Iron in 1790: production statistics 1787-96 and the arrival of puddling

Peter King

ABSTRACT: The 1780s and 1790s were a period of great change in the British iron industry. These decades saw a rapid transition from most bar iron being made with charcoal in finery forges and hammers to the use of reverberatory furnaces fuelled with coal, and the iron being rolled into bars instead of hammer-forged. This change is illustrated by a series of lists, of which the fullest and most important was probably compiled in 1790, but partly updated in 1794. The list provides good evidence of the spread of potting and stamping and of a process to recycle scrap iron, but has a few surprising omissions. The subsequent successful adoption of puddling depended on the production of finers' metal, developed at Merthyr Tydfil in about 1791. This only gradually replaced the stamping process, which was the first to produce good bar iron without charcoal.

Introduction

A main purpose of this paper is to publish (as an Appendix) an edition of a list (hereafter the '1794 list') of ironworks, which bears the date 1794, and to examine its relationship with other lists from the period since 1787. The 1794 list is contained in a paper book, 230 mm by 185 mm, made by folding 13 sheets of paper. It bears the title, List of the different Iron Works in England Wales Scotland and Ireland to the year 1794. Copied from the papers of the late William Wilkinson. The 1794 list itself, which will be described below, is followed by a list (not reproduced here) of forges allegedly from 1749, but actually c1737 (see below) with the ‘present’ State of each; then a list of ‘declined’ charcoal furnaces and of ‘coak furnaces’; and finally estimates of charcoal and coke pig iron production at 25 December 1791. These retrospective lists seem to be research material used in the preparation of the main 1794 list, which is important enough to require a full description and an edition. However, before looking at the 1794 list and its precursors, this article will examine earlier estimates. Next, it will cover a series of lists and estimates from the period just before 1794. Then, the 1794 list and its content will be considered as to its date and content. Finally, the 1794 list and other documents from the period will be used to elucidate the nature and chronology of the advance in ferrous metallurgical processes in the period.

Earlier estimates

Statistical lists, such as these, are an important source for the size of the iron industry of the period. The first known estimate, from about the 1660s, of 20,000 tons, comes from the archive of the first Earl of Shaftesbury, in a paper advocating an import duty on Swedish iron. The source of the figure is not known, but it could be based on the amount collected on an excise levied on iron during the Commonwealth. This tax on iron was not renewed when the excise was continued after the Restoration. This excise was farmed to Walter Noel, who sub-farmed it to Robert Foley and Edmond Pierce. Their agent John Smith compounded with ironmasters in Derbyshire and Nottinghamshire for annual or quarterly sums. This led to a difficulty when the Convention Parliament terminated the excise at the end of August 1659, part way through a quarter. Foley and Pierce found themselves liable to pay over sums for July and August that they could not collect. The outcome of this is not known. Nevertheless, it is likely that information on