Appendix 4

The independence of the 18th century ironworks lists

The reliability of interpolated figures inevitably depends on the accuracy of the figures from which they are made. With so many of them derived from the 18th century lists, their reliability is crucial. The purpose of this appendix is to examine how independent they are of each other. I have argued elsewhere that they are generally complete and relatively reliable, but there can be little doubt that the high output figures for 1718 resulted from the unusual conditions of that year, caused by the Swedish embargo. Doubt has also been cast on the reliability of the 1749 figures because they seem to have been rapidly compiled, and often merely repeat a 1718 figure.[1]

In order to examine how serious this problem is, I have carried out some computations on the lists to determine objectively how independent the lists are of each other. The results of this appear (at the end of this appendix) in tables A4.1 to A4.5. In these I have taken those forges that occur in a pair of lists and calculated for each forge whether the output in the later list was equal to, decreased, or increased compared to that in the earlier one. This was done without adjusting any figures (except apportioning combined items). Comparison of adjacent lists, not unexpectedly, shows an increase for the majority from the 1715 list to that of 1718, followed by a decrease from 1718 to 1736 (see tables A4.1-2). Comparison of the figures from 1715 with those for 1736 shows no obvious trend, except that the figures are usually different, confirming their independence: there are about equal numbers of increases and decreases, but no change in under a fifth of cases (see Table A4.3). In contrast, the comparison (in table A4.4) of the figures listed for 1718 and 1749 shows stability in almost half of cases, particularly in the Northwest, as far south as Cheshire and Denbighshire, also in Carmarthenshire. There are however some oddities. The change from 200 to 260 tons at Backbarrow could be the result of a misprint. However the increase at Warmingham from 100 tons in 1715 and 1736 and 120 in 1718 to 300 tons in 1749 seems incredible, while at Backbarrow the output is higher than the quantity of pig iron supplied by the adjacent furnace would indicate.[2] On the other hand in Yorkshire, north (but not south) Derbyshire and the west Midlands and southeast Wales the output figures for 1749 are often different, and usually even higher than for 1718.

---

[1]. King 1996b, *passim.*

[2]. Furnace accounts (Barrow in Furness R.O., Z192) show only enough pig iron sent to the forge in four years 1746-50 to sustain production of 95 *t.p.a.*, but the supply of pig iron also from its owners' Leighton Furnace (though unlikely) cannot be ruled out.

Comparison of the 1788/90 lists with that for 1749 (Table A4.5) produces the result that most forges had reduced their output very substantially, since it would be expected that output would be increasing in this beginning of the Industrial Revolution. Even where there were increases, the amounts are quite modest and may in some cases be an artefact of the methodology, which applies the same average output to every forge, whether other sources indicate it to be a trifling affair or not. This may also explain the largest increase in output, at Powick, since its output per finery is the very high figure of 130 tons that applies to all Worcestershire forges. However Powick was very favourably placed, at the mouth of the powerful river Teme, which was navigable up to the forge, and it is not unlikely that the increase was the result of its enlargement, by the addition of a third finery during intervening period.[3] Unfortunately there are very few surviving ironworks accounts for the period around 1790 to enable the accuracy of the figures to be tested. There are accounts for five forges of John Knight & Co. mainly in north Worcestershire, which show they made about 2130 tons a year about the time in question,[4] rather than the estimated 1450 tons of the list, but the high output of these forges is likely to be the cause of the high average per finery for Worcestershire and therefore to be atypical. Nevertheless, the considerable number of forges with a reduced output casts doubt on the reliability of one or other or even both of the 1749 and 1788/90 lists.

A similar comparison has been made between the 1788/90 lists and the 1715 and 1736 lists (Table A4.6), using an average of the two earlier lists where there in an output figure in each: this shows the number with an increased output in 1788/90 again to be similar to the number where it decreased with equality in only one case (Cwmdwyfran). Powick, with a low output for 1735 and a high one for 1788/90, again stands out as unusual. It is therefore suggested that the 1715, 1735, and 1788 outputs may be taken as normal, perhaps with some adjustment for cases of reduced output in 1735, particularly at Kidwelly and Powick. An average of these therefore seems to provide a good basis for interpolations for other normal years. For all that, despite the doubts as to the quality of the 1749 list, since it was probably a rapid compilation (made without a detailed canvas of the whole industry), there are sufficient figures that appear to be new data to cause hesitation in dismissing it completely. However it is almost impossible to distinguish fact from fiction. It is noticeable that the forges of the probable compilers, John Cockshutt (Wortley), Capel Hanbury (Pontypool and Llanelly), and Rowland Pytt jun. (whose father had various ironworks in west Glamorgan and Gloucestershire) are frequently among those with a high 1749 output.[5] Could they have perhaps been trying to exaggerate their own importance? Despite doubts about it, I have used the 1749 list largely as it stands, except that I have replaced some figures that are obviously repeats of the 1718 list with a more credible estimate, often the 1736

---

[3]. Lloyd 1975; Clinch ts.; this is one of relatively the few forges for which I have failed to trace contemporary title deeds or other records, but its history is reasonably clear from the accounts of the suppliers of pig iron for it and other sources. In the late 18th century it belonged to the Lloyd family of Birmingham, who had a number of ironworks and were both ironmongers and ironmasters on a substantial scale. I have assumed that the forge was enlarged when the Lloyds took it over: see appendix 5.

[4]. Ince 1991b, app.8-13.

[5]. House of Lords R.O., ms. minutes, 5 Apr. 1750; Cockshutt: Andrews 1956; Hanbury: Locke 1916; Rowland Pytt sen. in his petition (House of Lords R.O., LP.245/15) asserted that he had a furnace and two forges in Lydney, another furnace and two forges in Newland (i.e. Redbrook and Lydbrook), Aberavon Forge and Melin y court Furnace (Glam.), and further forges at Tortworth, Abbey Tintern and Upleadon.

figure: details of these corrections appear in the listing, in appendix 12 of the database used for the output computations.

Table A4.1

Table A4.2

Table A4.3

Table A4.4

Table A4.5

Table A4.6