This backdrop is then applied to the various case studies. Boddice presents his first – Victorian vivisection – as an affective practice of Darwinian sympathy with the physiology laboratory serving as a theatre of emotional control. Historical research to date has typically taken the apparent emotional callousness of vivisectionists for granted, in many ways following the lead of the antivivisectionists themselves. In contrast, Boddice's analysis insists that this new breed of medical scientist sought to check their emotions, to subdue, change and redirect them for the greater good of humankind. In this particular emotional regime, inflicting pain upon living animals could be genuinely thought of as an act of human sympathy.

Similar arguments are made in relation to Victorian public health officials' checking of their feelings towards liberty and invasions of privacy. But perhaps most significantly, Boddice offers an emotion-based rationale for the controversial field of eugenics. In the work of Galton and others, eugenics was guided by a sympathy for the whole of society. The successful rearing of a master race depended upon detached social engineering. Emotions themselves were to evolve and function on a higher plane if they could be suppressed for the social good.

Boddice admits that emotional failure was a common problem. However, the burgeoning community of late Victorian medical scientists was sufficiently large to provide continual reinforcement for a new emotional regime justified as morally and emotionally right. And, importantly, these scientists were not merely social commentators or critics: they affirmed their world views through practical activities such as cutting open live animals or vaccinating a child without express permission.

The Science of Sympathy is an impressive achievement, stimulating, interesting and well written. Boddice has reshaped some of the most common themes of Victorian medical history and remoulded them with up-to-date emotions-history methodologies. Indeed, perhaps the key strength of *The Science of Sympathy* is its demonstration that emotions history can be successfully and practically used in the histories of science and medicine to further our understandings of even the most familiar of topics, such as Darwinism. The book has the potential to be a key emotions-history text.

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Raymond G. Stokes and Ralf Banken, **Building on Air: The International Industrial Gases Industry, 1886–2006**. New York: Cambridge University Press, 2016. Pp. xvii + 465. ISBN 978-1-107-03312-2. £64.99/$99.99 (hardback).
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Building on Air is a welcome addition to the extant histories of industrial sectors. It is perhaps very surprising that a history of such an important industry has not been published before, although it is important to caution that the authors have defined the industrial gases industry in a way that suits their task: those gases that are produced directly from air. Carbon dioxide, although a vital gas and industrial raw material, is largely excluded since its main source was the brewing industry, but later it came to play an important part in the industrial gases industry.

Building on Air is primarily a business history. Most of the technical developments relating to the manufacture of gases, the pioneers in the industry and the uses for the gases are largely covered in the early chapters. The remainder of the book is devoted to the industry's business development, its expansion and the vital role patents and intellectual property rights played in the outcome of many negotiations.

The book is divided into four broad parts. The first, 'Defining an industry, 1886–1914', focuses on the origins of the air gases industry from the production of pure oxygen in 1886 by Brin's Oxygen Company, a British firm that used an invention of the French Brin brothers, to the more technologically advanced techniques of Carl Linde and Georges Claude that allowed

large-scale production of air gases. These developments were a response to the steadily increasing demand for oxygen (and acetylene) for oxyacetylene cutting, as well as welding. Storage and distribution of oxygen under pressure were advanced by the invention of the steel cylinder in 1885. By the end of this period the industry had been divided up geographically; there was acceptance within the industry for an individual company to take responsibility for a particular market.

The second part, 'Seeking equilibrium in an age of turbulence, 1914–1960', surveys the progress of the industry against the backdrop of two world wars and the difficult economic period in between. During the interwar period there were not only further technological advances involving production, distribution and storage, but also new applications for the gases. The third part, 'Mass production, specialization, and internationalization, 1960–1980', focuses on the role of the newcomer Air Products in Britain and then in the United States, as well as a comparison of the industry's growth in the Soviet Bloc (using East Germany) with that in Japan between 1945 and 1989. The fourth part, 'Concentration, consolidation, and competitions, 1980–2006', is concerned with how the industry became global in scope and activity through further innovation and reorganization.

The authors draw attention in the conclusion to how the word 'industry' has multiple interpretations and yet is often used without any clear exposition of which meaning is being applied. For the air gases industry, the 'industry' changed several times at critical stages. The starting point for the authors is Michael Porter's definition of industry from his book *The Competitive Advantage of Nations* (1990; second edition 1998) that makes reference to 'competitive'. However, as the air gases industry demonstrates, mapping a given firm or business onto a designated industry (or sector) is often not straightforward since industry boundaries are not always clearly defined. The *Building on Air* authors point out that the air gases industry changed its 'industry' four times to reflect whether the predominating feature was manufacturing, servicing or combinations. However, it is not unreasonable for a company to feature in different industries or sectors at any particular time; this might better reflect the different elements of the business strategy while also facilitating the company's securing government grants to support innovation in specific parts of the business.

Building on Air was the culmination of over five years of diligent research, with the authors granted access to a wide variety of archives and business records covering the time frame of the book. Valuable use was made of oral history to gather detailed information and insight into the workings of the current businesses and the strategies that have driven the industry forward in more recent times. It is important to point out (as the authors have acknowledged) that while Linde AG took the lead with the research project and funded it, there were no restrictions on using the archives of other companies and no interference in the research or writing of the book. Without this approach and support, a book that encompasses the air gases industry as a whole would not have been possible, and hopefully it will serve as a model for books on other multi-company industries.

Even with the welcome publication of *Building on Air*, there is a still a gap in the literature for a book that thoroughly explores the role of gases across the different industrial sectors, the businesses and processes involved and those responsible for the technical developments.

Building on Air is frankly a dense read and could have been improved for the reader in two ways. The business relationships that develop across the air gases industry result in a complex web of interconnected entities. As the web gets more entangled and difficult to follow, some ready-reference flow charts would have allowed readers to follow the changes more closely. Also, the importance of the air gases industry in servicing other industrial sectors could have featured more prominently either in the narrative or by graphical representation.

Building on Air is thoroughly recommended for business and economic historians while the early chapters will be of most interest to historians of science and technology.

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