

SHORT PAPER SESSION L9

L9.1 Thinking outside the box: Lessons from art history for the era of augmented reality radiology

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Since the discovery of X-rays in 1895, radiographic and other medical images have been almost exclusively confined to rectangular format, whether in hardcopy radiographs or via the margins determined by a computer monitor. The recent advent of augmented reality (AR) imaging techniques looks set to smash these traditional equilateral boundaries, in varied settings including interventional procedures, surgical planning and educational uses. Yet while these emerging applications rely on cutting edge technology, this paper argues that valuable lessons in the implementation of AR can be gained from art dating back hundreds, if not thousands of years.

From cave paintings, to ancient Egypt, medieval manuscripts to surrealist modernism, art history is crammed with examples of ambiguity in where an image begins and ends. Whether stumbling upon a form of partial volume effect in carving the sphinx, to stained glass saints who refuse to be confined by their pane, artists and craftsmen have grappled with AR relevant challenges throughout the ages. In examining the foundations of how these varied images were constructed and interpreted, we can be better equipped to understand the ever blurring boundaries between representation and reality, and how best to use this exciting technology for the benefit of patients.

1. Christie, M. (2024) 'Augmented reality and radiology: visual enhancement or monopolized mirage', *BJR Open*, 6(1), tzae021. doi: 10.1093/bjro/tzae021.

2. Lee, S.M., Coimbra Baffi, H., Ola, T., Tsang, B., Gupta, A., Faingold, R., Stimec, J. and Doria, A.S. (2025) 'Clinical applications of virtual and augmented reality in radiology: A scoping review', *Journal of Clinical Medicine*, 14(20), 7438. doi: 10.3390/jcm14207438.

3. Iqbal, A.I., Aamir, A., Hammad, A., Hafsa, H., Basit, A., Oduoye, M.O., Anis, M.W., Ahmed, S., Younus, M.I. and Jabeen, S. (2024) 'Immersive technologies in healthcare: An in-depth exploration of virtual reality and augmented reality in enhancing patient care, medical education, and training paradigms', *Journal of Primary Care & Community Health*, 15, 21501319241293311. doi: 10.1177/21501319241293311.

L9.2 The invisible light in Lancashire: Arthur Rayner and the establishment of x-ray services in Preston during the early 20th century

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Background

It could be suggested, that when discussing the history of radiology in the United Kingdom, research tends to focus on the X-ray martyrs and London based hospitals. However, in the North-West of the country, Dr Arthur Rayner was one of the leading radiologists and x-ray technicians at Preston Royal Infirmary, which opened in 1929. He also maintained an x-ray service from his home. After the development of the National Health Service in 1948, home based doctors and community medicine shifted to hospital-based care, and patients no longer paid for services such as those offered by Dr Arthur Rayner.

Purpose

- To celebrate and recognise the life and career of Dr Arthur Rayner.
- To consider how the development of services such as radiology, impacted communities in poorer regions of the country.
- To reflect on the journey back to community-based healthcare, 78 years after the introduction of the National Health Service.

Summary of Content

This submission focusses on Dr Arthur Rayner's life and career, exploring his passion for radiology and making healthcare accessible for all. This submission also explores the current shift to community-based diagnostics, which are reflective of healthcare during Dr Arthur Rayner's life and career. Lastly, this submission aims to shine a light on how radiology services were developed elsewhere in the country, outside of London.

L9.3 John Hall Edwards –A Birmingham Radiology pioneer remembered on the centenary of his death

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2026 is the centenary of the death of Hall-Edwards, one of Britain's first radiologists. Hall Edwards was born in Birmingham on 19 Dec 1858 and attended King Edwards School and Queen's College, Birmingham where he studied medicine. He became an assistant demonstrator in histology and had an early interest in microphotography. Hall Edwards qualified in medicine in 1885 and became a GP in Mosely. He developed an interest in photography winning medals and writing on this subject. In 1895 he realised the importance of Rontgen's discovery and set about championing this and gave one of the early demonstrations of X-rays in 1896 in East Birmingham and lectured on this topic. In 1899 he was appointed to the staff of the Birmingham General Hospital and appointed 'consultant surgeon radiographer' to a number of hospitals in Birmingham where he set about building new radiology departments. In 1900 he joined The Royal Army Medical Corps as Major and went to South Africa to help during the 2nd Boer War conflict serving as a radiologist at the Imperial Yeomanry hospital in Delfontein. Hall –Edwards returned to the General Hospital, Birmingham as the inaugural radiologist. He was Editor of the Journal 'Archives of the Rontgen Ray' from 1903-1905 the first British journal in the field. He was President of the British Electrotherapeutic Society in 1906 and in 1915 elected Vice President of the Rontgen Society. Sadly he became a radiation martyr having his hand amputated due to radiation damage and died in 1926.

Banerjee A. K (2020) John Hall Edwards – a radiology pioneer Hektoen International Journal of Medical Humanities 23 June 2020

Banerjee AK (2021) J F Hall Edwards a British radiology pioneer from Birmingham remembered.

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L9.4 Bullets and their Billets: John Hall-Edwards (1858-1926) and his experiences with the X-rays in the South African War

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Background

The pioneer Birmingham radiologist John Hall-Edwards went to South Africa with the British forces during the Boer War, and gave a detailed account of his experiences in his 1902 paper 'Bullets and their Billets.'

Preparations for the South African hostilities were inadequate and what was expected to be a brief conflict turned into a full-scale war. The Boer War was the first occasion since the Crimean War that the British Army had faced an opponent with weapons as modern as their own. The war lasted two and a half years. The medical arrangements became more complex as they progressed with a system of general (fixed) hospitals and field (moveable) hospitals. X-ray apparatus was supplied to general hospitals as part of the essential equipment for the campaign. Both electrical and radiation protection were still primitive. The general hospitals (but not the field hospitals) had portable X-ray apparatus to allow retained bullets to be detected and fractures to be diagnosed and treated.

Purpose

To understand how radiography became integrated into British military surgery. To learn about John Hall-Edwards' contributions to military surgery, and his insights into the optimal way to introduce this new technology. To celebrate the life of this remarkable radiologist.

Summary

A presentation will be made of: The work of John Hall-Edwards during the South African (Boer) War.

The integration of radiography into British military surgery.

Thomas, A.M.K. (2022) Invisible Light, The Remarkable Story of Radiology. Boca Raton: CRC Press (Taylor and Francis Group).