

Major-General William Burney Bannerman, C.S.I., M.D., D.Sc.
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THE Royal Society of Edinburgh lost a valued and honoured Fellow by the death, on the 3rd February 1924, of Major-General William Burney Bannerman, C.S.I., M.D., D.Sc., late of the Indian Medical Service.

He was elected a Fellow of the Society in 1902, and when he retired from service in India he took an active interest in the Society, becoming a Member of Council in 1919, and subsequently Vice-President of the Council in 1921.

Bannerman was born in Edinburgh on the 6th July 1858. He was a son of the Rev. Dr James Bannerman, sometime Professor of Theology at the New College, Edinburgh. He was educated at the Edinburgh Academy and the University of Edinburgh, graduating M.B., C.M. in 1881.

In 1883 Bannerman entered the Indian Medical Service, and after the usual period of probationary training at Netley he arrived in Bombay as a Surgeon in that service in May 1884. At this time he was 25 years of age. He was posted to Secunderabad, but soon saw active service in Baluchistan, where he was transferred in February 1885 after passing the lower standard examination in Urdu. For a short period he acted as a sanitary officer, engaged in the prevention of the spread of cholera, but later was in medical charge of the Civil Dispensary at Thal Chotiali.

He was sent up in such haste to Thal Chotiali—and as was supposed for so short a time—that he spent a whole winter in that inclement region under canvas, with only the light summer clothing in which he went up.

He had several experiences, more exciting than pleasant, in Baluchistan. On one occasion when performing an operation on a boy, in the middle of a group of armed tribesmen, he suddenly became aware that his patient had stopped breathing; the hospital assistant who was giving the anæsthetic having become absorbed in watching the operation. This had to be interrupted for some twenty minutes while artificial respiration was resorted to. Fortunately the boy recovered, and the operation finished without mishap.

Bannerman contracted malaria in Baluchistan, and in consequence returned to the Madras Presidency in April 1886, being posted to Trichinopoli in charge of the garrison staff and details.

Before many months, however, he was again to see active service, for he was ordered to proceed to Burmah, joining No. 20 Field Hospital, Mandalay, in November 1886. Later he was stationed at Pyntha, then an extremely unhealthy place. His predecessor in this appointment had died in six months, and his successor remained for only six weeks. It was a relief to be posted to Maymyo. He was with the Upper Burmah Field Force in Ye-u from March to October 1888. At this latter place he fell sick with a prolonged and severe attack of what was then called remittent fever. This illness pulled him down so greatly that he was sent home to England on furlough for one year, arriving there at the end of the year 1888. For his services on the Frontier and in Burmah he received the medal with two clasps.

While at home at this time he graduated M.D. and married Helen Brodie Cowan Watson, daughter of the Rev. Dr. Watson, and returned with her to India in 1889, arriving in Madras on the 26th November 1889.

Bannerman was then ordered to proceed to Gopulpore, thence to Berhampore and Sambalpur, reaching the latter place, after a long march of 265 miles, on the 20th January 1890. He remained in Sambalpur for rather more than one year, returning to Berhampore in May 1891. After acting for a few months as District Surgeon and Superintendent of the Jail, he was transferred to Mangalore as District Surgeon in December of the same year.

Bannerman remained at Mangalore for a little more than a year and a half, when he was recalled to Madras to act as Deputy Sanitary Commissioner in August 1893. He held this post until December 1894, when he went home on furlough.

During this period of leave he renewed his studies at the University in Edinburgh, securing the degree of Bachelor of Science in Public Health before his return to Madras in April 1896.

In the autumn of that year the great epidemic of plague started in Bombay and rapidly spread to other parts of India, recalling in its virulence and magnitude all the dread features of the mediæval epidemics of that disease. Bannerman was destined to take an active part in studying and combating the plague. He had not been many months in Madras when he was ordered to proceed to Bombay to examine the methods adopted there for the treatment and prevention of plague, and to report to the Government of Madras. He was instructed to devote his attention especially to the scientific work of Mr Haffkine and Dr Yersin. His report was submitted to the Madras Government in August 1897, the

Governor in Council complimenting him "for his interesting and instructive report on his deputation to Bombay in connection with bubonic plague."

The extension of plague to the confines of the Madras Presidency caused the Government of Madras to depute Bannerman to work under Mr Haffkine in order that he might make a further study of plague. At this time he spent almost a whole year with Mr Haffkine, devoting his time especially to the preparation of "the plague prophylactic," and in studying its effects on outbreaks of the disease. Bannerman gave much care and attention to these studies, affording Mr Haffkine valuable assistance in organising the methods of preparing the prophylactic on a large scale, and carrying out crucial tests to prove its value in combating the disease. It may not be out of place here to refer to one of these tests, not only on account of its historical interest as one of the largest and most complete experiments made up to that time to measure the protection produced in man by the injection of a bacterial vaccine, but also because of the vivid impression this experience left on Bannerman's mind, influencing as it did the course of his career.

Undhera is a small village situated about six miles from Baroda; an epidemic of plague started in the village in January 1898. On the 3rd February a careful census was taken which showed that the population of the village then was 1029. Up to and including the 14th February, seventy-nine persons had died of plague in the village, leaving 950 persons alive on that date. It was decided there and then to inoculate as nearly as possible one half of the inhabitants; 513 persons were operated on. No selection was made as to who was or was not to be inoculated other than that required to make the two groups, of inoculated and uninoculated, as comparable as possible in regard to age, sex, and physical fitness. Plague continued in the village for forty-two days after the date of the inoculations, and it visited twenty-eight families, who consisted of seventy-one inoculated and sixty-four not inoculated persons. The seventy-one inoculated had eight attacks and three deaths, while the sixty-four not inoculated had twenty-seven attacks with twenty-six deaths. If the inoculated had suffered to the same extent as their uninoculated relatives, they should have had twenty-nine deaths instead of three only.

Bannerman writes of his experience of this test as follows: "I myself carried the census lists, and from it called out the inhabitants of the plague-infected houses by name, and I shall never forget the experiences of that day. One incident I particularly remember, the finding in two huts in succession that all the uninoculated had died and that only the inoculated members of the household came out to answer to their names.

The attitude of the people was also very striking, for when asked about the results of the experiment, they said that 'about fifty uninoculated had been attacked, and they are all dead, while only a few inoculated have been ill, and they have all recovered.'

After this period of study with Mr Haffkine, Bannerman returned to Madras in April 1898. He was soon ordered to Calcutta to organise plague operations in that city. Owing, however, to the extension of plague into the Madras Presidency, particularly to the district of North Arcot and to Bangalore City, he was recalled to Madras in August of that year.

In December he visited Bombay to give evidence before the Royal Commission on Plague.

Returning to Madras, he continued to practise and preach inoculation against plague in various parts of the Presidency.

In March 1899 he revisited Bombay, to give further evidence before the Royal Commission on Plague, and continued at that time to work with Mr Haffkine till the latter proceeded on leave on 1st April 1899, when Bannerman took over charge of the Plague Research Laboratory.

It was at this time that Bannerman arranged to transfer the Laboratory from comparatively cramped and improvised premises to a portion of the Old Government House at Parel. On Mr Haffkine's return from leave, Bannerman remained at the Laboratory acting as Superintendent under the Directorship of Mr Haffkine, till he proceeded on leave in May 1901.

Bannerman returned to Bombay in June 1902. He was promoted to the rank of Lieutenant-Colonel in September 1903. In December of that year he was appointed Superintendent of the King Institute of Preventive Medicine in Madras, but he was recalled to Bombay in May 1904 to take charge of the Laboratory at Parel when Mr Haffkine proceeded on long leave.

On his return to the Laboratory in Bombay, Bannerman introduced improved methods of bottling the anti-plague vaccine and he developed a system of carrying out inoculations which was so carefully safeguarded that the operation could be performed by comparatively unskilled persons. So important were these improvements in the technique of preparing and handling the vaccine that no accidents of any kind have been reported from the use of the vaccine, in spite of the fact that many millions of doses have been issued to all parts of India, where inoculations have been performed by men with very varied medical qualifications and experience.

At this time also Bannerman greatly assisted the Plague Research

Commission appointed in 1905, by placing at their disposal the splendid accommodation at the Laboratory at Parel, and by lending the Commission the services of his experienced and trained staff of assistants. It would not be unfair to say that the success of the Commission would not have been possible without his help.

Bannerman held the appointment of Director of the Bombay Bacteriological Laboratory from 1904 to 1911. This institution owed its origin and early development to Mr Haffkine's painstaking work on plague, but to Bannerman, more than to anyone else, does the credit belong for organising and expanding its sphere of usefulness so that it is now one of the largest and most important laboratories in the East. For his work in connection with this institution he was promoted to the rank of Brevet Colonel in 1910.

Bannerman was selected to officiate as Surgeon-General with the Government of Madras in May 1911. His departure from Bombay was much regretted by Government and by his numerous friends in that city. In the same year he was created a Companion of the Star of India.

Bannerman held the appointment of Surgeon-General with the Government of Madras from 1911 to 1918, an unusually long period owing to the war. It was one of the most anxious and onerous periods of his service in India. The war deprived him of almost all his most trusted officers and he was called upon to improvise a medical service with an untrained and inexperienced staff, so that he had many worries and cares. These gradually undermined his health and constitution, so that he suffered from a severe attack of syncope in the end of the year 1917, which caused him to seek relief from his arduous duties. He retired from the Service in July 1918, having previously been appointed an Honorary Physician to the King in 1913.

He enjoyed a fair measure of health for some years during his retirement, but the syncopal attacks recurred from time to time, and in one of these he passed away at his residence in Edinburgh on the 3rd February 1924.

Bannerman was a man of a retiring nature; he was greatly loved by his brother officers for his genial and kindly disposition. He has been aptly described as a man without guile, honest and straightforward in his dealings with other men. He was a keen Churchman and always took an active part in the management and life of the Church in the places where he was stationed.

After his retirement he became a member of United Free St George's

in Edinburgh, where he was elected an elder, and he acted as Secretary of the Foreign Mission Committee.

As director of a laboratory he was at his best. His sympathetic understanding and his broad common-sense cleared away difficulties whether personal or scientific. The attitude of optimism, which permeated his mind and characterised all his dealings, gave inspiration and encouragement to those who worked with him. His memory will be revered by all who came in contact with him of whatever race or colour, of whatever station or degree.