Steel at the dawn of capitalism: reformation, technology and enlightenment

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ABSTRACT: The history of the ways of thinking which characterise the Age of Enlightenment can be traced back to late medieval humanism. The development of cementation steelmaking in early 17th century England was one of the earliest concrete expressions of an 'enlightenment' mode of thought. At one level there is a material connection between the products of such furnaces and the growing Enlightenment—cementation steel was used to create the weapons of the civil war, and provided instruments which drove forward a scientific revolution from late in the 17th century. However, at another level there is a more complex relationship between different ideas about how the world was structured. This paper will argue that the design, construction and operation of these furnaces formed a deliberately rational act at the dawn of the capitalist era: the very act of steelmaking was a bridge between humanism and the Enlightenment.

Introduction

The English Enlightenment is usually regarded as being contiguous with the 'long 18th century', gaining momentum after the Restoration and getting fully into its stride in the early 1700s. Joel Mokyr has used the term 'Industrial Enlightenment' to describe the 18th-century process of 'studying natural phenomena and regularities, reducing them to general principles' and then applying them to the processes of manufacture and trade (Mokyr 2006, 271–3). However it is difficult to ignore the 'Scientific Revolution' which informed and preceded the Enlightenment; which in its turn was preceded by the development of humanist individualism in the 16th century. In this context it is perhaps preferable to define 'Enlightenment' not as a temporal construct with a capital 'E' but as a philosophical one. In this form it is a movement concerned with rationality, with making empirical observations and developing ways of understanding the world that are independent of received wisdom. Such an experiential or experimental approach was explicitly set out early in the 17th century by Francis Bacon, who valued the increase in human knowledge gained 'when the experience of several mysteries shall fall under the consideration of one man's mind' (Bacon 1605, cited in Kearney 1964, 122). Tracing the trajectory of Baconian empiricism back further, it is possible to argue that the 'enlightenment' began with the re-discovery of Aristotelian thought in the Middle Ages and the emergence of humanism—itself leading, one way or another, to the Reformation.

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'The Monks all thought it was still the Middle Ages. So Henry... told Cromwell to pass a very strong Act saying that the Middle Ages were all over and the monasteries were all to be dissolved' (Sellar and Yeatman 1930, 64).

The notion that the process of Reformation and Renaissance brought about the modern world is not new; indeed it was one of the cornerstones of progressive histories from late in the 19th century onwards. Such whiggish narratives sought to emphasise the rise of individualism at the expense of the corporate body. The argument was taken a stage further by Max Weber at the beginning of the 20th century, who regarded the emergence of capitalist society as the consequence of die protestantische Ethik (Weber 1904–5). The idea