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*Invisible Fuel* appears in a series which aims to provide concise overviews of the evolution of a variety of industries and major firms in the United States. There is certainly a gap in the market for an up-to-date survey of the history of the US gas industry and Dr Castaneda, the author of several monographs on aspects of the history of the gas business, is well-placed to fill the gap. He has succeeded in producing a balanced account, wide-ranging in its coverage, which draws extensively on both secondary and primary sources, while always remaining clearly structured and readable.

The material is organised chronologically. After a brief introductory section outlining the European origins of gas manufacture, the second part of the book covers the nineteenth century development of the gas industry in America in about 60 pages. The first gas company in America was established in Baltimore in 1816 and by 1850 some 50 cities had manufacturing plant for producing gas from coal. Gas was mainly used for lighting, and because of the high price its use was confined to the wealthiest of citizens, and to the business community. For the latter part of the nineteenth century, Castaneda documents the main developments including the origins and growth of the natural gas industry, the remarkable increase in the use of manufactured water gas and the beginnings of competition from electricity, when gas was ousted from the provision of lighting and had to turn increasingly to the heating and cooking markets.

The chapters on the first forty years of the twentieth century show that merger waves and the involvement of companies such as Standard Oil in the gas business soon created some large and powerful corporations. The trend towards increased industrial concentration continued into the 1930s, with the development of combined gas and electric companies, and of holding companies controlling many subsidiary firms. Some companies owned long-distance pipelines crossing several state boundaries, making it impossible for them to be regulated at the state level. Anti-competitive practices led to calls for new legislation at the Federal level to control the utility industries. The 1935 Public Utility Holding Company Act abolished the large pyramid-structured holding companies and also required the separation of natural gas and electricity operations. The 1938 Natural Gas Act enabled the Federal Power Commission to approve or set the prices to be charged by natural gas companies.

Part 4 of the book covers the era of federal regulation from the late 1930s through to the 1980s. For more than twenty years after World War II the U.S. natural gas industry enjoyed unrivalled growth and prosperity. The regulatory framework delivered price stability for consumers while strict limits on entry into the industry enabled the established gas supply companies to earn satisfactory profits. Improvements in pipeline technology meant that gas from the large natural gas fields in the south-west of the country could be piped into large north-eastern cities such as Boston, New York and Philadelphia which had been the last bastions of manufactured gas in America.

But the seeds of future problems were sown in this era of prosperity. The regulatory framework established in the 1930s did not allow for controls on the prices of natural gas production, only transmission. Since there were large numbers of producers, many of them small-
scale, there was not a compelling economic logic for the regulation of production. On the other hand, it was difficult for regulators to set fair prices for consumers without some control of the wellhead price, especially for integrated companies. The extension of regulation into gas production, after the Phillips decision of 1954 in the US Supreme Court led eventually to serious shortages of natural gas. Regulated wellhead prices were too low to encourage sufficient exploration and new production. By the late 1960s, gas production was running well ahead of the discovery of new reserves, and by the 1970s producers were unable to meet their contract obligations in full.

The book concludes with a discussion of how successfully the deregulation of the American gas industry from the 1970s to the present day has been at overcoming these problems, and also provides some apposite comparisons between the large utility combines of the 1930s and those which have emerged in recent years as one of the more worrying aspects of deregulation.

Overall, the book is at its best on matters of business history, supplying in concise narrative form information on particular entrepreneurs, technological and organisational innovations, and changes in the competitive environment faced by gas businesses. There is a lack of emphasis on regulatory issues, especially for the period before Federal regulation. The origins of regulation in the utility and transport industries in this period have been widely debated by a range of commentators, from left-wing historians such as Gabriel Kolko through to Chicago economists, who have analysed the role of interest groups, consumers and of the companies themselves in establishing regulatory bodies. It would have been fascinating to have had a blow-by-blow account of the main developments in the case of the gas industry, but this would have required considerably more space than the one or two very brief paragraphs provided here.

Some comparisons with other countries would have been valuable. Other developed economies have also witnessed the decline of a long-established manufactured gas sector, as well as competition with electricity, and battles in the political arena with oil and coal producers. On the other hand, some features of the American gas industry, such as the lack of municipal or government ownership appear more unusual. Comparisons with other countries could have sharpened the analytical focus.

The book is generally well-provided with graphs and statistical tables but a few more would have been useful. The author tells us that electric lighting supplanted gas lighting rapidly, but no figures are provided. Similarly some data on the extent of use of manufactured and natural gas in the nineteenth century and the first half of the twentieth century would have helped to clarify trends in these two sectors of the industry.

Such omissions as there are stem mainly from the concise format of the book: surveying 200 years of the history of such a major industry in about 200 pages of text is no easy task. Castaneda has accomplished it very well and Invisible Fuel is an excellent starting-point for all students and researchers interested in the history of the American gas industry.

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