

OBITUARY

Dr. Joe Edwards FIMF (1925–2021)

When I received the news that Dr. Joe Edwards had died on 10th March I was not only deeply saddened but also greatly shocked. I had been invited by members of his family to join his 'on-line' birthday party to celebrate the fact that on 20th December he had reached the grand old age of 95. With most of his considerable immediate family also involved he was obviously in excellent humour and looked to be in very good condition considering his age. So to hear a mere 11 weeks later that he had passed away was a nasty surprise.

Joe Edwards was one of the outstanding members of the surface coatings industry during the mid and late twentieth century. Although there were many highly intelligent men and women involved in this profession at that time Joe stood out in terms of his intellectual ability and breadth of knowledge. He came from a working class family in Burslem, Stoke on Trent and was educated in local schools, finally at St. Joseph's College Trentvale, run by the Christian Brothers. Joe was faithful to his family and educational backgrounds, and remained a devout Roman Catholic for the whole of his life.

He excelled in the sciences and in September 1943 was accepted by the University of Birmingham to study chemistry. His excellence showed immediately in that, at the end of his first year, he was awarded the Bursar Prize for best student of the year and for three years he received a University Exhibition scholarship. The fact that he was awarded a 1st Class Hons. degree perhaps came as no surprise and resulted in him being accepted as a PhD student in January 1946.

It has, however, proved impossible to obtain accurate details of Joe's activities in his University years. Why, for example, he chose chemistry as his degree subject is not clear. Likewise the precise subject of his Doctorate and the name of his supervisor do not appear on any accessible records. However, Joe's lifelong friend Dr. Peter Farr points out that all of this happened

during wartime and situations were not as highly regulated then as they are currently.

However, Joe completed his Doctorate in December 1948 and commenced work on electrodeposition at the British Non-Ferrous Metals Research Association in February 1949, which indicates that his Doctorate was closely related to this technology

Joe's ability was quickly recognised at BNFMRRA and he was promoted to the position of Section Leader less than 3 years later in 1952. He spent 17 years at the Association becoming engaged in many technical investigations during this time which resulted in the publication of forty technical papers covering a wide range of topics.

He is, however, best recognised for his management of a highly original and innovative study using radioactive compounds to study the mechanism of incorporation of addition agents into nickel electroplating solutions. The work was based on organic compounds where particular atoms of carbon and sulphur in the molecules were labelled using radioactive isotopes during their synthesis. This enabled the decomposition and incorporation of the molecules into the deposit to be studied in detail.

Joe published a series of eight papers related to this topic in the *Transactions of the Institute of Metal Finishing* between 1962 and 1967 describing this work. The full extent of these studies has never been fully revealed since a considerable part of it was carried out for the Defence Industry under cover of the Official Secrets Act

In the post-war years, however, the use of organic addition agents had become a matter of prime importance in the nickel plating industry. Prior to the Second World War nickel/chromium electrodeposits were very widely used in many applications, most importantly in the rapidly growing automotive industry due to their unique lustrous appearance and corrosion resistance. Unfortunately, the coating process at that time involved mechanically polishing the nickel deposit before the final



Joe Edwards pictured at his 94th birthday party

chromium layer was applied, an expensive process.

However, it had been shown that addition of selected organic addition agents to nickel solutions enabled the metal to be deposited in a fully bright condition. This eliminated the mechanical polishing stage thus achieving significant cost savings. The extent to which Joe's work influenced the choice of materials for commercial applications is not clear since much of the development work by industry supply houses was directed towards formulating proprietary processes.

However Joe's unique and highly important contribution to the science of electroplating whilst at BNFMRRA was quite rightly recognised by a number of very significant awards.

From the Institute of Metal Finishing (now the Institute of Materials Finishing) he received the following:-

- The Hothersall Memorial Medal**
- The Westinghouse Prize (on two separate occasions)**
- The Institute Gold Medal (its highest award)**

On the international scene the American Electroplaters Society granted him the prestigious

Scientific Achievement Award

In 1966, however, Joe left BNFMRRA having been recruited by Dr. Gordon

(Bill) Bailey to become Leader of the Chemical Group at the International Nickel Research Laboratory in Birmingham. In this capacity he managed not only the Electroplating Section but also Corrosion and Batteries Section.

As a manager Joe was very active in relation to the technical aspects of all of these units. However, he was most heavily involved with the newly formed Battery Section and the development of a completely novel method of manufacturing nickel-based batteries. Known as the Controlled Micro Geometry (CMG) process it was based on nickel electroforming technology. Joe's close involvement resulted in him being cited as one of the inventors in a Patent taken out by the company.

It therefore came as no surprise that in 1970 when International Nickel opened a new Process Research Laboratory at their nickel refinery in Clydach, South Wales Joe was appointed Manager. The refinery was involved in the manufacture of very high purity nickel products using the unique nickel carbonyl gas refining process invented by Dr. Ludwig Mond in the late nineteenth century. This quite obviously involved Joe in becoming familiar with vapour phase technology, very different to electrodeposition. However, under his overall management many important improvements were made in the manufacturing processes

Significantly, during his years as Manager of the Clydach Research facility a completely new product was developed intimately related to Joe's electroplating experience. For many years International Nickel had been producing a proprietary anode material called 'S Nickel' used for nickel electroplating and electroforming. This was manufactured by an electrolytic refining process during which a very small amount – 0.03% – of sulphur was added to the nickel. This enhanced the way in which the material dissolved in nickel plating processes. It was produced in the form of 'Rounds', circular pieces of nickel about the diameter of a 10 pence piece and 5mm thick.

However, at the Clydach refinery one of the major products was a very high purity nickel pellet, approximately 12 mm diameter. At the time that Joe was Research Manager a new technology was developed by which the same amount of sulphur could be incorporated into these pellets during the vapour phase carbonyl refining process. 'S' pellets have inherently superior handling properties compared to 'S Rounds' and consequently have become widely used within the industry. This popularity has stood the test of time to the extent that 45 years later this material in pellet form, developed during Joe's tenure as Research Manager at the Clydach Refinery, remains a preferred product in the nickel electroplating and electroforming industries.

During the 1970s however the nickel supply industry became increasingly more competitive to the extent that International Nickel, then known as INCO, made large reductions in its research activity. The Research facility at Clydach was closed and in 1978 Joe returned to a senior management position at the Birmingham Laboratory. However, as competitive pressures increased the size of the Birmingham facility was progressively reduced until eventually it closed in the mid-1980s.

Joe left the company in 1982, prior to closure, to work as an independent consultant. He continued in this role until retirement working for a large number of important clients including Henkel Chemicals, United Nations Industrial Development Organisation, British Aerospace, the UK Ministry of Defence and John Brown Engineering. He also served as Manager of the National Corrosion Service's Metal Finishing Club from 1982 to 1990.

Just as a side-line Joe enrolled as a student at the Open University on a course encompassing music, mathematics and computing from which he graduated in 1985 with the degree of Bachelor of Arts.

Throughout the whole of his career Joe was an enthusiastic and loyal

member of the Institute of Metal Finishing (now the Institute of Materials Finishing). He was rewarded by being elected as President from 1975 to 1977, his tenure being marked by a radical overhaul of the Institute's procedures. This ultimately catalysed the IMF's move from its London headquarters to Exeter House, Birmingham, from which it still operates. Joe was also recognised by the Midlands Branch of the IMF serving as Chairman from 1998 to 1990.

Joe's professional career was obviously a remarkable one which poses the question 'What was Joe like' as a person. I knew him for over 55 years and can testify that he was a very modest, unassuming man with a kind and gentle nature, and a great deal of charm. I never knew him show anger or malice to anyone.


He was also very much a family man with a large clan of 5 children, 9 grandchildren and no fewer than 11 great grandchildren, plus another on the way at the time of his passing.

The basis for Joe's personality and lifestyle was undoubtedly the fact that for the whole of his life he was a convinced Christian. He was born into a Roman Catholic family and remained a loyal and active member of his Church throughout his life. Since Joe seemed to attract awards for his professional activities it is perhaps not surprising that he received two awards related to his faithfulness as a devout Catholic – a Ubi Caritas award in December 2015 and an award from the St. Vincent de Paul Society in 2018 in recognition of 20 years of outstanding service.

There is obviously only one fitting end to this obituary:

May his sweet soul rest in peace in the arms of the Lord whom he worshipped faithfully throughout his life on earth and rise in glory.

Tony Hart

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