see as particularly important. The company could be profit led (any drug would do, provided it raised money), disease led (focusing on drugs that target a particular disease, tuberculosis perhaps), or drug led (developing biotech products, or drugs from products now used as folk or herbal medicines, for example).

What might be the advantages or disadvantages of the virtual company?

The drug industry is made up of a few vast companies which reside in definable and tangible bases ("homes"), which, by and large, have identity, stability (staying power capable of long term investments), and familiarity (including their foibles); they tend to produce perhaps dozens of drugs, have a vast science base, have an unsurpassed worldwide sales network, and have some shared understanding with both doctors and society at large. Over the years the roles and responsibilities of drug companies have been defined in law and practice, as have their financial arrangements (public company status), which bring with them the openness (albeit limited) that the business world demands.

Virtual companies would be very different. Gone would be any dividend arising out of stability and familiarity, any advantage from having a dedicated science force working to a recognised process, any insights arising from any shared understanding, and we could find ourselves dealing with a myriad new companies producing only a few products. In the new order, society would have to revise the ways it might influence the companies. Instead of lobbying shareholders and the financial sector, we would, for instance, have to lobby the venture capitalist, and this would require new insights and understanding. But in return, a more dynamic and imaginative drug producing process could result, the overpowering and stifling influence of drug companies on governments and policy makers would be lifted, and the price of medicines should fall.

Competing interests: None declared.

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doi 10.1136/bmj.39055.610764.47

Sir Victor Horsley—an inspiration

Michael Powell

Introduction

You probably know nothing of this extraordinary late Victorian and Edwardian age surgeon, but you should. Horsley contributed on so many different fronts: pioneering neurosurgeon, ardent experimenter, medical politician, social reformer, and author. If you ever need a doctor as a role model, a medical figure of international importance who was also a vocal social conscience, look no further.

By the age of 29, Horsley was a fellow of the Royal Society and had become the first surgeon in the world appointed to a hospital post as a "brain surgeon," with an impressive series of operative firsts to his name. He had confirmed the cause of rabies and helped to abolish the disease from the United Kingdom, and he had researched and published widely on many anatomical and physiological topics.

By his early death at 59, he had reformed the British Medical Association (BMA), Medical Defence Union (MDU), and the General Medical Council (GMC). He had also attempted and failed to reform the Royal College of Surgeons of England (no change there). He had espoused many radical socialist causes, pushing a somewhat reluctant medical establishment into supporting National Insurance, and making himself thoroughly unpopular supporting such issues as votes for women.

A brief historical overview

Horsley was born into London's artistic aristocracy in 1857. His father was a painter, a royal academician,

who invented the Christmas card in 1843. His grandfather was a composer; his aunt inspired the composer Felix Mendelssohn. The house where he was born, in Camden Hill, Kensington, was a small artist's colony: artists Holman Hunt and Edward Lear, the water colourist who taught Queen Victoria, lived there. Horsley was named by the Queen, who became his godmother. He shared his birthday with her youngest child, Princess Beatrice.

By the time he entered London's University College Hospital (UCH) as a medical student, medicine and particularly surgery were at a turning point. The effects of ether had already been demonstrated in 1846 and Lister had described his antiseptic principles, although in the late 1870s they were not universally accepted. Two of Horsley's relatives taught at UCH. One, Marcus Beck, made Horsley a disciple of Listerian principles.

At UCH, he stood out. A vigorous and persuasive debater, he remained furiously argumentative throughout his life. He was already fervently against smoking and alcohol. He won many prizes, particularly in anatomy, and published several papers. Restless and energetic, with a head he described as "boiling with ideas," he qualified in 1881.

At the nearby National Hospital in Queen Square physicians were laying the foundations of modern neurology, among them Sir William Gowers,

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BMJ 2006;333:1317-9

Sir Victor Horsley, FRS (1857-1916)

A study in facial adornment—staff at the Institute of Neurology and the National Hospital for Neurology and Neurosurgery in 1906 with Horsley in the centre

Charlton Bastian, John Hughlings Jackson, and Sir David Ferrier. The young Horsley worked with them as a medical student.

He did animal experiments on topographical neuroanatomy and on qualifying was appointed as professor superintendent to the Brown Institution. This was the university's animal experimental workshop, where he continued his experimental studies. At UCH, he was also both the surgical registrar running surgery and assistant professor of pathology.

About this time, the first brain operations were taking place. They were considered highly controversial, almost akin to vivisection. The pioneers were Sir William Macewen in Glasgow in the late 1870s, who operated mainly on abscesses and who had removed a superficial meningioma, and Sir Rickman Godlee, whose single attempt at operating on a glioma was followed by the patient's death from infection a month later. When the Queen Square board decided to appoint its own surgeon, the obvious choice was Horsley.

Appointed in February 1886, he immediately left for Paris to research rabies with Pasteur. On his return, he started his career as a neurosurgeon by excising an epileptic scar. By the end of the year, he had performed 10 cranial cases, with only one death—a boy with a cerebellar tumour who was moribund at the time of operation.

His surgical career was prolific. By 1900 he had reported a series of 44 operations for gliomas, the earliest pituitary operations, procedures on spinal tumours, and a process for managing malignant brain swelling. His final and possibly greatest surgical achievement was to invent with Robert Henry Clarke a machine allowing accurate localisation within the skull cavity. Originally used only in animals, the stereotactic frame is now used in patients whenever pinpoint accuracy is needed—for biopsies, brain stimulation, creating lesions in patients with movement disorders, and radiotherapy. He also continued his general surgical career at UCH, where he became professor of surgery in 1902.

All through this he was occupied with his experimental work with Charles Beever and Clarke and with medical politics. Latterly, he became embroiled in a number of national issues and tried unsuccessfully to stand as a Liberal member of parliament in several constituencies. His radical views, particularly his vocal support for the suffragettes, made him unelectable.

At the outbreak of the first world war Horsley was an officer in the Territorial Army. Though he had done extensive experiments on wounds, shock, and fluid

replacement, the army had no use for this controversial figure. After a frustrating month in France, he went to Egypt and then on to Mesopotamia, where the medical care was poor. He succumbed to heat exhaustion and died near Basra.

Horsley as a character

Undoubtedly, Horsley was extremely eccentric. If he could see no reason for a convention, he would reject it completely, particularly the then standard doctor's uniform of tail coat and top hat; it prevented him cycling around London seeing his patients. He also disliked stiff collars, which he deemed "unhealthy"; photographs show him in wide soft collars.

While he was unfailingly courteous to his patients and his juniors, he was almost unfailingly rude to his contemporaries. He was devoted to his wife, who acted as his secretary and shared his opinions. He adored children, particularly his own; unlike other Victorian fathers, he allowed them to play noisily in his office as he worked. His letters to his daughter from the Middle East are full of warmth and humour.

He loved gadgets and was an early user of the bicycle. Later an enthusiastic motorist, he preferred to drive himself rather than use a chauffeur. On holiday, he would make extraordinary expeditions to visit architectural attractions covering distances that are ambitious even today.

Horsley had an extremely strong egalitarian social conscience—race, sex, or social status were unimportant to him. He is notable for his support of an outstanding young physician, James Risien Russell, who was of mixed race. Horsley's powerful letters persuaded Sir William Gowers and the board to appoint his protégé to the next consultant neurologist post at the National Hospital—surely the first Afro-Caribbean consultant appointment in the UK.

Horsley as scientist

Throughout his professional life Horsley was an ardent investigator—an archetypal "surgeon scientist." He had exceptional ability to devise experiments to answer the questions that he was concerned with. He left a huge body of work with books, papers, and addresses on many subjects including science, politics, and history.

Horsley's interests ranged wide, and he pushed others into publishing research he had encouraged. He experimented on the thyroid and pituitary glands and worked with Sir Felix Semons on the innervation of the larynx. (The result was Semons' law, which defines the movement of the larynx.)

Horsley as surgeon

Horsley's contemporaries noted his astounding surgical confidence and operating speed, but also his care near delicate structures, a result of his supreme neuro-anatomical knowledge. While clearly an exciting and inspirational man to work for, Horsley lacked the patience to take a young surgeon through a case, though he gave them the confidence to tackle difficult cases. He didn't leave a clear "school" as his younger contemporary, Harvey Cushing, unquestionably did, though he left several devoted trainees in the UK, Europe, and the United States.

Unfortunately, the best known description of his surgical skills is a derogatory one from Cushing, who was an extremely slow, methodical surgeon who obsessively chased every bleeding point. In 1900 Cushing accompanied Horsley to a private house, where Horsley both anaesthetised and operated on a patient's trigeminal ganglion, all within the hour. The astonished Cushing claimed to have seen nothing but blood and swabs and wrote that "there was nothing of modern neurosurgery that he could learn from Horsley." The two were chalk and cheese: it's hard to see the patrician teetotal, non-smoker Horsley getting on with the forceful, brash, chain smoking American.

Although he established a number of neurosurgical operative principles, his surgical legacies are his enormous bone rongeurs and his wax, used to plug holes in cancellous bone.

Horsley as a reformer

With his strong sense of social justice, his incisive mind, and formidable debating skills, it is no surprise that Horsley changed much in society around him, particularly medical society. He started with the MDU, of which he became president in 1893. In Victorian times it pursued quacks. Horsley thought that this should be the duty of the GMC, and he used his position in the BMA to correct this in 1896.

His indictment of the president of the GMC was much discussed. This resulted in him being elected with a huge majority to the council of the GMC later that year. Here he quickly corrected the registration of medical practitioners but caused a stir by continuing to attack the ailing president, who died shortly afterwards. He promoted the idea of a single medical degree for the UK. His battles with other bodies relating to the registration of doctors continued, particularly with the representative of the Society of Apothecaries—"a

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handful of city grocers who have not a particle of medical education" were his words, a fine example of Horsley's lack of tact.

He was an ardent supporter of the BMA, through which he acted to promote his public health reforms. He urged reform here as well, becoming chairman of the constitution committee. A new constitution was submitted in 1900 and 1901 and eventually accepted in 1902 after vigorous debate.

Horsley died admired by some of his peers—Sir William Osler compared his achievements to John Hunter's, loved by his trainees and patients, but profoundly disliked by a legion of enemies and former friends with whom he had argued and insulted. His lack of professional interpersonal skills was his greatest failing. Despite being so gifted, he was unable to compromise and unable to accept another's point of view. But that was only part of the story.

When Horsley's astonishing achievements as surgeon scientist and reformer should have been celebrated—on his death in 1916—the world's attention was understandably elsewhere. Now, 150 years after his birth, we can start to set the record straight.

Competing interests: None declared.

doi 10.1136/bmj.39056.527407.55

A multicolour chart for doctors

Hanna Esser: When I was 5 years old I drew these two pictures for my dad, who is a general practitioner. That was six years ago. Ever since then, he's been coming home telling me what he uses them for. When somebody comes with a cough he asks them which colour the phlegm looks like and then he can tell them whether they need an antibiotic. When patients say that they have black poo my Dad asks them if it really is like the black square, and if it isn't, it's okay. When they say that they've got really dark urine he asks them to point to the colour and usually that's ok, too.

Gerhard Esser: For a long time my daughter has nagged me that she would like to present her pictures in the *BMJ*. I indeed use the chart often in discussions about suspected melaena and symptoms of jaundice. Sometimes I wish that there were more "shades of sputum," but acknowledging some green colour reassures most patients that their message has come across. I would like to suggest a similar chart throughout the NHS. This would help doctors to communicate about colourful conditions not only with patients, but also with professionals on the telephone.

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