



William Bayliss

The first lecture in this series was given by Sir Charles Lovatt Evans who had been Jodrell professor and head of the Department at UCL from 1926 to 1949. Entitled *Reminiscences of Bayliss and Starling* it was a beautiful account of a world long lost, even in 1963. The lecture was published by The Physiological Society in 1964 and I treasure my copy. I believe it was sent to all Members of The Society. The quotations below are from this published lecture.

I first met Sir Charles in 1958 when I was drafted into the RAMC and sent as a physiologist to Porton Down. He had retired from the Jodrell Chair at UCL and was head of the physiology section. He came in to the department some 3 days each week and invariably had tea or coffee and a chat in the lab in which I worked. So there were many stories about UCL, many of them scandalous. The obituary by I de Burgh Daly and R A Gregory is a charming and sympathetic account of his life (*Biographical memoirs of Fellows of the Royal Society* 1970, 16, 233–252).

Lovatt Evans had worked with Bayliss and Starling from November 1910 when he had been an external candidate for the London University BSc in physiology and the practical examination was at UCL. Francis Gotch was the external examiner. Gotch asked Evans to stay behind as Starling wished to talk with him. Thus he met the staff and 'I was quite overcome by the natural friendliness of all these well-known people, and returned home

The Bayliss-Starling Prize Lecture

agony with the exciting experience.' So Evans became Sharpey Scholar at £150 *per annum*. That must have been a substantial sum for those times. So began a new life at UCL.

Bayliss was born in 1860, and Starling in 1866, so 1963 was the mid-point between their centenaries. Starling died at 61 and Bayliss at 64.

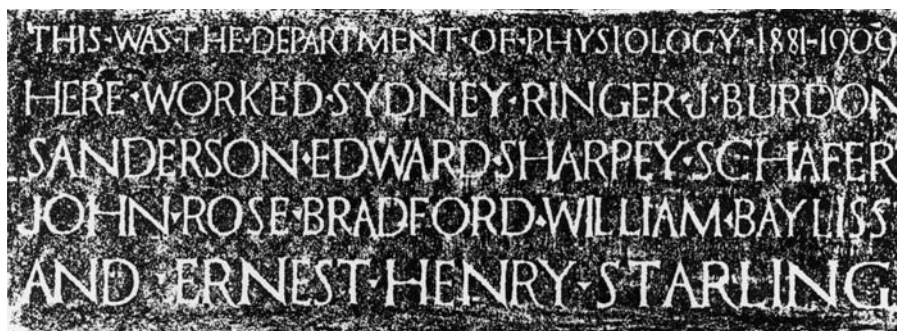
'Bayliss was well-to-do, but of simple personal tastes, and of the most gentle, retiring and kindly disposition. He had a large house in a 4 acre garden adjoining Golders Hill Park' where there was tea and tennis on Saturdays. He was married to Starling's sister. In a shrubbery between the two tennis courts was a small summer house where ... one might find Bayliss surrounded by piles of penny exercise books, suggesting a marking of homework. This was in fact the preparation of the *Principles of physiology* ... Close by was a laboratory he had built years before, and in which he afterwards made the photographs for the illustration of his book...'. This book, in the early editions, is a marvellous monument to his erudition. He had studied science at UCL and then as a medical student failed anatomy. At the oral examination the examiner said: 'your written answer to the question on the cords of the brachial plexus was extraordinary – wherever did you get it from?' To which Bayliss replied 'Well I never could memorize that sort of thing, so I put it the way I thought it ought to be.' By 1890 he began to collaborate with



Ernest Starling

Starling who was then at Guys. They 'were complementary. Bayliss was patient, over-modest and most genial. He radiated happiness and his talk was spiced with laughter. ... his reading was vast and omnivorous.' With him it was not master and pupil, but two colleagues comparing notes. In 1922 he received an instruction 'to appear at Buckingham Palace to receive the accolade of the Order of Knighthood; he replied that as the date coincided with that of a Meeting of The Physiological Society, he would be unable to attend'. His priorities surely were right.

In 1903 he was involved with the anti-vivisectionists in what became known as the 'Brown Dog case'. He was accused of performing an experiment on a dog without anaesthetic. He won an action for libel, with £2000 damages, against Stephen Coleridge, which sum he gave to the college. Bayliss was exposed to 'the usual accompaniment of publicity, prejudiced press comments, and shoals of anonymous letters, abusive, threatening,



A rubbing of the plaque erected at UCL to commemorate the Institute of Physiology (courtesy of the Physiology Department, UCL)

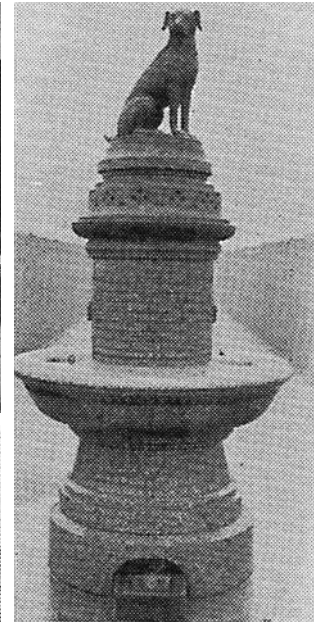
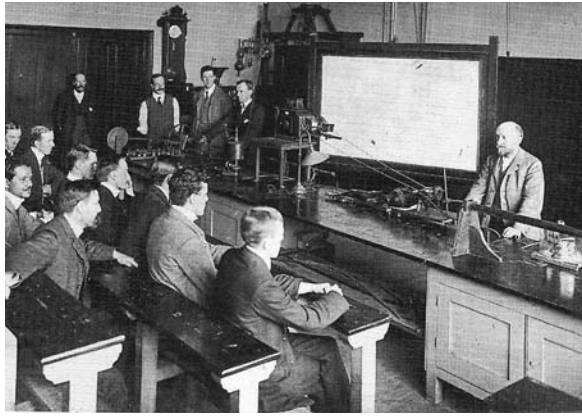
obscene or comical, the case must have been very distasteful to him at the time ...'. The best account that I know of this case was written by Leonard Bayliss, son of W M Bayliss, *The 'Brown Dog' Affair* printed in a UCL Physiology Department magazine entitled POTENTIAL (Spring 1957, No 2, pp 11-22, UCL, Price 1/-). This piece is hard to find.

A bronze statue of a dog was erected in Battersea by the anti-vivisectionists to commemorate a dog. The statue was subsequently removed after attacks by medical students. The council was sued but the subsequent action went in the favour of Bayliss given the libellous nature of the inscription. The statue was erected in Latchmere Gardens and the cast iron fence around the area carried a sign in the 1980s saying, apparently without irony, *No dogs allowed*. Photographs of the re-staged experiment, of the statue of the dog, and of the location can be seen in *The world of UCL* by Harte and North (revised edition 1991, p. 127).

In contrast with Bayliss, Starling was 'brisk, ambitious, a bit quixotic, serious, generous and highly strung ... he enjoyed the limelight, and the use of power, for good ends, but was too forthright and impatient to be diplomatic, though he realized that power lay that way ... he enjoyed company, good wine and food, dancing and tennis, and was always keen on helping young people.'

'At the Physiological Congress in 1926, he (Starling) said that the British excelled in science because they were devoted to sports, and research was the greatest game of all. At which Gley, a small man with the voice of a bull, in an impassioned oration described France as "le berceau de la physiologie", and Pavlov spoke in German of his own invention.'

Starling's background was in medicine with the fundamental science added 'largely through his association with Bayliss, but the needs of medicine really formed the foundation of most of his work'. He was much influenced by Wooldridge at Guy's who advised him to work with Kuhne at Heidelberg. He



A reconstruction of William Bayliss' lecture used in the famous 1903 libel case (above, left); the 'Brown Dog' statue in Latchmere Gardens, Battersea, erected by the anti-vivisectionists (above, right); the site where the statue once stood (left).

was 19 years old at the time. From both Charles Darwin (an original Honorary Member) and T H Huxley (a founder Member) 'he drew the wide biological vision which characterised his writings, and from the second a keen interest in education and the desire to smite all humbugs – however big.'

He was elected to The Physiological Society 'on the same day as Bayliss, at the Annual Meeting at University College on 15 February 1890, Sidney Ringer in the chair'.

Starling, aged 33, went to University College as Jodrell Professor in 1899, the year of his election to the Royal Society.

And so the present Institute of Physiology came to be built. Before

that the Physiology Laboratory was in the North wing of the College above the Slade School. It is commemorated at the top of the stairs in the front east corner of the Slade School. From the basement ascend nearly 75 steps to the second floor. There is a grey stone plaque with engraved inscription tinted gold on the wall to the rear. The inscription reads '*This was the department of Physiology 1881-1909. Here worked Sydney Ringer J Burdon Sanderson Edward Sharpey Schafer John Rose Bradford William Bayliss Ernest Henry Starling*'. G H Hardy would have regarded this as forming the foundation of a very good first 11.

Starling was dissatisfied with this accommodation and there came to be built a large new department to be a nucleus of the new Faculty of Medical

The 2006 Bayliss-Starling Prize Lecture, *Annexin 1, glucocorticoids, stress and inflammation*, will be delivered by Rod Flower, FRS (William Harvey Research Institute, UK) (pictured right) at The Physiological Society Focused Meeting at the University of Bristol on Monday 4 December 2006.



Sciences. It was located on the land previously forming the playground of the University College School for Boys which moved to Hampstead. The building was completed within 1 year of going to the architect and with all equipment and fitting out cost ~£20,000. Large gilt letters on the front proclaim Institute of Physiology in an art nouveau style to be seen today. This was a tribute to German physiology institutes and 'much disliked by the then Provost, who thought he scented secession'. The building was very advanced for the time and in 1909 Starling wrote a *Description of the new physiology institute*.

Lovatt Evans summarised the joint work of Bayliss and Starling thus: 'The fruits of their labours have by now been homogenized into current knowledge, but the source of their enrichment should not be forgotten. The discovery of secretin was no doubt their most spectacular and fertile contribution, but

even their first publication, on the electromotive phenomena of the heart beat, was of pioneer quality. Fundamental, if less dramatic, and bearing valuable, if late, fruit, were Starling's own work on lymph formation and on renal excretion, and the importance of Bayliss's investigations on membrane potentials needs no stressing in these days.'

The discovery of secretin and the coining of the name hormone, came about in an environment where the notion of chemical transmission was discussed. Oliver and Sharpey had published their work on the adrenal gland, and Eliot was contemplating ideas about the autonomic system. The time was right for their beautiful experiment and brilliant insight which opened up a whole new field of biological science, not only in medicine and physiology.

There was also Bayliss's work on the vasomotor system and his

investigations of enzyme action, adsorption, and surface action. Starling introduced the heart – lung preparation and enunciated the 'law of the heart'. Starling published *The Principles of Human Physiology* and Bayliss *Principles of General Physiology*. 'Both books served to set the subject into its present mould.'

'Bayliss, the serene and devoted scholar, the true natural philosopher, Starling the man of action, with wide sweeping views; neither of them were subjected to the isolation of the specialist. It might be said that Bayliss and Starling flourished at a gestatory period in the history of physiology, a period in which, out of the fullness of time, the emergence of modern physiology was due.'

These lectures justifiably continue to honour them.

Tim Biscoe

Honorary Member, London, UK

A life of Ernest Starling

By John Henderson

2005, Oxford University Press. £35.99 (hardback)
ISBN 0 19 517780 0

When reviewing a biographical memoir, one is inevitably faced with the question of how much biographical information to include. In the case of John Henderson's entertaining life of Ernest Starling (1866-1927), published by OUP as part of a series sponsored by the American Physiological Society, Tim Biscoe's extended introduction to the Bayliss-Starling Prize Lectures above saves me the trouble, and can be consulted for details.

Starling is a fascinating figure. Although there is plenty of competition, he must be a leading candidate for the title of 'most important physiologist never to have won the Nobel Prize'. He was also never knighted, despite his pre-eminence and unlike many of his contemporaries. To learn why, read this book.

Henderson's book is enjoyable both for its glimpse into the past and for the contemporary parallels it tempts one to draw. Henderson recounts Starling's scientific achievements, and his collaborations and interactions with other scientific eminences like Bayliss, Charles Lovatt Evans and (later) A V Hill, and describes

the early history of physiological research at Guy's Hospital and University College, the institutions where Starling spent most of his working life. The book follows Starling through all the phases of his career, including his war work in poison gas defence and his key influence on medical education in the London colleges.

Starling comes across in this book as a surprisingly modern figure in some ways, and often notably out of step with the more genteel tenor of the times. Tim Biscoe quotes Lovatt Evans, speaking in 1963 many years after Starling's death, describing Starling as 'highly strung' and 'forthright and impatient'. The book's picture of Starling bears this out, suggesting a man given to saying exactly what he thought, unvarnished, and without much regard for how it would be received. Through his outspokenness Starling seems to have had the knack of offending various establishments, medical, military and political, which almost certainly cost him a knighthood. Even when being complimentary Starling does not seem to have been the most tactful of men. The book describes how he recommended A V Hill, who he greatly respected, as his successor as Jodrell Professor of Physiology at UCL, but told the Dean that Hill [was] 'not a physiologist ... of course' a remark clearly capable of being misinterpreted (the point was actually that Hill was something different, namely a biophysicist).

Starling also emerges as a believer in science as something that transcended national boundaries. Apart from the British physiologists who appear in the book, international figures of the time like Pavlov and Gleb Anrep also appear, testifying to the internationalism of physiological research both before and after the Great War. Like many of his contemporaries, Starling had trained in the laboratories of the great German physiologists of the late 1800s and was by his early 20s a fluent German speaker. He thus felt deeply betrayed when Germany went to war in 1914, penning wartime letters with scathing references to 'the Hun' and advocating the use of Mustard Gas as an offensive weapon. But after the war he seems to have felt that what was important was for scientists to get back to doing science, and he welcomed the German physiologists back into the fold and continued to publish in German journals. This forgiveness was not universal in science at the time, and may even have cost Starling the Nobel. But it gives a true flavour of the man and his principled, if rather black and white, views.

To sum up, John Henderson has given us a fascinating portrait of a great scientist, and a man of tremendous conviction, though poor political instincts. Readers will enjoy both the history and the contemporary parallels, and the book deserves a wide circulation.

Austin Elliott