

## Dr Arnold Lynch, 1914 - 2004

Arnold Lynch died on 13th November 2004 at the age of 90. He had been a leading contributor to precision electrical metrology since the 1940s and he particularly specialised in dielectric measurements. His studies in this field ranged from low (50 Hz) to high (140 GHz) frequencies. He continued this work well into retirement. His mind remained sharp to the end, enabling him to be active in the field until October 2004.

Arnold was for many years a trustee of the Dielectrics Society to which he contributed his time both as an organiser of meetings and a presenter of technical papers. The Dielectrics Society amalgamated with the Institute of Physics in 2000 and became the present Dielectrics Group, so it is particularly appropriate that we remember the contribution that he made to accurate electrical measurements and especially to dielectric metrology.

Arnold was born in Tottenham, London in 1914. He studied at Emmanuel College, Cambridge, where he was privileged to be taught by Lord Rutherford, J.J. Thomson and G. F. Searle. He worked for the British Post Office from 1936 until 1974 at its Research Laboratory at Dollis Hill, London. During the Second World War he contributed significantly to the secret activities that allowed the Allies to decode military messages - activities normally associated with Bletchley Park, but in fact the Post Office and other institutions contributed significantly too. Arnold developed a paper tape reader with fast optical read-out for the decoding machine Colossus.

In the 1950s at the Post Office Arnold established reliable techniques for measuring the loss of low loss dielectrics. There was a requirement for polyethylene with low power absorption to be used as the transmission medium for the Transatlantic cable that was to be laid in 1954. The problem Arnold faced was to demonstrate reliably that British polyethylene had sufficiently low loss to be used in the cable – this was essential to enable Britain to pay for its share of the cable! Fortunately Arnold was very successful in this enterprise: he developed new sensitive measurement methods in the process. He continued to work in dielectric measurements throughout his career, and developed a wide variety of cells and bridge techniques for these measurements, always with an eye to improving resolution and accuracy. Though he became a senior manager in Post Office he was always keen to be working with ‘hands on’ in the laboratory.

Arnold was a Fellow of the Institution of Electrical Engineers (IEE) and promoted a wide range of its activities, among them the IEE’s Dielectric Materials Measurements and Applications (DMMA) conferences. Apart from his professional activities, one of his great interests was the history of technology. He was a member of the Archives Committee of the IEE for a quarter of a century and he worked hard to promote the use of the archives for education. He was instrumental in setting up the IEE's annual History of Electrical Engineering weekends and he took a great interest in the recent project to rebuild Colossus at the Bletchley Park Museum, and was able to provide many technical details for the reconstruction. He had many other interests besides, including chess, bridge (he was very accomplished in both) and the history of the Great North Road and of stagecoaches in Britain.

Arnold nominally ‘retired’ in 1974. At least he retired from the Post Office, but he immediately went back to work and was able to spend more of his time at the ‘hands on’ laboratory work that he loved. By 1977 he was working

two days a week at the City University, London, on high voltage measurement,

two days a week at University College, London, on open resonators for millimetre wave dielectric measurements,

and he was working one day a week at the National Physical Laboratory (NPL) on metal conductivity measurements and magnetic response at 60 kHz.

The conductivity and magnetic measurement techniques that he developed are still in use. He continued his work at NPL until October 2004. After a few years he transferred his open

resonator dielectric studies from University College to NPL where he continued to contribute significantly to the field of low loss measurements at millimetre wave frequencies. He was joint winner of the IEE Ayrton Premium for a paper on this work in 1992 – when he was in his late 70s. In fact the excellent quality of Arnold's work has been recognised professionally many times over the years. A number of measurement cells and techniques have received their names from him, e.g. Lynch's cell and Lynch's formula. He reached the grade of Senior Principal Scientific Officer at the Post Office and won a number of professional prizes, including 5 IEE premiums, the most recent in 1998. Arnold was invited to deliver the prestigious IEE Wheatstone Lecture in the year 2000 on the topic '*The Rise and Fall of the AC Bridge*'.

Arnold's contribution to precision measurements continued until just a few months ago. He was very conscientious about passing on his technical knowledge and experience to younger scientists and engineers in the institutions where he worked. Many of us through the years have been very grateful for his wisdom and guidance and for the experience we have gained through working with him.

Bob Clarke  
December 2004.