



# THE INFLUENCE OF THE BRITISH MASTERS ON AMERICAN SURGERY

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LOS ANGELES



REPRINTED FROM NEW SERIES, VOL. VI, NO. 6, JUNE, 1929, PAGES 826-836

*The American Journal of Surgery*

PUBLISHED MONTHLY BY PAUL B. HOEBER, INC., NEW YORK

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# THE INFLUENCE OF THE BRITISH MASTERS ON AMERICAN SURGERY\*

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THE development of the science of surgery out of the inchoate practices of the barber surgeons forms a chronicle of the most dramatic interest.

The Hippocratean principles of the art of healing had slumbered for centuries in the abysmal gloom of monastic ignorance and superstition. The channels for the dissemination of intelligence were few and those which functioned were hedged about with formalities and impedimenta which dwarfed all consistent efforts toward literary and scientific progress.

When printing was invented in the fifteenth century an amazing change spread over the world's civilization. Through the medium of the printed page the knowledge of progress in science and art could now be widely disseminated. The record of invention and discovery could be published to a world now eager for learning and knowledge. The dawn of a renaissance of science and discovery, of letters and of art, which reached its zenith in Britain in the glorious Elizabethan epoch, has no counterpart in history since Greece's Golden Age of Pericles.

Into this radiant atmosphere of England's flowering splendor was born a boy whose

original mind and genius for research soon placed him in the foremost rank in the study of the phenomena of life and function. William Harvey's discovery of the circulation of the blood and the physiology of generation were not only epochal; they served to establish for the first time in the history of medicine the fundamental basis for all subsequent anatomic and physiologic research and of all subsequent development in pathology and in surgical science.

There shines about the name and fame of Harvey a luster which the lapse of time has only served to render more significant and enduring. He lived and worked amid the companionship of England's most learned men in science and letters, the product of whose rich and resourceful minds constitute today the world's richest treasures in literature and art. His father-in-law, Dr. Lancelot Browne, had been Elizabeth's physician and as Harvey rose in favor he became himself the companion of princes and later physician and companion in travel of James I. Later still he held the same intimate association with Charles I, who was so ardent in his admiration of Harvey and his discoveries that he

\* President's Address. Read before the Pacific Coast Surgical Association, Santa Barbara, Calif., Feb. 22-23, 1929.

proved to be his most faithful friend and supporter. We know that he was friend and physician of the Duke of Lennox, of Lord Bacon and the Earl of Arundel and he must have known Shakespeare, who doubtless had intimate knowledge of Harvey's discoveries when he wrote: "The ruddy drops that visit my sad heart."

The early masters in Britain were among the first to formulate the study of anatomy and physiology into a system of correlated structure and function. There was a directness of approach in these studies which distinguished them from all other schools of scientific investigation. The celebrated schools of anatomy of William Hunter in London and of Charles Bell in Edinburgh were the direct result of this system of organized research. William Hunter, Percival Pott, John Hunter, the Monros, John and Charles Bell and Sir Astley Cooper composed a brilliant succession of masters and pupils, later to become teachers, whose influence and renown extended to three continents.

America especially benefitted by the instruction which our visiting students of medicine received at the hands of these British instructors. Once their fame reached our country, ambitious young medical students, who could afford the undertaking, braved the perils of the Atlantic, eager for the instruction in anatomy, physiology and surgery offered them in the schools of London, Glasgow and Edinburgh.

One of the first and most ardent of these young students was John Jones, who became a pupil of William Hunter in his school of anatomy and of Percival Pott in St. Bartholomew's Hospital. He was born in 1729 and died in 1791. He first studied medicine with Dr. Cadwalader in Philadelphia. Later he went to London to be with Hunter and Pott and afterwards visited the clinics of Petit, Le Dran and Le Cat et the Hôtel Dieu. In 1757 he took his degree in Medicine at the University of Rheims. Returning to America he opened offices in New York in 1753 and later returned to Paris.

While in London he was contemporary with John Hunter and while a student of his brother William became a skilful anatomist and formed a taste for operative surgery. He later returned to America, qualified to take a high place as a surgeon. Ten years after he had taken his degree at the University of Rheims he was made Professor of surgery in the Medical Department of King's College, just opened for instruction. He was the first American to be given a professorship in surgery. His biographer said of him: "He was well fitted by education and his various accomplishments to become the instructor of others; not merely as the skilful operator, but as the scientific surgeon and as the first teacher of surgery in the colonies, he justly deserves to be styled the Father of American Surgery."

Another of the early students of surgery to attain international fame was John Warren (1753-1815). He was a younger brother of General Joseph Warren, also a surgeon, who fell at Bunker Hill. Like his brother with whom he studied medicine, he became an ardent patriot and was at Concord and the first battle of Lexington. In 1780 Dr. Warren gave a course of lectures on anatomy with dissections at the Military Hospital. The following year the students at Harvard were permitted to attend his lectures. This lecture course finally led to the founding of the Medical Department in Harvard in 1783.

There were now three Medical Colleges of character in America: The Medical College of Philadelphia which became the Medical Department of the University of Pennsylvania in 1791; the Medical Department of King's College in New York which became the Medical Department of Columbia College in 1784, later in 1810 the College of Physicians and Surgeons; and the Medical Department of Harvard University. The leading spirits in the founding of these three great medical schools, which have had such an important part in the development of medical education in America, were almost all of them stu-

dents of the master anatomists and surgeons of London and Edinburgh.

In the beginning instruction in surgery was combined with the chairs of anatomy, chemistry and obstetrics. From now on these students of the British teachers demanded a distinctive place for surgery in the curriculum. Stephen Smith says: "This change in the system of surgical education was due to the genius of John Hunter, whose researches in the latter half of the eighteenth century gave to surgery the character, dignity and responsibility of a true science." While the teaching of the British scientists made slow progress in the schools of Europe on account of national prejudices and jealousies, they early took deep and abiding root in the virgin and fertile soil which the young and plastic schools of America afforded and through which they were to mould the character of its future surgeons. It was a fortunate circumstance that a corps of American students appeared at this critical time in the history of surgery in this country, thoroughly qualified by temperament and education to become the propagators of the principles and practice of the new faith through these pioneer schools."

It is quite impossible within the time limit of this address to consider with any degree of just appraisal the men whose avid desire for learning and superior endowments as teachers of surgery lent a singular distinction to their labors in our American Medical Colleges. Amongst the most celebrated of these teachers were:

Dr. Wright Post (1766-1828) who prepared for his medical study in the offices of Richard Bayley in New York. In 1784 he became a pupil of Mr. Sheldon in London and was an ardent follower of John Hunter's teaching and probably saw Hunter do his first ligation of the femoral artery for aneurysm. Later he returned to New York where he became professor of surgery in the Medical Department of Columbia University. He was the first professor of surgery in the College of

Physicians and Surgeons and became president of the College in 1821 and continued in this office until 1826. Valentine Mott, one of his most devoted pupils, said: "He was unrivalled as an anatomist, a most beautiful dissector and one of the most luminous and perspicuous teachers I have ever listened to either at home or abroad."

In 1767 Valentine Mott (1785-1865) was given the chair of surgery in the College of Physicians and Surgeons, which was now raised to a full and independent professorship. At nineteen he entered the office of Dr. Valentine Seaman. He continued under the preceptorship of Dr. Seaman until his graduation from the Medical Department of Columbia in 1807. Dr. Wright Post was his professor of surgery. Soon following his graduation Dr. Mott visited London to become the pupil of Sir Astley Cooper. He also attended the lectures and clinics of Cline, Abernethy, Blizard and Home. He remained in London two years as Sir Astley Cooper's assistant in surgery. He returned to New York in 1809 and offered a course of lectures on operative surgery on the cadaver. The following year he was appointed professor of Surgery in Columbia on the advice of his former preceptor, Dr. Wright Post. He continued to hold the chair of surgery until 1826. Later he was professor of surgery at Rutgers College and later in the Medical Department of the University of New York. He was rated as a superior teacher and clinical surgeon, versatile in his learning and an educator of the highest character. He had been trained at home under his preceptor Wright Post, in the principles of John Hunter; abroad he had had a splendid training under Home, Abernethy and Cooper.

Alexander H. Stevens (1789-1869) followed Mott at the College of Physicians and Surgeons. A graduate of the University of Pennsylvania in 1811 he had the fine training in surgery from Philip S. Physick, who had had exceptional training in experimental work with John Hunter.

Willard Parker (1800-1884) succeeded Professor Stevens and was made professor of surgery in 1840. He was a graduate of Harvard and a pupil of Dr. John C. Warren. "Thus it happened that the chair of surgery once occupied by Jones and Post, then made illustrious by Mott, one of his own pupils, was next filled by a representative of Physick, and now was to be given to a student of Warren." Parker was one of the finest and most original clinical teachers of surgery of his generation. It was common remark that he was among the first to adopt the bedside clinic to the theory of practice. He held this chair for thirty years and it is probable no surgeon in New York ever surpassed him as a clinical teacher, or equalled him in the inspiration for critical surgical analysis which he was able to convey to his admiring students.

In addition to this galaxy of master surgeons whose constructive work as teachers and organizers of systematic surgical study in the cities of New York and Boston there were those of the University of Pennsylvania equally celebrated in the city of Philadelphia. Philip Physick (1768-1837) was one of them. His long and intimate association with John Hunter had given him a prestige amongst his colleagues which was immediate and enduring. He had lived in Hunter's house as a member of his family and became so great a favorite, that at the end of his residence with him, Hunter asked him to become his partner. But he went on to Edinburgh where in 1792 he received his medical degree when only twenty-four. Returning to Philadelphia he was appointed surgeon to the Pennsylvania Hospital and in 1800 was given a lectureship in surgery. In 1805 the professorship in surgery was created and Dr. Physick was made professor. He occupied the chair of surgery for thirteen years and gave rare distinction to the systematic teaching of general surgery as an organized science.

Dr. William Gibson (1788-1868), who

succeeded Physick, ably maintained the high reputation which the arduous labors of his distinguished predecessor had given the department of surgery. Gibson was one of Princeton's fine scholars and after his graduation there he went to Edinburgh to be with John and Charles Bell. He took his medical degree from the University of Edinburgh; his graduating thesis was on the subject of "Necrosis" and was so fine it gave him instant distinction. On his return to America he was given the chair of surgery in the University of Maryland and in 1819 succeeded Physick as professor of surgery in the University of Pennsylvania.

In addition to these great surgeons whose training was directly derived from Home, Abernethy, Hunter and Cooper, were Bigelow of Boston, Gross and Agnew of Philadelphia, James R. Wood of New York, Donald Maclean of Detroit and Ann Arbor, who was for many years James Syme's first assistant, and Moses Gunn of Chicago. These men were directly or indirectly influenced by the early British masters, of whom John Hunter was their ideal, and by Joseph Lister with whom most of them were contemporary.

They were clever anatomists and some of them, inspired by the epochal work of Lister in pathology and bacteriology, became devoted disciples of this great teacher in the early adoption of the principles of antiseptic and aseptic surgery. For it must not be forgotten that Lister was the first to suggest and put in practice asepsis, as he had been the first to detail the principles of antisepsis.

The Senior Fellows of this association will recall with me the steam atomizer used in the operating amphitheatre in the early 80's and the phenolized fog which blinded us as we tried vainly to gaze through the choking fumes. Fortunately this method of rendering the atmosphere of the operating room sterile soon gave way to the aseptic technique in the preparation of instruments, dressings and everything which contacted the field of operation;

and by 1890 we had established an aseptic technique so meticulous in its detail that it never has been surpassed and now, after forty years, is scarcely equalled in the modern operating room. But it must not be forgotten, that, however great the obligation to Hunter Bell, Pott and Cooper, great anatomists and physiologists in their day (great constructive mentalities in establishing the art and science of surgery in the English speaking world) equally great is our debt to those who followed them and perfected the science which the early masters so vaguely outlined. For in Lister, Macewen and Horsley (and although still living, we should like to add Mayo-Robson) Britain gave to America and the whole world, not only the creative geniuses who made possible the perfected art we now enjoy, but with a dramatic and episodic flare, unexampled in the annals of science, gave to our guild the very highest development in the domain of specialized surgery. They were the first to approach the great problems of surgical pathology with the uncompromising analysis which made possible its interpretation in terms of a definite surgical remedy. They studied the function and minute anatomy of various organs both as discrete entities and in their correlated reactions with other organs contiguous to them. Their discoveries revealed the importance of bacterial infection both local and disseminated and they established the fundamental laws which govern surgical procedure in the complicated pathology of a disseminated infection. Through them and their incomparable labors the art of surgery has approached the state of a perfected science. By their modest, untiring but courageous, and at times revolutionary efforts they have left a legacy of scientific accomplishments whose luster will never fade.

So much has been said of late in the anniversary biographic reviews of the lives and works of John Hunter and of Lord Lister that it would seem improper to review their epochal work again. One

writer has recently said: "The history of surgery can, in fact, be divided into two periods—before Lister and after Lister." But Lister had an admiring colleague, who, like Lister, was a great pathologist and a still more accomplished physiologist. No review of the work of the master minds in British surgery would fail to pause before this luminous figure, the most modest and withal the most outstanding in stellar brilliance in the history of surgery. Victor Horsley's fame, to those who knew indirectly of his life of vast research, emanated from his work in localization and surgery of the brain and cord. And while that was where his creative faculties had their finest expression, he was, in fact, equally great in his work in physiology, pathology and the general field of surgical research.

It is true he has been known in America chiefly for his epochal studies in localization of the centers of the brain and his rare genius in brain surgery. But he distinguished himself also in his original work on the thyroid gland and his notable studies in confirmation of the work of Pasteur in rabies.

In 1880 at the age of twenty-three he became fellow of the Royal College of Surgeons. In 1884 at the age of twenty-seven he was appointed Professor Superintendent of the Brown Institution and began his notable work with Professor Schafer and Dr. Beavor. He discovered the nerve distribution to the major nerves, the "nervi-nervorum," by a special method of staining. At the Brown Institution, where he was Professor Superintendent for six years, he followed three lines of research: (1) the localization of function in the brain and the pathology of epilepsy and canine chorea; (2) the thyroid gland with special reference to cretinism and myxedema; (3) the protective treatment against rabies.

On April 4, 1883, Dr. Theodor Kocher gave an address at the Twelfth Congress of the German Surgical Association on "The Extirpation of Goiter and Its Conse-

quences," which was published in *Langenbeck's Archives*. He called the condition found in these cases "Cachexia Strumipriva." During April and June, 1883, the Reverdin published in the *Revue de la Suisse Romande* their "Note sur vingt-deux operations de goitre." They were acquainted with the British reports on myxedema and considered the *rapprochement complet* between the English cases of myxedema and their own cases of *myxoedeme opératoire*.

On November 23, 1883 at a meeting of the Clinical Society of London, Sir Felix Semon, calling attention to Theodor Kocher's observations, declared his belief that "cretinism, myxedema and cachexia strumipriva were closely allied conditions in which there was either complete degeneration or absence of the thyroid gland." On December 14, the Clinical Society appointed a committee to investigate this subject of which Ord, Hadden and Horsley were members. Recognizing what they called "the hitherto undreamed-of importance of the thyroid gland" they selected Horsley to study the subject by experimental physiology. He began his work in Professor Schafer's laboratory in the autumn of 1884. The report of the Investigation Committee was not published, however, until 1888. It contained 215 pages and is everywhere accepted as the first authentic experimental study of the thyroid gland.

On February 8, 1890 Horsley published his "Note on a possible means of arresting the progress of myxedema, cachexia strumipriva and allied diseases." He considers the work of Professor Schiff, published in 1884 in the *Revue de la Suisse Romande* and of von Eisselsberg on the transplantation of normal thyroid tissue in the body of a patient suffering from myxedema, and recommends this procedure which had been attempted by Kocher in 1883 unsuccessfully and again by the same surgeon successfully in 1889.

In the *British Medical Journal* of October 29, 1882, Fox of Plymouth and Hector

Mackenzie published their papers on feeding fresh thyroid and the dry extract by mouth. During 1893 a large number of cases were reported, aiding the experimental work and clinical study of the thyroid. Horsley does not stand alone but, in the words of Paget, "It was he who founded in this country (England) the modern study of the thyroid gland; and it was he who first in this country suggested the rational method of treatment. Those of his profession who remember the years of ignorance and the wonder and delight of the new learning, are not likely to forget what he did in 1884-86 for science and in 1890 for practice."

The work of Horsley on the prevention of rabies in England was not less romantically epochal than his research work on the thyroid gland. Pasteur treated his first patient for rabies on July 6, 1885. In April, 1886 a commission composed of outstanding men in England was appointed by the British Government to visit Pasteur and learn of his method of treating rabies. The distinguished names on this commission is an index of the importance attached to this investigation by Great Britain. They were Sir James Paget, chairman, Lord Lister, Sir Lauder Brunton, Sir Richard Quain, Sir Henry Roscoe, Sir John Burdon Sanderson, Dr. George Fleming and Victor Horsley, Horsley was secretary of the Commission.

Sir James Paget wrote a letter to Pasteur telling of the appointment of the Commission and desiring to arrange an audience. This letter was borne in person by Sir John Burdon Sanderson. Brunton, Roscoe and Horsley followed a few days later to Paris. They wanted to bear back with them an infected spinal cord and an inoculated rabbit to prove Pasteur's claims.

Pasteur proved difficult at first, but Horsley's grace and tact finally won the desired material. A number of cases were placed at the disposal of the Commission for study. Horsley returned early in May to London after seeing over 100 cases in Paris and in various parts of France to

which Pasteur referred him. Horsley's biographer found amongst his papers twenty-six letters written to him by Pasteur between May, 1886, and July, 1887.

The report of the Commission says that "Horsley's experiments begun in May, 1886 entirely confirm M. Pasteur's discovery of a method by which animals may be protected from the infection of rabies." It would be difficult to overestimate the importance of the discovery whether for its practical utility or for its application in general pathology.

The conduct of the experimental studies on rabies was greatly facilitated by the appointments at the Brown Institution where Horsley was superintendent and where he continued these experimental investigations. They were all brilliantly confirmatory of Pasteur's claims. During this year there was a startling outbreak of rabies amongst the herds of deer in Richmond Park. By April 1887, 160 deer out of the herds of 1200 had died of this disease. Before the disease had been checked 264 deer had died of rabies. Horsley conducted inoculation tests at the Brown Institution throughout the epidemic, abundantly confirming all cases studied.

A bill requiring dog owners to muzzle their dogs for a certain period of quarantine passed the House and became a law. But as was and has been true of every scientific advance in preventive medicine the enforcement met the same fanatical resistance which has characterized the anti-vaccinationists since Jenner's day. Horsley considered hydrophobia the most terrible in its terminal expression of any disease of which he had knowledge and felt it his professional obligation to give its study his most earnest and devoted labor. He was the greatest and most distinguished advocate and friend Pasteur ever had in the establishing and promulgation of his priceless discovery.

Because of his outstanding and original investigations in cerebral localization

Victor Horsley became easily the first authority in the world in the diagnosis of intracranial pathology. It followed naturally from his long and strict training in experimental physiology, reports of which, in collaboration with Schafer, Beevor, Semon and Ferrier, were made before the Royal Society, that he should elect the surgery of the brain and cord as the field in which he could work with the greatest facility. So widely was this leadership accepted that a senior surgical service was created for him in the Queen's Square Hospital.

It was there on May 25, 1886 that he did his first definitely planned operation on the brain. It was the excision of a scar following a crushing accident with loss of brain substance occurring several years before. It was a classical case of Jacksonian epilepsy. Horsley removed the scar and some of the brain substance contiguous to it and the patient recovered with improved mental condition and freedom from his convulsions. Hughlings Jackson was present at this operation.

On June 9, 1887, he removed a tumor from the spinal cord, the first operation of its kind in the history of surgery. It was a patient of Gower's and was reported by Gower and Horsley in the *Transactions of the Royal Medical and Chirurgical Society*. On March 5, 1888 at a meeting of the Medical Society of London, Horsley and Ferrier reported a case of cerebral abscess operated on with complete recovery on December 10, 1887, and in this meeting referred in his discussion to a case of septic thrombosis operated on by ligating the internal jugular vein and removing the infected clot from the sinus. This operation was done early in 1886 and was the first of its kind. It was reported on May 28 before the London Clinical Society in a paper by Horsley, "On a case of suppuration of the mastoid cells with remarks on the prevention of septic embolism in such cases."

In January, 1887 Horsley did the first trephine operation ever reported for relief



of the intracranial pressure in a patient suffering from an inoperable brain tumor. This procedure was done for the relief of pain, vomiting and optic neuritis. Cushing later designated this palliative measure as "decompression." In June, 1890 he read a paper prepared from experimental data which he and Spencer gathered from their work in the Brown Institution "On the changes produced in the circulation and respiration by increase of the intracranial pressure or tension."

At the August meeting of the International Medical Congress in Berlin he reported his work on the physiology of the brain and its function in collaboration with Schafer, Beevor and Semon. His demonstrations were before a large and distinguished assemblage of physiologists and surgeons from all parts of the world, critical to a degree; but before he was through with his brilliant and startling demonstrations they acclaimed him with the highest honors.

It would be impossible to enumerate the vast collection of original scientific data which every year, with increasing abundance, distinguished the untiring labors of this greatest of England's master surgeons. The accuracy, originality and brilliantly suggestive character of his work was enthusiastically acknowledged throughout the scientific world. His laboratory and clinics were crowded with those seeking to learn these new and priceless facts in neurologic physiology and surgery. No one in his generation could approach him in productive effort nor keep up with the pace with which his great mind solved those delicate and abstruse problems of the human brain and cord. He wore out and left behind every assistant who ever attempted to keep up with him. This I know personally and from numbers of men who were under his training. The fame and crowding honors which came so early to this young genius continued to come for more than a quarter of a century. Throughout he was the same modest gentleman of true

science, glad at all times to accord to those so fortunate as to collaborate with him, the generous share of credit. In Schafer, Beevor, Semon, Gotch, Spencer and Ferrier he had loyal and staunch friends and co-workers. But ever he was the leader of them all, inspiring them to greater and more difficult achievements.

When he resigned as professor of pathology in the University College a Department of Experimental Neurology was created for him and he was given his old laboratory in which to continue his work. One of his colleagues writes: "There he was always to be found on certain afternoons of the week tackling fresh problems with undiminished ardour as the pages of *Brain* testify. None who has ever worked there under his aegis are likely to forget his infectious keenness and his unequalled generosity. All that he asked for was that men who came there should be workers; and they did come, from home, from the colonies, from America, Germany, Poland, France and elsewhere. It was a matter of indifference to him whether their researches were published with or without his expressed collaboration; all recognized that he was the leading spirit in the international coterie that labored in that odd-shaped and out of the way room, which to many of the younger generation of neurologists at home and abroad was a veritable Mecca."

At the Toronto meeting of the British Medical Association in July, 1906 he was selected to deliver the "Address on Surgery." A distinguished surgeon of New York, who was present, told me all the other sections were deserted to hear this great address. In the same week Horsley reported his studies with Robert H. Clarke on the differentiation of lesions of the cerebellar cortex from those of the cerebellar nuclei. Clarke had devised a most intricate stereotaxic instrument to facilitate this research. It was constructed so that an insulated platinum electrode could be passed below the cortex into any

of the planes within the nucleus. At first the cells in the nucleus were stimulated by gradually increasing degrees of intensity until absolute electrolytic destruction of every cubic millimeter of the nucleus had been thus stimulated and finally decomposed. The most elaborate tracings, records and photographs, microscopical and gross, were made and were exhibited with this report. It was the first employment of electrolysis in experimental physiology and in its original conception the greatest piece of work ever done in intracranial differentiation.

On their return to England in August I joined them for a fortnight in Norfolk at Westwick Hall. They were still animated by the thrill of their great discovery and I spent many nights far into the early morning hours reviewing with them this amazing work and examining their equally wonderful photographic of it.

This quite compendious recital of but a few of the hundreds of original and epochal works and experimental demonstrations in the physiology and pathology of the brain and spinal cord made by this great master would be singularly inadequate were one to omit mention of one of the rarest examples of localizing precision and operative skill in the history of brain surgery. We are indebted to Stephen Paget for this graphic description, amongst a host of others. It was on the definitive impulses from the precentral gyrus. "What are the powers embodied in the precentral gyrus?" "What sensory impulses are accumulated in it rendering it serviceable to the movements of the upper limb?" He answers this question with a case from Queen's Square. The patient was a boy of fourteen with a case of violent convulsive movements of the upper limb; they had begun when he was seven; "He was in a distressing condition and was referred to me by Risien Russel with a view of arresting the spasm by an operation. Having stopped athenoid and clonic movements in two previous cases by the excision of the so-called motor area, I

advised that the arm area in this case be delimited by excitation and then removed."

On March 20, 1908 Horsley exposed the right precentral and postcentral gyri, mapped out exactly, by electrical stimulation, the whole arm area (precentral gyrus) and removed it. The convulsive movements immediately stopped and more than a year later, at the time of the Linacre lecture, there was no sign of any return of them. He attributed this return of purposive movements chiefly to compensatory action of the postcentral gyrus. Tactile sensation, the "feel" of the muscles and joints (muscle sense, arthritic sense), the appreciation of temperature and of pain, the ability to identify a point touched (topognosis) were impaired and there was profound impairment of the ability to recognize, by contact, the shape of solid objects (stereognosis). Thus, from this one case, Horsley was able to say that the gyrus precentralis is, in man, the seat of representation of (1) slight tactility; (2) topognosis; (3) muscular sense; (4) arthritic sense; (5) stereognosis; (6) pain; (7) movement.

Many of his American students have testified to his personal charm both as friend and teacher. Ernest Sachs of St. Louis said: "I had the rare privilege of working with him from September, 1907 to December, 1908 . . . Of the many privileges that I have had in my life working with various great men, that year and a quarter I spent with him I prize as the most valuable and delightful I ever had."

Notwithstanding the many diverting influences which crowded into the life of this much sought after scientist his surgical activities continued unabated. Up to February, 1909 he had operated on 21 cases of that most rare disease, chronic spinal meningitis, without a single death. On November 22 he reported 149 operations on the Gasserian ganglion with 7 per cent mortality. Of the patients under fifty years of age none had died.

In the spring of 1902 he received the honor of knighthood. It came as a complete surprise to him and he never even knew who recommended him. It had been said by some that he had begun to lose interest in professional matters shortly before the war and devote more of his time to sociological and political affairs. But the honors and recognition of his great contributions to the science of surgery continued to pour in upon him from every quarter of the world. At thirty-three he was elected an honorary member of the American Surgical Association. At thirty-eight he was made a Corresponding Member of the Société de Chirurgie de Paris. The same year membership in the Athenaeum was given him without ballot and the Fothergillian Prize was awarded him by the University of London. Two years later he was elected to the Medical Council and a month later was appointed on the Senate of the University of London. The following year he was elected President of the Neurological Society of which he was one of the founders.

In 1900 and 1901 he was one of the active spirits in the reorganization of the British Medical Association and at the Swansea meeting he was Chairman of Representation. At the Toronto meeting of the British Medical Association, where he delivered the Address on Surgery, in which he gave a summary of twenty years of surgery of the brain and cord at Queen's Square, the University conferred upon him the degree of Doctor of Laws.

Early in 1910 he was elected a foreign associate of the French Academy of Medicine. In July of the same year he was elected corresponding member of the Royal Prussian Academy of Sciences. The same year he was made President of the Section of Surgery of the British Medical Association. In May, 1912 he was elected a member of the Royal Society of Science of Upsala in succession to Lord Lister. In December of the same year he was elected an honorary fellow of the Italian Society

of Neurology. January 19, 1911, three years before the war, the Lannelonge Prize, just instituted by Professor Lannelonge of the University of Paris, was awarded to him, a gold medal and 5000 francs, "for the surgeon who in the previous ten years shall have done most for the advancement of surgery; to be awarded once in five years by a committee of surgeons, representatives of many nations, Great Britain and Ireland; the United States and Canada; South America, Japan and China; Italy, Spain, Portugal and Mexico; Scandinavia and Holland; Belgium, Germany and the Balkan States, one representative of each of these nations or group of nations." "Horsley received this unexampled honor," writes Paget, "the first Lannelonge Prize, from the hands of the President of the Société de Chirurgie. He spoke a few words of thanks and of compliment to Professor Lannelonge and said that his own country, which had long been under the influence of John Hunter's teaching, had later come under the influence of Claude Bernard, who had joined together physiology and surgery. 'That is what I have striven to realize. Unfortunately, if surgery advances with fair rapidity its practice progresses more slowly. That is because we are held in bondage by traditions from which we have difficulty in freeing ourselves.'"

Sir Victor was approaching the climax of a life of unexampled scientific effort. He had been acclaimed with a long procession of honors never before or since accorded to one of our guild. He had entered the medical service immediately upon the entrance of his country into war, had gone to France and shortly after been made executive Medical officer of the Gallipoli base with headquarters at Alexandria. After the fiasco at Gallipoli he volunteered for Mesopotamia, where the medical conditions were in appalling chaos. I had received a long autograph letter from him from Alexandria telling of the failure at Gallipoli and later another from Bombay describing the frightful conditions along the Tigris.

In grave apprehension of the hazard he was taking, his friends wrote and cabled, imploring him to leave the work in Amara in younger hands. These warnings came too late. They probably would not have been heeded in any event by this great spirit whose whole life had been a symphony of devotion to the welfare of his fellow men.

He was on duty at Amara up to the day before his death, when he had walked miles through the withering heat to attend a sick brother officer, and on Saturday evening, July 13, 1916 he was carried into the hospital. The next day his temperature rose to 107°, he became unconscious and on the evening of July 16, in a little hospital by the Tigris, on the burning plains of Mesopotamia, the name of the greatest surgeon in the history of England passed to the roster of the immortals.

These were some of the notable British masters who gave inspiration and impetus in the development of the art of surgery to the American student who visited them. Those of us whose study in the clinics of the Continent lent enrichment to our professional experiences may well remember the great obligation American surgery will always owe to our British teachers. No student of the genesis and development of an art can be oblivious to the achievements of the master minds whose constructive ideals created it. No student of the history of surgery can fail to accord to the great masters in surgical research in Britain the highest meed of tribute. They were the attendants on kings and princes, the companions of the most gifted minds in letters and in art and the noblest in the history of our guild.

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