surgery, he and his family returned to Chengtu in 1948, where he joined the staff of the West China Union University Medical College, where his specialty was pediatric surgery. Acutely aware of the impending change about to engulf China, he worked tirelessly to train young Chinese medical students to take over his work if he should have to leave suddenly. He was able to finish his training program days before he returned to Canada in early 1951.

In 1951, Outerbridge established a practice in New Westminster, where he joined the staff of the Royal Columbian Hospital. He played a key role in the establishment of their Department of Orthopedics. In addition to his own rapidly growing practice, he also was responsible for most of the trauma work in the Fraser Valley during the 1950s and early 1960s.

As a teacher, Outerbridge enjoyed the personal contact with his students. Many friendships were made that persisted through subsequent years. His astute observational skills led him to pursue areas of research with great enthusiasm. His work on chondromalacia patella led to the awarding of a Master of Science degree in the mid 1970s.

Ralph Outerbridge retired from orthopedics completely in 1986 and lived a full life until he died on August 8, 1990.

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Sir James PAGET
1814–1899

Sir James Paget was a great surgeon of commanding authority during the greater part of the Victorian era. He was born at Yarmouth on January 11, 1814, the sixth child of Samuel and Elizabeth Paget. His father earlier in life was a man of affluence with interests in banking, brewing and shipping; in 1817 he was Mayor of the town. All his sons attended Mr. Bowles’ school and the three elder went on to Charterhouse, but owing to a slump in the family fortunes, James and the younger sons finished their education privately. James, when 16 years old, started a four and a half years’ apprenticeship to Mr. Charles Costerton, an active and energetic medical practitioner of Yarmouth. During this period, Paget had experience of the first epidemic of Asiatic cholera, read many works on medicine, and with other apprentices attended a class of osteology. But apart from his strictly professional training, there were two activities that helped him later as a teacher of surgery. He eagerly embarked upon the study of botany, including plant collecting, and he was taught drawing and painting by Young Crome. In both of these pursuits he was encouraged by his mother, herself a collector, and who had been taught painting by Old Crome, a friend of her husband’s. Her skill was such that “some of her oil-paintings would anywhere pass for those of her master.” James was to make good use of his artistic talent by sketching objects of natural history and pathological specimens, and by drawings for his surgical lectures. Further-
more, his botanical researches were sufficient to attract the attention of Dr. (later Sir William) Hooker, with whom he corresponded. In 1834, Charles and James Paget published the *Natural History of Great Yarmouth*, wherein the flora and fauna of the neighborhood are described. James contributed an introduction of 32 pages, which reveal his early power of observation and description. Incidentally he touches on a natural preventive process of soil and coast erosion.

At the end of his apprenticeship he entered St. Bartholomew’s Hospital in October 1834, when teaching at the school had declined after Abernethy’s retirement. But Lawrence, the best scientific lecturer in London, and Stanley were very active in the affairs of the school. Paget became closely attached to both; their teaching and example had a considerable formative influence upon his development. He worked very hard at his studies, and having taught himself German, read Johannes Müller’s *Physiologie*. His first year at St. Bartholomew’s marked him out as an exceptional freshman. The examinations proved him the best student, and in addition he discovered a new entozoon, the *Trichina spiralis*. He had noticed that some dissecting room subjects had tiny white specks scattered in their muscles. Generations of dissectors had seen them and dismissed them as calcified tissue, but Paget, accustomed to having his curiosity aroused by natural phenomena, collected some of the tiny bodies for closer examination. Microscopes were rare; there was none at St. Bartholomew’s, but he went to the natural history department of the British Museum, where Robert Brown, the distinguished botanist, was using a little single microscope, and Brown courteously allowed him the use of the instrument. Paget found that what appeared a tiny calcified body was in effect a “worm in its capsule.” This observation aroused considerable interest. Richard Owen, later curator of the Royal College of Surgeons, read a paper on the trichina, while Virchow and others unraveled its life history. “It infects swine and is taken into the body by the eating of uncooked ham or pork, and its sudden multiplication and dissemination into the muscles cause intense suffering, high fever, and often death.” But the trichina, “once it has become encysted in the muscles, undergoes no further change, and gives no clear sign of its presence in them.”

In his second year, Paget was again the leading student, winning several prizes. On May 13, 1836, he became a member of the Royal College of Surgeons. At that time there was only one examination for this qualifying diploma. “The examination was very simple. The ten examiners sat at the outer side of a long curved table. Each in turn took a candidate, and when he had finished, others could ask questions.” After qualifying, Paget decided to remain in London rather than return to Yarmouth, as his father suggested, although there was no prospect of any appointment at St. Bartholomew’s. He went to Paris for 3 months and attended the lectures and clinics of Roux, Lisfranc, Cloquet and Magendie. On his return he had to maintain himself somehow. He tried coaching pupils, but soon found that he had neither the gift nor the liking for it, and he gave it up. In 1837 he was appointed curator of the museum at St. Bartholomew’s Hospital, then a minor post, for which he received £100 the first year, but on his declining to give his whole time to the work, his salary was reduced to £40. He combined his museum work with medical journalism. He was appointed subeditor of the *Medical Gazette*, his main work consisting of reports of lectures, reviews and translations from French, German, Dutch and Italian journals. In addition he worked under Dr. (later Sir John) Forbes on the staff of the *Quarterly Review*. This was heavier and more serious work; he was responsible for the *Annual Reports on the Progress of Anatomy and Physiology*, which entailed a great deal of careful reading and criticism of world literature. Paget spent 7 years of waiting at this work, during which his average annual income was only £170. Ascetic by inclination and necessity, he confessed: “I was at times very poor; but I lived plainly and quietly.”

These appointments had serious disadvantages, for during their long tenure he was cut off completely from clinical surgery. But there was also much gain. He acquired a wide knowledge of medical science, was forced to be analytical in his judgments and clear in expressing ideas. His curatorship started that lifelong study of the intimate change in human tissues induced by disease. He revised and expanded the museum catalogue of St. Bartholomew’s, and in 1842 began his great work of writing the *Pathological Catalogue of the Royal College of Surgeons Museum*. The magnitude of the task may be gauged by the fact that he described 3,520 specimens. “It certainly was laborious work and occupied some hours daily for seven years...I described every specimen as I saw it standing or lying before me: nothing was to be told but what could be then and there seen.”
Somewhat less than half of the specimens were Hunterian; these were identified by Clift, who as a young man had been John Hunter’s devoted assistant; the remainder had come to the museum from the collections of Sir Astley Cooper, Liston, Howship, and other surgeons.

Until 1843, Paget had ploughed a lonely furrow; he was poor and the future was unpromising. But suddenly that year the tide turned strongly in his favor. He received tokens of recognition that were particularly gratifying. First he was appointed lecturer in physiology, later warden of the new residential college for students at St. Bartholomew’s and lastly he was elected an original fellow of the Royal College of Surgeons at the institution of the Fellowship in December. There was, however, one emotional check to felicity—the death of his mother, who, apart from maternal affection, had encouraged him in his earlier scientific studies. His lectures were carefully prepared, both with regard to their substance and form; they were well attended and were spoken about in other schools. Physiology as a science was in its infancy. The lectures provided the material for Kirke, Paget’s pupil, to write his *Handbook of Physiology*, which many years later developed into Halliburton’s well-known textbook. Paget regarded the wardenship with a sense of responsibility towards the students. Hitherto in the school there had been little help or direction given them in their studies, but Paget advised them how to work and watched particularly those in college, suffering no idleness or dissipation. He confessed: “I feel almost as if I had thirty sons rather than pupils to watch over.” His care of them was reflected in their successes in the schools. In one winter session there came to him a batch of new students, among whom were (Sir) Jonathan Hutchinson, (Sir) Thomas Smith, (Sir) William Turner, and Elizabeth Blackwell, a rare vintage.

In 1884, he married Lydia, daughter of the Reverend Henry North, domestic chaplain to the Duke of Kent. She was a good musician who had trained under Crotch and Crivelli at the Royal Academy. They settled in the warden’s house; here their children were born; their married life was ideally happy. In 1847, Paget was elected assistant surgeon to St. Bartholomew’s Hospital. The same year he was appointed professor of anatomy and surgery at the Royal College of Surgeons. “It was a great and rare honour for the rule had been that some member of the Council should hold the professorship.” He was re-elected annually for 6 years. His lectures were based on the work he had done in the museum during the years he was writing the catalogue. They dealt with the general pathology of the principal surgical diseases and had the peculiar merit of describing the minute changes in disease tissues as revealed by the microscope. They were published in two volumes in 1853 and are among the classics of surgery. Two more editions appeared with the help of Sir William Turner, his old pupil.

In 1851, he resigned the wardenship and embarked upon private practice, settling at number 4 Henrietta Street, Cavendish Square, a house previously occupied by Sir Thomas Watson. His practice gradually increased until at last he had the largest surgical practice in London. This same year he was made a Fellow of the Royal Society; of the 15 candidates elected, he was the only one for whom the whole Council voted. Six years later, he gave the Croonian Lecture of the Society “On the Cause of the Rhythmic Motion of the Heart.” Early in 1858, he moved to number 1 Harewood Place, Hanover Square, where he remained for the rest of his professional life. In March, he was appointed Surgeon Extraordinary to Her Majesty, Queen Victoria. In 1861, he succeeded Stanley as surgeon to St. Bartholomew’s, and 4 years later was appointed lecturer in surgery; he had already resigned his lectureship in physiology. His surgical class soon became the largest in London. At this period he was working, even for him, harder than at any time in his life; there was scarcely any respite. In 1871, he had an alarming attack of blood poisoning contracted during a postmortem examination: at one time his condition was so desperate that his survival was very doubtful. When he recovered, he was warned to reduce his work. Submitting to this advice, he reluctantly resigned from the active staff of St. Bartholomew’s. He was passionately devoted to the hospital; his forced resignation was a grief to him. It was 28 years since he had been appointed warden of the college and during that time he had never ceased working for the hospital. He raised the standard of the school by his lectures and his vigilance of its affairs, so that students came to it in increasing numbers. And as a pioneer of surgical pathology, he enhanced the prestige of hospital and school. He was appointed consultant surgeon. Soon afterwards Her Majesty the Queen conferred a baronetcy upon him. Illustrious names have been associated with this most ancient of all British hospitals, there was none more illustrious than James Paget.
Although the hospital phase of his work was over, his wider fame was only beginning. During the 20 active years that remained to him, he achieved a position inside and outside the profession that had scarcely been attained by any surgeon before him. It was early in this period that he described the two diseases that have made his name familiar to every medical student.

Paget’s Disease of the Nipple

In 1874, Paget published a paper in St. Bartholomew’s Hospital Reports on “Disease of the Mammary Areola preceding Cancer of the Mammary Gland.” It was a short paper, even shorter than that other classic by Colles on fracture of the wrist.

I believe it has not yet been published that certain chronic affections of the skin of the nipple and areola are very often succeeded by the formation of scirrhous cancer in the mammary gland. I have seen about fifteen cases in which this has happened, and the events were in all of them so similar that one description may suffice. The patients were all women, various in age from 40 to 60 or more years, having in common nothing remarkable but their disease. In all of them the disease began as an eruption on the nipple and areola. In the majority it had the appearance of a florid, intensely red, raw surface, very finely granular, as if nearly the whole thickness of the epidermis were removed; like the surface of very acute diffuse eczema, or like that of an acute balanitis... But it has happened that in every case that I have been able to watch, cancer of the mammary gland has followed within at the most two years, and usually within one year. The formation of cancer has not in any case taken place first in the diseased skin. It has always been in the substance of the mammary gland, beneath or not far from the diseased skin, and always with a clear interval of apparently healthy tissue.

Paget’s Disease of Bone

In 1876, Paget wrote the most famous of all his papers, “On a form of Chronic Inflammation of Bones (Osteitis Deformans),” which was read before the Royal Medical and Chirurgical Society of London. It was an exhaustive and complete description of the disease; detailed postmortem findings with results of microscopical examinations of the diseased bones were given. He noted the evolution of the disease in a patient during the 20 years from its early manifestation to its termination by sarcoma of the radius.

I first saw this gentleman in 1856, when these things had been observed for two years. Except that he was very grey and looked rather old for his age, he might have been considered as in perfect health. He walked with full strength and power, but somewhat stiffly. His left tibia, especially in its lower half, was broad, and felt nodular and uneven, as if not only itself but its periosteum and the integuments over it were thickened. In a much less degree similar changes could be felt in the lower half of the left femur. This limb was occasionally but never severely painful, and there was no tenderness on pressure... The left femur and tibia became larger, heavier, and somewhat more curved. Very slowly those of the right limb followed the same course, till they gained very nearly the same size and shape. The limbs thus became nearly symmetrical in their deformity, the curving of the left being only a little more outward than that of the right. At the same time, or later, the knees became gradually bent, and as if by rigidity of their fibrous tissues, lost much of their natural range and movement. The skull became gradually larger, so that nearly every year, for many years, his hat, and the helmet that he wore as a member of a Yeomanry Corps needed to be enlarged. The shape and habitual posture of the patient were thus made strange and peculiar. His head was advanced and lowered, so that the neck was very short, and the chin, when he held his head at ease, was more than an inch lower than the top of the sternum. The short narrow chest suddenly widened into a much shorter and broad abdomen, and the pelvis was wide and low. The arms appeared unnaturally long, and, though the shoulders were very high, the hands hung low down by the thighs and in front of them. Altogether, the attitude in standing looked simian, strangely in contrast with the large head and handsome features. In January 1876 he began to complain of pain in his left forearm and elbow which at first, was thought to be neuralgic. But it grew worse, and swelling appeared about the upper third of the radius and increased rapidly, so that, when I saw him in the middle of February, it seemed certain that a firm medullary or osteoid cancerous growth was formed round the radius. Still the general health was good. After this time however, together with rapid increase of the growth upon the radius, there were gradual failure of strength and emaciation, and on the 24th of March, after two days of distress with pleural effusion on the right side, he died. Holding then the disease to be an inflammation of bones, I would suggest that, for brief reference and for the present, it may be called after its most striking character: Osteitis Deformans. A better name may be given when more is known of it.

But more than a century later, no more is known of the origin of the disease, nor of its cure.
Quiet Necrosis of Paget

Paget drew attention to the possibility of necrosis of bone occurring as the result of trauma without inflammatory reaction; he offered the same explanation for the presence of certain loose bodies in joints; pathological conditions that are also referred to as avascular necrosis and osteochondritis dissecans. In 1870, he read a paper before the Clinical Society of London on “A case of Necrosis of the Femur, without External Inflammation.” A woman aged 19 years was admitted to St. Bartholomew’s Hospital because of pain in the left knee.

What seemed more important was that a hard swelling, of which the patient knew nothing, surrounded the middle of the shaft of the femur. The swelling felt of nearly ovoid form about six inches in length, it was in every part very firm and tense, hard pressure on it was painful especially in its middle part . . . it might be due to her frequently breaking thick pieces of wood across her thigh . . . I made an incision about six inches long in the outer part of the thigh . . . All the textures cut through down to the outer surface of the periosteum appeared perfectly healthy; there was not in any of them the smallest sign of inflammatory change . . . . Between the periosteum and the bone the incision laid open a flattened irregular cavity from which a little blood-coloured fluid escaped and was followed by the protrusion of some soft substance like coarse granules. In this cavity which was from an inch to an inch and a half in diameter was a thin rough sequestrum, separated from the wall of the femur about an inch and a half in its diameter, a small prominent piece of bone, as if, with the cartilage a piece of the articular surface of the femur had separated. The borders of the loose body were smoothly rounded off . . . These loose bodies are sequestra, exfoliated after necrosis of injured portions of cartilage, exfoliated without acute inflammation.

Paget described certain fibromata, in connection with aponeuroses, fasciae, and tendons, which recur with shortening intervals after repeated removal. They became known as recurrent fibroid tumors of Paget. They should be regarded as fibrosarcomata, although secondary growths are rare. The pathology of tumors was of continuous interest to him. The name fibroplastic had been given to a certain bone tumor that on the continent had been separated from others as being different in kind. Paget proposed the name “myeloid” for this tumor because of its multinucleated cells and its origin from bone marrow.

He also contributed to our knowledge of tendon repair. In 1849, he conducted a series of experiments on rabbits. Contrary to the opinion of previous workers in this field, he concluded that extravasated blood and inflammatory exudate took no part in repair of a divided tendon. He maintained that a semi-fluid substance was exuded between the retracted ends of the tendon, which quickly organizes, forming a “nucleated blastema.” “In every experiment one finds cause for admiration at the manner in which a single well-designed and cord-like bond of union is thus gradually formed, where at first there had been a uniform and seemingly purposeless infiltration of the whole space left by the retraction of the tendon.”

A clinical lecture by Paget, on “Cases that Bone-setters Cure,” delivered in 1867, attracted considerable attention. He indicated the clinical type of joint that would benefit by manipulation, which should always be carried out under anesthesia. He concluded by saying: “Learn then to imitate what is good and avoid what is bad in the practice of bone-setters. . . . Fas est ab hoste doceri which is in no calling wiser than ours.”

During the last period of his professional life, Paget received all the highest honors. He occupied the chairs, at one time or another, of the Clinical Society, the Royal Medical and Chirurgical Society—and the Pathological Society—of London. He was elected to the Council of the Royal College of Surgeons in 1865 and was president 10 years later. His delivery of the Hunterian
Oration in 1877 was a memorable occasion. He spoke with amazing eloquence to an audience that included HRH the Prince of Wales, Gladstone, Dean Stanley, Lord Acton, Huxley and Tyndall. He paid tribute to John Hunter, who through no external advantage but through the force of his scientific mind, exercised a vast influence on surgery and made of it a profession commanding public respect. Paget was Bradshaw Orator in 1882, and for a time was Vice Chancellor of London University. In 1867 he became Sergeant Surgeon to Her Majesty the Queen. He reached the climax of his career in 1881, when he was president of the International Congress of Medicine held in London in that year. Those taking part in the discussions included Pasteur, Virchow, Charcot, Esmarch, Koch, Langenbeck, Völkmann and Ollier. The inaugural address of Paget was impressive.

His sound knowledge of morbid anatomy and his stress on the scientific basis of surgery made him a link between John Hunter and modern surgeons. His tact, courtesy, integrity and great eloquence made an appeal to the social world, where he counted as his friends leading figures of church and state in Victorian England. He was the recipient of honorary degrees from many universities, and was an honorary member of several scientific societies at home and abroad. He retired from practice in 1893 and went to live at number 5 Park Square West, Regent’s Park. Here he died on December 30, 1899. He held settled religious convictions all his life; in the last hours of consciousness he received Holy Communion from his son the Bishop of Oxford. The first part of the funeral service was in Westminster Abbey, where he had borne the pall for Tennyson and Browning. He was buried in Finchley Cemetery.

Sir James Paget was one of the greatest of English surgeons. By precept and example he exercised an immense influence among surgeons of the Victorian era and he handed on the torch of scientific surgery, which was lit by John Hunter.

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Ambroise PARÉ
1510–1590

Ambroise Paré was the greatest surgeon of his century. He was born in Laval in northern France, where, it is thought, his father was valet de chambre and barber to a nobleman. At the time, barbers customarily performed such surgical procedures as blood letting. Paré’s older brother was a barber–surgeon, and his sister had married a barber–surgeon. Poorly educated and knowing neither Latin nor Greek, but nonetheless ambitious, Ambroise Paré became a barber–surgeon through apprenticeship; he then served for 3 or 4 years as a “house surgeon” in L’Hôtel Dieu in Paris. His subsequent medical career was spent alternately on the battlefield with the French army during the interminable wars of the period and in practice in Paris during the frequent lulls in fighting.

Because of his intelligence, skills, and personality, Paré rose to become the surgeon to four