

Abstract

After consideration of the economic background in which the iron trade operated, the technology of iron production is examined. In the century of transition from charcoal to coke, innovations are identified, and a new explanation is given of the delay between the first viable use of coke pig iron in forges and its widespread adoption. The new coke-based forge processes of the Industrial Revolution are re-examined to distinguish those processes that were commercially useful from those that were not, and to identify the places where they were used.

An account is given of the macro-economic organisation of production, identifying for the first time the transitions from aristocratic entrepreneurs to professional ironmasters, who often had vertically integrated networks of ironworks with an effective monopoly on local wood resources. Subsequently, particularly in the Severn catchment, this system broke up, and was replaced by one where ironmasters' meetings regulated prices. This was facilitated by the availability of pig iron from distant places, which made it feasible to operate forges individually and removed the need for vertical integration.

The scale of iron production is estimated by a new method, using data on forges instead of that on furnaces. This identifies two periods of rapid growth, from 1540 to 1620 when production peaked at 18500 tons, and from 1785 to c.1812 in the classic Industrial Revolution period. Both of these were associated with the spread of new technology, the blast furnace and finery forge in the first case and 'potting and stamping' and then puddling (as the patents for these expired) in the second.

The new estimate of bar iron production allows the average annual output of furnaces to be addressed objectively. Additionally, by combining data on home production and overseas trade, iron consumption is estimated. Manufacture and consumption continued to grow even during the periods when home production was stagnant or declining, as a result of Swedish (and later also Russian) iron imports. Consumption per head grew rapidly from 1540 to 1620, and again during most of the 18th century. This gradual growth in consumption up to and during the Industrial Revolution contrasts sharply with the very sudden take-off observed in production in leading industrial sectors, including iron.

Events abroad affecting the supply of iron included the embargo on trade with Sweden in 1717 and 1718, the arrival of the first Russian iron after the Great Northern War, and the imposition of a limitation on Swedish production in 1747. Difficulties in marketing cloth in the 1610s coincide with the end of the first great expansion of English iron production. Exports rarely exceeded 20% of the iron manufactured, but the temporary cessation of trade with America in the late 1770s and the late 1800s caused recessions in the iron trade. The significance of some of these events for the English iron trade has not before been appreciated.