

## LECTURES AND ADDRESSES.

A HISTORICAL SKETCH OF SURGERY,  
ANCIENT, MÆDIEVAL, AND MODERN.\*BY B. A. WATSON, A. M., M. D.,  
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It is with us the midday of science. The grandeur of the present completely overshadows the past. Those mighty agents electricity and steam have become the servants of man and readily obey his mandates. The transatlantic cable annihilates space. The modern steamship brings us to our American homes from a city on the Emerald Isle within the short space of six days. The ponderous locomotive engine, breathing and pulsating like a thing of life, drawing a long train of cars freighted with human beings, traverses our broad continent from New York to San Francisco within about the same brief period of time. Are these the noblest achievements of science in our own age! The answer to this question must certainly be given in the negative, since we are fully prepared to show that surgery has kept pace with, if it has not actually led, every other department of science; but the historical treatment of our subject requires us to say adieu for the present to this land of mid-day brightness, in order to visit that of Egyptian darkness.

It was in this far-off Eastern country, in the northeastern part of the dark continent, that surgery and nearly every other art and science had their birth.

The brightness of this scientific day has passed away and we are now compelled to search for the evidences of her earliest grandeur in a dim light, which confines our researches to the pyramids, temples, tombs, and works of sculpture. But thanks to the Egyptologists who have deciphered the ancient hieroglyphics found on these works of art, and thus afforded us an indistinct and imperfect view of the old pagan civilization. In prehistoric times the practice of surgery at first was unquestionably patriarchal, but, as the inhabitants of the earth increased, the skill of certain individuals in this department became known; and thus they may have established the first monopolies.

Herodotus visited Egypt about the middle of the fifth century before Christ, and was informed by an Egyptian priest that Athothis, the first successor of Menes, founded the palace at Memphis, and, being a physician, was the author of books on surgery.

A medical papyrus in the museum at Berlin, composed under Ramses II (Dynasty XIX), confirms the latter statement. The era of Menes, according to Bunsen, was 3643 B. C.; according to Lepsius, 3893; according to Brugsch, 4455; and according to Mariette, 5004.

Priority in surgical authorship therefore comes down to us bearing an ancient and regal stamp.

The great school of anatomy, surgery, and medicine was founded at Alexandria 300 years before Christ. This famous school of medicine continued to supply the world with sur-

geons for many centuries. The most eminent among the earlier of the surgeons of this university were Herophilus and Erasistratus. They dissected the human body, and likewise made vivisections on criminals who were placed in their hands by Ptolemy I for this purpose.

Erasistratus was a bold surgeon, who opened the abdominal cavity for the purpose of performing surgical operations on the liver, and also for the extirpation of the spleen. The invention and application of the catheter in cases of retention of urine likewise belongs to him. Herophilus gained the king's favor and secured a position in the Alexandrian school by the reduction of a dislocated shoulder. Here he devoted himself earnestly to the study of anatomy, which to this day bears the impress of his name. Both Erasistratus and Herophilus are enumerated among the most distinguished teachers and authors of their day. The pupils of these eminent surgeons greatly enriched surgery by the introduction of the tourniquet and appliances for the reduction of dislocations of the femur. A pupil of theirs likewise employed an instrument for crushing stones within the bladder.

The ancient status of surgery in Egypt can not be fully shown by historical data, but that it attained a very high standard under pagan rule can not be doubted. Herodotus has informed us that the ophthalmic surgeons were celebrated and practiced at the Court of Cyrus. Ebers interprets a passage in the papyrus which he discovered as relating to the operation for cataract. Surgical instruments for the ear are figured, and artificial teeth have been found in mummies. The further examination of these bodies, which have been preserved from putrefaction for thousands of years in their Egyptian tombs, reveals the fact that bandaging in those ancient times was a fine art, and the well-set fractures certify to a high degree of skill in surgery. In the museum collections of Egyptian antiquities are found lancets, forceps, knives, probes, scissors, cupping-vessels, etc. The walls of temples and monuments are figured with patients undergoing surgical operations. It may be confidently asserted, on the basis of established facts, that Egyptian surgery under the old pagan civilization did not lag behind the other arts and sciences cultivated in that Oriental land. Therefore let us glance hastily at the progress which had already been made in architecture and sculpture. Architecture here attained in this early age a degree of perfection which has not yet been excelled, and in some respects not even equaled, in our own favored times.

In proof of the correctness of this assertion, let us carefully examine the ancient temples, obelisks, and pyramids. Sculpture was here molded with a high degree of accuracy more than two thousand years before the birth of Christ. The sciences of geometry, music, and astronomy are known to have reached a very high standard in the early history of Egypt. The most brilliant era of learning under pagan rule existed about one hundred years before the birth of Christ. The Alexandrian school had then reached the same of its glory, medicine had been divorced from the priestly rule, and likewise was freed from mysticisms and superstitions. The teachers had been selected because of their

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well-known scientific attainments, and represented not Egypt alone, but the scientific lore of the Orient. These professors were simply pensioned by the Government, and given free access to the largest library in the world; while, for the further stimulation to action of these scientific gladiators, they were required to engage in open debates and other literary trials. Is it therefore strange that this university should have produced a Euclid, whose name is still familiar in every school where mathematics is studied? The advent of Christ produced a struggle between paganism and His followers. The miraculous cures effected by the Son of God and His disciples were death-blows to scientific or rational surgery. The early Christians were a band of fanatical "Faith Curists." This new development produced its natural effect on the Alexandrian University, but still it continued its existence more than six hundred years after the birth of Christ. Consequently the life of this institution was about one thousand years. During this time there had been gathered into its library about seven hundred thousand volumes. In the year of our Lord 640 the city was captured by the Arabians, and the professors fled to various parts of the world to escape death at the hands of their enemies.

Many of the physicians and surgeons went into Italy, which became their future home. This school was the most brilliant gem in the pagan civilization. The surgeons who were trained within her walls while she was at the height of her glory became the peers of kings, and even those educated there after she had entered on her decline were always respected and honored where science could be appreciated. The destruction of this famous school of science was the prelude to the present Egyptian darkness. There is no mention made in the Old Testament of the performance of any surgical operation by the Jews before the children of Israel went into Egypt, where they sojourned four hundred and thirty years; and, consequently, it may be rationally inferred that they learned this art from the Egyptian surgeons. The first reference made to the performance of any operation on the dead or living human body after this Egyptian residence occurred seventeen hundred years before the birth of Christ, when "Joseph commanded his servants, the physicians, to embalm his father, and the physicians embalmed Israel." Circumcision was an operation which was practiced by the Israelites during their sojourn in Egypt. This operation was first performed on Abraham when he was ninety years of age, which was about 1897 before the advent of Christ.

The operation of circumcision was done with sharp Ethiopian stones. In addition to these surgical operations performed by the Israelites, there are also references made in the Scriptures to the following surgical dressings, appliances, and instruments: "An eye salve," "a lump of figs laid for a plaster upon the boil," "an awl for boring the ears," "a roller to bind," as applied to a broken limb, lancets, etc. There are no means known by which it can be determined whether the Jews had made much or little progress in the art and science of surgery after their departure from Egypt: but, after Christ came, the scientific study of medicine was entirely abandoned. The miracles of

our Lord, shown in the healing of the sick and the cure of bodily infirmities, led to the belief that the physicians in these difficult and disagreeable processes were all wrong, and that the true remedial mode was by prayer, fasting, and faith.

The earliest history of Greek surgery, like the Egyptian, has its origin in mythological legendry, and one of these legends may possess sufficient interest for my readers to justify me in repeating it here. This interest depends on the fact that representations of the serpent have been for ages and are still variously employed in connection with medical literature. Thus Hygeia, the daughter of *Æsculapius* and the goddess of health, is represented by an ancient statue in the British Museum as feeding a serpent. I saw, when at Pompeii in 1889, a similar statue standing before the ruins of an old drug-store.\* "The mythical origin of Greek medicine selects Melampus as the first who practiced the medical art in Greece, and he is believed to have acquired his skill by a divine revelation. Near his house stood an oak-tree, in whose trunk a serpent made its nest. The servants of Melampus killed the old serpent, but their master would not suffer the young ones to be molested, and he fed them daily with his own hands. One day he slept beneath the shade of the oak, and the young serpents, creeping about him, licked his ears. When he awoke he found to his astonishment that he could discern the uses of inanimate things—herbs, minerals, and all dumb animals. He began at once to apply this knowledge to the service of his fellow-creatures, and kings and princes became his patients."

The parentage of *Æsculapius*, the grandest of all the Grecian deities, is a subject on which all the ancient historians are in perfect accord. They have told us that Apollo was his father, and Coronis his mother. Furthermore, that *Æsculapius*, like most of the other young heroes of his time, was instructed by the Centaur Chiron in all the arts, especially those pertaining to the practice of surgery. Plato has informed us that the skill of *Æsculapius* was merely confined to the dressing and healing of wounds with herbs proper for arresting hæmorrhage and assuaging pain. "Plutarch asserts that such comprised the whole of ancient Grecian medicine."

The mythical story of *Æsculapius* possesses for every medical student a high degree of interest, since his name was for ages closely associated with the medical practice in Greece. He was revered by the Greeks as a physician, and at the same time worshiped as a god. The temples of *Æsculapius* were erected in every part of Greece, and no other deity in Grecian mythology shared with him his medical attributes. These temples served at the same time as hospitals for the sick and places for the worship of this deity.

Among the most magnificent of these temples were those at Epidaurus, Trikke, Cos, Rhodes, and Cnidoa. The temple at Epidaurus is supposed to have been erected twelve hundred years before Christ, and was surrounded by an extensive grove of trees, abounding in serpents. These serpents—emblems of health and life—were also kept in all the *Æsculapian* temples.

There were hung on the walls of these temples tablets

\* *A Chronology of Medicine*, edited by John Morgan Richards, p. 80.



on which were recorded the name and age of the patient, the disease and its symptoms, and the treatment by which the cure had been accomplished.

These records were the principal source from which medical knowledge was obtained when the Greeks commenced the study of medicine as a science. These temples were at first devoted entirely to the treatment of the sick and the worship of *Æsculapius*; afterward, in some instances, became the chief medical schools of Greece. The most ancient of these schools were situated at Cos, Cnidos, and Rhodes. The temples were always presided over by the *Æsculapiadæ*, a sect of priests, the reputed descendants of *Æsculapius*. The teaching of surgery was not long confined to the descendants of *Æsculapius*, since Pythagoras, in the sixth century before Christ, established at Crotona a school of medicine, in which Democedes, an eminent surgeon, was trained. It is also thought that some surgical training was given to students in the Grecian gymnasia. These priests, the *Æsculapiadæ*, in the selection of sites for the *Æsculapian* temples and the preparation of the sick for admission, showed a degree of knowledge worthy of an honest surgeon's highest admiration, while, by their constant exhibition of greed and their cunningly devised plans for the deception of their patients, they set an example which could be advantageously imitated by the most unscrupulous quacks of any age.

The temples commonly occupied some elevated and healthy locality, in close proximity to cities, surrounded by pleasant groves, and in the neighborhood of thermal springs or fountains of medicated waters. The sick, prior to their admission, were required to submit to a thorough purification by fasting, abluion, and inunction, while all other persons were rigorously excluded from these temples. Homer added other gems to the crown of the already deified *Æsculapius* by rendering immortal the names of his sons, *Maehaon* and *Podalirius*, whom he praised as the grandest of heroes and the wisest of surgeons. The two brothers were at the siege of Troy, which occurred twelve hundred years before the birth of Christ, and participated in this action in their dual capacity.

In Homeric poems their virtues are thus portrayed :

"Of two great surgeons, Podalirius stands  
This hour surrounded by the Trojan bands,  
And great Maehaon, wounded in his tent,  
Now wants the succor which so oft he lent."

The treatment of wounds at this early period (about 1200 B. C.) is thus described by Homer, who wrote in the ninth century before Christ :

"Patroclus cut the forky steel away,  
And in his hand a bitter root he pressed,  
The wound he washed and styptic juice infused.  
The closing flesh that instant ceased to glow,  
The wound to torture and the blood to flow."

*Iliad*, Book XI.

We learn from ancient history that skillful physicians were highly appreciated under pagan rule; when captured as prisoners of war they were sold into bondage for fabulous prices. In some cases they were admitted as residents

to the royal palaces of their captors and rewarded for special services by receiving in marriage the daughter of the ruling sovereign and a portion of his kingdom.

Homer, speaking for the wise and august Nestor, says :

"A wise physician, skilled our wounds to heal,  
Is more than armies to the public weal."

It must be admitted that nothing like a clear and comprehensive history of Grecian surgery can now be obtained until we come down to the Hippocratic period in the fifth century before Christ. Homer probably possessed some definite knowledge of the surgery of the Trojan period, but his writings, unfortunately, afford us but little of the desired light, and, in fact, they may be fitly compared to the vivid flashes of lightning in a dark night. Here follows a long period—about seven hundred years—of which nothing is known of the surgical progress of Greece. However, it is quite evident that surgical progress during this period was severely embarrassed by the want of an accurate anatomical knowledge. The laws of Greece strictly prohibited the dissection of the human body, and this condition must have been a great obstacle in the way of surgical advancement. Hippocrates (450–351 B. C.) was born on the island of Cos, a famous seat of learning at that time, and he availed himself of all its advantages. In later years, prior to commencing his life's work, he traveled over every part of Greece, spent much time in study at Athens and other seats of learning, and was everywhere assisted by the ablest masters in science and philosophy. In this manner his mind was well stored with knowledge by a long and faithful course of study, while the variety of these studies, aided by the advantages of travel and contact with the brightest minds of earth, had broadened his views and developed his reasoning faculties far beyond those ordinarily found in professional men of his or any other age. *Still, there was something wanting to enable genius to rise to an undying fame. He must know his own power.*

This knowledge was soon revealed to him. A pestilence had seized hold of Athens. He hastened to this city thus threatened with destruction, and succeeded in delivering her from the terrible scourge. The people were grateful for the deliverance, and promptly rewarded him for these valuable services. A golden crown was placed upon his head, and all the rights of citizenship were conferred upon him. These honors and marks of distinction were promptly followed by others from various sources, some of which he accepted and others he declined; but nothing was now wanting to enable him to fulfill man's highest mission, to win for himself undying fame, and at the same time become the world's greatest benefactor. His writings mark in Grecian history a new era—the brightest the world has ever known—and well may he be styled the "Father of Medicine." He died in the ninety-ninth year of his age, free from all disorders of the mind and body, and after death he was designated "*The Great*"—the same honor which was conferred on Hercules. He was the Homer of his profession. The works of Hippocrates were long preserved in the Alexandrian library, and have been handed down to us in such a form that every one who will may read them, and



they prove to us that he was a general practitioner and not a specialist.

"No less than eight of his seventeen treatises now admitted to be genuine works are strictly surgical, . . . and furnish us a very clear insight of the principles and practice of this science and art as it was understood twenty-three centuries ago. . . . When we reflect upon the character and importance of the numerous operations which were then performed, we certainly find more occasion for admiration than we do for adverse criticism. Thus we find that, in the ancient days of surgery, fractures and dislocations were carefully adjusted and reduced; extension and counter-extension were made by ingenious apparatus; the most exact coaptation of fractured bones was insisted upon, as it was considered disgraceful to allow the patient to be maimed with a crooked or a shortened limb. Splints, and even waxed bandages, giving as much fixity, support, and immobility to the parts as is now done by starch and plaster of Paris, were then in use. Hippocrates also gives directions for the suspension of fractured limbs in gutters and slings. The projecting ends of bones in compound fractures were carefully resected. The bones of the cranium were trepanned for fracture with depression of bone, or for the evacuation of accumulations of blood or pus. Abscesses of the liver, and even of the kidneys, were opened with boldness and freedom. The thoracic cavity was explored by rude percussion and auscultation for the detection of fluids, and, when found, paracentesis was performed, as was also done in abdominal dropsies. The rectum was explored by an appropriate speculum; fistula in ano and hæmorrhoids were operated upon; club-feet were adjusted by bandaging and the use of stiff leather and leaden shoes; the bladder was explored by sounds for the detection of calculi; lithotomy was performed by specialists; gangrenous and mangled limbs were amputated; the dead fœtus was extracted with instruments from the uterus; venesection, scarification, and cupping were also practiced in the days of Hippocrates."\*

Hippocrates failed to leave behind any distinguished sons or pupils whose names have been handed down in the history of surgery. Aristotle (384-322 B. C.), who lived at a somewhat later period than Hippocrates, added something to the existing knowledge of anatomy. Praxagoras, a distinguished surgeon of Cos—a contemporary of Aristotle—contributed to both anatomy and surgery. He was the first to establish a distinction between the arteries and veins, while in his surgical practice he was bolder than most of his predecessors, since he removed the uvula in inflammatory sore throat, opened the abdominal cavity in those affected with the iliac passion, and replaced the intestines in their normal position. Asclepiades was born at Prussa, in Bithynia, was educated at Alexandria under Cleophantus, and commenced life as a teacher of elocution. He taught in Athens and other parts of Greece, but, having failed in this attempt, he turned his attention to surgery, which he began to practice at Rome, where he flourished as a surgeon and the friend of Cicero about ninety years

before the birth of Christ. Here he gained, by the ostentatious display of a little wisdom and much tact, both popularity and wealth. He cultivated most assiduously the friendship of politicians and others having power. Asclepiades was the successor of Archagathus, a Peloponnesian, who settled at Rome as a practitioner of surgery about two hundred years before the birth of Christ, and is supposed to have been the first to practice medicine as a profession in that ancient city; but, having given offense to some of its ignorant and superstitious inhabitants, was nicknamed the "executioner," and finally banished.

Asclepiades shrewdly avoided the errors into which Archagathus had fallen, studied carefully the foibles and whims of the Romans, and thus enriched himself by appealing to their pride and vanity. He practically discarded the use of all internal medicines, under the pretext that they offended the stomach, and confined himself principally to hygienic measures and the regulation of the diet. The chief remedial agents employed by him consisted in the internal use of wine and a free application of friction to the skin. His comparative ignorance of medicine was in a measure compensated for by his superior knowledge of elocution, which he now turned to a good account by establishing a medical school, in which he became a teacher. He was the first to announce the doctrine of the self-limitation of disease, and declared that the principal cure for fevers was the disease itself. He wrote on ulcers, acute and chronic diseases, and likewise recommended tracheotomy in cases of impending suffocation. In perfect harmony with the many other acts of his life, we are told that he made a wager that he would never be sick, and, if we can believe his biographer, he won even this bet, since he died from the effects of a fall in old age.

The writings of the earliest historians make it apparent that Greece, like every other portion of the inhabited world, had her own charlatans many centuries before the birth of Christ. The Greeks had also in their pay military surgeons; but, according to Xenophon, they were only called after sanguinary battles to dress the wounded. The aleipti, or physicians, sold also secret remedies at the public baths, and were frequently consulted in cases of wounds, etc.

It is self-evident that attempts were made to practice surgery among all the nations of the earth at a very early day; in fact, such efforts were contemporaneous with man's wants. It is equally certain that the knowledge of this art did not make any decided progress among any of the nations until the other arts and sciences were cultivated. It may therefore be confidently asserted that those nations in which the light of general science was first diffused were the first to elevate the standard of surgery. In perfect harmony with this opinion is the fact that in Egypt and Greece the science and art of surgery, as shown by ancient history, soon attained a comparatively high standard, while Persia was dependent on these countries for her surgeons.

The story of King Darius and Democedes (fifth century before Christ) shows that the surgical representatives of these countries sometimes came in conflict with each other. "It happened that King Darius as he leaped from his

\* *International Encyclopedia of Surgery*, vol. vi, pp. 114 et seq.



horse sprained his foot. The sprain was of no common severity, for the ankle bones were forced out of their sockets.\* In fact, it was a dislocation. Now Darius had already at his court certain Egyptians, whom he reckoned the best skilled physicians in all the world; to their aid therefore he had recourse; but they twisted the foot so clumsily and used such violence that they only made the mischief greater. For seven days and seven nights the king lay without sleep, so grievous was the pain he suffered. On the eighth day of his indisposition, one who had heard, before leaving Sardia, of the skill of Democedes, the Crotonian, told Darius, who commanded that he should be brought with all speed into his presence.

When, therefore, they found him among the slaves of Crates, quite uncared for by any one, they brought him just as he was, clanking his fetters and clothed in rags, before the king. As soon as he was entered into the presence, Darius asked him if he knew medicine, to which he answered "No," for he feared if he made himself known he would lose all chance of again beholding Greece. Darius, however, perceiving that he dealt deceitfully with him and really understood the art, bade those who had brought him into his presence go fetch the scourges and the pricking irons (or blinding irons to put out his eyes). Upon this Democedes made confession, but at the same time said he had no thorough knowledge of medicine; he had but lived some time with a physician, and in this way had gained a slight smattering of the art. However, Darius put himself under his care, and Democedes, by using the remedies customary among the Greeks, and exchanging the violent treatment of the Egyptians for milder means, first enabled him to get some sleep, and then in a very little time restored him altogether, after he had quite lost the hope of ever having the use of his foot. Democedes, subsequently, while still residing at the Persian court, added another triumph to that already gained by the successful treatment of a tumor of the breast, under which Atossa, the daughter of Cyrus and wife of Darius, had labored for a considerable period.

There were no medical schools established in Persia prior to the birth of Christ; but the Nestorians, a sect of Christians fleeing the persecutions of orthodoxy, some time in the fifteenth century of the Christian era settled at Edessa, in Mesopotamia, and founded a medical college. This school gained some celebrity. Another body of Nestorians settled in the city of Dschondisabour and established another medical college. It was in this school that the Persians and Arabians studied the healing art during a portion of the Dark Ages. The Hindoo mythology assigns to Brahma the powers of deity and likewise those of a physician, but has most generously attributed to six other minor divinities the power of healing the sick.

It is unquestionably true that surgery in the early part of the Christian era had already attained to a high standard in India, the real question being whether the Greeks got their knowledge of surgery from the Hindoos, through the Egyptian priesthood, or the Hindoos obtained it from con-

tact with the western civilization after the campaigns of Alexander.

It seems to me highly probable that this knowledge came to the Hindoos from contact with the western civilization. The oldest existing book relating in any way to surgery is the *Charaka Samhita*, a bulky encyclopædia, probably composed some centuries after Christ. Another work of at least equal authority, but probably somewhat more modern, is the *Susrata*. The *Susrata* speaks of a single class of practitioners who treated both medical and surgical cases.

The only distinction recognized between medicine and surgery was the inferior order of barbers, nail-trimmers, ear-borers, tooth-drawers, and phlebotomists, who were outside of the Brahmanical caste. The same author describes more than one hundred surgical instruments made of steel, which include the most important of those now in common use by surgeons. The Chinese seem to have been far behind the Hindoos. Their knowledge of surgery is still of a very primitive character. Their distinctive surgical invention is acupuncture, or the insertion of fine needles into the seats of pain or inflammation. The present ignorance of the Chinese, as well as the ancient, in surgical matters is probably due to their prejudices and superstitions. They are opposed to drawing blood or dissecting the human body, although they are credited with opening boils. The moxa is a great favorite with them, but is employed more frequently as a prophylactic than as a curative agent. The Chinese policy was for ages opposed to any association with the civilized nations of earth; and consequently they debarred themselves from learning much of that which would have otherwise come to them through contact. They are, or have been until very recently, entirely without medical schools.

History fails to show that there has been in any age any attempt to teach medicine. The Japanese did nothing for the advancement of surgery during ancient times; in fact, all that has been said of the Chinese is equally applicable to them. Rome was settled about seven hundred and fifty years before the birth of Christ, and remained about six hundred years without either physicians or surgeons, trusting entirely during this long period, for the cure of diseases and wounds, to spells and incantations. Public edicts were issued against the professional practice of medicine and surgery during this period, while the public were encouraged to put their faith in traditional prescriptions and religious rites.

Cato, the first Censor, gravely wrote down the mystic words of incantation for curing dislocations and fractures of bones. Rome produced a surgical author, who lived during the Augustan period (30 B. C.—14 A. D.), whose writings have been handed down to us, and constitute the most perfect record in our possession of ancient surgery. The era in which he lived was the grandest period of the Roman Empire and gives us in literature the immortal names of Virgil, Horace, Ovid, and Celsus. The writings of Aurelius Cornelius Celsus likewise serve as a connecting link between the Hippocratic period and the early part of the Christian era, showing the marked progress which had been

\* *History of the Heroes of Medicine*, by Russel, pp. 2 et seq.



made during the preceding four hundred years. In these writings we behold the mighty influence wielded by the Alexandrian school on the science and art of surgery. In fact, the author shows perfect familiarity with both Greek and Egyptian surgery. Celsus has carefully described the operation for cataract, plastic operations on the ears, lips, nose, etc. Likewise the removal of nasal polypi and the plugging of the nostrils for the control of hæmorrhage. In addition to these operations, he described the method employed for the extirpation of bronchocele, the differential diagnosis of umbilical tumors and omental and intestinal hernia, and the treatment of the latter with pads and bandages. He also mentions the suturing of the intestines, treatment of hydrocele, varicocele, phimosis, stone in the bladder—operative method employed, etc.

These writings by Celsus show a marked advance in the performance of amputations of the extremities since the Hippocratic age. Hippocrates informs us that these amputations were only made through the dead parts lest the patient should die from loss of blood. Celsus gives directions for the performance of these operations through the living tissues, and describes ligation of the arteries as the most potent means known for the control of arterial hæmorrhage.

It should be here understood that I have enumerated only a limited number of the surgical operations which Celsus has described so lucidly, and the modern surgeon may be confidently assured that these surgical writings are still worthy of a careful perusal.

Soranus, surnamed the younger, a native of Ephesus, a distinguished pupil of the Alexandrian school, located at Rome, under the reign of Trajan and Hadrian (98-138 A. D.). The works of this distinguished author have perished with the exception of some fragments which have been handed down to us. In his treatise *De utero et pudendo muliebri* he gives a lucid description of the differential diagnosis of pregnancy, ascites, and solid tumors by the aid of percussion, palpation, and succussion; and likewise mentions the use of the vaginal speculum and the uterine sound. He also wrote a treatise on fractures, a portion of which is still extant.

Antyllus, a distinguished Italian surgeon and author, flourished in the latter part of the first or in the early part of the second century. The greater portion of his works have perished, but fragments have been preserved in the quotations of subsequent writers. He was the first to recommend bronchotomy in cynanche, arteriotomy instead of venesection, etc.

Galen, whose writings were regarded as the highest authority for more than thirteen hundred years on medical topics, was a physician rather than a surgeon. He was born at Pergamus, in Asia Minor, about one hundred and thirty years after the birth of Christ, settled in Rome, where he won the highest fame, in the year one hundred and sixty-four, but remained there about five years, when he returned to the land of his birth, where he died about 200 A. D.

The most worthy surgeons who graced the decline of the Roman Empire were Oribasius (350 A. D.), Aetius (400 A. D.), and Paulus Ægineta (420 A. D.). These were all compilers rather than original authors.

The surgery of Oribasius is characterized by timidity and shows no progress since the Hippocratic period. We have reached a period when amulets, charms, and incantations were employed in the place of rational means for the relief of surgical cases. Thus Aetius, in composing a certain ointment, required that there should be repeated in a loud voice, "May the God of Abraham, the God of Isaac, and the God of Jacob deign to accord virtues to this medicine"; and, when a foreign body had lodged in the gullet, recommended that the neck of the patient should be touched by the surgeon, who at the same time exclaims: "Get thee out or descend, the martyr Blaise, Servant of Jesus Christ, commands thee."

The writings of Aetius, like those of Oribasius, contained only extracts from the older surgical authors; and these were interwoven with the grossest bigotry and superstition—products offered by Aetius in the place of scientific knowledge and rational conclusions.

There is much difference of opinion among the old historians in regard to the age in which Paulus Ægineta lived and wrote; and at this day it is probably impossible to fix it with any degree of certainty. Some authorities believe it was as late as the seventh century of the Christian era, while others think it was as early as the fifth.

His writings are similar in most respects to those of Oribasius and Aetius, but possess some original and valuable information. He was educated at Alexandria, and is supposed to have been a professor in that city. His work presents an able and orderly summary of Greek medicine from Hippocrates downward. This author, in his published work, draws from many sources, and much from his own personal experience.

We have now traced the history of surgery from its mythological origin in Egypt, and from the cloud-capped Olympus, the habitation of the gods in Greece; we have watched it loitering in primitive purity about the temples of Æsculapius, till it found its onward way to Rome, where, polluted by the filth of that vicious metropolis, we have seen it converted into a diabolical system of charlatanism—reason and experience banished, ignorance and superstition re-established—where charms, amulets, and sacrilegious incantations take the place of scientific knowledge; in this degraded state it falls into the hands of the so-called Christian priest physicians, after it had been rescued from the pagan priesthood by the efforts of Hippocrates and the Alexandrian school of medicine.

The dark age of surgery is thus ushered in, but the darkness steadily increases during the next eight or nine hundred years. During this period there were no distinguished surgeons, and nearly all which had been previously learned of this science and art was forgotten. It was principally in the school of Salerno that even a flickering light was maintained. The University of Salerno was founded in 1150, and was long one of the greatest seats of learning in Italy. It appears from history, however, that Salerno, even prior to this date, was entitled to some consideration as a city of medical learning, since at the end of the seventh century it was the seat of a Benedictine monastery, and that



some of the prelates and higher clergy were distinguished for their medical acquirements. But it has been, by recent researches, clearly established that the celebrated "*Schola salernitana*" was purely a secular institution. It is therefore certain that the school of medicine gradually grew up, since, at the end of the ninth century, Salernian physicians were already spoken of and the city was known as "*Civitas Hippocratica*."

At a later period we find great and royal personages resorting to Salerno for the restoration of their health, among whom was William of Normandy, afterward the Conqueror. The Jewish element appears to have been important among the students, and possibly among the professors. The reputation of the school was great until the twelfth or thirteenth century, when the introduction of Arab medicine was gradually fatal to it.

The foundation of the University of Naples and the rise of Montpellier also contributed to its decline. About the middle of the eleventh century the Arabian medical writers began to be known by Latin translations in the western world.

Constantinus Africanus, a monk, was the author of the earliest of such versions (1060 A. D.). His labors were directed chiefly to the less important and bulky Arabian authors, of whom Haly was the most noted. During this period the translation of the works of the old masters in medicine was pushed forward, compendiums from the same source were prepared, but none of the books contained any original matter, nor were the selections always well chosen. In surgery this period was much more productive than in medicine, especially in Italy and France; but the limits of our subject only permit us to mention Gulielmus de Saliceto, of Piacenza (about 1275), Lanfranc, of Milan (died about 1306), Guy de Chauliac (about 1360), and the Englishman, John Arden (about 1350).

The above-named authors contributed somewhat to the advancement of surgery, or at least helped to stay the tide which was so surely bearing it away. They possessed sufficient independence to oppose the charlatanism of the greedy "Faith Curists" in the Roman priesthood, and taught the importance of clinical observations and rationalism in the practice of surgery. The science and art of surgery had at this time reached its lowest degradation. The priests had entirely abandoned the precepts of the old masters in surgery, and professed to cure all sorts of injuries by use of the so-called sacred relics, charms, amulets, etc. The most absurd reports were made of miraculous cures, attested by monks, abbots, bishops, popes, and consecrated saints. They alleged that they had restored the blind, the epileptic, the insane, etc. "The Saints of the Romanists have usurped the place of the Zodiacal constellations in the government of the parts of man's body; for every limb they have a Saint. Thus St. Otilia keeps the head instead of Aries; St. Blasius is appointed to govern the neck instead of Taurus"; and so old Melton goes on to the end of the list. Pettigrew gives the names of nearly fifty Roman Catholic saints who were believed to have special control over certain individual diseases, both medical and surgical. The priesthood also assigned saints to wells and springs to give heal-

ing virtues to these waters, and instituted health-seeking pilgrimages to these places.\*

This evil had become so firmly rooted that it required the best efforts of the Popes and Holy Councils for nearly one hundred years to remove surgery from the vile hands into which it had fallen. The first mandate against this practice was issued by the Lateran Council, under Pope Calistus II, A. D. 1123, while, "in 1215, Innocent III fulminated an anathema specially directed against surgery, by ordaining that, as the Church abhorred all cruel or sanguinary practices, no priest should be permitted to follow surgery, or to perform any operations in which either instruments of steel or fire were employed, and that they should refuse their benediction to all those who professed and pursued it." †

It is unquestionably true that the priest surgeons, on account of the opposition in the Roman Church, were at first influenced to employ barbers to perform surgical operations under their directions, although the practice had its origin in the early part of the tenth century, while the final edict which compelled this course was not promulgated until the first part of the thirteenth. The barber surgeons, having learned something of the art of surgery from the priests, finally usurped the entire practice.

Well may the surgeon of the present day thank God that his lot has been cast with intelligent *confrères* rather than with the barber surgeons, of whom Thomas Gale, an English military surgeon, said in 1544: "I remember when I was at the wars of Muttrel, in the time of that famous prince King Henry VIII, there was a great rabblement there that took upon them to be surgeons. Some were sow-gelders and horse-gelders, with tinkers and cobblers. This noble set did such great cures that they got themselves a perpetual name, for, like as Thessalus's sect were called Thessalians, so was this rabblement for these notorious cases called dog leeches; for in two dressings they did commonly make these cures whole and sound for ever after." ‡

History informs us in the following language that King Henry VIII and his Parliament, in the third year of his reign, *restrained the practice of both* (medicine and surgery) by the following act: "To the King our Sovereign Lord, and to all the Lords spiritual and temporal, and Commons in this present Parliament assembled: For-as-much as the science and cunning of physick and surgery (to the perfect knowledge whereof be requisite both great learning and ripe experience) is daily, within this realm, exercised by a great multitude of ignorant persons, of whom the greater part have no manner of insight in the same, nor in any other kind of learning; Some also can no letters on the book so far forth that common artificers, as smiths, weavers, and women, boldly and accustomedly take upon themselves great cures, and thing of great difficulty, in the which they partly use sorcery and witchcraft, partly apply such medicines unto the disease, as be very noxious, and nothing meet therefore, to the high displeasure of God, great infamy of

\* *International Encyclopedia of Surgery*, vol. vi, p. 1181.

† *Ibid.*

‡ *Ibid.*, p. 1189.



the faculty, and the grievous hurt, damage and destruction of many of the king's liege people, most especially *them that can not discern the uncunning from the cunning: Be it therefore to the surety and comfort of all manner of people,* by the authority of this present parliament enacted, that no person within the city of London, nor within seven miles of the same, take upon him to exercise or occupy as a physician or surgeon, except he be first examined, approved and admitted by the bishop of London, or by the dean of St. Paul's for the time being, calling to him or them four doctors of physick, and for surgery, other expert persons in that faculty; and for the first examination such as they shall think convenient, and afterwards always four of them that have been so approved, upon the pain of forfeiture, for every month that they do occupy as physicians or surgeons not admitted or examined after the tenour of this act, of five pound, etc."\*

These extracts present a faithful picture of the degraded condition of surgery in the hands of the barber surgeons, to whom it was principally confided until about the middle of the seventeenth century, while the use of the sympathetic powder of Sir Kenelm Digby affords us a glimpse of the irrational methods employed in the treatment of wounds. "Whenever any wound had been inflicted, this powder was applied to the weapon that had inflicted it, which was, moreover, covered with ointment and dressed two or three times a day." Fortunately for the science of surgery and humanity, during the whole period in which the practice of surgery was monopolized by the barber surgeons there were a few scientific and bold spirits, who kept alive the flickering sparks of an almost forgotten science. Among this number must be mentioned Mondini de Luzzi, a professor of anatomy at Bologna, who dissected the human subject before his class in 1315—a feat which had not been previously performed during the Christian era. He likewise composed a work on anatomy, which continued to be used in all the medical schools of Europe for about two centuries.

This bold and successful example was imitated by other teachers. The dissection of the human body once more placed surgery on a firm basis, and it has continued to progress both as a science and an art to the present time. It was not, however, until the first half of the sixteenth century that there appeared one greater than himself, and whose labors far excelled those of this noble pioneer.

Andreas Vesalius was born in 1514 and died in 1564. He became, when twenty-two years of age, a professor of anatomy in the renowned University at Padua, where he lectured to large classes of students. He published in 1543 by far the most splendid work on anatomy the world had ever seen. Thus it was that he surprised the world and immortalized his name. There was born at Laval, in the province of Mayenne, France, about 1509, the most famous surgeon of his age, Ambroise Paré, who did more for the advancement of surgery than any other that lived during the sixteenth century. He inherited from his parents poverty, a strong constitution, lofty ambition, and a strong will-

power. This inheritance secured for him in after life a royal recognition among men of science and the rulers of his country.

In boyhood he was apprenticed to a barber surgeon, from whom he learned the rudiments of minor surgery. Having come in contact with Germain Colot, a distinguished lithotomist, whom he greatly admired for his skill and dexterity, the young barber surgeon determined to go to Paris in order to further perfect himself in surgery. He served three years at the Hôtel Dieu as a house surgeon, and was appointed a military surgeon at the age of twenty-seven, in which capacity he rapidly rose to the highest rank in the French army. It was in this service that he so greatly distinguished himself as a close observer and rational practitioner. He rendered special service to the profession by the re-introduction and popularization of the ligature, by discarding the senseless and barbarous treatment of wounds with boiling-hot oil, by improving the hygienic surroundings of the wounded—which action was, at this early day, based on the discovery that the atmosphere of hospitals, camps, etc., contained some septic agent which exerted a deleterious effect on open wounds.

He likewise rendered great and permanent service to surgery as an author, and these books still remain and speak to the profession, although the hand which penned them has long since returned to dust. This distinguished surgeon died in 1590, full of years and crowned with honors. The grandeur of his labors has immortalized his name. Humanity owes him a debt which it can never repay, and may the rising generation of surgeons imitate his noble example, and thus erect a monument to their names which can never be destroyed by vandalism.

It may be observed, in rapidly passing over the history of the sixteenth century, that certain events which had occurred during the fifteenth century served to awaken thought and pave the way for the rapid progress made in the arts and sciences during Paré's time. Thus the discovery of printing became the hand-maiden for the diffusion of knowledge. The dissection of the human subject supplied the requisite anatomical knowledge for the intelligent performance of surgical operations. The establishment of medical schools in various parts of Italy—particularly those of Padua and Bologna—afforded an opportunity for students to congregate together for the purpose of receiving instruction and stimulated the professors to greater activity in their teachings.

Thus we find that Montagnana, a professor at Padua, in 1460, who cultivated anatomy, boasted of having opened fourteen subjects, a thing quite remarkable for his time, while Leonard Bertapaglia, a professor of surgery at Padua, published a commentary on the fourth book of Avicenna, which is characterized for its classical lore, but not otherwise above the barber surgery of the times, since his surgical theories are filled with absurdities. Another professor at Padua, Alexander Beneditti, is said to have contributed greatly to the improvement of anatomy and surgery in Italy toward the end of the fifteenth century.

It was likewise during this century that the operation was devised for the replacing of the nose when lost by ac-

\* *The Unity of Medicine.* By F. Davis, London. Pp. 48 et seq.



cident or disease. This operation was first performed by three Italians—Vincent Vianoe, Branca, and Bojani. It was afterward improved by Tagliacozzi. The treatment of gunshot wounds in the sixteenth century was greatly improved by Maggi Leone, a professor at Pavia; Botal, a celebrated anatomist; Felix Wurz, a German surgeon; Guillemeau, a pupil of Paré; and others. Besides the anatomists and surgeons already mentioned, among the distinguished in the profession in this century there should be added the following names: Fabricius Hildanus; Berenger de Carpi, who dissected more than one hundred subjects; James Dubois, who Latinized his name Sylvius, and was the master of the great Vesalius and the true founder of anatomy in France, and also the first who injected the blood-vessels. Likewise Eustachius, who discovered the Eustachian tube; Gabriel Falloppius, who first described the Falloppian tube; Fabricius ab Acquapendente, who first described the valves of the veins; and, lastly, Michael Servetus, who comprehended the circulation of the blood through the lungs; but it was reserved for Harvey at a later date to discover the general circulation.

The seventeenth century was not marked by any grand advance in surgery; but several discoveries were made which have since contributed to the material progress of this art and science. Thus the discovery of the general circulation of the blood by William Harvey in 1619 has brought forth valuable results. Malpighi, of Bologna, soon afterward supplemented Harvey's discovery by microscopically demonstrating the course of the blood-corpuscles in the minute blood-vessels, and the communication between the veins and arteries. History informs us that "burning spheres," as they are termed by Aristophanes, were sold in the shops of Athens in his day—about 400 B. C.

There is no evidence that lenses were employed at this early date for magnifying, at least otherwise than as reading-glasses. It is not until the seventeenth century that we find powerful magnifiers of glass actually employed for scientific investigation. The names of Malpighi, Lieberkühn, Hooke, Leeuwenhoek, Swammerdam, Lyonnnet, and Ellis are closely connected with the history of the simple microscope.

The use of this instrument has proved to be a most powerful adjuvant for the advancement of surgery, since it enables us to study the minute tissues of the body, and thus understand the nature and difference between histological and pathological elements. During this century there was considerable progress made in the study of anatomy, and among the names which were made illustrious by these researches in the anatomical field may be mentioned that of Schneider, a German anatomist and writer, whose name is associated with the mucous lining of the nose; Francis Glisson, memorable for his researches on the anatomy of the liver; Peyer, who studied carefully the glands of the intestines; Meibomius, who studied the anatomy of the eyelids; Thomas Willis, who studied the anatomy of the brain; while Stenson and Wharton studied the anatomy of the glandular system.

Surgery made little progress during this century, owing principally to the fact that it had not yet been taken from

the hands of the barber surgeons and elevated to the standard which it now holds among the professions. England, however, produced during this period some surgeons whose names are worthy of mention, although they are scarcely entitled to be considered illustrious. Among these were Richard Wiseman, author of a book on surgery, and James Young, an English surgeon of Plymouth, a contemporary of Wiseman, who published a treatise on several surgical subjects at London in the year 1679.

The eighteenth century was not characterized by any remarkable progress in surgery, although the tendency was in the right direction. There was, in fact, some marked improvement made in the treatment of gunshot wounds. (The discovery of gunpowder and the use of firearms in war marked a new period in military surgery; but the date of this innovation has never been satisfactorily settled. It is, however, fully established that it was employed in the early part of the Christian era. The soldiers were horrified at the enormous increase in the mortality attending a battle, while the surgeons were unable, in their ignorance of scientific wound treatment, to render any important service. Under these circumstances the wounds were soon declared to be poisoned with the gunpowder and ball, and the surgeons and soldiers united in thinking that this mighty agent was the power of hell and had been invented by the devil.) The old and cruel treatment which had been introduced by John de Vigo and others, based on the supposition that every gunshot wound contained a poisonous substance, even in its primary condition, and therefore must be treated by pouring boiling hot oil into it, was entirely abandoned.

The cumbrous dressings which had been previously in vogue were entirely superseded and more rational means were employed in the treatment of wounds. The numerous European wars of this century gave an abundant opportunity for the study of gunshot wounds. "The degrading association of the barbers and surgeons was abolished in 1743 at Paris by an edict breaking the legal fetters which had for so many years bound together the surgeons of St. Cosme and the barbers, and the example was speedily followed in 1745 by a similar act of the English Parliament. Freed from this galling servitude, surgery became a separate and distinct branch, to be ever afterward studied and cultivated by educated members of the profession." Prior to this date surgery had not been taught in the medical schools during the Christian era; but in this century surgical professors were appointed in Holland and Germany. The study of anatomy, which had made very rapid progress during the two preceding centuries, still continued to engage the attention of anatomists in every part of Europe. Duverney, during the latter part of the seventeenth century, had established the identity of the chyloferous and lymphatic vessels, Pacchioni had discovered the lymphatic glands of the dura mater, and Cowper the two glands which have since borne his name.

It was during this century that anatomists studied carefully the anatomy of the brain, nerves, eye, and ear. Pacchioni and Baglivi gave their attention to the brain, but the result was entirely negative. Tarin Le Cat and Meckel



studied the cranial nerves with satisfactory results.\* "It had already been established in the seventeenth century that the seat of cataract was the crystalline lens, and Morgagni now described the humor in the midst of which it was nourished. Experiments were also made by Petit in regard to the nerves of the eye, the effect of age in producing changes in the organ, etc.; and Albinus and Haller each professed to have discovered the pupillary membrane. The two anatomists, however, who accomplished most at this time in perfecting the study of the anatomy of the eye were Porterfield, of Edinburgh, and Zinn, of Göttingen, each of whom ascribed important functions to the ciliary process. The structure of the membrana tympani and the distribution of the auditory nerve had been accurately studied a few years before the commencement of the eighteenth century; but Valsalva now described much more precisely the minute portions of the ear, and of the labyrinth especially, the use of the fluid of which was afterward discovered by Cotunnus and Meckel." †

Important results were obtained during this century, by the study of the lymphatics, by Cruikshank, Hewsen, Paul Mascagni, and William and John Hunter. The study of pathological anatomy now commenced in all the European countries, with which the name of John Baptiste Morgagni is still intimately connected, having been perpetuated by the work which he prepared on this subject. The surgeons of the eighteenth century whose names have been handed down to us were the following: John Hunter, Jean Louis Petit, Laurence Heister, Percival Pott, Pierre Joseph Desault, William Cheselden, Sir James Earle, Henry Francis Le Dran, and Chopart. The first named in this distinguished galaxy of illustrious men was unquestionably the most distinguished anatomist and surgical pathologist of his era. He was born of Scotch parents in 1728, and died in 1793. Poverty, ignorance, energy, an indomitable will-power, and a robust constitution were his inheritance. His father had died when young Hunter was only two years old, and his mother, although a strong-minded woman, had failed to exercise much influence over him. He went to London when about twenty years of age, where his elder brother, William, had been living some time. At that time Dr. William was doing a large and lucrative practice and rapidly gaining in reputation. The meeting between the brothers was cordial, and John was given the position of assistant in William's anatomical rooms, which were then in their infancy, but rapidly growing in favor on account of the educational advantages which they offered to students. The high position which Dr. William Hunter had already attained in the great metropolis stimulated his brother John to put forth all his latent or undeveloped energies, in order that he too might at some future time become a power among men. Ignorant and poor as he was at that time, the indomitable will-power, supported by energy and a robust constitution, absolutely settled the question in favor of success, since with such persons "to will" is to do. He pressed forward, soon acquired a thorough knowledge of

anatomy, and acted as his brother's prosector for his anatomical lectures. He spent the summer of 1749 at the Chelsea Hospital, under the instruction of the celebrated Cheselden, who was then nearing his grave; and in 1751 he became a pupil at St. Bartholomew's, where he received instruction from the renowned Percival Pott, another luminary of British surgery.

It was at this time the desire of his brother William that John should become a physician rather than a surgeon. With this objective view, John was persuaded by William and other friends to enter as a student St. Mary's Hall, Oxford, in 1753. He remained there but a short time, having now fully determined that he would spend no more time in the study of Latin and Greek.\* He looked upon such studies as a waste of time; and, in referring to the subject some years afterward, he thus feelingly expressed himself: "They wanted," he said, "to make an old woman of me, or that I should stuff Latin and Greek at the university; but," added he, significantly pressing his thumb-nail on the table, "these schemes I cracked like so many vermin as they came before me." One can not but regret that Hunter did not carry out the wishes of his friends. A little "stuffing" of Latin and Greek would have been of vast benefit to him in preventing those errors of style and literary composition which so greatly disfigure and obscure his writings.

Hunter once more returned to his surgical studies, and we find him at St. George's Hospital in 1754, where two years later he was appointed a house surgeon. He, however, occupied this position only for a brief period, when, having received an appointment as staff surgeon, he went with the army to Belleisle, an island off the western coast of France, while the following year he participated with the English army in the Peninsular war. He returned in 1763 to London and resumed the practice of surgery, having profited greatly by his extensive military experience.

He added steadily from this date new laurels to those which he already possessed, gained in reputation and power, and soon after became recognized as the greatest surgeon of his age. His surgical writings show him to have been possessed of considerable originality and most excellent powers of observation. He wrote a *Treatise on Venereal Disease*, and likewise a *Treatise on the Blood, Inflammation, and Gunshot Wounds*. The former work contains such a clear and accurate description of the primary lesion of syphilis that it has since continued to be known as the true or Hunterian chancre.

The most distinguished surgeon of France in the eighteenth century was Jean Louis Petit, the inventor of the screw tourniquet, still in common use. He wrote the first *Treatise on Diseases of the Bones*, which was soon translated into several languages. Another French surgeon, Pierre Joseph Desault, who lived during the latter part of this century, did much for surgery. He invented many surgical instruments and appliances, some of which are still used and continue to bear his name. It is likewise claimed that

\* *History of Medicine*, by Dunglison, p. 262.

† *Ibid.*, p. 262.

\* *John Hunter and his Pupils*. By S. D. Gross, M. D., LL. D., D. C. L. Oxon., LL. D. Cantab., pp. 14 et seq. Philadelphia: Presley Blakiston, 1881.



he was the first to give a systematic course of lectures on surgical anatomy, and clinical lectures on general surgery.

A *General System of Surgery*, written by Laurence Heister, who was born at Frankfort-on-the-Main in 1683 and died in 1758, has rendered his name illustrious and kept it from perishing to the present time. He gained the reputation of being an accomplished army surgeon during the war between the French and the Dutch in Flanders, which lasted from 1707 to 1709. This work on general surgery was handsomely illustrated and published in several languages.

The distinguished English surgeon and author, Percival Pott, who was born in 1713 and died in 1788, gave us some of the most valuable contributions ever made to surgical pathology and practice.

His *Chirurgical Works* are contained in three handsome octavos. His classical and vivid description of caries of the vertebræ and spinal curvature caused his name to be affixed to this morbid condition. Pott's disease of the spine can never be forgotten while the English language is spoken or read.

We have traced our noble profession from the dim mythological ages, when the gods alone were supposed to possess the power of healing the wounded, down through the pagan civilization to the formation of the Alexandrian school, which, one hundred years before the birth of Christ, shed a grand meteoric light over the world, the true effulgence of a grand science; have followed it through the dark ages, when it struggled fiercely against the ignorance, greed, and fanaticism of the "Faith Curists," and likewise against the wicked superstitions of a belligerent and benighted populace; have pointed out the beacon lights which were erected by our *confrères* in mediæval times, and have now reached the commencement of the nineteenth century, the brightest period which has ever had an existence since the world was created. We stand in the position of a traveler who has wandered through the virgin forests, beheld the grandeur of an ancient Oriental city, traversed the quagmires of a dark and dismal swamp, emerged into a rural and sparsely settled district, where he beheld an occasional flickering light; but, pressing forward, he now stands within the suburbs of a great metropolis, where he beholds, by the aid of the brilliant electric lights, the grandest structures erected by modern civilization.

Would that I possessed the power of a Homer, Virgil, or Milton, that I might immortalize these men who have made surgery what it is in 1890; but, alas! I have neither the power or space in which to do justice to the many grand heroes of the present age, and must therefore content myself by merely mentioning the names of a few who have been the pioneers in the grandest work the world has ever known. The names Dupuytren, Roux, Lisfranc, Velpeau, and Nélaton, of France; Abernethy, Cooper, Brodie, Ferguson, and Laurence, of England; Colles and Hamilton, of Ireland; Bell, Syme, Liston, and Simpson, of Scotland; Graefe and Rust, of Germany; Scarpa and Porta, of Italy; Physick, Mütter, Pancoast, S. D. and S. M. Gross, of Philadelphia; Wright Post, Kissam, Rodgers, Watson, Stevens,

Mott, Van Buren, Parker, Sands, Wood, Little, Carnochan, A. C. Post, and Sims, of New York; Nathian Smith, of New Haven; the Warrens and Hayward, of Boston; N. R. Smith, of Baltimore; Warren Stone, of New Orleans; Dudley, of Lexington; Brainard, of Chicago; Eve, of Nashville; Hodgen, of St. Louis; and James Cabell, of Virginia, are now numbered with the noble dead, while there yet remain with us some of the grandest, noblest pioneers, and most distinguished surgeons the world has ever known. I can not, therefore, do justice to the surgical progress of this century without mentioning these names. Among this long list of distinguished names I can not refrain from mentioning some of our European *confrères*, although I shall enter more fully on the work done by Americans, since we all naturally feel an especial interest in our countrymen. Germany has produced during this century some of the most distinguished surgeons the world has ever known, and among those names already immortal are Virchow, who has given us the best work on *Cellular Pathology*; Billroth, the best on *Surgical Pathology*; and Esmarch, the best *Hand-book on Military Surgery*. However, the fame of Billroth and Esmarch does not by any means entirely rest on these valuable publications, since the boldness and originality of their surgical procedures have likewise electrified the world.

The commencement of this century found America without any really distinguished surgeon, without a surgical literature of her own, and without colleges in which to educate her own students. She was at this period almost entirely dependent on Great Britain for the education of her sons in medicine, and our medical literature was likewise principally obtained from the same source. It is likewise true that in no part of the civilized world had surgery reached a high degree of perfection, but America had just emerged from a long revolutionary struggle and started forth among the independent nations—she was now compelled to provide for her own wants. This fact undoubtedly prompted her to put forth her best efforts. The trying ordeals through which the colonies had passed in their long and murderous wars with the Indians, followed by the revolutionary struggle of seven years war with England, had produced a bold and hardy race of pioneers, who were prepared to attempt anything which offered even the slightest chance of success. The women possessed fortitude and courage, and were prepared to suffer pain, if it only offered an adequate reward. It is not therefore surprising that in the autumn of 1809 Mrs. Crawford, who was suffering from an ovarian tumor, approached the unpretentious house of Dr. Ephraim McDowell, at Danville, Ky., and there submitted to an ovariectomy—the first operation of this kind ever performed, but an operative procedure which has already been repeated many thousand times with the most happy results. Mrs. Crawford recovered and lived many years in the full enjoyment of health and with entire freedom from pain. This operation was subsequently repeated several times by Dr. McDowell, who, we are informed, saved the lives of eleven patients out of thirteen. Thus began an operation which has added thousands of years to the lives of civilized women, and saved them from untold misery. McDowell, however, did not escape the sad fate which awaits



every bold innovator in science. His fate in this respect was no better than that of the immortal Jenner, who was assailed by his own professional brethren, the ministers of the gospel, and the public press. Poor McDowell carefully prepared a report of this operation for publication in a medical journal which was edited by a personal friend and professional brother, carried it to him with his own hands, and requested this *now unknown* distinguished functionary to publish the same. The manuscript was in due time returned to the immortal McDowell, to whom it was suggested in a very friendly way that he ought never again to attempt the performance of this barbarous operation, the which had not even been recommended by the most distinguished surgeons of the world. It was likewise added by this friend and distinguished editor that the "publication of your report of this case would endanger the safety of my journal and be ridiculed by the entire profession." This rebuff probably deterred him for a time from making any further attempts at publication, since the earliest publication made by him on this subject was in 1817. The performance of this operation was at first ridiculed in England, but soon afterward he was given full credit for the same. Thus time rights these grievous wrongs and genius receives its just reward.

It was not until near the middle of the nineteenth century that the grandest achievement recorded in all history was consummated by the discovery of a potent and, at the same time, comparatively safe anæsthetic, which enabled surgeons to say to the most horrible agonies attendant on the performance of surgical operations "Begone!" when his words were promptly followed by a deep sleep, as if uttered by Jehovah himself, and the same condition continued at the will of the operator until the operation was completed.

The patient is then called back to life—a performance which approximates even, in the grandeur of its power, the miraculous raising of the dead. No discovery ever made in the arts or sciences possesses a value which can in any way be compared with that of chloroform and ether. It is the *priceless gem* to suffering humanity. What would not a rational man pay for the relief which these agents afford during the performance of a painful surgical operation? The king would surrender his realm if this priceless boon could not be obtained for a less consideration under such circumstances, and the miser would give up his life-long boardings for it. Let, therefore, the names of Morton and Simpson go down to future generations as the greatest discoverers known in the world's history. Their services to humanity are far more valuable than those of any other discoverers, inventors, or heroes who have lived in any age.

Priority in this grand work belongs to America, since Morton discovered and popularized the use of sulphuric ether as an anæsthetic in 1846, while Dr. Simpson did the same for chloroform in 1847. The use of these agents during the performance of surgical operations marks the commencement of the grandest epoch in surgery. The anæsthetic enabled the surgeon to perfect and make successful the old operations, while it opened the field for the performance of new ones, which could never have been undertaken without

the use of this agent. It enabled the scientific investigator to go forward with his vivisections without giving pain. It likewise in this case greatly increased the field of labor, and added at least fourfold to the previous value of these investigations. Brain surgery, abdominal surgery, and gynecology, which are essentially new departments in the surgical field, could have never had an existence without modern anæsthetics. The experimental work required in these departments could not have been done without their use.

Most of these operative procedures are also absolutely impracticable without the same. The most brilliant progress in surgery the world has ever known has been made since the discovery of modern anæsthetics. This wonderful progress has been so marked as to attract the attention of the laity. Says Dr. W. W. Keen: "This progress is due chiefly to two things—the introduction of antiseptic methods, and to what we have learned from laboratory work and experiments on animals."

It therefore appears that, at the beginning of this century, only two things were required to bring surgery to the highest possible standard. An anæsthetic was needed that the necessary experimental studies might be made on animals; furthermore, that all surgical operations might be carefully and properly performed; while the antiseptic method of wound treatment was required for the banishment of all septic complications. It must be now universally admitted by every careful student of surgery that the introduction of the aseptic method of wound treatment marks an era in surgical progress only second to that dependent on the use of anæsthesia.

The world is indebted to Sir Joseph Lister, of London, who primarily perfected and popularized this method of wound treatment. He has been far more successful than the majority of innovators, since he has lived to see the value of his labors universally acknowledged by the principal surgeons in every part of the world. The marvelous feats performed in brain surgery, relating to the removal of tumors alone, is thus stated by Dr. Keen: "Now, there have been twenty tumors removed from the brain, of which seventeen have been removed from the cerebrum, with thirteen recoveries, and three from the more dangerous part of the cerebellum, all of which proved fatal. Until this recent innovation every case of tumor of the brain was absolutely hopeless."

These successes in brain surgery have been made possible principally by the experimental studies of Ferrier and Horsley, of England; Fritsch, Hertzog, and Goltz, of Germany. In another part of this paper we have mentioned the fact that the first ovariectomy was performed in 1809; but only thirty-five years ago the abdomen was really a closed cavity, and the entrance of the same was even then practically tabooed by every prudent surgeon. Accidental wounds of this cavity, with very few exceptions, terminated fatally. Dr. Keen, in speaking of the success of operative procedures on this cavity, says: "Mr. Tait has completed

\* Dr. Keen in *Harper's New Monthly Magazine*, October, 1889, pp. 708 et seq.



a second series of one thousand cases in which he opened the abdomen for the removal of tumors, for abscesses, for explorations, etc. In his first thousand cases only ninety-two patients died (9.2 per cent.), and in the second thousand only fifty-three died (5.3 per cent.).

"In ovariectomy alone the percentage fell from 8.1 in the first thousand to 3.8 in the second. Only a quarter of a century ago the mortality of ovariectomy was but little if at all under 50 per centum. . . .

"Spencer Wells, even with the far larger mortality of his earlier days, added twenty thousand years to human life as the net result of one thousand ovariectomies."

How changed the condition to-day in regard to this cavity, since not a single organ within it is any longer exempt from the work performed by the surgeon's knife! The uterus is now frequently successfully extirpated, gunshot and stab wounds of the intestines are sutured, etc. In this cavity American surgery has led the way, and to Americans surely belong the highest honors. The first case of abdominal section for traumatism was that of Dr. Walters, of Pittsburgh, Pa., for ruptured bladder, in 1862. The first case for gunshot wound of the intestine was that of Dr. R. A. Kinloch, of Charleston, S. C., in 1868. "The elder Gross long since led the way by his experiments on dogs, but we owe our present boldness and success chiefly to the experiments of Parkes, Bull, and Senn—all Americans—who have first shown in animals that it was safe and right, with antiseptic methods, to interfere actively for the health and healing of our patients."

In the department of gynecology the highest honors ever won justly belong to Dr. J. Marion Sims, of New York, who finally succeeded, after many years of patient and industrious experimentation, in discovering a method by which he was enabled to certainly and effectually cure both vesico-vaginal and recto-vaginal fistulae. Dr. George J. Fisher says of this great surgeon, who has certainly immortalized his name by his labors,\* that "every now and then the world is amazed by the appearance of a genius who, in a few short years, does the work which all previous centuries had failed to do, teaches his lessons well, becomes immortal, and flits away. It is impossible to speak too highly of such a one who has just departed. Gynecology scarcely had an existence previous to the commencement of J. Marion Sims's brilliant and successful operations for vesico-vaginal fistulae. There is nothing in the whole domain of surgery at all comparable with this man's contributions to gynecology. He taught how to effect the absolute and permanent cure of the most distressing and loathsome condition of woman which it is possible to imagine, resulting from the injuries and lacerations incident to difficult childbirth, a condition which the most skillful surgeons had up to that time utterly failed even to ameliorate. Frankly and freely, and without remuneration, to go forth to all the principal civilized nations of the earth, personally and unreservedly to teach the surgeons of the world all his methods, and to establish model hospitals for the benefit of multitudes of afflicted women, furnished an example of broad and generous humanity, and of

unselfishness, to which the world had been before a stranger.

"Dr. Sims well merited all the appreciation, admiration, and glory which were rather tardily bestowed upon him. In future the civilized world will never cease to express its unlimited gratitude for his eminent services, and this will be repeated age after age as long as the primal curse shall rest upon woman, and until she shall enter upon a millennium when sickness and disease shall be no more."

The present high standard of orthopaedic surgery is due very largely to the efforts of an American surgeon, who, by his energy and mechanical skill, brought about a reformation in the treatment of these morbid conditions which has yielded the most satisfactory results in these cases. Professor Lewis A. Sayre, of New York, has won the highest laurels in this department of surgery, and may be properly regarded as the father of the present method of treatment of these cases. Dr. Bigelow, of Boston, Mass., has introduced and popularized a method of rapid lithotomy which has attracted much attention in professional circles, and been accepted as a marked improvement over the other mode of treatment.

The limits of this paper forbid that more time should be occupied in bringing forward the grand achievements of a noble profession. Let the aspirant for honors in this field remember that he who enters here, with the full determination of gaining honest laurels, must possess all the qualities of mind and body which would secure fame for him on the field of battle. The battle for honest fame is always a desperate struggle; many must fall by the wayside and be carried to the rear fainting and disappointed; some of these will so far recover that they may, after a while, return to the front to again renew their struggle, while others will be buried in unknown graves, unhonored and unwept.

The moment an aspirant enters a gladiatorial contest for fame he will hear the jeers of the populace, will be confronted by his foe, and will require the courage of a lion. Having already gained the victory, he will then find that his *confrères*, still fearing that a full acknowledgment of the dearly earned laurels, so recently won, may possibly have an injurious influence on their own reputation or business, contrive that to the hero only fair words and no substantial aid will be given. Dr. J. Marion Sims must have fully realized the force of all these facts when he came to New York, after having patiently studied gynecology for years, when he demonstrated to Dr. Valentine Mott and others the methods by which he was enabled to heal vesico-vaginal fistulae, and performed several operations in their presence which resulted in perfect cures, *since still they would not consent to join with him in the establishment of a female hospital where he could have an opportunity of carrying forward his humane work.* Poor Sims, in this moment of despondency, came in contact with a true friend, a newspaper man, who said to him, "*You shall succeed; your mission is a noble one, and you are worthy of success.*" The good Samaritan called a public meeting, which was attended by the best people in New York city, except physicians, who were especially conspicuous by their absence. The charitable designs of Sims were fairly presented, as well as

\* *International Encyclopaedia of Surgery*, vol. vi, p. 1201.



the great value of his recent discoveries to suffering humanity. This meeting resolved that Dr. Sims should have an opportunity to go forward with his noble work. The following morning the newspapers gave a full report of the doings at this gathering. The effect of this report on the distinguished surgeons was magical. They promptly drove to Dr. Sims's residence and congratulated him on his prospects, magnified the value of his discoveries, and proffered their assistance. *His laurels were won and his worth was duly acknowledged.* These points have been brought forward to illustrate the difficulties with which all great advances have to contend. Dr. Sims's trials and difficulties were no greater than those which have obstructed progress in all former times. The following question now presents itself for our consideration: Is fame worth the effort? We all recognize the fact that Dr. Sims has erected over his bones an imperishable monument; but this is *no reward* for the great effort which he put forth. However, there is another and far nobler result which he has accomplished. His labors will, for ages yet to come, prevent thousands from suffering untold agony.

In this light we behold him as the benefactor of the whole human race, entitled to their sincere homage, and one who should be glorified on earth. Labor in such a field is the grandest in which any human being can ever engage, while death in such a cause raises a man almost to the level of the gods. The old pagan civilization fully recognized this right, and he who became distinguished as a mighty healer of the sick was henceforth classed among the gods. Let us so far imitate this worthy example as to dedicate the temples erected for the healing of the sick and wounded to the men in our own noble profession who have immortalized their names on earth by their untiring efforts in behalf of suffering humanity. Let honor be given to whom honor is due. Then we shall see hospitals bearing the names Paré, Hunter, Morton, Simpson, McDowell, Lister, Sims, Gross, etc., instead of those of "faith-curing" monks and questionable saints, who lived in the dark ages when ignorance and superstition won all the prizes.

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