from above and if circulation is cut off, sometimes causes interference with healing.

British Medical Association

I had the pleasure of attending the British Medical Association at Bath as the American delegate. While it is not as large as our association, it is very splendidly conducted. Only one topic in each section is discussed a day, the afternoon being given to sightseeing excursions. Sir Berkeley Moynihan was chairman of the Surgical Section.

Intestinal Obstruction

Intestinal obstruction was chosen as the topic for the surgical section. The opening paper was by Sir William Taylor of Dublin who showed that the mortality was no better than it was twenty years ago, first, because of delay in operating, and, second, on account of the administration of cathartics. The clinical group in which the symptoms have only been in existence less than twenty-four hours, the patient in good condition, little distention, but where splashing could always be obtained by gently "flicking" the abdomen, are the most favorable cases. The second class were the third and fourth day cases with distention and vomiting, which were more grave. The third group were the advanced, neglected, delayed cases which were cold and almost moribund.

He recommended washing out the stomach before operation in every case, as well as afterwards, which were equally important, and after releasing the obstruction he advocated Bonney's method of making a separate incision in the left upper abdomen and doing a high jejunostomy, sewing in a tube of six to eight millimeters in diameter and evacuating several gallons by siphonage in a few hours, followed by the injection of bicarbonate of soda and glucose, and allowing the tube to remain in two or three days. In the desperate cases after washing the stomach, the patients were operated on in their beds under local anesthesia and only an enterostomy done. Some of these cases may survive by this method.

He had had most striking results in intussusception, having only three deaths out of eighty-one operations. These unparalleled results were stimulated by the occurrence of this accident in one of his own family, and he had preached early diagnosis all over Dublin so that intussusception constituted thirty-five to forty per cent of the whole obstruction group. He insisted on squeezing out the last dimple in the intestine and thinks the mortality should be five per cent instead of fourteen per cent. Mr. Sampson Handley of Middlesex Hospital lamented the impotence of the textbook descriptions of intestinal obstruction and urged that we teach the early symptoms which are the most im-

portant and not only the full-fledged picture which is really indicative of lost opportunity. His rule is that if no gas or feces are passed in twenty-four hours, after two turpentine enemas are given, intestinal obstruction should be diagnosed whether any other signs or symptoms are present. In strangulated hernia with necrotic area he advised doing lateral anastomosis around the area leaving it in the wound which is unsutured, especially in patients who are feeble and those who could not stand resection.

The writer has reported five cases of late strangulated hernia, with extra-peritoneal enterotomy of the gangrenous knuckle with and without abscess with recovery of all, without primary resection. Dr. Floyd had an additional successful case from simple incision recently.

Mr. Wilke of Edinburgh thinks that early operation under adverse circumstances is better than operation in ideal surroundings later and called attention to the early shock in strangulation due to torsion of the mesentery in which every half-hour means so much. Enormous quantities of saline by installation was advocated. It has been shown that intestinal obstruction causes a great deficiency in the chlorids. Mr. Rowland of Guy's Hospital said their mortality the last four years was 31.5 per cent and if hernia and intussusception were omitted it would be fifty per cent. He urged against waiting for refinements of diagnosis and advocated a short incision to admit the wrist only at first as all surgeons know the danger of eventration in these cases and the wisdom of dealing with the obstruction in the simplest possible way without evisceration. Mr. Vick of St. Bartholomew's Hospital called attention to the fact that in the last four years 300 cases, including all operative deaths, the mortality was only twenty-eight per cent. In volvulus after laparotomy and the insertion of a rectal tube, the recoveries numbered 100 per cent. Mr. Burgess of Manchester advised against waiting for fecal vomiting, and described palpable peristalsis as an important early sign. Mr. Souttar collected the combined statistics for all operations for acute intestinal obstruction from seven London Hospitals from 1920-1924:

Obstruction from intestinal strangulation, 223 cases; mortality fifty per cent.

Obstruction from carcinoma, 358 cases; mortality 43.5 per cent.

Obstruction from adhesions, 342 cases; mortality thirty-one per cent.

Obstruction from intestinal strangulation, 223 cases; mortality thirty-three per cent.

Obstruction from intussusception (idiopathic), 613 cases; mortality twenty-two per cent.

Obstruction from intussusception (with tumor), seventeen cases; mortality thirty-five per cent.

Obstruction from volvulus, seventy-four cases; mortality fifty-one per cent.

Obstruction from inguinal hernia, 524 cases; mortality 16.6 per cent.

Obstruction from femoral hernia, 675 cases; mortality twenty per cent.

Obstruction from umbilical hernia, 200 cases; mortality thirty-five per cent.

Total, 3,064 cases.

Gye's Cancer Virus

Dr. W. E. Gye of the Medical Research Council in London has succeeded in identifying what he believes to be the etiological factor in malignant growths, namely, an ultra microscopic virus or micro-organism which his associate, Mr. Barnard, has photographed as a spheroid and which when mixed with an extract of the tumor from which the virus was filtered, will reproduce the tumor in an animal of the same species. This work was based upon the sarcoma of fowls that was described by Rous of the Rockefeller Institute in 1911 and which he was able to reproduce in the chicken by inoculation with the dead cells or with cell-free filtrate. In fact, Rous was able to reproduce three filtrable tumors, all sarcomata, but of course there were many hundreds of tumors that could not be transplanted; only the so-called fowl-sarcoma.

Gye has been able to transplant carcinoma of the breast from

the human species. Prior to this time no mammalian tumor had been transmitted by cell-free filtrate. The chicken sarcoma of Rous seems to differ morphologically from all other tumors. So much so that Carrel and others have questioned whether it was a true sarcoma, but the majority of pathologists believe it to conform to all of the requirements.

While it has been believed by many that malignant growths were of parasitic origin, no tumor has ever been reproduced with a culture of any organism.

The mouse sarcoma has been carried from mouse to mouse by fragments of living cells but curiously enough it will not grow in a rat, and the tumors reproduced by the filtrate always reproduce a tumor of exactly the same type so that they reproduce themselves not only in the same species but in the same tissues only.

At the present time most men have looked upon the transformation of cancer cells as the physiological reaction to some long continued irritation.

The Rous tumor will appear in two weeks after inoculation and they destroy the fowl within one month.

The epoch-marking feature of Dr. Gye's work postulates that there are two factors: (a) a living virus which he calls the extrinsic factor and (b) some chemical substance produced by the cells of the growth itself called the intrinsic factor. The culture of the growth itself will not reproduce a cancer and neither will the treated filtrate from the tumor, whereas a mixture of the culture and the filtrate will regularly produce a full-fledged tumor on or about the thirty-eighth day. The adenocarcinoma of the breast from the patient of Professor Gask of Guy's Hospital was reprdouced in a chicken, beginning at the end of a week; reached its maximum size on the twenty-first day and killed the chicken on the twenty-eighth day. Gye speaks of the common factor in the production of the Rous tumor, of the mouse sarcoma, of the rat tumors and of the human breast tumor as a specific factor. It seems to be common to all of these transmissible tumors and is almost certainly a virus. He thinks that this specific factor that is obtained from the tumor extract ruptures the cell defences and enables the virus to infect the cells. This

seems to correlate with our clinical observation that chronic irritation has much to do with the production of cancer and would appear to facilitate the infection. It is a virus then presumably that gains access to the cell and provokes it to the continued multiplication of its cells. The specific intrinsic factor shows great specificity for species but the virus does not do so as tumors from one species of animals can reproduce it in another species. Thus the mouse carcinoma virus plus the fowl sarcoma specific when it is injected into mice, produces no effect but when injected into fowls reproduces sarcoma. The human carcinoma virus plus the fowl sarcoma specific injected into mice produces nothing; but injected into fowls produces a sarcoma. The parasitic theory had about been abandoned by most men and it was felt that it could never be established. Ribbert had proven that cancer in its inception was a local disease and Buntlin first demonstrated that if cancer is widely removed sufficiently early it is an entirely curable disease. This has been proven over and over again by all surgeons.

Gye's theory is most ingenious and explains why the extrinsic factor, while it may be a virus common to all neoplasms, cannot by itself reproduce a neoplasm but that the intrinsic factor, perhaps some substance produced by the cell itself, is essential to allow the extrinsic factor, i.e. the virus itself, to attack the cell. He has shown, moreover, that the virus can be cultivated. It would seem that this work tends very definitely toward the solution of the real cancer problem. Gye has investigated the filtrable viruses for a long time and his discovery that an extrinsic substance is required, should allow further advances in the study of these viruses. It should be pointed out that the mere fact that an organism is not infectious by itself, but requires some additional factor, is not peculiar to the cancer virus but has been observed in the gas gangrene bacillus which requires dead tissue in which to propagate. This has been referred to as descent rupture or kataphylaxis. This is true of tetanus and the tuberculosis infection and really in many of the streptococci infections. It is interesting to note that Coley of New York only recently suggested that kataphylaxis was required to allow the

cells to be attacked so as to produce the phenomenon of cancer. This seems to be the only correct guess out of many hundreds.

In addition to the great value of this discovery of Gye's, it is believed that the cause of a great many other diseases can be now studied to great advantage, namely, smallpox, measles, encephalitis, foot and mouth disease, and certain infections of the lower animals.

It has long been known that ultra-microscopic micro-organisms exist because certain infected material has been proven to retain the infective agent even after passing through a filter so small that the smallest known visible micro-organism will not pass.

Barnard, working with Gye, has shown that by the ultra-violet light a photograph of these small bodies can be made if a short enough wave length is used. This has been done by a microscope of special construction that has great stability and high accuracy of movement. Mr. Barnard has long been interested in this work and has written on the violet light microscopy in the "Dictionary of Applied Physics." He had already studied trench fever and some important work in bovine pleuro-pneumonia which is really the smallest organism that has been observed under ordinary bacteriological culture methods. He photographed sphermoids that appeared as a surface colony on tubes after twenty hours that had been inoculated with the filtrable virus. The malignant growth virus has a much lower visibility than the pleuro-pneumonia owing to its very much smaller size. The small bodies that were photographed were controlled and in the control the inoculated tubes of medium were uniformly blank. It still remains of course to cultivate the virus from a single colony or even perhaps from a single spheroid that has been photographed and the tumor reproduced from the culture thus obtained. That is the work that Dr. Gye is going to continue and it is very ardently hoped that the solution of the cancer problem so far as its etiology is concerned, is on the way.

It is not improbable that there are as many viruses as there are varieties of cancer. Cancer is so protean, has many types, attacks many different tissues, which react in many different

ways, and has many degrees of virulence. In view of such extensive and elaborate investigation by a trained bacteriologist, physicist and microscopist, dealing boldly and honestly with the many hitherto insuperable obstacles to the unravelling of its real cause, the injection of substances of a secret character seem so empirically and ignorantly puerile, as not to be distinguished from commercialism thinly veiled.

How to Add Years to Life and Life to Years*

There is a great opportunity for medical leadership in the reorganization of society and in the management of human affairs. Physicians who are in the strategic position of studying individuals both in health and disease, are in better position to understand the constructive forces that will aid in stabilizing society because they are constantly studying the things which make for change in behavior. Civilization has become so complex that it is going to overwhelm existing society unless we are able to control those forces and compel them to flow within banks. One of the first things is to control physical disease as health is the greatest individual and national asset. The same endeavor should be applied to the protection of the mind. In our efforts to adjust ourselves to the ever changing environment of our modern life, we must make every effort in a constructive way to cherish our ideals and to evolve healthful practices.

Leaders of medical thought are appealed to in preventing the pestilences in armies and in making man power fit to fight. It must also be its great problem to make men fit to live and fight the battle of the destructive forces as opposed to the constructive ones. No grander body of men ever came together than the Medical Corps of the U. S. Army, numbering 35,000 men. We must, with this same nucleus and led by the mentors of our profession, battle to make men appreciate life and its preservation, as well as we made them fit to destroy it. After all, it is the medical corps that prevents the scourges and epidemics that decimate armies. The same intelligence and effort directed along psychological lines would prevent the moral pestilence and degradation that ensue from the loss of ideals. It seems a pity that upon the medical profession at last rested the ability to make men so free from disease that they could be the most Gaugantian destroyers of each other's lives that ever existed. We have yet a higher and nobler calling, the battle of peace has its victims no less than the horrors of war. It must not be said of the medical service that its supreme achievement was to obtain a higher de-

*Read before the Louisiana State Medical Society, Monroe, La., April 15-17, 1926.

gree of health protection in war in order to make the ability to destroy more enormous.

The orderly working of the mind is just as essential as healthy heart and lungs, healthy liver or kidneys. We must find peaceful and harmonious solutions of the many problems that vex the individual's peace of mind, as well as national unrest as they also are controlled by normal mental processes. Mental conflicts are dangerous, and often are the things which precede national brawls. The physician who is versed in psychology and that part of impaired psychology, psychiatry, are better than statesmen, and if their advice is sane and compelling it will do more good than legions of armies in the prevention of hostilities.

The most indispensable individual in any community is the all-time health officer who not only preaches the gospel of individual health, but who in a broad way administers these laws for the prevention of epidemics and for constant improvement in sanitation and cleanliness.

Tuberculosis is the captain of the men of death. It is being controlled by education and sanitation. Yet there are a million active cases in this country at all times and perhaps another million that are inactive. One of every ten persons who die, dies of tuberculosis. More than 50 per cent of all children are affected before they are ten years of age, and it increases until they are 15 years of age. If theoretically it were possible to form a barrage of handkerchiefs for every expectorated particle that comes from the mouth and lungs of every individual and that could be immediately burned, tuberculosis and all of the acute respiratory diseases would be greatly curtailed. When one hears school boys and college boys yell, "Block that kick!" it suggests the slogan, "Block that sneeze" (with a handkerchief); "Block that cough" (with a handkerchief). The sneeze and cough atomize a fine spray of assorted germs that are more deadly than a machine gun. As it is, the death rate of tuberculosis has been almost miraculously cut in twain in the last two decades and preventive medicine is one of its most striking victories in the throttling of the Great White Plague.

Out of about forty contagious diseases, six of them are car-

ried by some form of insect. Many of the others are propagated by the roller towel and any other towel that has been used, and especially from unguarded spitting and coughing and sneezing, together with drinking and eating from unsterile vessels. These other 34 contagious diseases, therefore, are contracted by getting the infection through the mouth or nose. Tuberculosis is the greatest of the antitoxin for diphtheria by Behring in these. Louisiana has decreased the death rate in tuberculosis by nearly one-third in the last 6 years.

Malaria cost the lives of fifteen thousand people in the Southland alone last year, and yet if we can teach the coming generation to despise mosquitoes and destroy their breeding places and not take comfort behind screen doors, the menace of malaria can be man-handled. The draining of swamps, the destruction of little bodies of water where the mosquitoes so quickly develop and the pouring of oil on water where they are prone to breed, will go far toward lessening this terrible and unnecessary disease. A railroad company in the southwest by draining its ditches and oiling the water to prevent the breeding of mosquitoes lessened the incidence of malaria in one of the hospitals alone from over 600 a year to less than 100. What an enormous economic gain modern medicine confers upon civilization. Louisiana has cut down the deaths from malaria nearly one-half in the last five years but she still has nearly one-tenth of the deaths of the entire registration area of the United States. She likewise has over twice the death rate per 100,000 from typhoid fever as the other states.

Nearly one-fourth of a million school children in this country are affected with organic diseases of the heart. This is a terrible indictment and especially when it is recognized that many of these cases could be prevented by the removal of infected and diseased tonsils and adenoids, decayed teeth, and by protecting children from over-strain after acute illnesses, like scarlet fever.

The year that Columbus discovered America witnessed a terrific scourge of this dread disease in Nuremburg, which spread slowly from person to person and from community to community and became not only epidemic, but almost universal. Prior

to the time of the finding of the germ by Loeffler in 1883, and the discovery of 1893, the death rate was about 35 per cent. It had broken the fireside circle of nearly every home. Now owing to the beneficence of the antitoxin and the wisdom of the medical profession in its utilization, and the education that has become necessary, the death rate the world over is now less than 9 per cent.

Ignorant of the scourge of small-pox when every seventh baby in Russia died from it, and the fact that by long periods of vaccination, we have become more largely immune to the disease and protected from its ravages, some misguided people argue against vaccination.

About one-fourth of all the deaths in this country are communicable. Pneumonia stands at the head. Tuberculosis, measles, scarlet fever, whooping cough and diphtheria are the diseases which kill children before they are 10 years of age. Diphtheria has been made very much less dangerous by the use of anti-toxin in its very beginning. It can be prevented by employing the Schick test which will tell whether or not a given child is susceptible to the disease. If he is, then it should be almost totally prevented by giving the diphtheria toxin anti-toxin. If the Schick test is negative, it means that almost infallibly the child will never have diphtheria. This has brought the death rate in New York City down to less than half of what it was five years ago, but still 547 children died of diphtheria in New York in 1923, all of which, theoretically, were preventable. Any family physician can, and should, give the Schick test to every child unless it is done at the request of the parent by the physician in charge of the school.

There is a similar test for scarlet fever with a similar name, the Dick test, which can tell whether or not a child is susceptible to scarlet fever and if so, it can be prevented with almost the same certainty as can diphtheria.

Children should be interested in the prevention of illness and in the welfare of the community health and well-being. They should know all about the water supply, which is very much more important than the dynasty of departed kings.

The annual health examination of school children is very essential, but if it cannot be done every year, it should be done on admission on the beginning of school life, and at least every second or third year thereafter, and always in the presence of one or both parents if possible, so that any abnormalities or conditions requiring correction should be thoroughly understood, and moreover should be followed up particularly by the health nurse to see that they are carried out, even if the parents do not do their full duty. The examiner could at once refer the child to their family physician or dentist, but it is the nurse's business to follow up the case with the co-operation of the teacher and physician.

Every child should be weighed and measured at least every two or three months, and every month if his condition warrants it. If a child is persistently below the standard of weight, something is really wrong, which should be corrected. Of all the simple and mathematical means to determine the health of a child, a weight chart is the best. A pair of scales and measuring rod should be in every school. If the school funds cannot or do not allow it, then the women's clubs or the men's clubs or some philanthropic citizen who would be glad to be of some real service to the city, should provide them.

City Boards of Health should offer to the schools (public, private and parochial), nursing service, especially for the diagnosis of communicable diseases, medical and dental service, nutrition classes, little mothers' classes, health talks, supervision of children in open air schools, and open window rooms, and special medical attention to the handicapped, including the deaf and the partially deaf, blind and the partially blind, and the crippled.

We should have the fullest co-operation with the State Boards of Health. We should have "state medicine" in its better and broader sense, not in the contract physicians' sense, or its degeneration to the plane that it was in Germany or the panel system existing in England, but modern American medicine with a larger outlook, wherein the state, in connection with the physician, conserves the health of the individual and supplies laboratories for the aid of the rural practitioner and encourages county and community hospitals.

Periodic Health Examination

Periodic health examination is the acme of preventive medicine for the patient and the apotheosis of pre-clinical medicine for the profession, and requires a big program. The Medical Society should sell it to its own members and then to the laity by proper informative lectures to special groups, churches, clubs, schools, public meetings and fraternal organizations. Leaflets for distribution among the profession should be prepared by a special committee, another for popular distribution among the people at large for their information. Posters should be obtained for quick visual education, a *health week* established locally, the press should be called on for its help in the essentially individual and public health movement.

In the apparently normal person, who has a systematic physical examination, even if no real abnormality is found, he often needs, and will ask about other health problems, those of adolescence, sex education, exercise, diet, environment, mental hygiene and the principles of sanitation.

If all the duty of life comes from duty well done, there is no more gratifying experience than the appreciation the patient expresses after a thorough, painstaking examination. They want it, they deserve it, they appreciate it. The satisfaction of the average person after having passed a successful physical examination and test, is really appealing. The opportunity for correction of minor defects and incipient disorders is alluring. The "ounce of preventive" must have been coined in anticipation of universal physical examination of the apparently well. So many conditions can be presented, many more alleviated, and cure can be invoked in the cases still amenable to relief.

It will take such a large block of diseases from the advanced and the irremediable class into the incipient and curable class. It will lay the ghost of the age-old plant of the physician, "If I had only seen you a little earlier."

One out of six applicants for life insurance are declined or postponed. The annual health audit will detect albumin or sugar, high blood pressure, slight cardiac disorder, incipient tuberculosis, beginning neoplasm, and any and everything else. Your

family physician will do the rest. What does it profit a person to be an ostrich with his ailments or like the Spartan youth to hide a disease until it gnaws out his vitals? Get the disease before the disease gets you. Get it early. Get it before you think you have it.

People have too long had such faith and confidence in their physician that they think he can cure anybody who has not been dead over three days. Our profession admires the faith of their clientele, but dislikes to be put in such superlative and unequal tests.

If elevators are inspected regularly, why not one's mouth and teeth? If a boiler must be examined regularly, why not your heart and lungs? You have tested the brakes on your car, why not the kidney function? You have your watch regulated, but not your diet. You have your batteries charged, but you let your weight run down from disease.

Should the most complex and wonderful mechanism in the world, that not made with hands, be allowed to become broken or impaired, to corrode or disintegrate? Neglect your business if you must, neglect your golf if you can, neglect your wife if you dare, but don't neglect your physician and a yearly physical examination and health inventory on your birthday.

Address at the Opening of the Rutherford Hospital, Murfreesboro, Tenn., May 2, 1927

The opening of a new hospital in a community is an event of great magnitude. This magnificent building which is being dedicated today fills a great need in this community. The superior structure, beautiful appointments, complete equipment and the personnel of the staff make it one of the best of its type in the United States.

The Commonwealth Fund has indeed a wise and beneficent plan for the amelioration of suffering and the alleviation of disease. It is a very great compliment to Murfreesboro that this trust has been placed in her hands for the benefit of her citizens and the development of modern medicine which is an integral factor in the progress of our civilization. For Rutherford county it means restoration of its citizens to health and wellbeing, the prevention of the gradual but threatening advent of disabling diseases, the prompt and efficient care of accidents and emergencies, the performance of operations to thwart impending danger, the restoration to the hearthstone of an unbroken family circle, insuring happiness and safety of the people of this community.

Side by side with the churches and schools must stand the hospital with its great opportunity for service. Service is a legion that discredits no creed. It is founded upon no dogma, but chooses for its ideal the Golden Rule and in the practice of medicine and in hospitalization it follows in the footsteps and precepts of the Great Physician.

There is as much difference between hospitals as there is between cathedrals and missions, between hotels and camps, between ocean-going greyhounds and the crude raft. You are particularly fortunate to be the recipient of one of the most splendidly equipped, most modern, up-to-date and best arranged hospitals that modern sciene and industry can possibly construct. With opportunity there always comes responsibility. This is an institution that all classes, all creeds, all business interests, all rural neighborhoods and all citizens can utilize. Its privileges can be shared by all and its benefits and mercies come to you as

did the charity, the tenderness and the sympathy of the Samaritan.

The growth of hospitals founded upon necessity and perpetuated by service has been phenomenal. In the last fifty years the hospitals of this country have increased from 149 to 6,762. The hospitals of the early Hindus and Egyptians were models of cleanliness and effort. After the fall of the Egyptian civilization the Roman hospitals were really temples where the sick congregated and were adjured by persons who had presumably recovered from a similar illness to employ similar remedies. The hospitals of the Dark Ages were wretched alms-houses. During the renaissance they were conducted by religious orders and sisterhoods who, imitating the best religious traditions, combined with the existing knowledge and practice of the profession of the day, served very great and useful purposes. Many of the first hospitals were called "Hotel Dieu," House of God, and still more were named for the saints and martyrs. St. Bartholomew's Hospital in London which was together with the hospital of My Lady of Bedlam, an insane asylum from which we have the by-word bedlam, were the only two hospitals in London spared during the destruction of the monasteries in England. It is still the oldest, one of the most famous hospitals in the world, harboring in its venerable walls a great medical school. Hospitals were purely charitable institutions and only for the extremely poor. This type of hospital was very highly developed by special societies, various churches, many municipalities. The most successful example of this type, such as Bellevue Hospital and the Blockley Hospital in Philadelphia became models of scientific development. The paupers of the large cities were given every care and the benefits of all modern methods, including the best medical and surgical skill of the community. Training schools for nurses sprang up in the last three decades which have added greatly to the efficiency, cleanliness and humaneness of all institutions. Great teaching hospitals, such as Johns Hopkins Hospital, the Hospital of Tulane University conducted by the Sisters of Charity and more recently Vanderbilt Hospital, are widely distributed examples of highly technical and ably-managed institutions, fulfil-

ling with great precision the educational function of a hospital. They minister to the patient in the most superlative manner, perpetuate and improve the science and art of medicine for the coming generation by educating doctors and nurses. Formerly there was scant provision for the family of moderate means. The well-to-do received care at their homes but were not enabled to obtain the benefit of hospitalization with all of its perfection. We had the peculiar situation where the poorest members of society received the most superior care, so far as hospitals were concerned, and those who were able to pay for it had no provision for their relief. This condition still exists in England where there are relatively few or no hospitals of the American type that provide adequately for all classes of society. In this country one person out of every five has a hospital experience during each year. It means that there are probably half a million people in the hospitals of the United States today and there are many, many more that would profit by the perfected care which could be bestowed by hospitalization. Over a billion dollars is invested in the construction and maintenance of hospitals of the United States. This figure is almost inconceivable. A billion minutes represent all of the time that has transpired from the Crucifixion to the present day. We cannot visualize so vast a sum. It has been computed that a billion soldiers placed four abreast and marching according to army regulations would extend six times around the earth at the equator.

A hospital should have all the architecture, equipment and up-to-date management of the best hotels in the country. It should have the exquisite cleanliness and care of an excellently conducted private home. Its training school for nurses should have the ideals and opportunities that the best colleges for women maintain. The laboratories must have the most sceintific and modern instruments of precision. The personnel must have the courtesy and efficiency of a high-grade club. Great hotels strive to please. Hospitals should radiate kindness and forbearance, courtesy and cheerfulness. The hospital staffs are uniformly composed of the best trained men in the community.

They represent the advance in modern medicine, surgery and the various specialties.

Hospitals are never manned by others than members of the regular medical profession. Persons who say there is no such thing as sickness, of course, build no shelter for the sick, afflicted or dying. People who profess to believe that all sickness originates in the back-bone, require nothing more scientific than the hands of a masseur.

Those who have one remedy for all the manifold sicknesses of the human body with its intricate, but ignored chemical and disease change require no hospitals.

Medicine has made more stupendous strides in the last half century than it has made in the five preceding centuries. When Pasteur, fifty years ago, showed to a disbelieving community that the twenty-five sheep inoculated by the vaccine against anthrax lived and a similar number, unvaccinated, died before the very eyes of the doubting onlookers, it proved the germ theory of disease and led to the discovery of the particular germs that cause most of our contagious diseases. This was the essential and rational step toward prevention and now most of the infectious diseases have been wonderfully controlled. At one time every seventh babe in Russia died from smallpox. Now if one neglects to have his child vaccinated and it should die from smallpox, it would be a personal and community crime. Tuberculosis has been so controlled by the knowledge of its prevention by sanitation and cleanliness and its cure by sunshine and rest, that it is no longer the Great White Plague. The rosy glow of health is being brought to the pallid cheeks of its victim. In the whole world one person still dies of tuberculosis every time the second hand on the clock ticks thrice, but each stroke of the pendulum shows scores of lives preserved.

Cancer, the merciless cause of more deaths than any diseases of middle and elderly life. Theoretically, there is a time in the beginning of every cancer when it can be cured absolutely. Practically it is nearly always hopelessly neglected and delayed. In spite of that, as high as 45 per cent in the favorable forms are now cured by operation and radium.

Since yellow fever was proven to be contracted from the bite of a certain mosquito and its destruction has been encompassed by oiling or draining stagnant water, screening and cleanliness, the seventeen thousand people who died in Tennessee and her three neighboring states in 1878 will be the last victims. Cholera which is taken into the mouth by contaminated food and drink is no more. Typhoid fever, which formerly raged throughout the world and killed twenty-three thousand during one epidemic in Philadelphia, can now be almost entirely prevented by the anti-typhoid serum. Slightly more than six hundred cases developed in the four million American soldiers, whereas if the same incidence had occurred as in the Civil War, there would have been over two hundred and sixteen thousand cases. The danger of diphtheria if treated by the anti-diphtheric serum in the first few hours of the disease is not much greater than the sting of a bee. Every child should have the Schick test to see whether or not he is immune to diphtheria and if not, he should be immunized. Scarlet fever can be similarly tested for and immunized against. The bite of a rabid animal can be rendered harmless by Pasteur's great discovery. The mad dog will no more roam our highways if treated with the preventive serum.

Over two hundred thousand school children have heart disease and most of these cases come from the infectious diseases of childhood, infected tonsils and diseased teeth. The prevention of the former and the cure of the latter should cut down this dreadful and unnecessary toll of the flower and youth of our country.

The time was when half of the human race died before they were five years of age. Now thanks to the beneficences of modern science, prevention, infant welfare and maternity clinics, health instruction in schools, modern sanitation and the constant supervision over all of these great agencies by the medical profession, the reduction in mortality in these little buds of love has been marvelous. Due to the conquest of epidemics and the salvage in infant and child life, the average of human life has been increased in the last fifty years from 43 to 58. When every county in the United States has a hospital like this, there is

no reason why man should not reach on an average the three score and ten of Holy Writ.

HEALTH is the new chivalry.

War should be directed against disease and not against our brothers. Health, our most priceless possession, should be preserved and fought for, treasured and cherished. The hands of the medical profession who faithfully employ all the instruments given them by the understanding of the Divine laws and secrets of Nature should be upheld by the people, to the end, that peace, long life, happiness and well-being should engirdle the world.