

Engineering revolution

Willem Hackmann

The Third Man: The Life and Times of William Murdoch 1754–1839, the Inventor of Gas Lighting. By John Griffiths. Andre Deutsch: 1992. Pp. 373. £20.

THIS book is not set in post-war occupied Vienna, but in the Cornwall and Midlands of the Industrial Revolution. William Murdoch is the Harry Lime of this plot, one of the Industrial Revolution's most creative figures. His co-stars are Matthew Boulton and James Watt, the partners of the innovative Soho Manufactory outside Birmingham where Watt's steam engines, and a host of other metal goods, were produced by the latest technical methods, many of them developed by Murdoch.

In *The Third Man*, Holly Martins, a second-rate writer of cowboy stories, tries to discover what had happened to Harry Lime. In this book, John Griffiths attempts to piece together the life of Murdoch from the scraps that have survived: a handful of letters and mechanical drawings, and a few objects. A sinister reason suggested by the author as to why so little of the correspondence appears to have survived of this hero of the Industrial Revolution, is that the records were 'cleaned' by Watt's relatives, not long after Murdoch's death in 1839. The author's finger of suspicion is pointed at James Watt junior, whose relationship with his father's erstwhile employee and friend was complex, and who was keen to sustain the 'Wattolatry' that had sprung up and which still dominates history books. In an attempt to correct this image, an exhaustive search was made of existing archives for Murdoch material, apart from in the Watts papers at Doldowd to which the author was refused access, although they are listed in the Public Record Office. This is unfortunate, even if the present owner, Lord Gibson Watt, took the trouble to assure the author that these papers contained no relevant material.

Watt deserves his reputation as one of the giants of the Industrial Revolution, which was built on his improved steam engine and on the flow-line production techniques pioneered by Boulton. In many respects Watt was a modest man but, by means of his voluminous correspondence, the author shows that he could be inordinately jealous of his reputation as an inventor. However, this was not an uncommon concern in a period noted for financial freebooting and heated patent litigations. The firm of

Boulton and Watt was continually trying to curb its competitors, either in court or out of it, and was not adverse to a little industrial espionage. The author recounts several humorous anecdotes of Murdoch's forays into enemy territory.

On one occasion he and Abraham Storey, manager of the foundry of the Soho Works, were sent to the famous Round Foundry in Leeds of Matthew Murray (who had become Boulton and Watt's principal competitor in the manufacture of steam engines) to discover how it could make the engines at a much reduced price. On this ostensible 'goodwill mission' they were admitted to every part of Murray's factory and succeeded in extracting from him the secret of his forge work in the course of two evenings of heavy drinking. Next, one of Boulton and Watt's former employees, who had been enticed by Murray to Leeds, tipped off the Soho firm about the improved casting techniques used by Murray in the manufacturing of his engines. In the meantime Murray had become furious with Boulton and Watt, for his expected return visit never materialized, no doubt because they feared that he might return the favour and spy on them. Murdoch was again sent to Leeds, but this time to make contact with their former employee who, after a drinking bout, agreed to accept a guinea a week to act as a spy until Watt junior decided that he should re-defect to the Soho firm. Through these tactics Murdoch discovered the casting techniques employed by Murray.

Murdoch emerges from these pages as a sympathetic figure, large in body and spirit, growing increasingly irascible with age, but who maintained his inventive mind virtually until the end. This Scottish miller's son, born and bred on the estate of James Boswell's father, had such an urge to make his way in the new technological age that, when a young man, he walked the 250 miles to Boulton's Soho Works. He remained associated with the firm until his seventies, for many years as installer and maintainer of its steam engines sold to the Cornish mines, and then as the manager of the foundry of the Soho Works. He made numerous inventions: the 'sun and planet gear' for Watt's steam engine, which turned its oscillation into rotary motion; the oscillating steam engine (later used on early steam boats); the D-slide steam valve; a model steam carriage; the sending of messages by compressed air; and, the cause of a great economic revolution in the nineteenth century, the harnessing of coal gas for the purpose of lighting.

Boulton died in 1809 and Watt ten years later. Murdoch was an inconspicuous spectator at the public meeting held in 1824 to raise a memorial sub-

scription to Watt for his bust to be placed in Westminster Abbey. On Murdoch's death no memorial was raised and no notices were published in national newspapers. A marble bust was made by Chantry (who also made busts of Watt and of that other important figure of the Industrial Revolution, the civil engineer John Rennie). Murdoch lapsed rapidly into an undeserved obscurity, overshadowed by the men for whose success he had been essential. This is well brought out in this book. Memorable in *The Third Man* was Anton Karas's evocative zither music. Memorable in Griffiths's biography is his description of the harsh working conditions of the Cornish miners among whom Murdoch worked for so many years. □

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Clues to early life

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The Proterozoic Biosphere: A Multidisciplinary Study. Edited by J. William Schopf and Cornelis Klein. Cambridge University Press: 1992. Pp. 1,348. £105, \$195.

TWO billion years, from roughly the fiftieth to the nineteenth percentiles of Earth history, is the compass of the Proterozoic Eon. At its dawn was the great protracted period of formation of the continental crust. Its demise was hastened, so we believe, by the accumulation of oxygen in the atmosphere to a degree that allowed all the basic body plans of complex life forms to spring forth in the early Cambrian burst of evolution.

The scientific study of the Proterozoic biosphere was slow to develop. Lurking at the base of the stratigraphic column was a mass of deformed and molten rocks. Far from revealing a coherent story of the early evolution of life, it was difficult to imagine fossils preserved at all. Yet at the turn of the century, Charles Walcott's acute eye had spotted the proverbial needle in the haystack in the form of carbonaceous spiral impressions in the kilometres-thick Belt strata of Montana, now known to be around 1,400 million years old. Such early discoveries remained in limbo for want of adequate biological or temporal context. S. A. Tyler and E. S. Barghoorn's description of silicified microbes from the early Proterozoic Gunflint chert in 1954