

BOOK REVIEW

Jeffrey Womack, *Radiation Evangelists: Technology, Therapy, and Uncertainty at the Turn of the Century*

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Immediately after Wilhelm Röntgen's discovery of X-rays in 1895, a surge of technological enthusiasts swiftly seized upon its therapeutic potential. Spanning a diverse spectrum of backgrounds and orientations, these radiation therapists – including physicians, physicists, experimental biologists, diagnosticians, X-ray technicians and radium salespeople – are gathered together using Jeffrey Womack's evocative label: 'radiation evangelists'. Womack's book presents a captivating account of the early history of the contentious practice of radiation medical practitioners in Britain and America between 1895 and 1925. Womack chooses a religious term to capture the fervent faith of these technological enthusiasts, who devoted themselves passionately to the hyped promise of X-rays and radium, which sadly left many of them crippled and burned.

Womack's meticulous scholarship traces the intricate landscape of early radiation pioneers and evolving technologies. Drawing extensively from diverse historical sources – ranging from newspapers, magazines and academic journals to letters and archives – Womack unveils the therapists' enthusiastic endeavours from the dawn of the 'Röntgen rush' to after the First World War. In the early twentieth century, journals and societies were founded to create a space for specialists and non-degree-holding technicians to exchange views on standards, ethics and licensing issues against quackery during the wave of medical specialization, as illustrated in Chapters 2 and 3. During the same transformative period, refinement of cathode tubes and comprehensive explorations of mechanisms of therapeutic actions were launched, as detailed in Chapters 4 and 5 respectively. Attracted by the lucrative medical marketplace, some evangelists also engaged in the mythmaking of the scarcity and miracle of radium, to a certain extent misleading the public to consume more radium than advisable, even by contemporary standards, as exposed in Chapters 6 and 7.

Nearly all of these stories have a tragic end. With the exception of Frank Hartman – the radium broker depicted in Chapter 7 who was fearful of radium – most evangelists ended up as martyrs, even though they were at least vaguely aware of the uncertainty and hazards of radiation from the beginning. Uncertainty cast a shadow from multiple angles, such as deficiencies in the X-ray apparatus framework, inaccuracies in dosimetry and the obscure mechanism of the effects of ionizing radiation on human bodies. But these technical shortcomings and medical uncertainties failed to quell the evangelists' enduring technological optimism. The hazard, evidenced by dermatitis, erythema and cancers, was downplayed to a level of tolerance. It inflicted patients with skin problems while therapists suffered from insufficient shielding from radiation exposure. Meanwhile,

therapists embraced as an ethical principle the golden rule of conducting experiments on themselves before applying treatments to patients, which added a self-sacrificial tinge to the evangelical mission of these therapists. But the narrative of medical martyrdom – a religious label that was adopted by the radiation evangelists themselves – is greeted with scepticism by the author, who attributes much of the self-inflicted tragedy to undue enthusiasm for new technologies and underestimation of the associated uncertainty.

These factors contributed to the poignant fate of almost an entire generation of radiation therapists and patients, who succumbed to diseases induced by uncontrolled dosages of radiation and long-term risks of radiation exposure, as viewed from a modern-day perspective. Mourning the martyrs of radiation, Womack appeals to prudence and precaution in the application of innovative technologies to the human body, regardless of their apparent promise. Whereas other historians have unravelled the perilous fallout of technological optimism, such as Zuoyue Wang in his study of the President's Science Advisory Committee in Cold War America, Womack contributes a focused analysis of the clinical dangers of hasty adoption of new technologies for medical treatments, which became a matter of life and death.

Radiation Evangelists speaks to existing scholarly work in the history of biology, including the history of radium presented by Luis Campos in *Radium and the Secret of Life* (2015), the history of radiobiology by Angela Creager in *Life Atomic: A History of Radioisotopes in Science and Medicine* (2013), and the history of radioactivity in modern American history by Matthew Lavine in *The First Atomic Age: Scientists, Radiations, and the American Public, 1895–1945* (2013). Weaving together insights developed from a careful investigation of specialized journals, medical textbooks, advertisements, meeting agendas, memoirs, correspondence between journalists and experimenters and personal records from early therapists, the book is primarily intended for historians of medicine and historians of technology, but historians of modern America and Britain intrigued by the paradox of one of the most important medical interventions in the early twentieth century will likely find the book immensely appealing, if not somewhat alarming.