

Brother Potamian CYReilly: Irish Scientist and X-ray Pioneer

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It is doubtful if any scientific discovery has excited such an immediate and widespread interest as Rontgen's discovery of x-rays in November 1895. Within days of his communication, "On a new form of Radiation" to the Wurzburg Medico-Physical Society on the 28th December, 1895, translations were appearing in newspapers and scientific journals all over the world, and physicists and others having access to the requisite equipment were repeating his experiments. The potential of the new rays in medicine and physical research was widely appreciated and appropriate apparatus to generate and record x-rays, though primitive by today's standards, was already widely available in physics laboratories, even in schools such as De La Salle College in Waterford.

It is generally accepted that the first recorded clinical x-ray photograph in Ireland, of a girl's hand, was produced by Professor Barratt and Mr. Jefcote at the Royal College of Science on 16th March, 1896, at the request of Richard Bolton McCausland, surgeon to Dr. Steevens' Hospital, and that William Steele Haughton, surgeon to the same hospital, was using his own x-ray apparatus before the end of March 1896.¹ The news of the clinical applications of the new xrays evidently spread down the country very quickly, because on 13th April, 1896 in the De La Salle College in Waterford, in the presence of all the physicians of the city, a radiograph of a young woman's hand showing a splinter of steel, was made by Brother Potamian O'Reilly.²

The radiograph was taken with a 6" spark coil, a small focus cathode ray tube and a wet photographic plate with an exposure time of 1 minute. The splinter was successfully removed by a Dr. Atkins who had requested Brother Potamian to take the x-ray.⁴ The photographic plate was preserved until 1956, when unfortunately it was lost while on loan to an exhibition in New York. However, a photographic print is available which shows a needle-like metallic foreign body about 1 cm long between the heads of the middle and ring finger metacarpals (Fig. 1). Brother Potamian evidently appreciated the need for a small focus and the print is remarkably sharp.



Figure 1: X-Ray taken by Brother Potamian in Waterford on 13th April, 1896, showing needle-like F.B. between heads of middle and ring finger metacarpals.

Brother Potamian O'Reilly was already an internationally known scientist of high repute even before his pioneering feat in Waterford, having published important papers on electricity, telegraphy and the telephone between 1873 and 1893. In 1893 he succeeded in sending a wireless message across a room and predicted "that all that is now necessary is to put up machinery powerful enough to send wireless messages around the earth". In 1893 he even foresaw the day "when not only can you listen to speakers in distant parts but actually see them on a screen".² Marconi's historic wireless message across the Atlantic took place in December 1901 and Baird did not publicly demonstrate his television system until 1925.

Michael Francis O'Reilly was born in Bailie-borough, Co. Cavan in 1846, but in the following year the family, fleeing the famine, emigrated to New York. His early education was by the De La Salle Christian Brothers in New York, and at the age of 13 years he entered the order's novitiate in Montreal, taking the name Brother Potamian. After his novitiate he taught at the order's schools in Montreal, Quebec and St. Louis and in 1870 was appointed to St. Joseph's College, Clapham, London. His bent was evidently towards science and under his influence the college specialised in science subjects such as physics, chemistry and natural history. Brother Potamian graduated B.Sc. in the University of London in 1878 and despite being very much involved in Catholic educational "politics" in England during that period, he successfully presented a thesis to London University and in June 1883 was awarded the D.Sc.

During that period he contributed many scientific papers on electricity and magnetism under his own name of M. F. O'Reilly and organised many award winning exhibits at international scientific exhibitions, notably in London, Vienna, Paris and Chicago. His chapters in "Electric Illumination", the standard textbook on the subject of the period, on the voltaic arc and electrical measurements contained much of his own original research not previously published.³ A co-author was the renowned Silvanus Thompson and there is reason to believe that he also collaborated with Oliver Lodge and Ambrose Fleming in their experiments. Both were subsequently knighted for their fundamental contributions in electromagnetic radiation and diode valves. His admiring students certainly believed so, though he himself was very reticent about his part.² His uncanny predictions concerning the potential of the new discoveries and his own publications of that period suggest that he was more than an interested spectator. A particular friend and collaborator was James Wimshurst, the inventor of the well-known static electric induction machine. In 1906 Marconi publicly acknowledged his friendship and indebtedness to Brother Potamian for solving problems for him relating to induction.²

But apart from his scientific achievements, Brother Potamian left an indelible stamp on Catholic education in London. While director of St. Joseph's College, Clapham, he inspired and organised the transfer of the College to Tooting between 1886 and 1888 despite serious financial difficulties, opposition from non-Catholic sources and even doubts within the order. This magnificent college is a memorial to his foresight, dedication and perseverance, but he shunned the limelight and in 1889 with the new college firmly established he stepped down as director to concentrate on his teaching and scientific interests. In 1889 his achievements were further recognised by his election as a Member of Convocation of the University of London.

In 1893 he was transferred to the newly opened Training College in Waterford as Professor of

Physics, but maintained his scientific interests in London, which he visited frequently, returning to fire the admiration and enthusiasm of his students with accounts of the new scientific discoveries and his assessment of their potential.

Alas, for it was certainly Ireland's loss, in August 1896 he was transferred to Manhattan College, New York, the order's most prestigious institution in America and a college of university status, having been granted a charter by the University of New York in 1863.² With his usual zeal he threw himself into the task of developing the college's school of engineering to which he devoted the final 20 years of his life. He continued his interests in electricity and magnetism with many papers in the *Electrical World and Engineer*, and he compiled a two volume catalogue of the library of the American Institute of Electrical Engineers in 1909. He had a particular interest in the history of the science of electricity and magnetism, publishing papers on Benjamin Franklin, William Gilbert of Colchester in the 16th Century and Petrus Perigrinus who was author of the earliest treatise on the magnet in 1269 A.D. His monumental work "The Makers of Electricity" in collaboration with James J. Walsh is still the definitive biographical history of electricity.⁵ He also published papers on Newton and Becquerel and on the importance of electricity and allied subjects in college courses, but the paper of particular interest to us is his very last publication "The Coming of Age of the X-Ray" in the *Catholic World* in October 1916 just before his death on January 20th, 1917 at St. Lawrence's Hospital, New York. In this paper he states that none of the remarkable developments of the late 19th Century "stirred up popular and professional interest as much as the announcement from a quiet university town in Bavaria of the discovery of the mysterious and wonder-working x-ray". He also indicated the difficulties which he encountered in trying to repeat Rontgen's achievement "as Rontgen's paper contained no directions concerning the technique of the new photography and the first experimenters had to find out everything relating to the sensitive plate and its development as well as the distance of the x-ray tube and time of exposure".⁴ Brother Potamian evidently overcame those initial difficulties successfully because the print from his Waterford plate is sharp enough to show bone detail and trabecular pattern quite clearly.

Just before his death the *New York Herald* described him as "one of the pioneers in radiography", and a measure of his international reputation as an educator and scientist were the many eulogies that appeared after his death in educational and scientific journals around the world in English, French and Italian, all paying tribute to him as a pioneer in electricity, radio and x-rays. He had been awarded honorary doctorates of science by Fordham and Villanova University in 1912 and, in an obituary, the *Electrical World* likened him to Lord Kelvin and Joseph Henry.^{6,7}

In all, Brother Potamian spent less than 5 of his 70 years in his native land but he was a truly great

Irishman, a saintly follower of St. John Baptist de La Salle, an educator to whom England and America owe a great debt and a pioneer scientist whose humble and retiring nature prevented him from claiming full credit for his achievements.

Acknowledgements

I am indebted to Mr. Michael McGrath and the Brothers of the De La Salle College, Waterford for their great help in making sources and other material available to me and for a print of the original x-ray plate of 1896.

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