

# Gunner of Renown



Royal Australian Artillery Historical Company

## Major Sir William Lawrence BRAGG, CH, OBE, MC, FRS

(1890-1971)

Lawrence Bragg was born on 31 March 1890 in Adelaide, the son of William Henry Bragg, Professor of Physics at the University of Adelaide and Gwendoline, neé Todd, the daughter of Sir Charles Todd who was the inspiration for and builder of the Overland Telegraph Line linking Adelaide and Darwin.

In 1912 William Bragg invented the x-ray spectrometer which initiated the science of x-ray crystallography. Once in Britain, Lawrence studied at Trinity College, Cambridge and then joined his father in additional research.

However, the outbreak of WW1 temporarily interrupted this research and in 1915 Bragg was a lieutenant in a Leicestershire Royal Horse Artillery Territorial Force battery. He was on the threshold of being awarded the Nobel Prize for Physics with his father on x-ray crystallography when he was summoned to the War Office on 19 July 1915. He was ordered to France on 31 August with a small team of physicists to work with French military scientists who were developing sound ranging (SR) – the technique for locating artillery by the characteristic sound wave that emanated when a gun fired.

The French had three different ‘methods’, and Bragg recommended the British Army develop the Bull-Nordmann system as the one with the most promise. Basically, an array of microphones deployed along a surveyed base ‘heard’ gunfire as the sound passed over them at different time intervals. A recorder connected to each microphone ‘traced’ the sound or air pressure disturbance on special paper which could then be interpreted to reveal the origin of the sound.

By the autumn of 1915 the British General Staff were convinced that they should raise a SR Section of their own. Bragg gathered about him some clever scientists and mathematicians and went to the front in the Vosges Mountains to be trained by the French. Early results were not very encouraging for consistency, and soon Bragg recognised that the microphone was the culprit. The solution came gradually over the next few months, when a Corporal Tucker, formerly of Imperial College, London and after whom the microphone was named, devised an improvement. Bragg recalled the ecstatic moment:

‘We got some (platinum) wire and rigged it up in an ammunition box and made it one arm of a Wheatstone Bridge which we balanced with our galvanometer in the usual circuit. I remember vividly the night we rigged it up. A German field battery obligingly fired towards us, and when the film (in the recorder) was developed there was a short, sharp break for the ‘shell wave’, followed by a characteristic but definite large ‘break’ made by the gun report, which could be read with accuracy. It was a wonderful moment, the answer to a prayer. It converted Sound Ranging from a very doubtful proposition to a powerful practical method.’

He commanded the first Sound Ranging Section in the British Expeditionary Force from 15 October 1915 and provided the first location on 2 November. By the end of the war there were more than 29 Sound Ranging Sections deployed on the Western and Italian Fronts. They contributed significantly to each Corps Counter Bombardment Office for the accurate location of enemy guns. On the Western Front where the Australian Corps was operating, their greatest problem was the theft of signal wire connecting their SR bases. Bragg solved this by making signs on the equipment, 'Danger, 3000 volts'.

Bragg was promoted major and moved on to command an experimental sound ranging section and sound ranging school and in 1918 became technical adviser in sound ranging at GHQ.

After the war Bragg was widely honoured and became one of Australia's foremost scientists and his work is of enduring importance. He remains the youngest Nobel laureate ever. He died at Ipswich, Suffolk, aged 81 on 1 July 1971. His WW1 service earned him the OBE and MC, elected FRS in 1921, subsequently knighted in 1941 and appointed a Companion of Honour in 1967.

Sources:

The Adelaide Advertiser (undated cutting); P. Chasseaud, *Journal of the Western Front Association*, No. 30 (Winter Edition), pp.23-27, and *Artillery's Astrologers*, chap 6; Alan H. Smith, *Cannonball*, *Journal of the Royal Australian Artillery Historical Company*, No.38, pp.9-12; L Hindmarsh, loc. cit., No. 40, p.3; *Catalogue of Australian National Portrait Gallery Exhibition, 2003*, Australia and the Nobel Prize, p.3; John R. Innes, *Flash Spotters and Sound Rangers; Australian Dictionary of Biography vol 7 (MUP) 1979*; *Who's Who 1958 (British)*; Farndale, General Sir Martin, *History of the Royal Regiment of Artillery, Western Front 1914-18*, pp. 374-379; Keith Ayliffe and John Posener, *Tracks of the Dragon: a history of Australian locating artillery*, AMHP, 2004.

For more information follow this link: <http://adb.anu.edu.au/biography/bragg-sir-william-henry-5336>