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Arthur W. Hothersall: pioneering researcher.

D. R. Gabe*

All members of the IMF will know of the name Hothersall by virtue of the Institute's Medal award and lecture, but many will not know of his great influence in the early days of the Institute and metal finishing research in the UK. It is not clear whether he was a founding member but he was certainly an early member recruited by Donald J. MacNaughton, who was a founder with Samuel Field and others, and for whom he worked and succeeded at the Woolwich 'Arsenal' Research Department.



Portrait of Arthur Hothersall at the time of his Institute Presidency (1937–39)

Arthur Wesley Hothersall was born on 10 November 1895 at Mytholmroyd in Yorkshire, the son of a Methodist minister. His father died when he was a child but he nevertheless had a good education at the Kingswood School Bath and Manchester College of Technology where he graduated in Applied Chemistry (Metallurgy) with first class honours in 1915. He then spent six years with High Speed Steel Alloys in Widnes and Burma during which time he married Alice Garner in 1920. In 1921 he joined the War Office in its Research Department which in those days was in Woolwich and was popularly known as Woolwich Arsenal. He worked initially as personal assistant to Dr Harold Moore, the Director of Research, who was an influential national figure in metallurgy and eventually a founding member of the Institution of Metallurgists. By virtue of the projects he was given he became a cooperating colleague of D. J. MacNaughton who headed the section dealing with chemical metallurgy, notably electroplating. His first project concerned wear of gun barrels, a problem identified by the Royal Engineers at the end of the 1914–18 war. Thus he developed methodology for coating the inside of gun barrels in work that has never been fully

published but the brief account he wrote in 1945 is still read with interest. The process was in use in Royal Ordnance factories until the 1970s.

When MacNaughton left in 1933, to become the first Director of the Tin Research Institute, Hothersall inevitably succeeded him, taking the whole group to Swansea during the Second World War and returning to become acting superintendent of the Woolwich branch. However, his health gradually deteriorated culminating in major surgery prior to his death at the age of 55 on 20 October 1951.

During the period 1928–51 Hothersall wrote 36 papers and was probably the most prolific author in metal finishing in the UK. Together with his colleagues (and those at the Tin Research Institute with whom collaboration was extensive) including MacNaughton, George Gardam, C. J. Leadbetter, Roy Hammond, S. G. Clarke, W. N. Bradshaw and J. C. Prytherch, they created a reputation second to none. The range of topics covered is impressive:

- hardness and structure of nickel deposits
- adhesion of electrodeposits
- internal stress in electrodeposits
- porosity of coatings
- properties of tinplate
- heavy engineering deposition.

to which can be added a number of miscellaneous topics including anodic polishing and the use of chromium on nickel.

As a consequence of his administrative load and his declining health many of these researches failed to reach true fruition. In particular the studies on stress in chromium and its implications for fatigue life of engineering components were only just beginning and eventual fruition under Cyril Williams took another 10 years to mature and be adopted. Similarly the work on chromium plating of the inside of gun barrels was never widely known owing to security restrictions but Hammond eventually managed to add to Hothersall's preliminary paper (of 1945) in 1954.

In concluding his review of Hothersall's career, Gardam declared rather ruefully that there was no Hothersall test or process despite his work on a number of experimental topics such as adhesion, stress and porosity. However, the Hothersall Medal has lasted longer than most tests and the lecture remains a fitting memorial and an important occasion in the life of the Institute.

Hothersall was a retiring man but was nevertheless widely known and highly respected. He was known as a meticulous writer of papers, every word being chosen with great care. In the Institute he was:

- 5th President 1937–39 (Presidential Address in 1938)
- 2nd Gold Medallist (1950)
- dedicatee of the Institute's R&D award.

The first recipient of the Hothersall Award and the consequent lecturer was Dr George Gardam, a former colleague at Woolwich, who devoted the lecture to a detailed career and appraisal of Hothersall's career giving a full list of his publications.²

References

1. A. W. Hothersall: *Trans. IMF*, 1938, **14**, 49–54.
2. G. E. Gardam: *Trans IMF*, 1953, **29**, 78–96.

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