MEDICAL PIONEERS IN SCIENCE

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THE recently elected President of the Royal Society, Sir Frederick Gowland Hopkins, is "a medical man" in the sense that he possesses a medical degree. Since the death of Newton in 1727 there have been nine Presidents of the Royal Society who have held medical degrees, namely:[1] Sir Hans Sloane, Bart.; Sir John Pringle, Bart.; William Hyde Wollaston; Sir Benjamin Brodie, Bart.; Sir Joseph Dalton Hooker; Thomas Henry Huxley; Joseph, Lord Lister; Sir Charles Scott Sherrington, and Sir Frederick Gowland Hopkins. The election of these men to the presidency of the Royal Society was on grounds far removed from the fact that they held medical degrees, but it may be interesting to enquire who and what manner of men they were and are who, by the votes of their peers in science, were enabled to sit in the chair of Newton — the highest scientific extra-academic honour obtainable in the English-speaking world.

As regards their professional occupations, two, Brodie and Lister, were surgeons; one, Wollaston, was a chemist and physicist; one, Hooker, was a botanist; one, Huxley, a biologist in the widest sense of the word; Sir Charles Sherrington is a physiologist, and Sir Gowland Hopkins a biochemist, so that only two, and these the first two, were practising physicians. As to racial descent; Pringle was of pure lowland Scottish ancestry, Sloane was Scoto-Irish, and the remaining seven English. Not one of the deceased Presidents died in office. One of the nine Presidents was created a peer, Baron Lister of Lyme Regis, the first medical man to be raised to that dignity; three were baronets, Sloane, Pringle and Brodie; three were knights, Hooker, Sherrington and Hopkins; and two, Wollaston and Huxley, had no title. Sloane was the first medical man to be made a baronet.

The lengths of the periods during which the eight past medical Presidents held office have varied from fourteen years to two, always excepting the exceptionally short tenure by Wollaston. Sloane was in office fourteen years, Pringle six, Hooker, Lister and Sherrington each five, Brodie three and Huxley two. Of the nine Presidents, all except Wollaston were married, Sir Joseph

1. Lord Kelvin, President from 1890 to 1895, did hold the honorary degree of M.D. from the University of Heidelberg (1886), but it would be pedantic to call Lord Kelvin a "medical man".

Hooker, twice. Of the seven deceased Presidents, who were married, only two, Pringle and Lister, had no children.

Hans Sloane, who was elected President on the death of Sir Isaac Newton in 1727, was one of the best known and best liked medical men of his time. He amassed a large fortune that enabled him to form a library and a collection in Natural History which together became the nucleus of the British Museum. His practice was very large; he was consulted personally and by letter by physicians in every corner of England and Wales. It was he who gave to the Society of Apothecaries the ground for "a physic garden" at Chelsea, a place still in existence where his statue by Rysbrack may yet be seen.

Descended from a family of Scots living in Ulster, he was born in County Down on April 16, 1660. About the age of sixteen, after an attack of haemoptysis, deciding to study medicine abroad, he went over to Paris and ultimately as far south as Montpellier. But the University of Orange was to be his Alma Mater, for there he graduated M. D. in 1683.

On his return to England in that year, Sloane went to live with the celebrated Dr. Thomas Sydenham, "the English Hippocrates." Within two years he was elected into the Royal Society, and in two more admitted a Fellow of the College of Physicians.

The great event of his life was his visit to Jamaica in 1687. He went to the West Indies as physician to the Duke of Albermarle, Governor of Jamaica, and during his fifteen months' stay in those islands studied the plants and other natural objects to such good purpose that he returned to England in 1689 with about 800 specimens.

In 1693 he was elected Secretary of the Royal Society, an office he held for 19 years. On April 3rd, 1716, George II conferred on him the honour of a baronetcy. The work on which his European fame rested came out in 1698—*Catalogus Plantarum quae in Insula Jamaica sponte proveniunt aut vulgo coluntur.* Fourteen years later, Sir Hans published his—*Voyage to the Islands of Madera, Barbadoes, Nieves, St. Christophers and Jamaica, with the Natural History of the Last,* dedicated to Queen Anne. The second volume, dedicated to King George I, appeared in 1725. As early as 1708, Sloane had been elected one of the eight foreign members of the French Academy, but his crowning honour was election to the Presidency of the Royal Society in 1727.

Probably no such eminent medical man wrote so little on professional topics, for his only published medical work is a tract of seventeen pages on "An account of a most efficacious medicine

for soreness, weakness and other distempers of the eyes." It extols the virtues of "viper's grease," a substance not even discovered by himself, but by one Dr. Luke Rugeley. Neither was Sir Hans an innovator in medical practice; when called to the death-bed of Queen Anne he could suggest nothing more original than bleeding. He was, however, very much concerned about the prevalence of small-pox, so that he adopted the then new practice of inoculating the virus of that disease, and even persuaded some members of the Royal Family to submit to this now obsolete form of prophylaxis.

It is, however, as one of the founders of the British Museum that he is best known. In his will (1749) he left his vast collections to the nation, on condition that £20,000 was paid to his family. When George II was told of this, he said he doubted if there was £20,000 in the Treasury, and if there was, he had to buy gunpowder with it.

In 1753 an Act of Parliament was passed which empowered the nation to purchase Sloane's museum, and appointed certain trustees of whom one was Horace Walpole. In the next year, the trustees bought Montague House and placed therein not only Sloane's treasures but also the Cottonian and the Harleian manuscripts. He had had his collections around himself in the Old Manor House of Chelsea, a place originally built by Sir Thomas More, which had sheltered Erasmus when his guest was on his visit to England. Here Sir Hans died after three days' illness on January 11th, 1753, in the ninety-second year of his age. He was buried beside his wife in the churchyard of Chelsea old church by the side of the Thames, under a stone urn, the work of Wilton. Time has dealt unkindly with this elegant monument, for its inscription is now almost illegible.

In private life Sloane's hospitality was conspicuous; he was generous to poor patients, and ever ready to join in any movement for social amelioration. Thus he was one who helped to institute the Founding Hospital, and he was a promoter of the Colony of Georgia (1732).

Pope's lines are almost too well known to quote:

> And books for Mead and butterflies for Sloane:

and

> Or Sloane's or Woodward's wondrous shelves contain.

One portrait by Kneller is at the Royal Society, another is at the College of Physicians, and a third, given by himself, is in the Bodleian Library at Oxford.

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After an interval of thirty-one years, the Presidential Chair of the Royal Society was once more filled by a medical man and a baronet, Sir John Pringle, M.D.

Though Pringle's practice never attained to anything like the size of Sloane's, he was a very much more important person in the realm of scientific medicine. He has been called "The Father of Military Hygiene," and his laboratory experiments on antiseptic substances were the first on this now extremely important subject. Like Sloane, he was a favourite at Court, and like Sloane too he was elected one of the eight foreign members of the French Academy.

John Pringle, the youngest son of Sir John Pringle of Stitchell, was born at Stitchell House in Roxburghshire on April 10th, 1707. After a short time at St. Andrews, he went to study Medicine under the celebrated Boerhaave at Leyden, where he graduated M.D. in 1730. Having returned to Scotland, he was appointed to the Professorship of "Pneumatics and Moral Philosophy" in the University of Edinburgh. But Medicine had marked him for her own.

Pringle had evidently friends in high places, for his next appointment (1743) was that of physician-in-chief to the Military Forces in Flanders under the command of the Earl of Stair. Later he was made physician-in-chief to the military hospitals of Flanders, in which capacity he was present at the Battle of Dettingen. In passing through London with the Duke of Cumberland en route to Culloden in 1745, he was elected a Fellow of the Royal Society.

He tells us that while he was in Flanders, Lord Stair achieved that fine piece of work in the interests of humanity, namely the agreement by both sets of combatants to recognize all military hospitals as neutral. The French commander-in-chief readily agreed to this, and so the seeds of the Red Cross movement were sown. How horrified these men would have been had they lived through the Great War!

After the Peace of Aix-la-Chapelle, Pringle returned to London and immediately engaged in private practice, being doubtless much helped therein by having been appointed physician-in-ordinary to the Duke of Cumberland. It was during the next few years that he made his series of careful experiments into the nature of antiseptics.

Pringle was searching for substances which would act as antiseptics when taken internally in such diseases as were then called "putrid fevers." The real nature of putrescence being unknown, he believed that it could go on within the living body and could be subdued by appropriate drugs. He experimented with a

large number of chemical substances, observing their retarding or other influence on materials decomposing in corked bottles. Before we scorn the crudity of Pringle's experiments, we must remember they were made 21 years before oxygen was discovered, and 100 before the microbic origin of putrefaction was demonstrated. For his researches into "septics and antiseptics," he was awarded the Copley medal of the Royal Society.

Sir John Pringle has been justly called "The Father of Military Hygiene." This title he won through having been the first medical man to study systematically not only the diseases of the army in the field but also those in times of peace. His book, "Observations on the Diseases of the Army" (1752), is the first systematic treatise on Military Hygiene. His continental fame rested on this work. In 1766 he received the honour of a baronetcy of the United Kingdom at the hands of King George III, the title in his family having been only a baronetcy of Nova Scotia. In 1778 Sir John Pringle resigned the presidency of the Royal Society after a tenure of six years, to be succeeded by the celebrated Sir Joseph Banks.

Pringle, who had always been interested in the great scourge of his day, jail-fever, ship-fever, or as we now call it, "typhus," was associated with the Rev. Dr. Stephen Hales in installing Hales's ventilator at Newgate prison. A very short time after this contrivance had been in action, there was a notable reduction in the number of cases of jail-fever at Newgate.

Though he had enjoyed the society of his learned and scientific friends in London, he thought he would like to go back to Edinburgh and there renew the friendships of his youth. But he had not reckoned with time, which had not spared even the ornaments of the "Modern Athens." Disappointed to find almost all his friends dead, he returned to London where he died on January 18th, 1782.

Sir John Pringle was buried in St. James's, Piccadilly; but a fine mural monument by Nollekins was erected by his nephew to his memory in the south transept of Westminster Abbey.

He was a man possessed with a desire for the utmost truthfulness in all things, and was conspicuous for his moderation in speech. He was moderate in more than speech, for he once told Boswell that he had never once been intoxicated by alcohol in his life, which was more than Boswell could have said of himself.

Pringle married a daughter of Dr. William Oliver of Bath, inventor of the celebrated "Bath-Oliver" biscuit.

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The third President of the Royal Society to hold a medical degree was William Hyde Wollaston, a name second only to that

of Faraday in the record of important discoveries in physics and chemistry. Wollaston, who possessed both the degrees of M.B and M.D., had for some time practiced Medicine. It is, however, not as a medical man he is remembered to-day, but as a physicist, chemist, geologist and mineralogist.

William Hyde Wollaston, born in 1766, was one of the seventeen children of a clergyman in Norfolk! After four years at the Charterhouse, he left in 1778 for Caius College, Cambridge, where he graduated M.B. in 1788. Having attempted to practise in two places in the country, Wollaston came to London in 1797 only to relinquish his profession entirely. As early as 1794, at the age of 28, he was elected into the Royal Society.

After five years' research, he made his famous discovery of how to render platinum malleable, a discovery that brought him £30,000. In 1802 he was awarded the Copley medal; and from 1804 to 1816 he acted as Secretary to the Royal Society. On the death of Sir Joseph Banks in 1820, the council wished to elect Wollaston President, but he, knowing the ambition of Sir Humphry Davy to become President, very graciously decided to act as President only *ad interim* from June, 1820, until the meeting on November 30th.

Wollaston's extensions of our knowledge in both theoretical and practical physics and chemistry were extremely important. He discovered two metallic elements, palladium and rhodium, in platinum ore. He made the first reliable analysis of urinary calculi, discovering as "cystic oxide" what we now call cystin. He gave to Dalton's atomic theory considerable corroboration by rendering more precise the "Law of Multiple Proportions", while his concepts regarding atoms associated in a tri-dimensional relationship were the real origin of stereo-chemistry. In 1804 Wollaston found that explosions of coal gas will not pass through fine tubes, thus anticipating by fourteen years Davy's discovery of the miner's safety-lamp.

To physics he made some valuable contributions. He invented the very convenient *camera lucida,* a device which enables the drawing of a microscopic object to be made exactly to scale. It was through an effort to fix this *camera lucida* image that William Henry Fox-Talbot was led to his discovery of photography.

He invented periscopic spectacles, and in a posthumous paper described the combination of lenses for the "objective" of the microscope known as "Wollaston's doublet." As early as 1802 he saw the "Fraunhofer" lines in the solar spectrum, but totally misinterpreted their significance. Wollaston believed in the identity

of galvanic and frictional electricity, and increased the probability of the truth of the wave-theory of light. In 1821, ten years before Faraday, he observed that there was a "power acting circumferentially round the axis of a wire carrying a current."

Wollaston rendered valuable services to the Government of the day both on the Commission on Longitude, and in evidence before a House of Commons Committee (1814) on weights and measures, in the course of which he recommended the "Imperial Pint" of ten lbs. of water as a standard. He was a member of the Commission which *rejected* the adoption of the decimal system.

Wollaston made a few interesting observations in pure physiology. In his Cromian Lecture for 1809, he discovered the nature of the muscle-sound and showed that its auditory events follow each other at an interval of from one twentieth to one thirtieth of a second.

From observing after an illness that he suffered from half blindness in each eye, he inferred, what has been since proved, that the optic nerve in man undergoes a partial decussation. Wollaston, who never married, dictated a scientific paper from his death-bed. To some extent he resembled the bachelor scientist Cavendish in living in his laboratory for the love of his work. But he was by no means a misogynist recluse like Cavendish. Wollaston in his quiet way was a warm and generous friend to many. In the year of his death, 1828, he bestowed £1,000 worth of consols on the Royal Society for the furtherance of research. His disposition was calm and critical: his love of accuracy and fear of error so great that his friends called him "The Pope" because he strove after Infallibility.

He was once the guest of Sir Walter Scott at Abbotsford, where Lockhart has told us that his dignity while fly-fishing would have become a sporting archbishop.

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Sir Benjamin Collins Brodie, fourth medical President, who died sergeant-surgeon to Queen Victoria, was, in his day, the most celebrated surgeon in London, a man whose income at one time was £10,000 a year.

His father's family was of Scottish derivation. Benjamin was one of the seventeen children of the Rector of Winterslow in Wiltshire, where he was born in 1783. His father taught him Greek and Latin until at eighteen years of age he went up to London to study Medicine under Abernethy, and Anatomy at the Hunters' School, Great Windmill Street. Brodie was so industrious that as early

as 1803 he was appointed lecturer on Anatomy at this famous place. He soon became immersed in physiological problems raised by his study of the works of Bichât, then attracting a considerable amount of attention.

Between 1810 and 1814 he read four papers before the Royal Society, three of them having to do with the influence of the nervous system on animal heat and on the secretion of gastric juice, while the fourth was a study of the action of several vegetable poisons on the animal body, the famous (or, according to Tennyson, infamous), woorara (curare) being of the number.

These researches created so much interest that Brodie at the early age of twenty-seven was elected into the Royal Society (1810) over which he was to preside 48 years later. He served as President from 1858 to 1861, when he resigned through failure of his eyesight. In 1844 he had been President of the Royal College of Surgeons. It was largely through his expert evidence on poisons, at the trial of William Palmer of Rugeley for poisoning the young man Cook, that Palmer was convicted in 1856. In the realm of medical literature, Sir Benjamin is chiefly remembered as the author of a work on "The Pathology and Surgery of Diseases of the Joints" (1819).

High as was Brodie's skill in surgery, it was still higher in diagnosis. He assisted Sir Astley Cooper in removing a small wen from the scalp of George IV. That operation (trifling, as we think it to-day, thanks to Lister) gave Cooper the most acute anxiety lest erysipelas should supervene.

Brodie, who had the honour of being the first President of the newly constituted General Medical Council in 1858, and had been sergeant-surgeon to King William IV, was created a baronet in 1834.

Sir Benjamin was what would be called a strong character: he was an inveterate foe to quacks and quackery; he is said to have flattered no man, and to have been servile to none. He died at his country house of Broome Park in Surrey in the seventy-ninth year of his age (1862).

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The fifth medical President of the Royal Society was Sir Joseph Dalton Hooker, the botanist. He was born in 1817 at Halesworth in Suffolk, the second son of William Jackson Hooker, later Professor of Botany in the University of Glasgow. Joseph Hooker was educated in Glasgow, and graduated M.D. at the University there in 1839.

Having been appointed assistant-surgeon to the *Erebus* in Sir James Ross's antarctic expedition, he sailed from Chatham in September of the same year. On his return in 1843 he had material for six quartos, two on Flora Antarctica, two on Flora Novae Zelandiae, and two on Flora Tasmanica. From 1847 to 1851, Hooker and a Dr. Campbell were botanising on the northern frontiers of India, whence much additional material was brought home. In 1845 he was an unsuccessful candidate for the chair of botany at Edinburgh University, although Baron von Humboldt and the great botanist Robert Brown both gave him testimonials.

In 1847, at the age of thirty, Hooker was elected a Fellow of the Royal Society, and in 1855 he was appointed assistant to his father, the Director at Kew. From 1865 to 1885, Joseph Hooker was Director of those famous gardens. He was a great traveller; he visited Palestine, Morocco and the United States. His great works are the "Student's Flora of the British Isles", and the "Genera Plantarum" in which Bentham co-operated.

Hooker had been created a Knight Commander of the Star of India in 1847, and on the publication of his monumental "Flora of British India," he was made a G. C. S. I. The recipient of the Royal Copley and Darwin medals of the Royal Society, Hooker was elected President in 1873, and served for the recognized term of five years. It was during his presidency that the holding of the Ladies' Soiree was introduced.

As early as 1844, Darwin had confided in Hooker his views on Natural Selection, and he and Lyell were the first to induce Darwin to publish them. In his presidential address to the British Association at Norwich in 1868, Sir Joseph Hooker spoke strongly in support of the Darwinian hypothesis.

Four years before he died in 1911, he had been admitted into the Order of Merit, which was appropriate, for in earlier life he had received the Prussian Order "Pour le merite."

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Of our nine Presidents, the name of Professor Huxley in all probability is by far the best known to the so-called "man in the street." For one person who has ever heard of Wollaston or Pringle, there are tens of thousands who have heard of Huxley. The name of Thomas Henry Huxley, the great protagonist of the doctrines of Darwin, is known in every quarter of the globe; and whereas in scientific circles he was admired for his fearless advocacy of what he believed to be the truth as it is in biology, in circles known as "orthodox" he was regarded as the veritable "man of

sin." With the name of Huxley will always be associated those of Darwin and Tyndall in a sort of unholy triple alliance.

Thomas Henry Huxley, who was the youngest surviving of the seven children of George Huxley, a schoolmaster at Ealing, was born there on May 4th, 1825. Deciding to study Medicine, he went to the Charing Cross Hospital Medical School, where he had Wharton Jones for his lecturer in physiology. This teacher made physiology so interesting and the pupil worked with such success, that Huxley discovered a hitherto undescribed sheath in the human hair, and on it he wrote his first paper in 1845. In that year he graduated M.B. at London University, and in October of the next was gazetted surgeon to H. M. S. *Rattlesnake*, an old frigate commissioned to explore the waters adjacent to the Barrier Reef of Australia.

Huxley was the naturalist; and he has left an amusing account—for his sense of humour was very keen—of the meat-cover which the cook gave him in lieu of a strainer, of the water and cockroaches in his cabin, of the scurvy due to the food, and of the occasions when his half-finished dissection of some marine creature would be thrown overboard as a "mess." But the *Rattlesnake* did for Huxley what the *Beagle* did for Darwin, and the *Erebus* for Hooker—enabled him to interrogate Nature at first hand. Huxley did this to such purpose that on his return he was able to send to the Royal Society a splendid monograph on the "Oceanic Hydrozoa" illustrated with 25 Plates.

In 1851, at the very early age of 26, Huxley was elected a Fellow of the Society over which 32 years later he was to preside. He seems to have taken the whole field of living Nature for his province; he was a zoologist, a physiologist, a geologist and a palaeontologist all in one. And he was no mean psychologist and "philosopher", as his "Life of Hume" testifies.

It would be tedious to give even the titles of all the books and articles which Huxley wrote; some of them "dry" systematic works on comparative anatomy, others, his later ones, fascinating discourses on everything from a piece of chalk to the "Gadarene swine."

Having been an unsuccessful applicant for four university chairs, Huxley was appointed in 1854 Lecturer on Natural History at the School of Mines, Jermyn Street, at a salary of £200 a year, about the tenth part of the pay of an hotel chef. His financial success at this time was in the inverse ratio to his scientific. In 1858 he lectured before the Royal Institution, and in the same year was elected into the Athenaeum.

The realm of the intellect has never been quite the same since November 24th, 1859, the day on which Darwin's *Origin of Species* was sent forth by the Murrays from Albermarle Street to disturb the whole world. The meeting of the British Association in Oxford in the following summer was the occasion of the ever memorable debate between Bishop Wilberforce and Huxley about the relationship of men and monkeys. The bishop, in a speech which has been described as "fluent, florid, unfair and jejune," asked Huxley whether it was through his grandfather or his grandmother that he claimed simian descent. Huxley's precise reply will never be known, because it was drowned by the applause, but it was to the effect that he would rather be descended from an ape than from a man of education who had prostituted his talents to obscure the truth. Huxley never sought but never shrank from a controversy. One was with Sir Richard Owen, who would never admit his error regarding a structure in the brain of the monkey. Huxley's vigorous articles in the *Nineteenth Century* in the controversy with Mr. Gladstone about "the bedevilled pigs" are still fresh in the memory of some of us.

His lecture on a Sunday evening at Edinburgh on the "secular" subject of Protoplasm raised a storm at the time, but his definition of it, as "the physical basis of life," has never been bettered. In 1869 he coined the word "agnosticism"; and as President of the British Association at the Liverpool meeting in 1870 he gave a memorable address on "Biogenesis and Abiogenesis."

His literary industry was prodigious: he wrote 31 books, 88 essays and 179 scientific memoirs.

His "Lessons in Elementary Physiology" have been re-issued more than 32 times. Huxley was a graduate of ten universities, and a member of 76 learned societies at home and abroad.

He *was* the science of the nineteenth century, as Louis the Fourteenth declared himself to be the State.

Huxley put science in her right place in the educational scheme of his country. He told a distinguished company at South Kensington on the unveiling of the statue to Darwin that "Science commits suicide when she adopts a creed." Huxley ushered in the era of the official recognition of science within the British Dominions: he found science a Cinderella, he left her a Princess.

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Joseph Lister, the seventh medical President of the Royal Society, was the man who found surgery a dangerous art and left it a safe science. Lister's life was devoted to a study of two things—

why the vast majority of wounds in healing became foul and painful, and *how* that dangerous state of matters might be prevented. Pasteur had shown in the years following 1857 (though Lister did not *then* know it), that putrefaction was only one kind of fermentation in organic matter. Decomposition of dead material was Nature's method of getting rid of corpses, but when it went on in wounds trying to heal, it poisoned the patient to a more or less serious extent. The decomposition of the pus and other discharges from open wounds (sepsis) was the perfect bugbear of mid-Victorian surgery, and nowhere so much so as in the hospitals. Lister, coming to know in 1865 of Pasteur's discoveries, at once saw that if the micro-organisms of disease could be excluded from wounds, there was nothing to prevent these healing by the so-called *vis medicatrix naturae.* Sepsis evidently called for antisepsis, and in carbolic acid Lister found an antiseptic with more to recommend in it than to condemn in it.

Joseph Lister was born of a Quaker family at Upton in Essex in 1827. His father, a Fellow of the Royal Society, was a wine merchant by day and a skilful microscopist in the evening. Young Lister never had to worry about making a living.

He took a leisurely course of study in Medicine at University College, where Sharpey the physiologist and Wharton Jones were among his teachers. Once more, Wharton Jones was lecturing to a future President of the Royal Society. At the age of 25, he graduated M.B. (London), and took his Fellowship of the Royal College of Surgeons. While still a student, Lister had done some excellent original work in histology. He was advised to go to Edinburgh and "see the practice of Mr. Syme." He saw more than that, for Agnes Syme became Mrs. Lister.

He had already begun to study the clotting of blood and inflammation, subjects the physiology of which was in the most lamentable state of confusion. In 1860 the Crown appointed him Regius Professor of Surgery in the University of Glasgow, the same year in which he was elected F. R. S. At Glasgow, Lister had charge of a ward in the old Royal Infirmary where wound diseases were accepted as a matter of course. It distressed this cultured, tender-hearted Englishman to see so much foulness, pain and death regarded as inevitable by the most enlightened surgeons of his day. He would not so regard it. Building on the sure foundation of the germ theory of Pasteur, he aimed at excluding the germs of putrefaction from every open wound, with the result that sepsis disappeared from his ward as though by magic. In the wards all round there was the same old stench, pus, pain and high death-rate.

Lister's ward was just as dirty, badly ventilated and overcrowded as those of his colleagues, but "oh the difference" to the people in the beds! Compound fractures for the first time in human history healed as perfectly as those under the unbroken skin.

In 1869 Lister was appointed Professor of Clinical Surgery in the University of Edinburgh, and in the old Royal Infirmary he repeated the successes of the Glasgow period. Here he had as a private patient W. E. Henley, the poet, who has left us a portrait of "The Chief" as faithful as it is charming.

In 1877 Lister was invited to succeed Sir William Ferguson at King's College, London. The contrast here was painfully evident: he left his worshipping students in Scotland in tears, only to find himself in the most intellectual city in the world confronted with an exhibition of the indifference of a massive professional mental inertia. But, though a gentle spirit, Lister was not a weak one; he worked away at perfecting his antiseptic system, and for the first time since the world began emancipated his fellow creatures from the haunting incubus of an intolerable plague.

Of course honours flowed in. He was made a baronet in 1883 by Queen Victoria, upon whom he had at one time operated antiseptically. In 1897 he was caused to adorn the peerage by being raised thereto with the title of Baron Lister of Lyme Regis. He completed the full term of five years as President of the Royal Society from 1895 to 1900.

As has happened so often before in similar cases, Lister's teaching was adopted abroad earlier and with greater conviction than at home. His tour through Germany in 1875 was a triumphal progress.

Of course he had forerunners, who has not? When in 1883 he heard of Semmelweis (who died in 1865), he at once acknowledged him a sapient worker in the same field. But Lister did what no one else did, built the success of antiseptic surgery *confessedly* upon the validity of the "germ theory" of Pasteur. Every child born to-day, every open wound from a scratch to an appendectomy that heals cleanly, every barber who sterilises his brushes, is a testimony to the efficacy of "Listerism". In Lord Moynihan's exquisite paraphrase, "Lister *opened* the gates of mercy on mankind."

The character of Joseph Lister was about as noble as we are likely to see embodied on this imperfect planet; for he was learned, dignified, gentle, courteous, strong, industrious and modest. Attacked by ignorance and prejudice, he never retaliated.

He died at Walmer on February 19, 1912, and was buried by his own request in the West Hampstead cemetery.

A portrait medallion by Brock has been placed in the Abbey. As the Listers had no children, the peerage became extinct.

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The eighth President to hold a medical degree is Professor Sir Charles Scott Sherrington, M.D. (Cantab)., O.M., of the Chair of Physiology at Oxford University, where he succeeded Professor Gotch in 1913. Sir Charles, who was President from 1920 to 1925, is one of the greatest living physiologists, and in the realm of the nervous system *facile princeps*. He has investigated by beautifully delicate modern methods the most intricate problems which the physiology of the nervous system presents. A superb experimentalist, he has added immensely to our knowledge of the functions of the brain and of the spinal cord, embodying some of these results in a work, "The Integrative Action of the Nervous System", which is already a classic. In his scientific papers his literary style is condensed and full of highly technical terms, many of which he has himself devised. Sir Charles Sherrington, who had studied at Caius College, Cambridge, was from 1895 to 1913 Professor of Physiology in the University of Liverpool. Before that he had been lecturer on physiology at St. Thomas's Hospital, London.

It would be difficult to say where Sir Charles's reputation is highest, at home, on the Continent, or in America, for he has received every honour which the two hemispheres have to bestow. Yet to meet him or hear him speak, one might think he had discovered nothing of any importance. As a matter of fact, he has added enormously to our store of natural knowledge.

He is a Doctor of Science of five Universities, and an LL.D. of ten. The mere names of all the learned foreign societies to which he has been elected would fill this page. Sherrington has been Silliman Lecturer at Yale University, Page May Memorial Lecturer at the University of London, and Durham Lecturer at Harvard University.

In 1927 he delivered the Second Lister Oration before the Canadian Medical Association at Toronto. Sherrington has served on several Government and Home Office committees where his expert knowledge about vision, fatigue, tetanus and alcohol has been invaluable.

It would be entirely misrepresenting his qualities to make out that he is but a very deft experimental physiologist, for in point of fact his interests range over far wider fields. He not only knows the history of biology, but amongst the great thinkers of antiquity he has his "spiritual home." Above all, he is a poet in the truest

sense of the word, and if that can be said of a man, then all is well with him, aesthetically speaking.

Sherrington's outlook on life and knowledge is that of the poet and philosopher. He refuses to see any essential antagonism between Science, Literature and the Fine Arts. His own intellect is large enough and vigorous enough to wrestle with the hardest problems in the Science of Life without having to forego any of the enjoyment of the beauty and the wonder that is in the world. The texture of Sherrington's mind is as fine as it is strong.

In 1925, Sir Charles published a small volume, *The Assaying of Brabantius and other Verse*, proving, if indeed that required to be proved after we had Sir Ronald Ross's poetical writings, that the most exact man of science can also be one of the sweetest singers.

Such lines as these in the sonnet, "Noon's Silences"—

> The hand-clasped silence of a lover's hour
> Wordless lest word tear lips from lips away

are exquisite, for not only do they palpitate with vigorous emotion, but they reveal a sympathy with youthful human life as intense as it is genuine.

The man of science is here lost sight of in the true lover of beauty, the delicate artist in words.

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The latest President, elected last November, Sir Frederick Gowland Hopkins, is the ninth medical man in our series. He is a Londoner born, but has made Cambridge his (chemical) home.

Almost everyone by this time has heard of "vitamins": they were adumbrated by Hopkins in 1912.

This is not the place to retell the story of his discovery of them, but the idea underlying these "accessory food factors," which was Hopkins's original name for them, is briefly this. When rats were fed on food sufficient in quantity to make good their wear and tear, and also to supply them with the requisite amount of heat, they did not thrive if that food had been made unnaturally or artificially "pure". In other words, on a "chemically pure" diet these rats did not grow up properly, and they became liable to disease. But when Hopkins added a mere trace of fresh milk to their food, the animals began to revive and started to grow again.

Sir Frederick called the unknown substances, which even in infinitesimal quantities made such a great difference to the rats, "accessory food factors." The meaningless and barbarous word "vitamin", for which he was not responsible, is a veritable, verbal, etymological Melchisedec.

Sir Frederick Hopkins is a bio-chemist, an exponent of that comparatively new science composed of chemistry and physiology which used to be called physiological chemistry when some of us were young, and which did not exist when some of us were younger. He has been Professor of Biochemistry in the University of Cambridge since 1914, and is head of the great institute of bio-chemical research endowed there by Sir William Dunn, for Sir Frederick is a great inspirer of work in others.

His eminence in bio-chemistry has been fully acknowledged in his own and in other countries. He was elected F. R. S. as far back as 1905, and has already been awarded two of the Society's highest honours, the Royal medal and the Copley.

In 1920 the President was asked to deliver the Huxley Memorial Lecture in London, and in 1921 the Herter Lecture in New York.

Sir Frederick was Cameron prizeman at the University of Edinburgh in 1922, and in 1929 he was awarded the Nobel Prize in Medicine—the highest honour of its kind, for though it is bestowed by Sweden, it is open to all the world.

His modesty is as conspicuous as his knowledge is deep. Perhaps no living "celebrity" in science has kept so consistently *out of* the lime-light.