

Appendix 1

Sources and methodology for the history and topography of ironworks

Underlying this thesis is a large body of research into the dates of operation, ownership and output of every ironworks in England and Wales operating between 1500 and 1815. This main focus of this research has charcoal blast furnaces and finery forges outside the Weald. Somewhat less effort has been applied to bloomery forges, and to early coke blast furnaces, but these have not been ignored. Less primary research has been undertaken concerning the many ironworks of the Weald. This is because that region has been particularly well researched.¹ The research also covered plating forges (to distinguish them from finery forges), and also slitting mills, wire mills, and tinplate works, because they were processing bar iron from the forges. However, needle mills and blade mills (known around Sheffield as wheels and in some places as scythe mills) were not included in the study, because they did not seem to throw much light on iron production. The intention is that the detailed results of this study (which preceded work on this thesis) will be published as a series of books, probably entitled *Iron in the North*, *Iron in the Midlands* and *Iron in the West*. These will contain gazetteers of ironworks setting out their history, size, trading, surviving accounts, and a list of sources. The contents of these gazetteers is the source of most of the data used for the calculations on finery forges and blast furnaces in chapter 5. That data is listed in appendices 9-12 and 14-17. The latest text of each of these volumes is included in the accompanying CD-ROM in folders with the book title.²

Wherever possible the research has involved the investigation of the original source material about a given ironworks, rather than merely placing reliance on what others have written. Previous authors may have had a limited objective in mind, such as the history of a single ironworks (perhaps as part of a village history) and may therefore have decided not to mention what was beyond the scope of their subject. Furthermore they may have missed something, or through limited knowledge of the subject they may have failed to appreciate the significance of certain information. Occasionally, they have misinterpreted their sources. A particular error that has been noted in certain biographical articles on industrialists is that the author has attributed the erection of an ironworks to his hero, when he had actually acquired existing premises in which to trade, perhaps then developing and expanding the business as his life progressed. This is particularly likely to happen where an author's main source is his subject's correspondence or other papers and the author has not done adequate collateral research.

¹. Straker 1931; Cleere & Crossley 1995; *Wealden Iron, passim*. Certain of my research results were supplied to the editor of and incorporated in Cleere and Crossley 1995. Others are in King 2002c.

². See appendix 24 for further details of these.

The starting point for research in any county has been the subject index at its county record office, usually under such key words as 'iron', 'furnace', 'forge', 'mill', 'mine', and 'timber'. For most ironworks none of its ironmaster's own records survive, but very commonly the history of its ownership (or more strictly occupation) can be discovered from the archives of its landlord,³ commonly one of the greater gentry or above. Sometimes detective work has been necessary in order to locate the requisite estate archive. For this purpose title maps and awards have been used to discover the identity of the then landlord (as well as the precise location of the ironworks). The various contemporary lists of ironworks (mostly of forges) operating in the 18th century have been useful as check-lists.⁴ Where, as is not uncommon, an ironworks was located on a river or brook that was also the boundary between two parishes (or even farms), the ironworks was usually actually in one of them rather than both, but not uncommonly some references to its existence and ownership can nevertheless be found in documents emanating from the other side of the boundary, sometimes as a result of a small rent being paid for 'water damage', where a mill pool or leat flooded land on that side. Having identified the landowners concerned, a search was then made for their documents using name and place indices at the record office. Where this proved unsuccessful, the probable location of an archive has been sought using genealogical sources, such as Burke's *Peerage* and *Landed Gentry* to determine who is the heir of a known landowner and where their principal seat is (or was). This, for example, enabled a small group of documents relating to ironworks in Yorkshire to be identified in the Thorold collection in Lincolnshire Archives, in which they were included as a result of Jane Hayford, the heiress of a Yorkshire ironmaster, having married into the Thorold family. In other cases, a search in the National Register of Archives has enabled the location of an estate archive to be discovered, as in the case of the Lawleys of Canwell Priory south of Lichfield, whose documents form part of the Howard of Estrick collection in Hull University Library.

Within an estate archive there are usually three easily accessible sources of information. Firstly there may be counterpart leases or articles of agreement. Details of leases may also appear in lease books, in which leases (or some particulars of them) were entered. Such articles of agreement often not only leased the ironworks, but also the sold wood (for charcoal) and of 'mine' (ironstone), the raw material for a furnace. The quantity of wood to be sold provides a means of estimating the output of a furnace or forge using yield factors collected by Hammersley,⁵ though the output thus calculated is inevitably a minimum output, since it is likely that ironmasters would also buy wood from other sources if they could. Furthermore a lease sometimes has an annexed inventory of fixtures to be left by the ironmaster at the end of his lease. The number of pairs of bellows listed in an such inventory indicates the number of hearths in a forge, a forge with three pairs of bellows having a chafery and two fineries.

³. Throughout this thesis ironmasters are referred to as 'owning' an ironworks, which they were in fact renting usually from the local estate.

⁴. The use of such maps and so on has been routine, but I have not normally cited them among my sources, unless other useful information on the occupation of the ironworks has been obtained from them.

⁵. Hammersley 1973.

The second group of sources within estate archives are rentals and surveys, since they name the person from whom a landlord was receiving rent. Records in this group vary considerably, including plans with detailed terriers, particulars prepared prior to the sale (or settlement) of the property, estate accounts that record the receipt of rent, as well as rentals proper. Rentals are particularly valuable when there is a long run of them, since they show precisely when an ironworks changed hands.⁶ Attention has also been paid to casual receipts sometimes entered at the end of rentals, which sometimes include money received for the sale of wood, ironmasters commonly being the only buyers of substantial quantities. However lists of chief rents payable to the lord of a manor by its freeholders and copyholders and also manorial surveys (of non-demesne lands) conducted by a manorial court of survey are rarely useful, because the ironmaster was usually either a leasehold tenant of part of the demesne or a leasehold tenant of part under a manorial freeholder. In either of these cases the ironmaster's name does not appear. This category of record also includes the post-Restoration accounts for royal forests, which record the sales of cordwood from the Forest of Dean (but not other forests). All substantial buyers of cordwood can be identified as ironmasters.⁷

Thirdly each title deed for the whole estate or a significant part of it contains a 'parcels clause' describing the property conveyed and commonly naming those occupying it.⁸ These sometimes need to be used with care due to the practice of conveyancers of copying the parcels from an earlier deed.⁹ Such title deeds tend to be a good source for smaller estates or ones recently assembled, but less good for larger or longer established estates, whose title deeds frequently merely list a series of manors, described in quite general terms. While the main interest here is focused on the parcels clause (describing the property conveyed), details of leases to which the property was subject are sometimes specified in the covenant against encumbrances (among the covenants for title).¹⁰ There is a fourth source that might be added to the three mentioned. That is estate correspondence, but this has not usually been catalogued in sufficient detail to enable references to ironworks to be found without a prolonged search. Accordingly, relatively little use has therefore been made of such agents' letters. In a few cases, the use of certain estate collections has been impracticable, either because they are not currently accessible to researchers or for other reasons, and I have had to rely for these on the work of others.¹¹

If such estate records are the weft of ironworks histories, the warp is records left by ironmasters themselves, especially accounts.¹² These are relatively plentiful compared to many other commercial activities of the

⁶ *E.g.* N.L.W., Powis Castle Rentals have allowed a significant revision of the conclusions in Davies 1939.

⁷ P.R.O., LR 4. In other forests, the equivalent wood may have been subject to the estover of firebote for commoners or a perquisite of the forest officers.

⁸ For example, the only evidence discovered as to the history of Weeford slitting mill in the early 18th century is a deed naming 'Mr Mander' among the tenants of that manor: P.R.O., C 112/106, no.180.

⁹ This particularly applies to transfers and redemptions of mortgages and deeds in connection with the barring of an entail, both of which are particularly prone to anachronism.

¹⁰ This applies particularly in the 16th and 17th centuries.

¹¹ I have not had access to Belvoir Castle, Raby Castle, or Longleat, nor to Lord Forester's collection in Shropshire Record Office.

¹² Where the matter referred to in such accounts and also letter-books is specific, it has usually been cited by date, rather than by piece and page. References to corresponding pages in a sequence of account books are frequently by a page title rather than a page number. References to such a source (without more) are normally to it *passim*. Details of how certain series of accounts have been cited is indicated in the bibliography.

period, but nevertheless quite scarce, only surviving for a minority of ironworks. On the other hand ironmongers' records are extremely scarce. The majority of what survives has also come from country house archives, usually as a result of an ironmaster investing his profits in buying a landed estate. This applies to the archives of the Spencer family in Yorkshire, and the Foley, Knight, and Botfield families in the Midlands.¹³ Certain others including Staveley Ironworks Records (mostly relating to ironworks at Sheffield, rather than to Staveley), Kirkstall Forge accounts, and Coalbrookdale accounts have been preserved at those ironworks.¹⁴ Accounts for the Ebbw Vale ironworks and for Rough Hills ironworks and colliery (whose products included ironstone) are among Chancery Masters' exhibits in the Public Record Office.¹⁵ These have been used extensively, but with a particular emphasis on references to the sale and purchase of pig iron, since the purchaser or vendor was usually another ironmaster. Where the latter's ironworks (or at least his address) is given, it indicates who was occupying that ironworks. However, even where it is not, such an accounts entry may be combined with information from other sources giving a location, to add depth to what is known of the activities of a particular ironmaster.¹⁶ Thus, it may confirm that he was still in business at a particular date and had not yet been replaced by a successor, who is known to have occupied his ironworks a few years later. The ownership in the mid 18th century of the slitting mills of the Stour valley has likewise been determined from payments made by Edward Knight & Co. for their iron to be slit. Estate account entries and in formal articles of agreement, dealing with the sale of cordwood or ironstone can be used in much the same way. For example records of ironstone mining in Durham have thrown considerable light on the iron industry there in the 17th century. Similar techniques can be applied to other products of ironworks, particularly purchases by the Navy and Ordnance Boards for the armed forces. The vendors of cannon and also iron ballast for naval ships were usually the owners of blast furnaces. Shot either came from furnaces or from separate foundries, the latter usually in the environs of London. Hoops for barrels, bought by the Victualling Board, came mainly from slitting mills on tributaries of the Thames.

Sometimes it is necessary to resort to inference. It is dangerous to assume that an ironworks dates only from the time of the first reference to it, unless the reference is specifically to its erection. However the grant of a lease of its site some little time before the first mention is likely to date its origin and if such lease survives it will commonly be found to contain clauses concerning the building of an ironworks or at least permitting the conversion of a mill from corn-milling or some other use.¹⁷ Such conversion can safely be assumed to have

¹³. Sheffield and Bradford Archives, SpSt.; Herefs. R.O., Foley colln, E12/VI; and Downton colln, T74; Worcs. R.O., Kidderminster Lib. colln, Knight mss., 899:310 BA 10477; John Rylands Library (Manchester), Botfield colln.

¹⁴. Sheffield Archives, SIR; Leeds Archives, KF; CBD a/c and HH a/c (various locations).

¹⁵. P.R.O., C 114/124-5; C 108/111.

¹⁶. A particularly striking case of this concerns Cwmbran Forge in Carmarthenshire. At one point the stock of Blackpool Forge (Pembrokeshire) in 1710 included 40 tons of pig iron being in 'Alex. Phillips' custody at Comb.' (Herefs. R.O., E12/VI/DFf/5, f.1) This links Alexander Phillips with Cwmbran, whose detailed history was hitherto unknown. It also links a series of sales of pig iron from the Forest of Dean to Alexander Phillips and with shipments by or for him recorded in Chepstow port books going back to 1681 and possibly with a sale of Invergarry pig to John Phillips in 1730-2: Foley a/c; Tintern B a/c; Chepstow port books.

¹⁷. Archivists listing estate collections have often not looked further than the parcels clause, term and rent, and have therefore failed to identify the objective of such leases. This may be indicated by the grant of liberty to convert the mill to an ironworks, or of a covenant to do so, or the grant of liberty or an obligation to carry out other works, such as making a leat.

taken place shortly after a new occupier took over, rather than on the first mention of it as an ironworks, which may only be when he sold it or renewed his lease. Where no lease survives, the date when an ironworks was built can sometimes be inferred from a later reference to the unexpired term of the lease. Thus a lease with 11 years to run is likely originally have been for 21 years, whereas one with 79 years to come was probably granted for 99 years. Where it can be determined that A succeeded B as ironmaster in X Furnace and Y and Z Forges, but there is only explicit evidence of the date of change in the case of Y, it can usually be assumed that the date of the change was the same for them all and that the business was transferred as a whole. Finally closure of an ironworks often coincided with the expiry of a lease.

In respect of the period 1780 to 1832 further detail, similar to that obtainable from rentals, can be obtained from Land Tax assessments, which were required to be preserved by the Clerk of the Peace at this period as evidence of the right to vote.¹⁸ Occasionally the records of the Commissioners who administered Land Tax also survive, as in the case of parts of Sussex, where they go back to the early 18th century.¹⁹ An ironworks should appear twice, assessed both as land and for the stock employed in it, which was also (despite its name) liable to Land Tax. Once the hereditament concerned has been identified, its ownership and occupation can readily be followed from year to year,²⁰ since the tax payable did not normally vary between one year and the next.²¹ Furthermore the hereditaments usually appear in precisely the same order. The hardest problem is often the initial identification of the correct hereditament. Sometimes this is named in the assessment, but more often the key is that a known ironmaster appears among the occupiers or that the owner or occupier is known at some particular date.

The forms in use in the late 1820s provided a column for the hereditament to be named, but sometimes the description is absent or merely a vague one such as 'messuage and lands'. The greatest difficulty in following an identified hereditament arises when there are two changes in the list at once, such as a general change in the order of the names simultaneously with a change in ownership or the consolidation or division of a hereditament. This may be sufficient to prevent the hereditament being traced further. However, frustratingly, not every ironworks can be identified in Land Tax records. Sometimes this is because a landowner paid the tax himself for his whole estate (or a substantial part of it) and the various hereditaments are not specified. In other cases a new ironworks, built after the tax was introduced, was never separately assessed to tax on land, the tax presumably continuing to be paid with the remainder of the old hereditament. The use of the assessment on the stock employed in the ironworks ought to provide a way around this difficulty (and sometimes does so), but this does not help with new ironworks, either because there was no mechanism for assessing newly created stocks or (if there was one) due to a severe failure in its

¹⁸. These are usually among Quarter Sessions records, and have as such devolved upon County Councils.

¹⁹. Where these survive they have usually been deposited in the County Record Office, but those for Durham are in the Durham University's archives department.

²⁰. This depends on the assessments having either been rearranged by parish (or strictly constablewick). Where the assessments remain in their original arrangement in annual bundles for each hundred (or wapentake), as in Lancashire, the production of a whole series of assessments for a single parish (unless microfilmed) imposes an unacceptable burden on Record Office staff, and thus becomes impracticable.

²¹. There were changes in the rate payable in the pound of the assessed rental value before 1780, but this only becomes an issue in the rare cases (such parts of as Sussex) where assessments survive from before 1780.

implementation. Occasionally similar use may be made of rating assessments on property, for highways, poor law, or some other purpose. Land tax and other such records have been useful for determining the dates when certain ironworks were closed. This may consist in the disappearance of its stock, or the property becoming 'void', or in it changing hands to some one known (or suspected) not to have been an ironmaster. It is observed that such closures often coincide with the expiry of a lease, something that is perhaps hardly surprising.²² This observation can be applied in other cases where the date of closure is only approximately known, the date when a lease expired is likely to indicate the exact date.

Other sources as to land titles can in some cases be used. In Yorkshire the registered memorials of 18th century deeds have sometimes been useful, but not always, since the memorial usually only gives the names of the parties and the description of the property, so that the nature of the transaction is often uncertain. Furthermore leases were not registrable, and the descriptions used for large estates are the same in the memorials as in the underlying deeds themselves, for which the difficulties have been described above. The requirement for papists to register their estates during the 18th century has also proved a useful source of information in certain cases.²³ It is only relatively rare that an ironworks was built on copyhold land,²⁴ but in these instances the manor rolls of that manor enable the descent of the tenement in question to be traced. However the existence of the ironworks will not necessarily be apparent from the manor rolls, due to the conservatism of manorial stewards, who habitually copied the description used when the property was previously dealt with, leading to the use of highly anachronistic descriptions. Thus Broadwaters Lower Forge continued to be described as a fulling mill long after its purchase by John Homfray in 1754 and conversion to a forge. Something similar could also happen where leases were routinely renewed. This was the case at the Bedlington ironworks, which continued to be described in leases by the bishops of Durham as a corn mill for many years after the ironworks had been built, though the identity of the tenants, ironmasters such as Hawkes, indicates that the corn mill was moribund (or perhaps a mere sideline). G. Hammersley stated that the memorandum rolls of the Exchequer were a good source on early ironworks. These record prosecutions for using timber to make charcoal for ironworks near the sea or a navigable river, and other offences under the legislation of Henry VIII and Elizabeth for preserving wood. Unfortunately the agenda books (which list the contents of these rolls) are themselves voluminous and a great deal of time would be needed to extract the rather sparse references in them to ironworks. In consequence relatively little use has been made of the memorandum rolls.²⁵

²². For example, Colnbridge Forge in Yorkshire was converted to a textile mill in 1796.

²³. These registers are to be found in Quarter Sessions records.

²⁴. Most ironworks were built on manorial demesne, usually because the lord of the manor had a direct financial interest in the success of the ironworks, as a vendor of wood (for charcoal). This was because the main areas of woodland in the manor were normally manorial 'waste', which belonged to the lord. Sometimes the waste had been made into a park in medieval times, thus remaining woodland pasture and still belonging to the lord.

²⁵. Hammersley 1973, 597n. These rolls (class E 159) contain a great deal of detail on illegal trades including the use of logwood as a dyestuff, of gig mills, of detected smuggling, and of the illicit export of ordnance, as well as of engrossing, forestalling, and regrating. This ought to be a major source of information on commerce in the early modern period, and a major study of them needs to be undertaken. For a discussion of this source see Beresford 1957, which however concentrates on the most prevalent offences including wool broggers and with marketplace offences.

Estate records (other than title deeds) commonly do not survive further back than the late 17th or 18th century. As a result information on the 16th and early 17th centuries is much less good. Furthermore the earliest of the major series of ironworks accounts only starts in the 1660s. For earlier periods the main sources on the ownership of ironworks derive from litigation in the Courts of Chancery and Exchequer, whose archives seem to be very largely complete. Unfortunately, despite many years work by officers of the Public Record Office, the finding aids for these are only lists with brief details of the parties and sometimes subject matter, without alphabetic indices even of the parties, let alone the subject matter. Most of the lists of Chancery records are still only listed according to the initial letter of the plaintiff's surname, and searching for a subject (such as ironworks) is rather like searching for the proverbial needle in a haystack, there being no subject indices except in the case of disputed estates. Looking for a particular case with known parties and an approximate date is not too difficult, since the lists follow the order of the bundles, which were made up roughly in chronological order, but even this can be very time consuming.²⁶ This situation will be greatly improved as more proceedings are incorporated in to the Public Record Office's Equity Proceedings on-line catalogue, which began to appear too late for me to make use of it.²⁷ Certain catalogues for Chancery proceedings set out the subject matter of the proceedings. Those for Elizabeth's reign seem to have been fully searched by H.R. Schubert.²⁸ I have fully searched the printed lists of Chancery proceedings for part of the reign of James I and also Bridges Division out of the pre-1714 Six Clerks series, as well as the manuscript calendar for the rest of James I and the recent typescript list of decrees.²⁹ Some others have been searched selectively, particularly when looking for a particular case or for the activities of important ironmasters, such as the Foleys. In particular the identification of proceedings early in the reign of Charles I between Colman and Chetwynd and between Middleton, Goreing, Nye and others has thrown considerable new light on the iron industry in south Staffordshire in the preceding period, the results of which have been published.³⁰ It has usually been sufficient to examine the pleading, noting documents and events recited. From these the outcome of the claim is often obvious, as a party setting out his title from a series of documents is plainly in a better position to prove his case than his opponent who merely makes vague allegations that he has been wronged. As a result it has rarely been necessary to search for depositions (written evidence) or look at the entry books of decrees and orders to discover the outcome of a case. Indeed many cases did not get that far. The present difficulties in locating relevant proceedings will probably to some extent disappear in years to come as the text of the present finding aids is incorporated into the Public Record Office on-line catalogue, but even that will only provide an index to the content of those finding aids and will not provide a description for those proceedings where the list only gives the parties' names.

²⁶. Considerable time has been spent unsuccessfully searching for a case *Slaney v Foley* about 1662, known from a compromise agreement (Foley E12/VI/KAc/20 45). The P.R.O. on-line catalogue lists depositions in this action, which unfortunately do not state what ironworks Slaney owned, the information primarily sought.

²⁷. At present this only covers class C 6, but searches in this have revealed various proceedings of which I had been unaware. These will no doubt add significant detail to what is known of individual ironworks, but will probably not alter the conclusions of this thesis significantly.

²⁸. Schubert 1957, app. V.

²⁹. That is lists for C 2/Jas.I and C5 and C 78. Additionally lists for C 3 and C 4 have been searched

³⁰. King 1999a.

The records of the equity jurisdiction of the Court of Exchequer are similar. The means of access to these normally recommended (for example by P.R.O. staff) is by way of the printed list of depositions by commission.³¹ However such depositions were only taken in cases that had not been settled or abandoned by the time that evidence needed to be collected. A more satisfactory entry point is the bills and answers, whose sole finding aids are contemporary 'bill books'.³² However proceedings in these bill books are arranged by county (probably that in which the plaintiff owed a debt, real or fictitious, to the crown) as a result of which searching under counties that were major producers of iron is not too onerous. This is often rewarding, as in the 16th and 17th centuries the subject matter of the claim is usually given briefly after the names of the parties. However a search for proceedings listed under London is time consuming. There are similar lists of equity bills for the Court of Requests and Star Chamber, which have produced some useful material. Documents from the equity jurisdictions of the Palatinates of Lancaster and Durham have not been searched at all, nor have those for the Great Sessions in Wales, while only limited use has been made of equity proceeding in the courts of the Palatinate of Chester and Duchy of Lancaster, the latter only for Kings Mills at Castle Donnington.³³

In parallel with this research in manuscript sources, published material has been examined. For this purpose many local studies libraries have been visited in search of local history pamphlets and periodicals. These are listed in the bibliography, which includes all works from which any useful information has been gleaned in the course of compiling detailed histories of each ironworks, not merely those that happen to have been cited in this thesis. The footnotes in such works have been fruitful as a starting point for research. It has similarly often proved useful to consult works on other industries. For example, if an ironworks was succeeded by a paper mill, and a historian of the paper industry has found a date when the paper mill was built, that is probably the date when the preceding ironworks closed.

The programme of research just described was directed to elucidating the whole history of each ironworks, as far as possible from when it became an ironworks until when it ceased to be one. Any charcoal ironworks built before about 1780 was (if possible) traced up to its closure, even if long after 1815. However new ironworks (mostly using coke), and particularly those built after 1780 have normally only been traced up to 1815. The results of this exercise, which provide the raw data for the computation on the output of forges in chapter 6. The data itself appears in appendices 9-12 and 14-16. Appendices 17 and 18 are included for completeness and to indicate the existence of other ironworks described as forges or ironworks, which have however

³¹. That is, the list for class E 134, originally printed in 19th century *Deputy Keeper's reports* for the Public Record Office.

³². This class (E 112) was formerly stored at Hayes, Middlesex, rather than at Chancery Lane and had to be ordered from there a week or so in advance. Since the bill books themselves had (and have) to be ordered as documents rather than being on the open shelves, it used to be necessary to make two visits to P.R.O. in order to see a document, one to identify it and the other to read it. This made the class relatively impenetrable and resulted in Exchequer bills being little used, leading the Keeper to believe they were of little value. In the early 18th century much of the subject matter was tithe disputes, which are probably of little general interest, but at other dates there was substantial litigation on other issues. When the contents of the Chancery Lane office were moved to Kew a few years ago, the Exchequer bills were also transferred there and are now much more accessible.

³³. All these are in P.R.O., except those from the Courts of Great Sessions in Wales, which are in N.L.W. and only survive from the 17th century for certain Welsh counties. No records survive from the equity jurisdiction of the Councils of the Marches and of the North.

been concluded not to have been finery forges. Though producing statistics was always an objective of the previous research, it was only one of its aims. The work has for example enabled previously unknown firms and regular successions of ironmasters with several ironworks to be identified, as a result of finding the same person associated with several ironworks. For example it has enabled me to demonstrate that the south Derbyshire iron industry was focused on supplying Birmingham, and that certain works consistently descended from members of the Jennens family in the late 17th century to Humfrey Vaughton (his manager) and then Vaughton's sons and daughters and then to members of the Mather family who had been managers under the Vaughton daughters. All these families, except perhaps the Mathers, had their origins in Birmingham and their main residence there. Ultimately when the Derbyshire industry rapidly went over to coke in the early 1780s Walter Mather leased Staveley Furnace thereby establishing a business which, as Staveley p.l.c., still exists, though not now concerned with ferrous metallurgy.³⁴

³⁴. King, *North*.