

Fifth Business: A Life of the Chemist and Educationist Henry Edward Armstrong. By WILLIAM BROCK. Pp. 352, illus., index. University of Chicago Press: Chicago. 2025. £34.00. ISBN: 978-0-22-683958-5.

Fifth Business is the final monograph by the late William H. Brock (1936–2025), who was Emeritus Professor of History of Science at the University of Leicester. Originally trained in chemistry, Brock went on to become one of the preeminent historians of chemistry of his generation. He was a stalwart of the Society for the History of Alchemy and Chemistry, serving as the Society's Chair for almost ten years and as Editor of its journal *Ambix* for well over a decade. He was also a prolific author. Active for six decades, Bill (as he preferred to be called) produced some of the best introductory texts in the history of chemistry together with four book-length biographies of more or less well-known nineteenth-century chemists, including William Prout, Justus von Liebig, William Crookes, and now the English organic chemist, Henry Edward Armstrong (1848–1937).¹

Armstrong – who, like his biographer, was a chemist and educator as well as an active member of his scholarly community – is a highly appropriate subject for Brock's final work. It is also fitting that, having addressed Armstrong's early life and career (Part I), Brock – whose own retirement years were so productive – devoted almost half of this book to Armstrong's post-retirement activities (Part II). *Fifth Business* displays the erudition gained over a career spent studying nineteenth-century chemistry in the easy style of an accomplished and experienced biographer. Sixteen broadly chronological chapters examine different aspects of Armstrong's life, integrating Brock's previous studies of Armstrong's activities in the field of education with original material, including valuable new accounts of his frequently overlooked scientific contributions, especially during the latter decades of the nineteenth century.² The text is complemented by ten images, six of which depict Armstrong, including one with his wife, Louisa. The book is made easily navigable by a comprehensive index. As with Brock's biography of Liebig, the reviewer was struck by the author's ability to weave together strands of chemical technicality, architectural detail, and educational philosophy with quotidian details of his subject's personal, social, and professional life.³

Among the many riches on display, the account of Armstrong's time at Finsbury College in chapter three is memorable for illustrating his commitment to a chemical training that spanned experiment and theory, requiring Armstrong's involvement with laboratory architecture, textbook writing, and pedagogical advocacy, as well as teaching itself. Chapter five is devoted to Armstrong's research while at the Central College in Kensington, beginning with a rare glimpse of his studies of the structure of

¹ Susannah Ahluwalia et al., "William Hodson ('Bill') Brock (15 December 1936–16 February 2025)", *Ambix* 72 (2025): 208–20.

² William H. Brock, *H. E. Armstrong and the Teaching of Science, 1880–1930* (Cambridge: Cambridge University Press, 1973).

³ My own historical scholarship was partly inspired by Brock's (1997) biography *Justus von Liebig: The Chemical Gatekeeper* (Cambridge: Cambridge University Press, 1997; paperback edition 2002)

benzene during the 1880s and 1890s. Readers used to triumphalist stories of the immediate success of August Kekulé's (1865) benzene ring will be struck by Brock's more even-handed treatment, which pays welcome attention to the crucial contributions of Kekulé's assistant, Wilhelm (Guglielmo) Körner. Elsewhere, the book reveals Armstrong's wartime interests in agriculture and food chemistry (chapter eleven), his ongoing efforts to promote science education (chapter twelve), and the range of activities that occupied his retirement. With views on gender Brock characterises as "regrettable" (p. 128) and a propensity to stick to his guns, e.g. in his steadfast aversion to the word "vitamin" (p. 256), this biography brings Armstrong to life: scientist through and through, but no white-coated genius. Brock borrowed this book's title from Robertson Davies's (1970) novel of the same name, a reference both to acting (one of Bill's early enthusiasms) and to the frequently unrecognised significance of those deemed to be playing supporting roles. Brock's *Fifth Business* richly demonstrates Armstrong's importance to chemistry in Britain during the decades around 1900.

If this book has a limitation, it is one that derives directly from the breadth of knowledge and interest that Brock shared with his subject. For this reader, the accounts of the science of nineteenth-century chemistry in *Fifth Business* were fascinating and illuminating, giving the lie to the author's characteristically modest claim that John Vargas Eyre's (1958) biography had fully described and analysed Armstrong's chemical research. But they – and some of the *en passant* remarks elsewhere regarding technical matters – are presented without much in the way of context or explanation. This is surely a reflection of Brock's own interdisciplinary skills, but it has the unfortunate consequence that these important aspects of Armstrong's career, and therefore of this fine biography, are likely to remain at best partially accessible to readers unversed in the key developments and major controversies of nineteenth-century chemistry.

It would be impossible to close this review without noting the collegial generosity that led another preeminent historian of chemistry, Alan Rocke, to edit Brock's manuscript when the author became too ill to continue work. As I read the published text, I found myself wondering how much of its elegant phraseology was due to Rocke. But in the end, I concluded that this wasn't all that important. Historians of chemistry – like those of other sciences – have spent some decades seeking to persuade readers, including their colleagues in earlier generations, that chemistry is a collective, collaborative practice and not the product of individual geniuses. Nineteenth-century chemists, such as Armstrong, certainly knew this to be the case: all original contributions have their roots in the work of many, and this is as true of historical scholarship as it is of scientists' attempts to make sense of the world around us.

Fifth Business is a long overdue biography of one of the finest English chemists of the second half of the nineteenth century, a period dominated by German practitioners. It will stand as a fitting testament to Bill Brock's career, and to the high regard in which he is held by his colleagues worldwide.

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