

Appendix 8

A description of computational files

Many of the files used for the computations presented in chapters 6 to 8 are much too large to print. Various extracts and summaries appear in tables and charts in the text and also in subsequent appendices. The complete calculations cannot be presented as hard copy, and are therefore only included in the accompanying CD-ROM disc. The identity of the files containing these tables, charts, and appendices is indicated in the bottom right hand corner of most of them. Some of these contain the results of further calculations concerning on growth rates or other matters. Files in the Sound Toll series also contain detailed figures for trade in iron from Sweden, Russia, and other Baltic states to countries other than England. Neither of these is otherwise referred to in this thesis. In many cases figures quoted in the text will be found in a worksheet called 'Select'. This shows the precise means by which these figures have been calculated and enable the data from which it was calculated to be identified. Certain of the files may be obsolete or contain obsolete elements, for example estimates that were made, but were found to be unsatisfactory. This is often indicated by the use of pink as a background colour.

Almost all the calculations were carried out using EXCEL97 spreadsheets. These are usually linked, so that that changes to the data are automatically updated. However in certain cases the scale of the data manipulation is so large that this proved impracticable. In such cases a macro has been written using Visual Basic for EXCEL, and it is necessary to run that macro in order to recalculate the spreadsheets. This applies to the detailed calculations on the output of finery forges and of blast furnaces and also to the manipulation of material extracted from the Coalbrookdale accounts. In each case the key macro (to run the whole process) is stored in the first or second workbook in the series of workbooks. In these cases the cells of the spreadsheet merely contain the result of the computation, with no indication of how the figure was obtained. Even by this means, some calculations take a very considerable time to run. Nevertheless, the macros are designed so that it is apparent that they are indeed running. In later stages of each computation where the data is summarised, the quantity of data is somewhat smaller, and this makes it possible for the cells to contain the formula as well as its result.

An attempt was made to use user-defined functions in each cell. These included instructions to obtain data from a specified location in another workbook. An attempt to do this for the calculation of forge output proved unsatisfactory, as it was necessary for the workbooks to be opened and closed in precisely the right order in order that every answer should not be an error message. It was for this reason that macros were written to

work out the result of the function and put that result in the cell. However such user-defined functions have been retained in some of the files concerned with imported iron, where the data source is another worksheet in the same workbook.

Macro-driven files will only operate correctly if the files in the location specified. For the Coalbrookdale files (for chapter 5) this is the disc on which they are located, which should be in drive E. However all others will need to be moved to the location intended for them prior to use. This is 'C:\My Documents\ForgeXL' except in the case of files concerned with overseas trade where it is 'C:\My Documents\Import Trade'. The latter (despite its name) includes files on exports. If this is done, the files should function properly. Should the error message 'subscript out of range' appear, it usually means that a file that is required by the macro is not open. This problem will be resolved by selecting 'debug', which will cause the line that cannot be executed to be highlighted. Then open the file that is needed; then go back to the Visual Basic window and press f5 to resume running the macro. To use the files from other locations, it would be necessary to alter file addresses in the Visual Basic macros. This is not recommended, as it would also render it necessary to alter a large number of external references in formulae in cells. It might however not be too difficult to do this for the Coalbrookdale series, where there are few external references.

Chapter 5 *Coalbrookdale*. All files are in a folder called Coalbrookdale. The whole calculation is run by a macro called 'MasterDriverMacro', which is within Coalbrookdale A.xls. This will open other files and run other macros to sort and summarise the data. There is an introduction to this series of files in the same file.

Chapter 6 *Iron production*. 'Forge' and 'Furnace' calculations are driven by macros called 'Calcdriver'. That in Furnace3.xls contains an option to recalculate the forge data as well. Individual files can be recalculated by macros with names such as 'calc5', but it should not normally be necessary to run these manually, as they are run by the 'Calcdriver' macro. The corresponding calculations concerning the Weald, bloomeries, and melting fineries have formulae in cells and do not need macros to be used.¹

Chapter 7 *Overseas Trade*. The detailed calculations on the Sound Toll data appear in a series of files with those names. The calculations from data collected from port books is in a series called 'Eng.Ports ...'. These are all calculated by formulae, some (as mentioned) user-defined. Much of this is excessively long-winded, in that essentially the same formula appears in each of a large number of cells. In a few cases, it is desirable (in order to prevent a long delay in opening a computational file) that a file containing data that it works from is opened before the computational file. If so, this is indicated in the 'file properties'.

¹. A calculation was also made concerning slitting mills, but is not presented as part of this thesis. However one file that is included on the accompanying disc contains a reference to a file from that series, but no figures derived from that file appears in any of the charts, tables, or appendices included in the thesis.

Chapter 8 *Consumption*. The calculations (with formulae) are the 'Consumption' series in the folder 'ForgeXL'. Certain of the source files for these computations are in a different folder, and it is therefore particularly important that comments (above) as to file locations should be strictly adhered to.

In each of the major series, the number and letter at the end of the file names refer respectively to the stage of the calculation and the edition of the file, but only the latest editions are usually included on the disc. For the Furnace, Forge and Consumption series successive stages are numbered, the final letter referring to the edition. For Coalbrookdale and Sound Toll series, they mostly are lettered.