GLIMPSES OF SURGERY

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HISTORY OF SURGERY

The earliest known pictures of surgical operations are engraved upon stones over a tomb in Memphis, Egypt. These engravings were made about 2500 B.C. The pictures show the operation of circumsicion and also operations on the arms and legs. These operations included all surgical operations performed by the Egyptians. Their surgery of that time was entirely wound surgery. It consisted mainly of dressing and treating wounds, opening abcesses, and, as a last resort amputation of a limb. All operations were on the surface of the body or the extremities. The Egyptians were unaquainted with the anatomy beneath the surface. However had they possessed such knowledge and had attempted to operate for, say appendicitis or gall stones, the patient would have died anyway, for they had no way of controlling hemorrhage or preventing infection. The few operations of the Egyptians were undertaken without anesthesia.

The Egyptians had only a rudimentary knowledge of the structure of the body. This seems peculiar since they embalmed their dead. The fact that they did embalm indicated their belief in the sanctity of the body, and to them dissection was an offense against the dead. However the process of embalming necessitated observation of the abdominal contents, but none of these observations were utilized for surgery.

The Babylonians, like the Egyptians, had little knowledge of anatomy, however we know there were surgeons among them for as early as 2250 B.C. surgeons fees were regulated by law. These laws contained certain condition to discourage reckless

surgery. As, if a patient as a result of an operation lost his life or an eye the surgeon was required to cut off his hand in retaliation.

The ancient Jews, like the Egyptians and Babylonians, had little anatomical knowledge. However they had strict mandates about hygiene. There are only two surgical operations mentioned in the Old Testament, circumcision and the operation on Adam for the formation of Eve.

Human anatomy, the first requirement of surgery, was not attained by the Greeks. They made valuable contributions but they did not dissect the human body. The Greek religion was even more hostile to dissection than the Egyptian. Galen, in the second century A.D., perhaps the greatest Greek physician of Rome derived his knowledge from the pig, the ape, the dog, and the ox. He assumed the structures he found in these to be identical to those of the human. Even up to the thirteeth century the human breastbone was, following Galen's teachings, segmented like the ape, the liver had many lobes like the hog, the uterus had two horns like the dog and the hip bones were flared like the ox. Galen's work had gained such a hold upon the clerics and physicians of the middle ages that when Versalius in the sixteenth century showed Galen's description of the hip bones was wrong, the excuse was offered that man had changed shape through the wearing of tight trousers.

With the decline of the Roman Empire, the Arabs collected the work of Galen and the Greek physicians and carried them to Arabia. Galen had made the statement that surgery was a form of treatment to be subordinated to medicine. This conception appealed to the Arabs. They also held the idea that it was unclean or unholy to touch the human body so they advanced the study of anatomy and surgery.

In the early Middle Ages there were no trained surgeons in urope. The only men with medical education were the Jews who ad studied in Arabia and the church forbade the employment of hese. However, the Church officials consulted them in case of erious illness. At no time during the Middle Ages and the enaissance did physicians undertake surgical work. Not until he end of the Middle Ages did they begin specializing in Surgery. hen they performed no operations. They were confined entirely o dressing wounds. The surgical operations were performed only y barbers and vagrants who wandered about the country.

The earliest medical school in Europe was at Salerno, founded bout 900 A.D. The instructors were Jews who had studied in rabia. The anatomy taught was that of the hog as recorded by alen. However at its height it made its more important con- ributions to medical science in the development of surgery and insisted on a preliminary education of three years in advanced ientific work in addition to four years in the arts of healing. efore the student was granted the right to practice surgery, he as required to work for some years under the tutelage of some ll known surgeon. The school attracted students from all over e world and its influcence and reputation were world wide. It s abolished by Napoleon in 1811.

Under the influence of the church, the practice of surgery s relegated to barbers, bath house keepers, executioners, etc. rgeons were looked upon as menials.

In France between the thirteenth and seventeenth centuries, ree classes of people were practicing the medical arts. They re the pre-eminent physicians, the surgeons of the long robe, d the surgeons of the short robe or barber surgeons. The ysicians prescribed medicine and gave advice. The surgeons the long robe dressed wounds with poultices and plasters but

rformed no operations. The barber surgeons were looked upon by e others as merely servants. They were originally trained to eed and shave monks.

Shortly before the French Revolution the surgeons of the long be and the barber surgeons united in a common guild and early in e nineteenth century the distinction between the physicians and rgeons was broken down. Atthis time both were required to have degree of Doctor of Medicine.

During the late Middle Ages an occasional dissection was lowed by the ecclesiastical authorities on executed criminals. vever the head was often removed because of prejudice against posing the brain, which was thought by Christians to be the seat the soul. They didn't study the cadaver but merely pointed parts Galen had said were there.

A few outstanding names of the thirteenth century are those Buno da Longoburgo, Hugh of Lucca, and William of Salicate. no da Longoburgo is credited with a new definition of surgery outlining a code of ethics for all surgeons to follow. In GREAT SURGERY which was published in 1352 he insisted that the entials of surgery were 'to bring separated parts together, to arate those which have become abnormally united and to extripate t is superfluous'. He is said to have invented several new rations to cure abnormalities within the abdomen. He operated n the intestines and contributed several important methods in ing for wounded and gangrenous intestine.)

Following Buno was Hugh of Lucca. His contribution to the gery of his day was a sort of crude anesthesia. The drug man-gora served as a base for anesthesia in these days though opium also combined with it. Da Lucca's method was inhalation and was d for nearly a hundred years. It consised of a solution of iragora, opium, hycayamus, lettuce, and camphor which was

red upon a sponge until it was saturated. The mixture was dried when the occasion arose for using it, the sponge was moistened hot water and held to the patient's nose until he was asleep. ucca also observed cleanliness in the treatment of wounds. He ded the use of probes and other articleslikely to carry contamina- into the wound. He used compresses soaked in ~~urine~~ vinegar as an septic.

But, by far the greatest surgeon of the thirteenth century was iam of Salicate. He had considerable experience in military sur- . He described in detail wounds of various kinds, and devised ods of sewing wounds together. He advanced the treatment of ocations and fractures. He also opened the head to drain off d in cases of water on the brain.

Lanfranco was the most outstanding surgeon of the fourteenth ury. He was exiled from Italy and went to France to live. There tudied and gave accurate descriptions of fractures of the skull. as the first to describe concussion of the brain. Also, he tained that exposure to air favored the formation of pus in ds. He is particularly noted for his method of suturing nerves n had been severed.

Another brilliant surgeon of this time was Guy de Cheulias. nsisted on experience rather than theory as a method of learning ery. He advocated the early treatment of cancer and that erably with a knife.

John Yperman and John of Arden were among the later medevial eons of note. Yperman is supposed to have treated every kind of cal disease known while John of Arden described rabies and drew y accurate picture of this disease. He devised a treatment for natic tetanus.

In the latter part of the fourteenth and early part of the fif- n centuries we find the name of Leonardi de Vinci. He was not

a doctor but an artist and scientist at the time of the Italian Renaissance. He founded physiologic anatomy by making impromptu sketches of dissected subjects which are even modern in accuracy and display of physiologic function. He reveals an acquaintance with muscular anatomy possible only to the Greek sculptors. Over seven hundred and fifty sketches were made which included the delineations of muscles, drawings of the heart, lungs, the cervical, thoracic, abdominal and femoral blood vessels, the bones and nerves and also deep dissection of viscera and cross sections of the brain.

As thoroughly as the great artists of the Renaissance studied external anatomy, dissection for teaching purposes was still hampered by the theological idea of sanctity of the body. The anatomy of the schools was still the anatomy of Galen.

Ambrosio Pare is called the father of scientific surgery. He rose from the lowest rank of his profession, that of a provincial barber's apprentice to councilor of state and surgeon to four kings of France. Pare was born in 1510 of poor parents at Leval, France. In his early boyhood he was apprenticed to a "barber surgeon". He was taught how to bleed, do dressings, and treat fractures. When he had completed his apprenticeship, he went to Paris for further study. There he became associated with a prominent surgeon for whom he did dressings and assisted at operations. He availed himself of every opportunity to dissect the human body, and there soon followed an appointment as residentstudent at the Hotel Dieu. The facilities for study and dissection were more abundant at the Hotel Dieu. In 1536 he was made surgeon to the Colonel-General of the artillery. Several years later he returned to Paris and practiced medicine and surgery.

Pare, although he had not followed the prescribed course

f medical studies and passed an examination was admitted to the ollege of Surgeons in 1545. He invented many improved forms of urgical instruments and he was the first to use ligatures to con- rol bleeding. He operated for hare lip and devised a boot for he treatment of club foot. Pare merits eternal honor for all hese achievments and many more. He died December 20, 1590.

A contemporary of Pare was Andreas Versalius who made anatomy living science. Versalius was born in 1514 of German extraction. s a youth he studied medicine at the University of Paris, then returned to Belgium to teach. Atthe age of twenty-four he was ppointed professor of anatomy. For three years the youthful teacher rked at dissection, tracing out every muscle and nerve in the dy. He had beautiful plates made to illustrate his work. In 42 he published his book on anatomy. The younger medical men iled Versalius' work with enthusiasm; but the name of Galen was ill supreme in the schools. Versalius was looked upon as an start who had dared to challenge an authority whose word had en repeated for thirteen hundred years. His old teacher, lvius, called him a madman and the storm of disapproval was great that Versalius burned the invaluable notes which had le for other books. In 1544 he accepted the position of court ysician to the Emperor, Charles V, settled down and made no rther contribution to science of medicine. However his book s one of the great turning points in the history of surgery. laid the foundation upon which the study of anatomy has ever ce been built.

One of the four great pathfinders in the history of medicine William Harvey, the founder of the modern science of physiology. vey was born in 1578 in Folkstone, England and after a liminary education at school and at Cambridge University

went to Padua to study medicine. Harvey took his degree of Doctor of Medicine in 1602 and returned to London to practice medicine. In 1615 he was appointed a lecturer at the Royal College of Physicians.

The observation that blood is in motion may have occured to the first primitive man who cut open a live animal or saw a wounded artery. The idea that the motion was along a definite path may have occured to the Egyptians and Greeks, but Galen's false concept about the pores in the ventricular septum diverted all speculation in the wrong channels for fourteen centuries. Even Servetus, who came nearest the truth, would only admit that some, not all, of the blood took a circuit through the lungs. In the drawings of Versalius, he indicated arteries and veins. The truth about circulation was literally staring any observer in the face.

All the men of the sixteenth century knew was that the blood passed through the body to nourish the various organs, but no one knew that all the blood moved in a continuous stream from a central source and back to it. The scientists supposed that one kind of blood flowed from the liver to the right ventricle of the heart, from there to the lungs and then through the whole body, by way of the veins. Another kind of blood, they thought, flowed from the left ventricle of the heart to the lungs and then through the whole body by way of the arteries.

In 1628, Harvey published his great book. In it he shows that the valves of the blood vessels will only permit the blood to flow toward the heart through the veins and away from the heart through the arteries; thus proving that there must be a continuous flow of blood into the heart through the veins and out through the arteries.

Furthermore, Harvey calculated the actual amount of blood flowing and found that, in one hour, the heart discharges into the aorta blood equaling more than three times the weight of the whole body. He proved that the left heart receives oxygen bearing blood from the lungs and forces it out through the great artery to all the tissues of the body. From these tissues it passes back to the right heart through the great veins and is forced to the lungs to begin the round over again.

Harvey, however missed seeing how the blood passes from the arteries to the veins in the capillary system. In 1661 the great scientist Malpighi provided this knowledge, by the use of the microscope, when he saw the blood in the lungs of a frog pass from one vessel into the other.

The work of Harvey did much more than to solve the age-long mystery of the circulation of the blood. Versalius had taught men to observe the body; Harvey taught them to study its working. The whole modern science of physiology rests upon the basis which he laid.

Antony Leeuwonhoek was born in 1623 in Delft, Holland, the son of well-to-do parents, brewers. His father died early and his mother sent him to school to become a government official. He tired of school at sixteen and became an apprentice in a dry goods store and went back to Delft. There he set up a dry goods store of his own. For twenty years after this little is known of him except that he developed an idiotic love for grinding lenses. The greater part of his life was devoted to the study of natural history. He had two hundred and forty-seven microscopes with four hundred and nineteen lenses, all of which he had ground himself. He did a vast amount of work on animalculae and plant histrology. He made many discoveries of captial importance to medicine. Leeuwonhoek was the first to describe

the spermatozoa and also the first to give a complete account of the red blood corpuscles. He discovered the striped character of the voluntary muscles and the structure of the crystalline lens. Protozoa and microorganisms were first seen under the microscope by him. He gave for the first time accurate figurations of bacterial chains and clumps, as well as individual spirella and bacilli.

John Hunter (1728-1793) has won for himself a permanent place in the annals of surgery as the founder of surgical pathology, a pioneer in comparative physiology and experimental morphology. His scientific accomplishments as well as his own inspiring personality had much to do with the change of public attitude towards the medical profession. With him surgery ceased to be a trade. It became an honored profession.

It was about this time that America undertook the training of its own physicians and surgeons, instead of importing them from various countries of the world. The University of Philadelphia, later called the University of Pennsylvania, was the first to establish a separate medical department in 1765. Two years later, in New York, the medical department of Kings College was established.

In 1809 Ephriam MacDowell of Kentucky performed the first ovariotomy. As of olden times, a large crowd of the patient's friends and neighbors were waiting outside the home of the surgeon where the operation was being performed and were ready to take revenge on the Doctor if his efforts had proved fatal. The ovarian tumor removed by MacDowell at that time is said to have weighed over twenty-two pounds.

In the year 1857, James Marion Sims was the first to recommend

the use of silver wire as suture material for perennial repair and especially in the repair of vesico-vaginal fistula. In 1861 Dr. Gordon Buck described a method for treatment of fracture of the femur which is still known as "Buck's Extension". Dr. John S. Bobbs of Green Village, Pennsylvania performed the first operation for gallstones in 1867. This only a very short list to show the active and important part the surgeons of this country have played in the development of surgery.

Still another honor goes to an American doctor, Oliver Wendall Holmes, who in 1843 published an article on "The Contagiousness of Puerperal Fever", bringing the first victory of antisepsis to surgery through obstetrics. He asserted in his paper; "The disease known as puerperal fever is so far contagious as to be frequently carried from patient to patient by physician and nurses."

At the same time Oliver Wendall Holmes was carrying on his fight still another, many miles away, was waging a similar war. This was Ludwig Semmelweis, an Hungarian physician. He was the assistant professor in the obstetrical clinic of the University of Vienna. The stethoscope and microscope had just come into their own; physicians in their enthusiasm for these instruments had forgotten about cures, but not Semmelweis. From these groups of diagnosticians he rose demanding cures and preventions.

Semmelweis worked in the lying-in hospital in Vienna, which was divided into two sections. The first division was for medical students; Semmelweis was assistant of this. The second division was for the midwives. There was a marked difference between the first and second division, the first had a great many more deaths from puerpral fever than the second. Semmelweis wondered why the first division with its medical students

should have more deaths than the second division which had only midwives.

The solution came to Semmelweis in 1847 when he was listening to the account of the death of one of his colleagues. The colleague had been performing an autopsy when he accidentally received a prick on the finger, the finger became infected, septicemia developed and he died. As Semmelweis listened to the story he thought puerpral fever and septicemia--why they were the same thing! No wonder the mothers of the first division were dying of fever, the doctors and medical students themselves were the cause. They carried infection on their fingers directly from the autopsy room to the maternity department.

Semmelweis immediately had a new regulation. All students must wash their hands in chlorinated lime before entering the maternity department and between examinations on different patients. Following this the doctors had less fever deaths than the midwives.

The nineteenth century may be pointed out as the age of greatest strides in the advance of surgery, through the epoch making achievements of three great scientists. I refer to the contributions of Pasteur, Lister, and Long.

Lord Lister was studying the problem of infection and antisepsis during the last few years of Semmelweis' life. After Lister graduated from medical school he went to Glasglow as Professor of Surgery. Here he found as elsewhere, the so-called hospital diseases, erysiplas, pyemia, and gangrene. Amputation was considered a dangerous procedure for four o ut of every ten patients died. There were infections following all operations, and abdominal surgery was considered so dangerous as to be rarely attempted.

Lister was also very disturbed by the pestilential odors which he saw as a result of decomposition of tissue following operations.

About this time Louis Pasteur began the investigations by which he established the fact that micro-organisms were the cause of suppuration in wounds and of the great mortality following operations. Pasteur's work was brought to Lister's attention and he at once began experimenting, both in the laboratory and the hospital wards to determine the value of Pasteur's work. Lister had also been impressed by an account of the effects produced by carbolic acid on sewage in a small town of Carlisle. He next connected Pasteur's theory with the experiment at Carlisle and began treating his compound fractures by the application of carbolic acid. He carried this practice into his surgery and in 1867 he published a paper entitled "Antiseptic Principles in the Practice of Surgery". Crude as his work may have been as compared to present day methods, it was a beginning which led to the present development of aseptic surgery. Now infection of clean wounds is the exception rather than the rule.

The discovery of anesthesia came to fulfill a great need. Hypnotism and mesmerism had been tried and failed and every surgeon worthy of the title was groping about for some means of rendering operations painless.

Therefore, it is not surprising that many claimed the honor of being the first to discover ether's effectiveness for surgical operations. The controversy between the claimants became acute and was not decided until an investigating committee of Congress decided in favor of Crawford W. Long, who had used it in surgery in 1842. Subsequently his statue was placed in Statuary Hall in Washington, D.C., the first medical man to be thus honored.

Soon after Long had discovered ether, Sir James Y. Simpson discovered the anesthetic properties of chloroform (March, 1847). He, too, is honored with a monument erected in Edinburgh. All who made claims to the discovery of anesthesia happened upon them accidentally. The story of Long is, perhaps, the most amusing. It was customary at that time for young people to have what they called "ether frolics" where ether was inhaled for amusement. Dr. Long was injured while he was on one of these frolics and knew nothing of it until he awoke. He was a keen observer and it occured to him that this might be a valuable way to control pain during an operation. He tried it and found it successful, however he did not publish his findings and they did not become known until the controversy developed between two others who claimed to be the first to use it.

With the solution of the three main problems of surgery, hemostasis, anesthesia, and asepsis, surgery changed from a limited mechanical field into a great science and it continues to make great strides forward. The end of the nineteenth century and the beginning of the twentieth saw the rise of specialism. In the early years of this century it looked as if there would be no place in surgery for the general surgeon. Surgery threatened to divide into numerous branches, so that now we have proctologists, and urologists, surgeons for the brain, the eye, the ear, and the nose, as well as radiologists, cardiologists, gastrologists, and many others. This change has been allover the world but it has reached its height here in America where there is hardly an organ of special function to which a specialist is not attached.

Specialism is the direct result of the growth of the natural sciences and their application to medicine. The late nineteenth

century witnessed a tremendous outburst of scientific work; new discoveriescame one after another--electricity, xray, wireless and radium.

Medicine of today makes use of almost every branch of modern science. Physics, chemistry, biology, mechanics, electricy, radiology, optics and many others bring to medicine instruments of precision for diagnosis, examination, or treatment. For an example, take the illuminating mirror. From this we have the opthalmascope, the laryngascope, the cystoscope, and the gastroscope. It has thrown a revealing light on many hidden mysteries. Thus medicine has become so big a subject, the number of facts to remember so great, that man's mind cannot grasp them all at once. Therefore he has been forced to devote his attention to a more limited field. This is the main reason for the rise of specialism.

These changes are affecting the nature of surgery in that surgery today tends to be more preservative and less excisional. Dr. Gask comments on this tendency, "It seems almost a paradox that the chief aim of the surgeon should be to find ways of avoiding surgery; but that is as it should be, for the best surgeon is an operating physician."

Surgery is now in a transitory era. By this I mean a transition from surgery as a mechanical correction of disorders of the body to surgery aimed at restoration of the body to the physiological normal.

Another trend of modern surgery is the discovery and exploration of the world of the submicroscopic entities that may affect the health and activities of all living things. These entities are called filterable viruses. This field of research is as yet scarcely three decades old and much is still unknown. It is not clear that the term "virus" refers to living things, to non-living chemical compounds or to both. But as to the existence and some of the effects of these viruses little doubt is felt. It is known that certain virus

produce diseases having surgical aspects. The disease known as lympho-pathia venerea is caused by this. It is probable that it also causes a great majority of non-traumatic strictures of the rectum. Since 1910 investigation has been made into the fieldof tumors. Could they possibly be caused by filtrable viruses?

The surgeon must try to keep abreast of these new advances made in this line. He may find that new therapeutic agencies may be required to deal the whole categories of diseases that are now being dealt with by unsatisfactory methods. It may mean the learning of new techniques. It may add to the field of practical surgery many new diseases or it may remove some from it which have been looked upon before as purely surgical.

For many years now there has been a regular advance in surgery and each year has seen the element of risk grow less. With this change the old fear of hospitals has largely disappeared. There was a time when people shunned the hospitals and entered them only in cases of emergencies. That is all of the past. Modern surgery began with the introduction of anesthesia, followed by the acceptance of the finding of Pasteur and the teachings of Lister on antiseptic and aseptic surgery.

Today the surgeon works with precision and care, regarding every organ in its essential function and preserving intact every portion that is not diseased. With the modern asepsis it is possible to operate and restore so that lesions previously fatal are followed by complete recovery and health. The reasons for death following an operation are usually found in the delay and recognition and failure to appreciate the seriousness of the disease until there are too great inroads upon the body that the whole organism is put in jeopardy. This is, for instance, the reason that appendicitis is so often followed by serious illness and

eath. If this condition was not ill treated by delay or the improper
se of cathartics before consulting a physician, there would be only
minimum of risk. If a case is operated on promptly before the
ppendix has ruptured or badly infected the results are almost perfect,
lly about five out of a thousand dying after the operation; but if
upture has occured and infection set in as a result of delay or
rer treatment, death occurs in from five to twenty percent of the
ses. When ninety percent of the annual twenty thousand deaths
the United States can be avoided, we realize the responsibility
ich rests upon ill advising friends and incompetant observers.

The surgery in America is on a higher level than in any other
rt of the world; there are more well instructed surgeons and the
spitals are better equipped and better manned than anywhere else.
day hospital organizations can handle any type of medical or
rgical problem and handle it better than it was ever handled before.
dern surgery is on a plane which entirely removes it from the realm
uncertainty and makes it possible for seeming miracles to be per-
rmed. There has been constant advances in the use of new and
ficient anesthetics. Ether is no longer used exclusively; chloro-
rm has almost disappeared from practice. Laughing gas is used very
quently and also local infiltrations of novacaine or one of the
er cocaine substitutes. Quieting drugs are often given with local
iltrations of anesthetics. Anesthetic drugs are used in the spinal
al. These practices have reduced the risk and discomfort of
sthesia almost to the vanishing point. Therefore it is possible
make extensive operations without shock or distress.

Every year witnesses new development in ways and means of deter-
ging disease, its extent, and various methods of measuring the
lity of the patient to withstand operation. Surgeons have learned
to operate on gall bladder disease and have reduced the mortality
n six per cent to less than one per cent in these cases which before

were considered fatal. These results and many others have been possible because the profession has demanded a high grade of excellence on the part of the hospitals and surgeons. Their motto might well be "ONWARD AND UPWARD EVER".

Ora M. Jennings

SUPERVISION

Supervision is the leading by one who has had experience and can interpet these experiences for and beyond the present needs to one who is learning. It is understanding of the present necessities.

A person, in order to be a good supervisor, must possess or develop certain qualties. Among these qualties the most essential are:

1. Physical and nervous energy.

   "Energy seems to be imparted and to be drawn out of others by an effective show of energy".

2. Purpose and direction.

   By this I mean that she must possess clarity and decision of her aims and present them in such a way that they are attractive to others.

3. Genuine enthisiasm.

   Enthusiasm is contagious and therefore is essential to cooperation.

4. Freindliness and understanding.

5. Trustworthy

   A supervisor must gain and hold the confidence of her workers.

6. Intelligence and a mastery of her work.

7. She must be a teacher and have faith in herself and her workers.

8. She should possess a sense of humor and diplomacy.

It is not only the supervisor who must grow and develop but also the learner. It is true that the supervisor must understand the learning process that the student undergoes but the student should also be aware of this process in order to avoid a sense of antaganism to the supervisor.

The learning prosess is a reaction of an indivual to a situation. However it can not be called knowledge until it has become an internal, living, and working part of that individual. It must change that person.

The supervisor must ast as a guide and open pathways by letting the student come into contact at the correct time with a given situation which will change that indivdual. A supervisor can act in this capacity through her tact and understanding so that the student gets experience and a sound basis for her growing responsibility.