

# 7 Overseas Trade

It is an objective of this thesis not only to determine the amount of iron made in this country (the subject of the preceding chapter), but also the quantities manufactured into iron goods in England, and their annual consumption. These last two figures can only be assessed indirectly from those for production and overseas trade. Overseas trade is therefore the subject of this chapter. The import of pig iron has been referred to above.<sup>1</sup> Exports of small amounts of English bar iron can sometimes be traced at various times, despite this trade being illegal until 1694,<sup>2</sup> but the quantity remained negligible until the 1790s, after which it grew rapidly to nearly 15000 tons in 1808.<sup>3</sup> Imports of manufactured ironware were also very modest. Figures on these aspects of trade will be included in the calculations in the next chapter, but are too insignificant to need much more discussion. This leaves three aspects of trade that were significant, the import of bar iron, its re-export, and the export of manufactured ironware, which can be further divided into nails and other goods. The first aspect is the most important, and will occupy most of this chapter.

## Bar iron imports: introduction

Over the three centuries covered by this thesis iron imports varied between very little indeed and more than double home production. In the 15th and 16th centuries, the most important source of iron imports was the Biscay region of Spain. With the rise of the Wealden iron industry in the 16th century, these Spanish imports declined into relative unimportance in the late 16th century, when England was almost self-sufficient in iron. From the second half of the 17th century Swedish iron was imported in significant amounts. This was joined from the 1720s by Russian iron. Finally at the end of the 18th century, the increased home production of the Industrial Revolution period rendered Britain again largely independent of iron imports. However imports did not wholly cease then, as the steel industry continued to need ore-grounds iron from Sweden.<sup>4</sup> With such considerable changes over the period, the subject has to be divided according to the exporting country and into periods. These periods are to some extent determined by the nature of the sources available. Figures for the 18th century are readily available from the Customs Ledgers, which consist of contemporary compilations of trade statistics. However before that, data has to be collected from sources that were compiled for other

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<sup>1</sup>. See preceding chapter.

<sup>2</sup>. Ashton 1924, 105.

<sup>3</sup>. After 1697 the quantity did not exceed even 100 tons per year until 1792: Schumpeter 1960, 27. Before that I have occasionally found references to exports of small quantities in Port Books, but only rarely. The last two figures quoted relate to Great Britain not just England, the first being the average of those in Schumpeter 1960 for 1792-7.

<sup>4</sup>. Barraclough 1984(1), *passim*; 1990; King 2003.

purposes, usually in connection with the collection of customs revenue. Such compilations, being based only on samples, can only provide a broad picture of long term trends, not short term fluctuations.

None of the means available for estimating English imports in the 16th and 17th centuries is entirely satisfactory. However the sources providing the least problems, in terms of interpretation, are English Customs records. These fall into two groups. Until the late 16th century there are Customs accounts, which continue a medieval series of records that was used by W. Childs for her study of iron imports in the 15th century.<sup>5</sup> From the early 17th century there are overseas port books, which were prepared for the information of the Exchequer and do not seem directly to have been part of any accounting process, at least not after the advent of the Great Farm of the Customs in 1604. In some periods the survival of port books for some ports is relatively complete, but none survive for London in the 18th century, and there are many gaps elsewhere in almost all periods. Nevertheless the quantity of material available is prodigious. There was a Customs account for every head port (including the trade of its subports) and later a port book for every port. There was usually an annual account for overseas trade from each official (collector, controller, searcher, and sometimes also surveyor) at each port, though their entries should be identical. At Bristol and London the business of the port was divided among several sets of officers, each responsible for a different aspect of trade.<sup>6</sup> Because of the enormous volume of the material, most studies have either focused on the trade of a particular port or group of ports and a limited period. Examples of this are A.M. Millard's study of London's trade in the early 17th century and G. Jackson's of Hull in the 18th.<sup>7</sup>

In order to provide a complete picture of English overseas trade, Customs accounts and port books have to be considered from every port. Examination of all surviving books would be a prodigious task. Accordingly they have been sampled about every ten years between 1500 and 1700 wherever records survive.<sup>8</sup> In the case of port books, this has been undertaken for each major port, and whenever a major port had significant iron imports, books for adjacent minor ports were also considered. In each case imports have been summarised according to their country of origin. The trade of each port in the intervening years has been estimated by linear interpolation, imperfect though this must be. The country of origin presents some difficulties in the early 16th century, as the provenance of a shipment is not always specified in the accounts. However, this is often apparent from the port to which a foreign ship belonged or from other goods which a ship carried: for

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<sup>5</sup>. Childs 1981; Gras 1918; Childs 1986, esp. xiv.

<sup>6</sup>. Hoon 1938, 8-9; P.R.O., E 122; E 190. Some of the comments on the sources are mine, resulting from my examination of a large number of documents. N.J. Williams (1951, 388n) commented concerning the junction between the two series, 'Much preliminary work of a diplomatic nature still needs to be done before historians can use both series with confidence.' Unfortunately half a century later this matter still remains to be adequately addressed. I hope to be able to provide some answers in this connection elsewhere, but more work remains to be done. In London there may have been as many as eight divisions each with five or six officers preparing a port book, making over 40 overseas port books per year from there Customs Farm: Holderness 1973, 175; Clarkson 1971, 185.

<sup>7</sup>. Millard 1954; Jackson 1972. Other examples include N.J. Williams' work (1988) on East Anglian ports in the late 16th century and B. Hall's (1934) on the northeastern ports

<sup>8</sup>. Poor survival has meant that the intervals have often been greater than ten years, particularly before the Civil War, and in every case there is a gap between the 1630s and 1660s, as hardly any records survive for the Interregnum. In a few cases in the Elizabethan period it has been necessary to combine totals from quarterly accounts for two or more years in order to show the scale of trade for one whole year.

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Figure 7.1 Import estimates compared

Import est compared/chart1

example, hemp and flax came from the Baltic, and chestnuts, rosin, and wine from Spain, while mixed cargoes of manufactured and tropical goods are likely to be from the Low Countries.

The deficiencies in the English records can to some extent be repaired by the use of foreign ones. Data is available from various periods for the principal iron exporting ports of Stockholm,<sup>9</sup> Gothenburg,<sup>10</sup> and St. Petersburg,<sup>11</sup> as well as for traffic paying duty ('toll') at Elsinore, as it passed through the Sound from the Baltic. Unfortunately the lack of destinations in the *Sound Toll Tables* before 1668 and the freedom of Swedish ships from toll between 1661 and 1710 make them difficult to use. Furthermore, the compilers of the *Tables* have treated Ireland as part of England. An attempt has however been made to use data from Stockholm to make good the deficiencies in the Sound Toll data. The difficulties with the data in the early 17th century hardly matter ultimately, because the quantities were so small, compared to English production. However later in the 17th century, iron imports from Sweden became much more significant. The great challenge is to estimate the timing of that growth. The Sound Toll data for the late 1670s should be complete since Swedish shipping was kept at home by war in the Baltic, but the data before 1675 and in the 1690s may well be unreliable. Figures estimated from the Sound Toll data and other foreign sources are compared with estimates from the English port books in figure 7.1.<sup>12</sup> While the general trends are similar, the two differ considerably in detail. Because the Scandinavian data provides considerably more detail on short term trends, it (rather

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<sup>9</sup>. Figures on Stockholm's exports from 1637 are given for certain years in Boëthius & Heckscher 1938. Further data could be obtained from the records of the Stockholm town dues, a local customs duty used by P. Riden (1987b) in his study of a fairly minor merchant in 1678. However Swedish Records are at best poor during the reign of Charles XII. There is better data in Högberg 1969, but only from 1738. Vallerö 1969 begins earlier, but is only describes the nature of the surviving records, not their content.

<sup>10</sup>. Lind 1923 gives shipping figures for Gothenburg almost yearly also from 1637 and export figures about every fifth year, but there is a gap during the reign of Charles XII. This source provides excellent figures on Gothenburg's trade. For years for which export figures are not given, the average lading of each ship going to England has been estimated by linear interpolation between the closest years preceding and following it, for which there is data. This estimate has then been multiplied by the number of ships to give an estimate of iron exported to England. After 1720 Lind only gives figures for Great Britain (rather than England and Scotland separately). However E.B. Grage has published Scottish figures for the late 18th century, which enable English trade to be estimated. However there remain considerable periods in the early 18th century where interpolation is still unavoidable.

<sup>11</sup>. Figures concerning the trade of St. Petersburg were probably obtained by the Russia Company from a Russian source in connection with treaty negotiations around 1790. There are detailed figures in poods for many (but not all) years between 1763 and 1799, showing the amount sent to each individual British and foreign port: P.R.O., BT 6/231-33.

<sup>12</sup>. The *Sound Toll Tables* provide a continuous series of figures (with a few gaps) on trade through the Sound from 1562-1783. Except for the inclusion of Ireland (and probably other English possessions) in the definition of England, the data presents no difficulty from 1710. In the preceding fifty years much of the trade was carried in toll-free vessels belonging to Sweden and Swedish Pommerania, except during a period in the late 1670s when England was neutral during a Baltic war. In this period the *Tables* only record the number (and not the cargoes) of toll-free vessels. I have attempted to estimate the trade carried in such vessels, using exports from Stockholm, by far the most important port in Baltic Sweden, and separately by assuming that English vessels carried the same amount of iron (on average) as Swedish ones. However neither of these methods is wholly satisfactory. For the century or so up to 1668 the problems are compounded by the *Tables* lacking destinations. It is therefore necessary to use nationality as a surrogate for destinations, (that is assuming vessels were going home), and ports of departure on one direction to indicate destinations in the other. However neither of these allows for the possibility of triangular voyages. In the late 17th and the 18th centuries, such triangular voyages were not uncommon, for example by ships taking iron to England and then going on to Portugal or Bordeaux for salt or wine to take home to the Baltic. Calculations based on such assumptions will also obscure the role of Dutch shipping in international trade, ignoring the effects of entrepôt trade in Holland.

than the English data) will be used in making estimates of English consumption in the next chapter.

However neither series is really satisfactory. The interpolated figures based on English sources are almost certainly too high before the Restoration, because they depend on high figures from the early 1660s. Unfortunately these are periods when few port books survive for London, the most important English port.<sup>13</sup> Subsequently the English estimate is probably better for the actual years of the sample port books used, but not necessarily for others. However the estimates made here are probably the best that can be obtained within the limits of the time and resources available.<sup>14</sup>

## Bar iron imports: the 16th and 17th centuries

### *Spain*

The foreign source material for Baltic trade is, of course, no use for English trade with Spain. England had two distinct commercial relationships with Spain proper. Firstly there was trade with southern Spain in which English manufactures and fish were exported in exchange for wine, fruit, and bullion. The exports included some manufactured ironware and also re-exported bar iron. In contrast iron featured significantly as an import from the Biscay region of northern Spain, the focus of the other Spanish trade. This trade has been little studied, except for W. Childs' examination of it in the 15th century.<sup>15</sup> Iron was produced in the Basque country in the hinterland of Bilbao and San Sebastian, and was mainly exported through those ports. Production by direct reduction methods in bloomery forges continued into the 18th century, essentially as a result of conservatism.<sup>16</sup> In the periods 1588-1604 and 1625-31, when England was at war with Spain, the trade was diverted through the neighbouring French ports of St. Jean de Luz and Bayonne.<sup>17</sup> The importing ports in England were mostly larger ports in the west and southwest of Britain, together with London, for east coast imports were generally from the Baltic, Holland, and Germany. The English south coast had its own local source of iron in the Weald, and thus apparently did not need Spanish iron. Smaller ports, such as Ilfracombe and those of south Wales, seem to have engaged only in short distance overseas trade (mainly with Ireland). They

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<sup>13</sup>. The survival of London import port books is reasonably good in the 1670s and early 1680s, but poor for the 1660s and after 1686. Nothing at all survives from 1641 to the early 1660s.

<sup>14</sup>. Given more time and other resources, data could be collected from more of the surviving English port books, particularly those for London and Hull, the two most important ports for iron imports. Further research could also be undertaken in Swedish archives relating both to royal and town customs dues, and probably also in the Sound Toll archives (from which the *Tables* were compiled). However such a project would entail spending prolonged periods in London, Stockholm, and perhaps other places. It would be necessary for the researcher to possess a much greater fluency in Swedish than I do (as well as fluency in English). Probably the greatest weakness in my estimate from foreign sources relates to the average amount of iron carried in toll-free Swedish vessels. Work should therefore in the first instance concentrate on providing better estimates of that. Comparison between English, Swedish, and Sound Toll records, aimed at verifying their consistency, would also be useful, in view of the doubts raised by Riden (1987b).

<sup>15</sup>. Childs 1978; 1981. McLachlan (1940) merely mentioned it in passing as did Cornell-Smith (1954), Davis (1962, 228-40 esp. 233) and Ramsay (1957, 133). Phillips and Phillips (1997) were mainly concerned with the wool trade. Much of the early imports of iron were of 'endys', the numbers of these being similar to those of bars later. This term has puzzled various authors. However Peter Crew (*pers. comm.*) suggests that this is an anglicisation of the Spanish word *hendidura* meaning 'cut', and suggests that the iron was imported in the form of cut blooms.

<sup>16</sup>. de Pintero 1988; Morrall 1995.

<sup>17</sup>. The following account is based (except where otherwise indicated) on Customs Records, mainly samples from classes P.R.O., E 122 and E 190. The records examined are listed in appendix 18. A similar procedure has been adopted to that of W. Childs (1981, 34-35 n.20) for identifying what iron was Spanish, save that iron arriving from St. Jean de Luz and Bayonne has been classified as Spanish (not French).

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no doubt obtained imported iron from larger ports, if imported iron was needed. Thus Neath  
exported coal to

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Figure 7.2 Imports from Spain

Eng. ports from Spain/Chart1

Spain, but had little import trade, return cargoes from Spain going to Bristol and Barnstaple.<sup>18</sup> This leaves four parts of England with significant imports from Spain, London, Bristol, the Northwest (Chester and Liverpool) and the Southwest (Devon and Cornwall) (see figure 7.2). The two latter produced little or no iron and an inflow of iron from somewhere was inevitable, whether from other parts of Britain or abroad.

London's imports fell greatly during the 16th century, from over 1600 tons per year in the 1490s to a mere 250 tons in about 1570. The decline was most rapid after 1540 (a year with imports of 1200 tons), and is matched by the rapid growth of production in the Weald.<sup>19</sup> Imports fell to particularly low levels during the Spanish wars under Elizabeth and Charles I, recovering somewhat in the intervening periods, and again in the later 17th century, and after the War of Spanish Succession.

Imports to all outports (that is all ports except London) together were in total at a similar scale to those of London during the 16th century. Imports to Chester and Liverpool were a modest 130 tons around 1500, but increased to pass 500 tons around 1540.<sup>20</sup> From this peak which is not found in other regions, imports declined again in the late 16th century, and then virtually disappeared in the 17th century, probably in response to increased production in the northwest Midlands. The ports of the Bristol Channel (including Barnstaple and Bridgwater) imported some 700 tons per year at the end of the 15th century, but imports fell from 670 tons in 1535 (including 536 tons to Bristol itself) to under 90 tons in 1583 (of which Bristol itself imported a mere 11 tons). Imports were no doubt replaced from about 1560 by Welsh iron, and later by Forest iron from the Forest of Dean. This virtual cessation of imports implies that the region was reasonably self-sufficient in iron in this period. However Bristol's imports of Spanish iron were resumed in the 1670s, being joined later by iron from Sweden and in the 1730s also from Russia. This was primarily due to the demands of the iron manufacturing industry of the Black Country, which far outstripped the iron production ability of the area in this period.

The iron imports of Exeter and other ports of the southwestern peninsula fell from 330 tons in around 1500 to under 50 tons in 1546. This low point may be related to the expansion of the Wealden iron industry, which no doubt also accounts for the extremely low level of imports to other ports of the English south coast. From this low of 1546, Spanish iron imports to the southwestern peninsula seem, in contrast with all other regions, to have enjoyed some (though not uninterrupted) growth with peaks of 650 tons per year in the 1680s and 600 tons in the 1730s. In the latter period, this region was receiving half of the imports of English outports, and in the 1680s

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<sup>18</sup>. Lewis 1927.

<sup>19</sup>. The Customs records for London have complications that do not apply to smaller ports: not only are there separate series for imports and exports, but petty custom was collected separately from other dues. There is no year for which both the import series survive and therefore no means of determining the precise relationship between them. From the 1560s there are two series of port books described respectively as alien and denizen. The alien books seem to represent a direct continuation of the petty customs accounts. The petty customs account for 1534/5 shows imports of 766.5 tons, while the preceding and succeeding accounts examined show under 200 tons. The poundage accounts for 1521 and 1547 both show imports of 1000-1100 tons. When these are combined there appears to be a peak of nearly 1800 tons in 1535, but it is possible that the difficulties encountered by English merchants in Spain in the years after Henry VIII's break with Rome (*cf.* Cornell-Smith 1954) may have resulted in the trade passing for a time into the hands of Spaniards. If so, the poundage account would have shown a corresponding reduction in trade. A further difficulty results from the way in which certain customs accounts recorded a merchants' declaration of several imports together by describing the first item fully '*cum aliis*' [with other things], for example the petty customs account for 2-3 Edward VI (P.R.O., E122/85/7): this has almost certainly resulted in imports being underestimated.

<sup>20</sup>. Wilson 1969, 71.



even more than London.<sup>21</sup> However, after 1690 the trade was periodically obstructed by war. After 1750 it fell to a low level, and virtually ceased by the end of that century.<sup>22</sup>

Other aspects of the trade changed over the period. In the Elizabethan period iron was often the main or even only cargo of ships from Bilbao and San Sebastian, but from the 17th century the import of Spanish wool also became important. This was used in the manufacture of certain of the 'new draperies', which were consequently called Spanish cloth. These were made in the West Country (Wiltshire and Somerset) and also Devon. They respectively obtained wool mainly through London and Exeter and their products were exported through them to southern Europe.<sup>23</sup> Most London merchants handling Spanish iron in the late 17th century also traded in Spanish wool, and were a distinct group from those involved in the Swedish iron trade. The relatively fragmented nature of the trade, with a considerable number of merchants each with a small parcel of iron in each ship may indicate that the iron was being imported more as a saleable ballast than as a prime objective of the trade in its own right.<sup>24</sup> It is likely that the importers were Blackwell Hall factors, for whom trade in Spanish wool was a principal by-trade.<sup>25</sup> However the examination of the wool trade undertaken here has been relatively superficial, and the subject deserves fuller investigation.

The estimate of iron imports from Spain made here, because it depends on interpolation, has smoothed out many of the fluctuations in the level of the trade. For London after 1697, a selection of actual figures from the Customs ledgers has been used, since there are no London port books, but for outports the estimate considerably underestimates the true level of Spanish imports (as recorded in the Customs ledgers). The estimates here are often several hundred tons less than what was recorded in the ledgers, representing over 40% of the imports to outports in the 1720s. At that period the availability of the Customs ledgers fortunately means that the estimate from port books does not need to be used in the calculations that will be described in the next chapter, but nevertheless it raises the disturbing possibility that imports may similarly have been underestimated at earlier dates. Even so, after 1600 Spanish iron represented a relatively small proportion of the iron traded in England, and any discrepancy will not seriously affect the conclusions of this thesis.

### *Ireland*

Some authors have implied that an Irish iron industry was another source of English imports. In the decades before the rebellion of 1641 this industry may have been a significant one, but it was only a very modest one

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<sup>21</sup>. The average outport import from 1721 to 1740 was about 1250 *t.p.a.*: P.R.O., CUST 3.

<sup>22</sup>. P.R.O., CUST 3 and 16, *passim*.

<sup>23</sup>. For an account of the wool trade from the Spanish side see Phillips & Phillips 1997; for new draperies: Wilson 1983, 76-9 291-4. Wool was also imported though Bristol, but seems there to have had a less strong link with the iron import trade. Around 1730 only one Bristol firm, Jos. and Samuel Percival, was importing Spanish iron: P.R.O., E 190/1207/2.

<sup>24</sup>. Because of its high density, iron could replace stones or sand as ships' ballast. consequently low freight rates were charged for iron in a number of trades, including the import of Virginia tobacco (ballasted with pig iron) and Norwegian deals (with Swedish bar iron): Kent 1973, 65-6; Middleton 1953, 170; Johnson (K.) 1959, 44; King 1995b, 15.

<sup>25</sup>. Bowden 1962, 182-3.

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Figure 7.3 Imports from Ireland

Eng. ports from Ireland/Chart1

later.<sup>26</sup> Some Irish iron was certainly exported to England,<sup>27</sup> but those port books examined show no consistent trend, the trade being spasmodic and generally modest in scale (see fig. 7.3). Its scale is too small to require detailed discussion.

### *The Baltic before 1650*

The production of iron in Sweden began long before the period of this study, and Sweden was substantially the only source of iron traded within the Baltic until the 18th century. Formerly Swedish iron was exported in the form of osmonds, balls of refined iron that had not yet been drawn out into bars, but from the mid 16th century bar iron began to replace it as the preferred export commodity. Finally during the 1620s, Gustavus II prohibited the export of unfinished iron, and the trade in osmonds ceased.<sup>28</sup> K.G. Hildebrand collected data on Swedish exports and showed that in the late 1530s about 2800 tons of osmonds were exported from Sweden, together with a mere 15 tons of bar iron. Of this, some 1300 tons went to Lübeck, 850 tons to Danzig, and rest to other Baltic ports. Exports of osmonds grew gradually. Passing 5000 tons shortly after 1590, they reached their highest level early in the next century at about 6500 tons. However growth in the export of bar iron was much more rapid: though still under 250 tons in 1560, the bar iron trade reached 1200 tons in 1590 and 3000 tons in 1615. By this stage the main destination for osmond iron was Danzig, which took 70% of it or more, with most of the rest going to Lübeck and a small amount went direct to western Europe, mainly to Scotland (see fig. 7.4).<sup>29</sup> After the export of osmond iron was prohibited, some Swedish bar iron continued to pass through Danzig, but (as will appear) exports from the Baltic were increasingly sent direct from Sweden.<sup>30</sup> Sweden also exported modest quantities of cannon, ironware, rod iron,<sup>31</sup> and such like, but these were always insignificant as imports to England, and need not be examined in detail here.<sup>32</sup>

Some of the osmond iron was re-exported from Danzig in that form, and some of it reached England in the early 16th century.<sup>33</sup> However, much of it was drawn out into bar iron at hammer mills in the hinterland of Danzig before being shipped westwards to Holland, England, Scotland and other countries (see figs. 7.5 and 7.6). The osmonds sent to Lübeck were made into bars in Holstein (between it and Hamburg) and probably reached the West through Hamburg, to which Lübeck was from 1398 linked by canal to the river Elbe.<sup>34</sup> Shipment of iron from Germany to England did take place on a small scale at some dates, and some of this was

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<sup>26</sup>. McCracken 1957; 1965; Andrews 1955; Kearney 1953; Barnard 1982; 1985; Rees 1968, 240-4; MacCarthy-Morrhough 1986, 168 183 224-5 229-36; P.R.O., C 78/471/13.

<sup>27</sup>. Andrews 1955, 142-3; Barnard 1985, 143-4. The Irish exports of 778 tons (if all to England) might be significant part of English iron imports, but not compared to contemporary English iron production.

<sup>28</sup>. Hildebrand 1957, 8-15 33-7; Åström 1963, 31-7; Zins 1972, 233-7; cf. *Sound Toll Tables*.

<sup>29</sup>. Hildebrand 1957, 8-15 33-7; Zins 1972, 233-7.

<sup>30</sup>. *Sound Toll Tables* (see below). This is apparent from the work of Fedorowicz (1980, 124-7), but its timing is to some extent obscured by his use of decennial averages.

<sup>31</sup>. Rod iron is, it is presumed, what is known as 'bundle iron' in Swedish.

<sup>32</sup>. Iron hammered or drawn to less than  $\frac{3}{4}$  inch square was considered to be manufactured, and so bore a higher import duty and such rod iron was therefore slit in England: Crouch 1725, 176-7. England was generally an exporter rather than an importer of cannon.

<sup>33</sup>. For example Hull imported almost 93 lasts (about 148 tons) of osmonds in 1511/2, probably from Danzig: P.R.O., E 122/64/2.

<sup>34</sup>. Spufford 2002, 202 300. In view of the inland waterway, it is not surprising that relatively little bar iron is recorded as passing the Sound from Lübeck: *Sound Toll Tables*; Hildebrand 1957, 8-13; Åström 1963, 33.

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Map 1

Map of the North Sea and Baltic

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Figure 7.4 Osmond iron passing through the Sound  
Sound Toll2a/Chart1

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Figure 7.5 Bar iron passing through the Sound by nationality of vessel  
Sound Toll 1B/Chart1

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Figure 7.6 Iron passing through the Sound in Scottish vessels  
Sound Toll2a/Chart2

probably Swedish iron that had been sent to Lübeck, but (later at least) England also imported German iron, though again not in significant quantities.<sup>35</sup>

Though Lübeck had formerly been the leading city of the Hanseatic League, Danzig had become far more important by the mid to late 16th century. From 1579 English trade with the Baltic was in the hands of the Eastland Company, a regulated company (rather in the nature of a guild), whose staple was at Elbing, a small port to the east of Danzig. This trade has been described in detail by H. Zins, S.-E. Åström, J.K. Fedorowicz, and others, based on studies of customs accounts, both English and foreign.<sup>36</sup> So far as can be determined from the *Sound Toll Tables*, based on the cargoes of English ships leaving the Baltic and the voyages of Baltic ships from England, it appears that England imported about 500 tons per year of iron from the southern Baltic between 1580 and 1610 (see figs. 7.2 and 7.6). This quantity was wholly insignificant compared to domestic production, and in the following decades the quantity was even lower.<sup>37</sup>

Swedish production underwent a considerable expansion following investment by Dutchmen, particularly Louis de Geer and Willem de Besche. Together they built ironworks at Finspång in 1615. Then from 1624 in the province of Uppland (to the north of Stockholm), they separately built works including Forsmark, Österby, and Leufsta, which were later renowned as the producers of the best ore-grounds iron for making steel, and others followed them.<sup>38</sup> The first investment at Finspång may merely have been opportunistic, but the later ones were probably related to the situation faced by the Dutch after their long war for independence from Spain resumed in 1621. The Spanish blockade of the Dutch landward frontiers cut them off from their traditional sources of iron around Liège and in the Rhineland, but that was evidently replaced by Swedish iron.<sup>39</sup> Both the initial investment at Finspång and the subsequent ones in Uppland were followed by sharp increases in the amount of iron passing through the Sound (see figure 7.6). From under 100 tons passing through the Sound in Dutch vessels in the decade to 1616, the quantity increased to over 500 tons each year from 1621 to 1626, and then very suddenly to over 2000 tons in 1628. In 1631 the amount of iron going through the Sound passed 4000 tons for the first time, and over 3800 tons of this came direct from Sweden, but how much of it reached England cannot be determined from these sources. There was a similar increase in traffic in Scottish vessels (probably mostly going to Scotland). Scotland had long been an importer of iron. Most of the osmond iron that passed through the Sound was carried in Scottish vessels (and presumably to Scotland), with a lesser quantity in vessels belonging to ports of the south Baltic (see figure 7.3). Scotland also imported bar iron (see figure 7.6), but up to 1618 the total of both commodities only averaged 125 *t.p.a.* The amount of iron carried

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<sup>35</sup>. German iron is sometimes mentioned separately in the Customs ledgers in the 1720s and 1730s: P.R.O., CUST 3, *passim*. Hull also had imports from Hamburg in the 1620s: P.R.O., E 190/315/7.

<sup>36</sup>. Zins 1972, 232-7; Fedorowicz 1980, 124-26; Åström 1963; Hinton 1959.

<sup>37</sup>. The quantity shipped in vessels belonging to Baltic ports has been estimated on the assumption that firstly they went from the Sound direct to the country from which they came back, rather than making a triangular voyage, and secondly that these ships carried the same amount of iron on average as English ships in the same year. Each of these assumptions is of questionable validity, but there is no obviously better means of estimation.

<sup>38</sup>. Hildebrand 1957, 66-70, 424-27; Nisser 1987, 29-36.

<sup>39</sup>. Israel 1995, 495-6; Hildebrand 1957, 39-42 425-28; Nisser 1987, 30-38.



through the Sound in Scottish ships (presumably to Scotland) increased significantly in 1619 to an average of 260 tons for the next eight years, and then again to an average of about 800 tons from 1628 to 1638.<sup>40</sup> This increase in Scottish imports coincides with (and may be related to) the closure of the ironworks around Loch Maree, which were probably the only powered ironworks in Scotland of their time.<sup>41</sup> For the next 130 years, Scotland appears to have relied solely on imported iron.

English trade with the Baltic was still monopolised by the members of the Eastland Company, which required their members to land their outward cargoes at their staple, at Elbing until about 1631 and then at Danzig.<sup>42</sup> This meant that most ships obtained their return cargo either there or at a nearby port, and there was little incentive to go up the Baltic to Stockholm for iron. Accordingly most of the modest amount of iron imported direct from the Baltic came from its south coast. The attitude of the company is illustrated by the case of George Gordon, a Scottish merchant, who arrived at London in 1630 with 40 tons of iron from Gothenburg, and found that the Company would not allow him to land it, because he was not a member. On his appeal to the Privy Council, pleading his ignorance of the Company's rules, they recommended the Company to levy a moderate fine.<sup>43</sup> Significant English imports of Swedish iron had begun in the late 1620s,<sup>44</sup> but the precise timing and speed of their growth remains unclear due to the dearth of surviving records.<sup>45</sup> Between about 1630 and 1672 imports from countries outside the Baltic were quite significant (see fig. 7.8). Iron was coming as a re-export from Holland, Germany and even Norway, all of which were outside the Eastland Company's monopoly, but this trade ended quite abruptly with the outbreak of the Third Dutch War. However certainly from the 1650s (and possibly earlier), direct trade predominated. This is reflected both in the records of Swedish iron exports and in English imports during the mid and late 17th century (see fig. 7.9). According to S-E. Åström's figures, Stockholm was exporting 8000-10000 tons to England in the 1680s and 1690s and sometimes even more.<sup>46</sup> By then, English production had fallen from its peak of over 18500 tons to 13000 tons or less,<sup>47</sup> so that Swedish iron was playing a very significant role in the English market. The lack of English records can to some extent be repaired by resort to foreign ones, despite the difficulties with them outlined above. Some figures for the 1640s and 1650s are available for Stockholm and Gothenburg, which were by far the two most important Swedish ports for iron, but this still ignores such ports as Nyköping and Geffle (Gävle), which also exported significant (but smaller) amounts of iron. The omission of these minor ports may however be counterbalanced by Ireland's inclusion in the Sound Toll figures for 'England'. However much the available data is manipulated, the results will inevitably be rather less than perfect, but they are the best estimate that can be obtained without extensive and very time-consuming research in Swedish and Danish

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<sup>40</sup>. *Sound Toll Tables*

<sup>41</sup>. Lindsay 1977, 49-52 and *passim*; Lewis 1984.

<sup>42</sup>. Hinton 1959, 58-9 66 78.

<sup>43</sup>. P.R.O., E 190/34/2, 6 Sep., nos. 23-24; 22 Dec., no.3; *Acts of Privy Council*, 10 Oct. 1630 (P.R.O., PC2/40/441).

<sup>44</sup>. Tables in Millard thesis.

<sup>45</sup>. It is a particular problem that there are virtually no English customs records between 1640 and 1660, and that their survival for the 1630s and 1660s is poor.

<sup>46</sup>. Åström 1963, 37.

<sup>47</sup>. See preceding chapter.

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Figure 7.7 Estimated bar iron imports to England through the Sound  
Sound Toll 1C/Chart3

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Figure 7.8 Estimated bar iron imports from Germany, Holland and Norway  
Eng.Ports from N.Eur/Chart1

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Figure 7.9 Estimated English iron imports, as indicated by port books  
Eng.Ports Summary/Chart1

archives. The sources available for Stockholm and Gothenburg are respectively different in nature, and they will therefore be examined separately.

### *Gothenburg*

Sweden is essentially a Baltic nation and the trade of Stockholm and the rest of its Baltic coast will be discussed later, but its North Sea coast lies outside the Sound, so that the *Sound Toll Tables* do not deal with its trade with England. Fortunately however, considerable information has been published concerning the trade of Sweden's most important North Sea port, Gothenburg (Göteborg). This city was founded in 1619, at the end of a corridor of land, which Sweden had recently re-acquired. This corridor gave Sweden direct access to the North Sea, avoiding the Sound. Its situation in the Baltic kingdom of Sweden may, in a sense, be compared with Peter the Great's (later) view of St. Petersburg as Russia's window on the West, though Sweden's isolation was never as great as Russia's. The city stands at the mouth of the River Göta, which drains Lake Vänern, the greatest of the Swedish lakes, and so retained its importance even after Sweden gained a longer North Sea coast. Iron was brought from shipping places, such as Karlstad and Kristinehamn on the northern shore of this lake down the river to Gothenburg. In the 16th century the iron production in the province of Värmland, then the most westerly iron producing region of Sweden, was concentrated in the Filipstad mining district, but increasingly after 1650 the forges there were replaced by new ones further west where untapped forest resources were available. This freed up the charcoal resources in the mining district for use in furnaces there. The transport links between Värmland and Stockholm were not good, and Gothenburg was therefore the natural outlet for the products of this region.<sup>48</sup> After Sweden captured adjacent provinces from Denmark and Norway later in the 17th century, it had other North Sea ports, including Uddevalla, to the north of Gothenburg. However Uddevalla did not export any iron in 1685, and usually exported only a few hundred tons in the 1720s, though over 3000 tons in 1720 and 1721: its contribution in the 17th century may accordingly be ignored. The exports of Swedish North Sea ports to the south of Gothenburg still did not in the 1720s exceed 150 tons, which is also negligible.<sup>49</sup>

In the earliest years for which figures survive (the late 1630s and 1640s), some 2000 tons were being exported from Gothenburg, of which Holland took 35-40%, Northwest Germany 25-30%, England 10-12%, and Scotland 8% (see fig. 7.10). From 1651 English imports began to grow fairly rapidly, though not as fast as those from Stockholm. For a time the levels of the Dutch, German and English trades became similar, but the Dutch trade declined sharply in the late 1660s, and the German began a slow decline. The growth of English imports continued, reaching a plateau of about 2700 tons in the 1680s, when they amounted to about 60% of Gothenburg's iron exports. Growth resumed in the English trade in the 1690s and, after the period in the reign of Charles XII when the data is poor, reached 6000 tons in 1721 and 8000 tons before the end of the decade.

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<sup>48</sup>. Hildebrand 1957, 80-4; Hildebrand 1992, 119-23; Boëthius & Heckscher 1938, lvii-lviii. This separation between furnace and forge sites reflects what occurred independently in England, though in England the erection of furnaces near iron mines in Furness and the Forest of Dean was quite as significant as the erection of forges in the Midlands.

<sup>49</sup>. Boëthius & Heckscher 1938.

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Figure 7.10 Gothenburg's iron exports

Gothenburg B/Chart5

This represented about 80% of Gothenburg's iron exports, with Germany, the Netherlands, France and Iberia each taking a mere few hundred tons. Growth in English trade ceased about 1730, probably due to the availability of Russian iron. Thus Graffin Prankard of Bristol imported some Gothenburg iron in 1729 for sale to slitting mills, but in later years he bought Russian iron for them.<sup>50</sup> There was a slow decline (averaging 0.6% *p.a.*) for the next 50 years,<sup>51</sup> but Scottish imports from Gothenburg grew from under 100 *t.p.a.* in the 1680s to 350 *t.p.a.* in the 1720s and 2370 tons in 1755, which represented a quarter of British imports.<sup>52</sup> Gothenburg's British trade largely ceased during the Napoleonic War, due partly to Britain becoming self-sufficient in iron during the Industrial Revolution and partly to American shipping (which was neutral until 1812) taking over much of the European carrying trade during Napoleon's Continental System, using Gothenburg as an entrepôt. From that time America became Gothenburg's principal market for iron exports.<sup>53</sup>

### *Baltic Sweden 1650-1700*

English iron imports from the North had been quite insignificant until the 1620s. However estimating their growth over the remainder of the century presents a considerable challenge. The lack of English Customs records for the middle of the century prevents them giving a complete picture, while the absence in the *Sound Toll Tables* of destinations at one period and of Swedish cargoes at another, prevents them making good the deficiency. Furthermore following the Peace of Westphalia in 1648, there was an unusually large amount of Dutch shipping entering the Baltic from England. It is likely that some of this shipping had carried iron to England, but the amount cannot readily be estimated. This entry of the Dutch into Anglo-Baltic trade and certain others caused a crisis, which led directly to the passing of the first English Navigation Act in 1651.<sup>54</sup> Calculations made by comparing the Sound Toll and Stockholm figures suggest that Swedish vessels carried 130 tons of iron on average, compared to only 65 tons in toll-paying vessels.<sup>55</sup> The *Sound Toll Tables* suggest that there was a rapid growth in English iron imports in the late 1650s (after the First Dutch War). Imports in English vessels rose from 157 tons in 1654 to 971 tons in 1656. English imports probably also included 250-500 tons each year carried in those Swedish vessels that returned home direct, 100 tons shipped from Prussia (including Danzig), and possibly another 500-1000 tons brought in Swedish vessels that went on to Portugal or other places. Swedish sources indicate that Stockholm's exports to England amounted to 373 tons in 1648,<sup>56</sup> 750 tons in 1652, and about 3443 tons in 1659.<sup>57</sup> Total imports from the Baltic may therefore possibly have amounted to 1000 tons in 1654 and 2000 tons in 1656, but these figures can only be regarded as rough estimates.

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<sup>50</sup>. Prankard *a/c.*

<sup>51</sup>. This is a compound annual rate calculated over the whole period.

<sup>52</sup>. Figures in this paragraph are taken or calculated from Lind 1923 and Grage 1986. There are slight discrepancies between their figures, which may result from different treatment of trade to Ireland.

<sup>53</sup>. Fleisher 1953; Heckscher 1954, 245.

<sup>54</sup>. Hinton 1959, 84-94; Israel 1992.

<sup>55</sup>. These figures are simple averages of the annual averages carried by each ship. The use of a single average is no doubt unsatisfactory, but there is insufficient published data on Stockholm's exports for anything more complicated. The calculation is imperfect in other ways: it assumes all Swedish trade came from Stockholm, when there was actually a small proportion that did not.

<sup>56</sup>. This compares with 375 tons estimated from the *Sound Toll Tables* in the previous section.

<sup>57</sup>. This is an average of figures given in Åström 1963, 37; Hildebrand 1957, 49; and Boëthius & Heckscher 1938.

Figure 7.11 An estimate of iron passing through the Sound to England according to the Sound Toll Tables

Sound Toll I/Chart2



Figure 7.11 shows an estimate of iron imports to England from Stockholm.<sup>58</sup> This estimate gives an average between 1669 and 1710 of 8978 tons of iron imported each year, compared with the average of the actual trade to England and Ireland in certain years of 9634 tons.<sup>59</sup> The actual amount appears to have been around or below 8000 tons until the outbreak of the Scanian War in 1675 and usually between 8000 and 10000 tons thereafter, but somewhat higher or substantially lower in a certain years. Measured over the long term the figures show very rapid growth (over 12% per year) in the 1650s, slowing to 6-7% from the mid 1660s to mid 1670s, and to about 1% around 1680 and then virtually nothing for the rest of the century.<sup>60</sup> Over shorter periods the picture is quite different: there were, apparently, periods of rapid growth in the late 1650s and late 1660s, separated by a period of recession from the Restoration to the middle of the Second Dutch War, annual growth rates peaking at 32% and 60% respectively.<sup>61</sup> The recession may reflect the re-opening of Spanish trade, or the Dutch briefly re-entering the carrying trade in the early 1660s when the Navigation Laws ceased to apply to iron.<sup>62</sup> The second of these peaks no doubt reflects the improvement in trade after the end of the Second Dutch War, but may be exaggerated, since the peak in shipping numbers (on which the estimate depends) probably reflects the great demand for timber to rebuild London after the Great Fire, rather than a sudden demand for iron.<sup>63</sup> Nevertheless these figures are for the speed of growth, not growth itself, and the growth undoubtedly did occur, though possibly somewhat slower than has been estimated. There was a peak in imports in 1676 during the Scanian War, when England was the only neutral maritime power, but the fastest growth was in the preceding period. During that war English merchants seized the opportunity to flood the Swedish market with goods. This glutted the Swedish market to such an extent that they had difficulty in finding sufficient Swedish goods to export from Sweden, to bring their money home again. The result was a glut of iron in the English market.<sup>64</sup> This glut seems to have given rise to a cyclical pattern of growth and recession, with minima every five to seven years, but (as already stated) the long term pattern was one of stagnation, with little or no long term growth: in other words the rapid growth in imports of the 1650s and 1660s had been replaced by stability by the 1690s. The basis of these estimates is not satisfactory, but it is the

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<sup>58</sup>. This estimate has been made by combining Stockholm and Sound Toll data to estimate that 130 tons of iron were carried in each toll-free ship of Swedish nationality. This has been multiplied by the number of toll-free ships shown by the *Sound Toll Tables* from 1669. Before 1669 the number of vessels going to England has been estimated from the number returning from England, inflated proportionately to take account of those going on to other countries. The factor for this used has been estimated from the actual shipping pattern in the early 1670s.

<sup>59</sup>. For years where there is actual data, that data is used rather than the estimate comprising the product of an average cargo and the number of voyages.

<sup>60</sup>. These are compound annual growth rates measured over 21 years. This is a long enough period to smooth out perturbations caused by war and cyclical effects.

<sup>61</sup>. These are compound annual growth rates measured over five year periods. It will be noted that the figures in this period depend considerably on estimates of Swedish shipping going to England. It has not been possible to include any estimate of what Dutch shipping carried iron to England. However Dutch shipping was carrying some 3000 tons of iron from Sweden in 1661-63, 1666-68, and 1671, also in the late 1670s, according to the *Sound Toll Tables*, and very little of this was carried other than to the Netherlands after 1669 (when destinations first appear); nevertheless the possibility of iron being shipped to England in Dutch vessels either direct in the years preceding 1669 cannot be ruled out, save England and the Netherlands were at war. However it is only before the Second Dutch War that the addition of some part of the Dutch cargoes to the estimated English imports would make more than a relatively insignificant difference. Dutch re-exports (and exports) have been estimated from English port books (see above) and seem to have ceased to be important in the 1670s, presumably from the outbreak of the Third Dutch War.

<sup>62</sup>. Iron was not an enumerated commodity in the Navigation Act of 1660: Statute 12 Chas.II, c.18.

<sup>63</sup>. Roseveare 1987, 39-46. The Navigations laws were temporarily suspended in respect of timber until 1669 in order to meet the demand for it in London.

<sup>64</sup>. Roseveare 1987, 156-7; 1988, 30.

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Figure 7.12 Iron passing through the Sound by destination  
Sound Toll F/Chart1

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Figure 7.13 Iron passing through the Sound: destination and Sources  
Sound toll G/dest ch

best that can be done with the inadequate data available. It is to be hoped that better estimates may yet become available, by the careful use of surviving archives for Stockholm and other Swedish ports.<sup>65</sup>

### Bar iron imports: the 18th century

After 1696 it is no longer necessary to rely on foreign sources for data on English imports, since one of the early actions of the Board of Trade was to arrange for the systematic compilation from customs declarations of trade statistics for England and Wales. Nevertheless English imports can only be seen in their wider European context by using data from foreign sources, particularly the *Sound Toll Tables* together with trade figures for Gothenburg. On the other hand the difficulty with the *Tables*, due to the cargoes of Swedish ships not being recorded, disappears in 1710, when they ceased to be toll-free. Sweden's iron exports in this period were described in detail by K.G. Hildebrand, using the figures from the English Customs Ledgers in respect of England and contemporary Swedish compilations for other destinations. He also used the *Sound Toll Tables* to compare Swedish and Russian exports after 1760 (but apparently not before).<sup>66</sup> The trade through the Sound was considered from the Russian point of view by A. Kahan, but only fairly briefly.<sup>67</sup> The conclusions reached here do not differ greatly from theirs, but it has been necessary to examine the primary sources, because K.G. Hildebrand did not set out sufficiently detailed figures. Data compiled from the *Sound Toll Tables* is presented in figures 7.12 to 7.15. The first shows the amount of iron sent to each country; the others give a fuller breakdown of the destinations of Russian and Swedish exports respectively, showing that the English market was the dominant one for both countries, but even more so for Russia than for Baltic Sweden. As described in chapter 3, the difference between them was largely a matter of quality. Swedish iron was the equivalent of English merchant iron; some Russian iron was equivalent to (or even rather worse than) English coldshort iron.

#### *Russian exports*

All Russian iron exports increased greatly during the 18th century, from virtually nothing around 1720 to 3000 tons in the 1740s, double that ten years later, to over 10000 tons in the early 1760s, and twice that a decade later (see figure 7.14). These increases represent a high rate of growth, about 6% per year.<sup>68</sup> The Russian iron industry underwent a great expansion during the Great Northern War, when its products were needed to feed Peter the Great's war machine. In 1715 the tsar had transferred certain of his own unprofitable ironworks in the Urals to Nikita Demidov, who then built further works there. These were in his hands highly successful, and made him and his descendants very wealthy indeed. While Peter the Great lived, iron exports remained at a minute level, probably consisting of small quantities of 'government' iron or even of just re-exports, but in

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<sup>65</sup>. A great deal of time would need to be devoted to the production of such estimates by a researcher familiar with the Swedish language and handwriting of the period, while resident in Sweden. The resources available have not permitted me to undertake any such research.

<sup>66</sup>. Hildebrand 1958.

<sup>67</sup>. Kahan 1985, 203-13.

<sup>68</sup>. This is a compound annual growth rate for 1730-83 (and also for 1740-83) in respect of all Russian iron passing through the Sound.

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Figure 7.14 Destinations for Russian iron  
Sound Toll L Russia/Russia ch

the next reign Nikita Demidov was in 1725 authorised to export his iron (known as 'Sable Siberia' and later as 'Old Sable').<sup>69</sup> In the early years when the exporters were looking for markets for their iron, England was just one of a number of markets to which it was sent, but soon after 1730 the great capacity of England for absorbing Russian iron became apparent, and from that time over 80% of Russian iron passing through the Sound was destined for England.<sup>70</sup>

There was a marked increase in the quantity exported immediately after the end of the War of Austrian Succession, and again after the end of the Seven Years War. This probably partly represents the outward shipment of iron that had accumulated in St. Petersburg during each war, for Russia's merchant fleet was minute, and so (unlike Sweden's) could not have taken over the trade from British shipping in wartime, even when Russia was neutral. However the post-1748 increase may also have been a reaction to the Swedish decision to limit their iron production (see below). There was also an increase in the amount going to other destinations between and after these wars, but that was still quite small compared to the English trade.

Russian iron was mostly exported from St. Petersburg, though some also came from Archangel by the late 18th century.<sup>71</sup> The iron was produced in the Urals and other places far inland, and it often took more than a year for it to reach the coast. Nevertheless the freight paid for it was relatively low, because it provided a useful ballast for hemp and flax.<sup>72</sup> This was very different from the Swedish trade, where iron was the principal cargo. The import of iron from both countries to Hull, was dominated by the mid 18th century by a few firms of merchants including the Sykes family and Williamsons and Waller. However they were merely two of the largest iron importers from St. Petersburg. This contrasts starkly with its import from Stockholm, where these two firms handled 75-100% of the trade in iron. This left room for others, such as Samuel Sketchley and his sons (the Burton upon Trent brewers) and John and Simon Horner (probably of Gainsborough) to play a significant role in the Russian iron trade, evidently importing iron as a return cargo for their own products.<sup>73</sup> Little is known of the organisation of London's imports, because no 18th century port books survive.

### *Swedish Baltic after 1700*

England was also the single most important market for iron exported from Stockholm and Sweden's other Baltic ports, taking half to two-thirds of it (see figure 7.15). However this proportion was rather lower than for St. Petersburg or Gothenburg. Accordingly, England was less overwhelmingly important for Stockholm

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<sup>69</sup>. Hudson 1986, 28-48. For 'sable' see Kahan 1985, 183. The name 'Old Sable' was evidently to distinguish it from Tswordischoff's and other kinds of 'New Sable': Tswordischoff's is mentioned Jackson 1975, 16. Old Sable (or one kind of it) was probably also known by its mark 'CCND', presumably standing (in Cyrillic letters) for 'Sable Siberia Nikita Demidov'. By 1805 there were apparently also other kinds of 'Old Sable', being the products of five separate Russian ironmasters, three with the surname 'Demidoff' and the other two 'Jacovleff'. The former at least were presumably descendants of Nikita: Science Museum Lib., Weale Mss. 371/3, 312.

<sup>70</sup>. The actual proportion between 1732 and 1783 usually fluctuated between between 75% and 90% with occasional years outside this range and an overall average of 83%. There was also trade with Archangel at least at some dates: Kahan 1985, 186 189 254-8; P.R.O., BT 6/231-33, *passim*.

<sup>71</sup>. Kahan 1985, 203-7 210; P.R.O., BT 6/231-33.

<sup>72</sup>. E.g. Prankard l/b, to Vigor and Davenport, 28 Jun. 10 Jul. and 7 Aug. 1732.

<sup>73</sup>. King, *North*; cf. King 2003; both from Hull port books; cf. Owen 1978, 62 and *passim*; Jackson 1972.

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Figure 7.15 Destinations for iron exported from Baltic Sweden  
Sound Toll M Sweden/Sweden ch

than the others.<sup>74</sup> There was some growth in exports throughout the period. Total exports averaged under 18000 tons between 1710 and 1740, growing overall at 1.8% per year. From then until 1783 they averaged over 22000 tons, but with an annual growth rate of under 0.5%. Significant growth in total Swedish exports ended in the mid 1730s, and was followed by relatively stability and then a slight downward trend.<sup>75</sup> This long period of virtual stagnation is closely connected with the prohibition (imposed in 1747) on the erection of new Swedish forges or the expansion of existing ones,<sup>76</sup> a subject which will be considered further in the next chapter.

The most obvious difference between Swedish and Russian exports is the relative importance of the Netherlands and Portugal for Sweden and their insignificance for Russia. This difference is almost certainly related to Swedish demand for salt and wine, which were imported from Bordeaux, Portugal and other parts of southern Europe. This trade was mostly carried in Dutch vessels initially to Holland, but with some contribution by English shipping. However in the 1720s there was a shift to Swedish ships, particularly following the imposition in 1724 of the *Produkt Plaket*, the Swedish equivalent of the Navigation Laws, which required Sweden's main imports (including salt) to be brought in Swedish vessels. This brought an immediate increase in direct trade between Sweden and Portugal and with it an increase in Swedish exports of bar iron to Portugal.<sup>77</sup> However the growth began in 1723 (before the *Produkt Plaket*) and was no doubt encouraged by the end of the Great Northern War. The trade averaged 2500 tons over the following 60 years. Swedish exports to France also became significant from the 1760s. The *Produkt Plaket* however had little effect on trade with England, since there was little return trade from England and a preferential English customs rate for iron brought in British ships. Accordingly, British shipping predominated in trade to England, except when England was at war and Sweden neutral.<sup>78</sup>

### *English bar iron imports: the evidence of the Customs Ledgers*

The preceding sections have looked at English imports primarily on the basis of statistics compiled from foreign sources. This one will look almost exclusively at an English one, the Customs Ledgers. The foreign sources enable trade in iron to England (including Ireland) to be compared to that to other lands. However they are not the best source for imports to England itself after 1697. The Customs Ledgers are a contemporary compilation (by the Inspector-General of Imports and Exports) of statistics on English foreign trade, and provide a continuous series of trade statistics with few gaps from 1697 until recent times. The ledgers set out the quantities of each commodity imported, exported, or re-exported from or to each country or colony.<sup>79</sup> They are the ultimate source for almost all 18th century and later trade statistics.<sup>80</sup> Unlike Customs accounts and port books (used to provide estimates of

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<sup>74</sup>. Details of English imports will be given in the next section.

<sup>75</sup>. There was a decline of ¼% *p.a.* for 1735-55, but a growth of ¼% for 1730-70.

<sup>76</sup>. Heckscher 1932; Hildebrand 1957, 160-4 *cf.* 148-59; Hildebrand 1995, 21; Floren & Ryden 1996, 259-62; Kent 1973, 72.

<sup>77</sup>. The salt trade, like the iron trade was complex, with all Baltic states as recipients, not just Sweden, and would require a study as detailed as that of iron made here to elucidate its full details: the picture presented here may well be a mere caricature of the truth.

<sup>78</sup>. This trade is discussed in detail in Hildebrand 1958; for shipping see Kent 1973, 69-71 78-9 184-5.

<sup>79</sup>. From the early 19th century there are also separate ledgers arranged by commodity and then country. Before that (for most of the period covered by this thesis) there are only ones classifying trade first by country. This makes compilation of figures on a single commodity a time consuming process.

<sup>80</sup>. The volumes for 1705 and 1712 are missing, but iron import figures for 1712 are preserved in Scrivenor 1841. There are two series of ledgers that overlap for the years 1772-80. These, in fact, contain exactly the same figures, but in her compilation, E.B. Schumpeter (1960) showed different figures for 1775 and 1780 at the end of those apparently made from the earlier series. Though her



imports in the 16th and 17th centuries), the Customs Ledgers were prepared for the express purpose of providing the government with statistics on foreign trade. Unlike foreign sources, they do not need any adjustment before they can be used, either to exclude trade to Ireland or to take account of omissions.

The trade statistics for bar iron imported into England are presented in figure 7.16. Perhaps the most obvious feature of this figure is the break in English imports from Sweden in 1717 and 1718. As mentioned in chapter 1, the British government prohibited trade with Sweden for almost two years from March 1717, and imports of iron to Britain were reduced to nothing almost overnight. English imports of iron were very low in 1717, but the following year a large amount was imported, mainly from Holland and to a lesser extent Germany. In 1717 little iron passed through the Sound and virtually all of it went to the Netherlands, but imports had been falling off for several years before this, possibly due to the increasingly isolated position of Sweden politically.<sup>81</sup> In 1718 Swedish exports through the Sound to destinations other than the Netherlands suddenly ceased almost entirely. They were replaced by exports from non-Swedish Baltic ports. From the low level to which they had fallen over half a century earlier, these exports rose suddenly to 7712 tons, of which 4650 tons went to Great Britain and a further 2775 tons to the Netherlands, much of it probably for re-export to England. 6338 tons out of the 7712 came from the South Baltic, mostly from Königsberg and other east Prussian ports, which would have remained neutral if the Anglo-Swedish crisis had turned into actual hostilities. Of this, 2000 tons was shipped in Dutch vessels and the rest in English and Scottish. These south Baltic ports continued their exports the following year, but at a slightly lower level, after which the area resumed its previous utter insignificance as a source of iron. Dutch imports direct from Sweden rose in 1719, no doubt partly for re-export and partly to restock warehouses denuded by the sudden British demand to import iron

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other figures are mostly the same as mine, these two are lower and are wrong. Her publication of two differing figures for these two years may have led some authors falsely to think that the two series are inconsistent. Others, such as Engerman (1994, 188), have drawn graphs of trade statistics using the data published by Deane & Cole (1967, 48 and app. I), with a discontinuity at 1772-74 due to the use of figures for England before that and Great Britain thereafter. The appearance of a discontinuity is appropriate due to the nature of the published figures, but not actually necessary since separate data on England alone continues until 1790. The figures for 1790 to 1808 in the second series of ledgers only relate to Great Britain as a whole. However there is a separate series of ledgers relating to Scotland, and this enables English figures to be recovered as the difference between Great Britain and Scotland. Figures calculated by this means correspond precisely with figures quoted in contemporary compilations (Scrivenor 1841, 358 quoting Oddy 1805; Kahan 1984, 213 quoting English figures in P.R.O., BT 6/231-33). This demonstrates the validity of this reconstruction. Unfortunately figures for several years after 1808 were destroyed when the Customs House was burnt down in 1814 and little data is available for the period 1809-13. Where figures are missing entirely they have been estimated by averaging or making making linear interpolations between adjacent years for which figures are known. My own figures are largely derived from the ledgers themselves, but there remain a number of apparent discrepancies between my figures and Schumpeter's, and between details and totals extracted by me from the ledgers. I have not succeeded in resolving these, but some probably result from the illegibility of the microfilms, on which the ledgers are currently made available at the Public Record Office. Others seem to be contemporary accounting errors, which can sometimes be resolved by reference to the valuation given, which is almost always £10 per ton for imports and £13 per ton for re-exports. Fortunately the unresolved difficulties with the data are insufficient to affect my conclusions significantly.

<sup>81</sup>. Alternatively this may have been some kind of cyclical trend. The high figure for 1710 may represent a reaction to the low figures in the preceding years, ultimately due to Sweden's weakness following the defeat of Charles XII at Poltava. Possibly also, the change in the regulations for the Sound tolls in 1710 (when the exemption of vessels of Swedish nationality from the tolls was abolished) may have led to a boom in foreign shipping visiting Sweden and consequently in English iron imports.

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Figure 7.16 English imports according to the Customs Ledgers  
import statistics/Chart1

from Holland.<sup>82</sup> As indicated in the preceding chapter, this was a traumatic period for the British iron industry. Its effects did not disappear at once, as ore-grounds iron was still being imported from Holland in 1722, for conversion into steel at Sheffield.<sup>83</sup>

English iron imports from Sweden remained fairly steady throughout the first half of the 18th century, averaging 15100 tons annually. There was a slight growth in some decades and a slight decline in others. There was a decline of a few percent per year in the 1760s, due to the revaluation of the Swedish currency in 1766, which had the effect of squeezing the profit margins of Swedish ironmasters on sale contracts priced in sterling (or silver *riksdalers*). However the decline was reversed in the 1780s.<sup>84</sup> Russian imports grew from next to nothing in the early 1720s to an average of almost 4000 *t.p.a.* in the 1730s, and then after a period when trade was hindered by the War of Austrian Succession they rose substantially to 6500 *t.p.a.* in the 1750s, 15000 *t.p.a.* in the early 1760s and 27000 *t.p.a.* a few years later. The long term growth rate for this trade as a whole was very high in the 1730s and still averaged over 4% in the 1740s. In the period of resumed high growth in the 1750s and 1760s Russian imports were growing at 6% to 9% per year with an average of 7.5%. These are very high growth rates indeed. Spanish imports averaged over 1500 tons in the period between the wars of Spanish and Austrian Succession, but declined to an average of some 750 tons per year in the period of the greatest Russian imports and amounted to very little in and after the 1780s.

Except during the embargo, relatively little iron was imported from anywhere else. This averaged some 1450 tons per year for the whole period from the 1720s to the 1780s. It came mainly from Germany, Holland and Norway, each of which contributed over 1000 tons at some periods and a few hundred or less at others. Some of the iron from Norway was almost certainly Swedish, having been imported specifically to be re-exported as ballast for timber.<sup>85</sup> However the figure also includes American bar iron. A modest quantity of this was imported, but mainly only after import duties on this were taken off it, in 1750 for imports to London and in 1756 elsewhere. These American imports rose to over 1000 tons from 1765 to 1775, when the American Revolution ended the trade.<sup>86</sup>

Overall imports grew significantly in the 1720s and 1730s. This was followed by stagnation during the War of Austrian Succession. Growth resumed in the 1750s and 1760s, but imports then remained relatively steady until the end of the 1780s, when a sharp decline began. In absolute terms total imports averaged about 16600 tons per year up to 1725, when Russian iron began to come in quantity. The average for the 1740s (22500 *t.p.a.*) is rather less in the late 1730s (27300 *t.p.a.*), but from the end of the Seven Years War until 1800 imports averaged over 44000 *t.p.a.*, with a peak of nearly 53000 *t.p.a.* in the early 1790s. However at 38500 *t.p.a.* they

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<sup>82</sup>. P.R.O., CUST 3; *Sound Toll Tables*.

<sup>83</sup>. SIR Y a/c; King, *North*.

<sup>84</sup>. Högberg 1969; Roberts 1980, 250-7; 1986, 160 171. The Swedish currency that normally circulated had been copper *dalers*, which provided an inconveniently heavy coinage. Paper *dalers* were therefore brought into circulation, but these lost some of their value due to inflation in the 1750s, leading to the decision to revalue.

<sup>85</sup>. Kent 1973, 63 65.

<sup>86</sup>. Statutes 23 Geo.II c.29 and 30 Geo.II c.16; Bining 1933; Pelham 1949; Ashton 1924, 118-25.

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Figure 7.17 English bar iron imports: a summary

English imports A/Chart1

were rather lower in the late 1770s than before or after that. After about 1800 came a sharp fall, with barely over 28000 *t.p.a.* being imported from 1804 to 1808 and even less in the following years. This was, of course, the period of Napoleon's Continental System, but the expansion of iron production in England is likely to have been a far more significant factor than the trade difficulties. Furthermore, imports lost in their competitive advantage against home production due to wartime increases in the import duty payable, and this was at a time when bar iron was, if anything, falling in price.<sup>87</sup>

### *Conclusion*

The demand for imported iron had varied considerably during the period covered by this thesis (see fig. 7.17). In the 15th and early 16th centuries the nation had been heavily dependent on imported iron, mainly from Spain. This was followed by a long period when imports were of very little significance. Direct trade with Sweden began around 1630, but it was only after the Civil War that imports began to be important again. However for the next century and a half imports increased greatly, until new coke-based ironmaking technology introduced during the Industrial Revolution once again enabled England to be largely self-sufficient in iron. This imported iron, together with English iron, was a resource for blacksmiths, nailers and other manufacturers. Nevertheless a small proportion of the imports were re-exported. In addition some wrought (*i.e.* manufactured) iron was exported. Neither of these was substantial in comparison with what was absorbed by the home market (as will appear in chapter 8). However they were not wholly insignificant. The final section of this chapter will therefore devoted to these aspects of overseas trade.

## Exports

### *Bar iron*

Despite being illegal under a statute of Edward III,<sup>88</sup> occasional exports of English bar iron can be found in Customs records. For example, in 1640 36 tons of iron were exported to Guinea and the Canaries and 2 tons to New England.<sup>89</sup> However, the majority of the bar iron that left England was 'foreign merchandise exported', that is re-exports (see figure 7.18 and appendix 20). Before the 1790s exports of English bar iron were either negligible or wholly non-existent. This changed dramatically during the 1790s, when exports of British bar iron then suddenly grew rapidly. They were still under 250 tons per year in the mid 1790s, but rose to nearly 15000 tons in 1808, representing an astounding compound annual growth rate of 34%. However, when exports and re-exports are combined the growth rate falls to a more modest 6.6%, which is still a spectacular rate of growth.<sup>90</sup>

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<sup>87</sup>. Import duty rose from £2. 16s. 2d. progressively from 1796 to over £5 in 1805 and £6. 9s. 10d. in 1813. Common bar iron was priced at £20. 10s. in 1806, £14 in 1809, but only £11 in 1815: Scrivenor 1841, 386 405-6 409-10. See also chapter 1.

<sup>88</sup>. Ashton 1924, 104-5.

<sup>89</sup>. P.R.O., E 190/43/1.

<sup>90</sup>. Schumpeter 1960, 27. 250 tons is the average for 1792-7.

Re-exports were recorded from 1697 separately in the Customs Ledgers, divided into 'exports of foreign merchandise in time' and 'out of time'. The latter were insignificant in the case of iron.<sup>91</sup> Duty paid on import (or part of it) was 'drawn back' (that is repaid) upon re-export 'in time', a period which was increased from 12 to 18 months 1704.<sup>92</sup> This practice of refunding ('drawing back') the duty paid on re-export derived from the Customs Act of 1660, but probably arose under a privy seal warrant of 1634, authorising 'composition trade' at Dover, trans-shipping goods traded between Spain and the United Provinces, which were then at war.<sup>93</sup> Until then English merchants must have been at a commercial disadvantage in re-exporting compared to foreign (particularly Dutch) rivals, because duty would have had to be paid on the goods both on import and re-export. Before 1697, data on re-exports is fairly elusive.<sup>94</sup> Information as to some aspects of trade is available from the accounts of the Royal Africa Company,<sup>95</sup> but those of the East India Company are less helpful.<sup>96</sup>

It is probable that bar iron re-exports were fairly minimal (say 100 *t.p.a.*) until about 1640. After that I have estimated that they grew steadily until 1697. This is almost certainly not the case, since a significant amount of the iron imported in the late 1670s was almost certainly re-exported to Portugal and other places in southern Europe, when England was the only neutral country during the Scanian War in the Baltic. This enabled the British temporarily to take over Dutch and Swedish trade. As already mentioned, this opportunity was mismanaged, as English merchants glutted the Swedish market with imported goods, and then had difficulty in finding enough Swedish goods to buy so as to bring their money home. This led to a glut of iron in London, as well as to increased re-exports to Portugal and southern Europe.<sup>97</sup> However, short-lived fluctuations of this kind are hard to estimate.

Around 1700 a few hundred tons of foreign iron (largely Swedish) iron was re-exported to each of Africa, North America, the West Indies, and southern Europe. The whole trade averaged 1600 tons per year in the Peace after the Nine Years War, but declined during the War of Spanish Succession. Re-exports again averaged 1400 *t.p.a.* in the 1720s, over 1850 *t.p.a.* in the 1730s, 2500 *t.p.a.* in the early 1750s, almost 4350 *t.p.a.* from the end of the Seven Years War to 1790, and 5300 *t.p.a.* in the 1790s and 1800s. However volumes were somewhat lower during the wars of the mid 18th century. Trade to southern Europe was particularly high

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<sup>91</sup>. 1697-1780: P.R.O., CUST 3; 1772-1808: CUST 17. Data after about 1790 relates to Great Britain as a whole, though data for England might be recovered using Scottish data in P.R.O., CUST 14, as has been done with English bar iron imports (above). After 1809 it is available from P.R.O., CUST 10-11. However separate English figures have not been obtained in this period, because the data on iron production, with which they might have been combined is not good to produce really reliable conclusions. After 1790 any figures used relate to Great Britain. It is not clear how the Inspector-General compiled his figures, but it may have been from claims for drawbacks, which do not survive, or possibly from the original bills of entry.

<sup>92</sup>. Statute, 2 & 3 Anne c.18, s.13.

<sup>93</sup>. Hoon 1938, 256-7; Statute 16 Car. I c.25, s.9, proviso; Statute 12 Car. II, c.4; Taylor 1972, 245ff. I have not succeeded in tracing a source for the original warrant.

<sup>94</sup>. Occasional entries appear in some outport port book, noting a certificate that goods had been imported to another port. However such data does not appear regularly in the port books. There are a few entries concerning re-exported Spanish iron in pre-Civil War London port books. These amounted to 54 tons in 1640, and went to San Lucar and Faro in southern Spain and Portugal, and to the Canaries: P.R.O., E 190/43/1. There was also a further quantity from Bristol.

<sup>95</sup>. P.R.O., T 70 *passim*.

<sup>96</sup>. India *a/c*. London port books show private merchants (as well as the Company) freighting goods (including bar iron) in the Company's ships. The quantity exported by the Company was accordingly considerably lower than that shown in the Customs accounts.

<sup>97</sup>. Roseveare 1987, 153-8.

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Figure 7.18

Re-exports of bar iron and exports

in the mid 1710s, 4853 tons going there in 1716. This was probably due to the difficulties to which Sweden was subject at that late stage of her Great Northern War with Russia, but the trade came to an end in 1717 when an embargo was imposed on Swedish imports to England in 1717. Southern Europe figured significantly again from 1768, over 500 *t.p.a.* going there on average in the succeeding period and over 1000 *t.p.a.* in the decade up to 1800. Italy and Turkey were both significant among the destinations in the 1780s.<sup>98</sup>

Re-exports to Ireland were negligible at the beginning of the 18th century, but grew rapidly from the mid 1720s with long term growth rates of 5-9% from the mid 1730s to the mid 1760s. They averaged 1200 *t.p.a.* from 1750 to 1764. Whether this reflects the entry of Russian iron into the market in this period or is more closely connected with the decline of their native industry is hard to determine. Re-exports to Ireland amounted to almost 2250 *t.p.a.* from 1765 to 1784, but were only some 1000-1250 *t.p.a.* for the remainder of the 1780s, presumably due to an increase in direct trade between Ireland and northern Europe, following the liberalisation of rules for Irish trade around that time. However, they rose again in the 1790s, which was also the period when English bar iron also began to be exported in significant amounts for the first time.<sup>99</sup>

Iron was a rarity as a European commodity that could be profitably sold in India. Re-exports amounted to under 200 *t.p.a.* until 1720, and then averaged 500 tons per year until the end of the Seven Years War. Immediately after that war they averaged 1300 tons for a few years, but only half that for the following two decades. However in the 1790s and 1800s the annual average rose to 1600 tons. Re-exports to Africa underwent rapid growth (over 3% *p.a.*) in the 1720s and early 1730s, but then stagnated until the 1750s, when there was another period of growth. The trade peaked at over 1000 tons per year in 1738, again in 1753 and 1764, and averaged over 1100 *t.p.a.* from 1764 to 1774, after which it declined sharply, presumably because of difficulties in the slave trade (which British exports to Africa financed) during the War of Independence, a subject that will come up again below. During the intervening troughs in trade only 200 to 350 *t.p.a.* were sent. Other areas (northern Europe, north America and the West Indies) were much less significant for re-exports, averaging together some 300 tons up to 1709, 130 *t.p.a.* from then to the late 1730s, but under 50 *t.p.a.* for the next 40 years, after which they took over 500 *t.p.a.* The reasons for the oscillations are unclear. They do not seem to be the result of any obviously explicable changes in demand from any particular place.

### ***Manufactured ironware***

Considerations of space have prevented the manufacture of iron into nails and other ironware being discussed in detail. However data on the quantity exported is needed for the calculations in chapter 8. Exports of such wrought (that is manufactured) iron must therefore now be considered. The sources for this are precisely the same as those for imports.<sup>100</sup> Certain kinds of iron goods, such as cast iron, and ordnance paid special rates

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<sup>98</sup>. These regions are so-named in the Customs Ledgers. 'Italy' does not include Venice (which appears separately). 'Turkey' is presumably the whole Ottoman Empire, including Syria and Egypt but not Barbary.

<sup>99</sup>. Customs Ledgers; *Sound Toll Tables*; cf. Cullen 1968, 45 78.

<sup>100</sup>. Data on exports by region after 1697 has been taken from Schumpeter 1960, tables xxv and xxvi. Total exports are taken from *ibid.*, tables viii and ix. The sources for this are 1697-1780: P.R.O., CUST 3; 1772-1808: P.R.O., CUST 17. Data after 1812 is taken from Scrivenor 1841, 419 421; this was derived from Parliamentary Papers and ultimately from the Customs ledgers P.R.O., CUST 8-9. Figures for 1809-11 and 1813 (which were lost in the Customs House Fire of 1814) have been interpolated. The figures for 1812 and 1814 come from a different compilation from the subsequent ones, and may therefore be inconsistent due to their being prepared on a different basis. There is certainly a substantial difference between the figures for 1814 and 1815. Figures before 1697 have been compiled from port books (P.R.O., E 190), as described in the text below.



of duty, but the export of all of them except ordnance was still small in 1700, and they can be ignored. Ordnance, being made of cast iron, does not need to be considered in detail here.<sup>101</sup> From the Restoration there were (as previously mentioned) two main classes of ironware for Customs purposes, nails and wrought iron, both paying duty according to their weight. Under earlier books of rates, nails had been assessed by number (by the 'some' of 10,000), and different kinds of nail paid different duties. As a result, it has not been possible to determine the weight of nails exported before the Civil War. However it is clear that this was very modest.

By far the most important destinations for English exports, both of ironware and nails, from the Restoration were British colonies in America. This was merely one aspect of the general practice of supplying manufactured products to colonies in exchange for their agricultural produce, particularly tobacco from Virginia and adjacent colonies, and sugar from the West Indies. This pattern of trade was no doubt encouraged by the Navigations Acts of 1651-63 with their strong focus on British possessions. The navigation laws (amongst other things) required that exports to the colonies should travel in British vessels and from Britain (before 1707 England). The cultivation of sugar was introduced into the West Indies about 1640 by Dutch merchants, who no doubt hoped that the colonists would provide them with a market. However the navigation laws shut them out from this trade, and reserved it for the British. The tobacco and sugar colonies were primarily agricultural societies, and were almost entirely dependent on Europe for manufactured goods, which had at least to pass through England. The position of English manufacturers was strengthened further by the abolition in 1703 'for the encouragement of iron manufacture ... of any drawback ... upon any wares made of wrought iron or steel' re-exported, thus imposing a tariff barrier against their contemporaries in Liège and the Rhineland. Government trade policy thus not only provided an advantage to British shipping, but also to British manufacturers, but this does not apply to all manufactures, as German linen featured among exports to the colonies.

Examination of port books indicates that much of the trade in iron goods from the larger ports consisted of a large number of small parcels, dispatched as part of mixed consignments of manufactured goods. This is in stark contrast with iron imported from Sweden, which often came in consignments of several hundred tons in a ship that carried little else. Exports both of ironware and of nails were almost invariably expressed in hundredweights, and relatively few consignments exceeded even half a ton. Some were as little as one quarter or even one stone, particularly in the case of wrought iron. Though the quantity of nails exported was smaller

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<sup>101</sup>. Being cast iron, the quantity exported does not enter into the estimate of wrought iron consumption. As indicated in chapter 6, ordnance was until the mid 18th century mainly made in the Weald and later either there or at coke furnaces. Accordingly it was not a significant element of the output of charcoal furnaces elsewhere. Certainly there is little evidence of charcoal furnaces elsewhere producing ordnance for export, except in the case of Peter Semayne of Pentyrch (Glamorgan) in the 1600s (Riden 1992b).

than that of wrought iron, some consignments were larger, sometimes amounting to over a ton or even several tons. These latter were presumably intended for sale by merchants and retailers in the colonies.<sup>102</sup>

The structure of trade varied somewhat according to the import commodity paying for the exports, or rather due to the differing creditworthiness of the colonial buyers of the supplies exported. For the poorer tobacco planters, there were by the mid 18th century merchant houses in Glasgow and Liverpool, which employed salaried factors to run stores, where the planters could obtain goods on credit. On the other hand larger tobacco planters, and also planters in the West Indies, ordered what they wanted from a commission agent often in London or Bristol, to whom they consigned their crop. A third alternative, the 'cargo' system, also existed by the mid 18th century, by which a colonial merchant ordered a whole cargo on credit from a commission house.<sup>103</sup> In addition to these merchants who specialised in importing a particular colonial commodity into England, there were specialist exporters (including ironmongers), who dealt mainly in one commodity. Such ironmongers included Thomas Plumsted of London, whose main business in the 1750s was exporting ironware to the North American colonies (particularly to Philadelphia) and also to the West Indies.<sup>104</sup> In his will, John Crowley, the greatest ironmonger of his day, directed his executors to wind up trade with the West Indies, where he seems to have supplied stores. Instead the Crowleys' products would presumably have reached the West Indies by London commission agents (or other exporting houses) buying goods from their Thames Street and Greenwich warehouses, for the production of ironware for export remained a major part of the Crowley business.<sup>105</sup>

The overseas trade depended a great deal on trust between the exporter and his consignee, since it would be more difficult for a resident of (say) London to use the courts abroad to collect his debts from defaulting customers than from those in England. Furthermore ready money was often scarce in the colonies, because the planters' produce was sold through merchant houses in England. Accordingly, colonial retailers often had difficulty in obtaining payment from them,<sup>106</sup> which was no doubt the origin of the factor-run stores mentioned above. This meant that a great deal depended on a relationship of trust between the English merchant and his correspondent abroad. This was best achieved if there was a significant amount of business between them, which a merchant could manage by handling many commodities, but an inland manufacturer of a few commodities could not easily achieve with his few casual exports.<sup>107</sup> In this, colonial trade may have differed from European trade by the mid to late 18th century. Direct contact between manufacturers and

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<sup>102</sup>. These comments are based in the examination of a small number of port books, mainly for London and Bristol and mainly from the late 17th century. This also explains why exports of wrought iron and nails appear in the Customs Ledgers (and hence in Schumpeter 1960) in *cwt.* not tons. Cf. Price 1980; 1989; Morgan 1993, 88-124 *passim*.

<sup>103</sup>. Price 1980, 126-29; Pares 1950, 240-2.

<sup>104</sup>. Skeel 1916, 138; Plumsted l/b. At least the surviving Plumsted letter-book implies that all his trade as foreign. However it is possible that he had another set of letterbooks for his home correspondence with suppliers.

<sup>105</sup>. Flinn 1962, 144-5.

<sup>106</sup>. See note 103.

<sup>107</sup>. Members of the Gibbons, Turton and some other Midland families occur as exporters in the Bristol port books, but the persons concerned seem to have been partners or agents resident in Bristol (as merchants), rather than manufacturers. The only significant inland manufacturers of ironware, so far discovered, who were personally exporting ironware were Laughler and Hancox, the Dudley nail ironmongers: Morgan 1993, 104-5.

European wholesalers certainly occurred in the cloth trade, and probably also in the Birmingham toy trade, and manufacturers (such as brewers) trading direct with St. Petersburg have been mentioned above in relation to imports.<sup>108</sup>

A survey of port books for some of the larger ports indicates that quite a number had some colonial trade in the late 17th century. However their exports consisted largely of the products of their hinterland, for example perpetuanas from Exeter. Iron goods, not being a local manufacture, hardly figure at all. Sample port books from the late 17th century, examined for Poole, Lyme Regis, Exeter, Plymouth, and Barnstaple, therefore generally record exports of iron goods amounting to only two to three tons per year for each port. These amounts are wholly insignificant.<sup>109</sup> It is therefore only necessary to consider in detail the trade of a few of the greatest ports, particularly London, Bristol and Hull, together with Liverpool and Chester, which were significant in the late 17th century solely due to their facing Ireland.

Even in the greatest ports, the export of ironware (of any kind) before the Civil War was very small indeed. London's exports of all manufactured goods in 1640 were only valued at £27,000 at official rates,<sup>110</sup> which included a mere 9½ tons of wrought iron (of which almost 6 tons was for New England), in addition to various nails, knives, and awl blades, whose weight is not stated.<sup>111</sup> Contemporary figures compiled for London for 1663 show that the plantations took 119 tons, and France 28½ tons, out of the 180 tons of wrought iron exported from there. They also took 44 and 17½ tons of nails respectively, the only nails exported. In 1669 the wrought iron exports had risen to 240 tons, but dropped in 1672 (during the Third Dutch War) to 133 tons.<sup>112</sup> By 1699 wrought iron and nail exports had risen to 800 tons and 334 tons respectively.<sup>113</sup> This represents almost fivefold growth for the two commodities together in under 30 years. At Bristol the picture is similar. In 1662 51 tons of wrought iron and 32 tons of nails were exported. These respectively rose to 107 tons and 128 tons respectively in 1685 and to 116 and 111 tons in 1700, but the volume was lower in 1695 during the Nine Years War. This however represents a relatively small proportion of the ironware that came down the river Severn, most of which no doubt went to consumers in southwest England and Wales.<sup>114</sup>

Exports from Chester and Liverpool totalled less than 70 tons in the 1680s, almost all destined for Ireland. In 1723 Liverpool's transatlantic trade in nails and ironware was a dozen tons each, with another dozen tons of ironware for Ireland.<sup>115</sup> Hull was similarly insignificant in the 17th century, exporting under two tons of

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<sup>108</sup>. Smail 1999, 94-112; Robinson 1960; cf. Wanklyn 2002.

<sup>109</sup>. P.R.O., E 190/997/3; E 190/887/1; E 190/945/8; E 190/954/7; E 190/963/7; E 190/969/6; E 190/1041/14; E 190/1050/27; E 190/952/4; E 190/956/2; E 190/962/5; E 190/979/6.

<sup>110</sup>. Fisher 1950, 154.

<sup>111</sup>. P.R.O., E 190/43/1.

<sup>112</sup>. B.L. Add. ms. 36785; P.R.O., E 190/54/1.

<sup>113</sup>. P.R.O., CUST 3/3.

<sup>114</sup>. Ironware was shipped down the river Severn on a significant scale, largely from Bewdley (the river port serving Birmingham) and overwhelmingly to Bristol, with Bridgwater (the next largest destination) taking a mere 13.5% of the total traffic. This traffic grew from a mere 47 tons in 1647 to 300 tons in 1666, about 600 tons in the 1680s, and exceeded 1100 tons in the mid 1720s: figures compiled from *Gloucester port books database*.

<sup>115</sup>. Chester exported 28½ tons of wrought iron in 1685. These comments are based on various Chester and Liverpool port books.

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Figure 7.19 Exports of wrought iron by destination

Export summary by destination/Charts

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Figure 7.20 Exports of all iron goods

Export summary/Chart1

nails to various European ports in 1685, and no other ironware.<sup>116</sup> However its exports rose from one ton in 1702 to seven tons of ironmongery by 1717 and to more than 5000 tons by 1783.<sup>117</sup>

Comparison between the Customs Ledgers for all outports and the port books for Bristol shows that it handled a very large proportion of the outports' exports, varying between almost 100% in the case of southern Europe and 40-80% in the case of Ireland and British colonies, the proportion being lowest for Virginia and the sugar colonies.<sup>118</sup> However Bristol's exports to northern Europe were minuscule. For the colonial trades it is reasonable to treat Bristol as a sample and estimate the exports of all outports from those for Bristol. However, this will not do for northern Europe, and exports thither have been estimated as varying proportionally with London's. These are not satisfactory methods of estimating the trade, but as the quantities were quite small compared with the English iron trade as a whole, the results should not significantly distort the overall picture. Accordingly, the poor quality of this estimate will have little effect on the estimate of home consumption made in the next chapter. Nevertheless this begs the question of the extent to which Bristol's share fluctuated at times compared to Liverpool's due to such factors as the greater exposure of Bristol's shipping to predation by French privateers during the Nine Years War.<sup>119</sup>

The interpolation of this data provides a picture of the growth of exports in second half of the 17th century. Because relatively few figures have been used to produce these, short-term trends remain unknown. However it is clear that there was relatively steady growth from a very low base during the period. These interpolated figures can then be combined with those from the Customs ledgers to form a continuous series from the mid 16th to the early 19th century (see figures 7.19 and 7.20), and rates of growth can be calculated. The results show growth rates measured over 21 years averaging over 4% from the 1660s to the early 1690s, with a particularly rapid growth in nail exports in the 1660s and 1670s. Growth was slower in wartime around the turn of the century, but after that, wrought iron exports increased again at about 4% until the mid 18th century. Nail exports also rose (but somewhat less rapidly), and their growth slowed in the 1740s. Exports to America decreased very substantially in the 1770s, and some other markets also took less. This was, of course, the period of the American War of Independence, when British trade to America largely ceased. After American independence exports recovered rapidly, which is unsurprising, since Britain's North American colonies had been the most important overseas market for ironware and particularly for nails.

The American imports of *nails* before 1775, often exceeded 500 tons and was once 1200 tons. This was out of a total English export of (usually) about 1000-1500 tons. The next most important market was the West Indies which generally took under 400 tons, but exports to Africa and the East Indies both increased in importance in

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<sup>116</sup>. P.R.O., E 190/328/2.

<sup>117</sup>. Jackson 1972, 337. These figures are the total of his for 'ironmongery' and 'manufactured iron'.

<sup>118</sup>. I have failed to identify from what ports most of the balance was going.

<sup>119</sup>. There are also certain other difficulties, which may be related how the consignments entered for two destinations, such as Pennsylvania and Virginia or Ireland and Barbados should be treated. I have assumed a probable destination for manufactured goods, respectively Pennsylvania and Barbados in these examples, whereas the Inspector-General may have taken the first destination named. This difficulty should only have a marginal effect on the total.

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Figure 7.21 (with table) Colonial iron consumption  
file: Consumption America/sheet1

the late 18th century, while exports to America lost their importance after independence. The growth rates were generally significant (though not great), except in trade to Africa and Asia where there was rapid growth from very little to about 200 *t.p.a.* towards the middle of the 18th century.<sup>120</sup>

America and the West Indies also dominated in the export of *wrought iron*, but their shares were more equal to each other, and were nearly matched by Africa and East Indies together and by Southern Europe. Total exports rose considerably during the 18th century from around 1000 tons in 1700 to more than 23000 tons in 1800. Exports to the West Indies and America each reached 2500-3000 tons before the War of Independence and 4000 tons in 1795. The growth rates in most sectors were quite significant in the early 18th century, though somewhat less later. Exports to southern Europe grew rapidly (at up to 10% *p.a.*) in the early 18th century, but more slowly later. Trade to Africa and Asia also grew rapidly (up to 8% *p.a.*). Trade to other parts of British Europe (presumably mainly Ireland), and also to the West Indies, grew at 4-6% in the mid 18th century, while that to North America was generally growing vigorously until the Revolution.<sup>121</sup>

It is useful to compare colonial imports with colonial population, in order to see how import consumption per head changed (see figure 7.21 and the table accompanying it). No iron was produced in the West Indies, and their imports of iron goods must reflect consumption. However the practice of smuggling manufactured goods to Spanish colonies in America may mean that consumption in the West Indies was less than those islands imported. Agriculture in Virginia and Maryland was heavily focused on tobacco. Iron was produced there from the 1720s, but its iron industry was heavily focused on producing pig iron for export to England, which was profitable due to the low freight charges for what was effectively saleable ballast. Nevertheless there were some forges where iron was produced for colonial consumption.<sup>122</sup> There was a plating forge in 1750 on the Northeast River in Maryland, but no slitting or rolling mill in that colony,<sup>123</sup> suggesting that nails were not then made.

Further north most of the colonies developed their own iron industries during the 18th century, but exported relatively little iron to England. Presumably therefore the output of their ironworks was largely consumed in America. This implies that some iron manufacture took place in these colonies, primarily for local consumption. Certainly by 1750 several of the northern colonies had the plating forges, steel furnaces, and

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<sup>120</sup>. Schumpeter 1960, tab. xxv and data from port books. Her figures are only for every fifth year and my earlier ones are even less frequent. The comments in this and the following paragraph are therefore based on a relatively small sample of data and are accordingly not entirely satisfactory.

<sup>121</sup>. *Ibid.*, tab. xxvi and data from port books.

<sup>122</sup>. The only general work on the American iron industry is Gordon 1996, but this is more about technology and resources than markets. For Pennsylvania see Bining 1933; 1938; Pascoff 1983; for Virginia and Maryland see Bruce 1930; Middleton 1953; Lewis 1979. There are also several works on particular companies including Brydon 1934 (Bristol Company); Johnson (K.) 1953; 1959 (Baltimore Co.); Whiteley 1887; May 1945; Robbins 1986 (Principio Co.); Byrd, *Prose Works* (Spotswood). See also the discussion of trade in pig iron at the end of chapter 6.

<sup>123</sup>. P.R.O., CO/1273/V71. I have failed to trace a certificate for Virginia. However J.H. Brothers (*pers. comm.*) tells me he does not know of any slitting mill in colonial Virginia. Thomas Jefferson had a 'nailery', but its raw material is said to have come from Pennsylvania.



slitting mills that were needed to prepare iron for manufacture, though not in large numbers.<sup>124</sup>

The development of iron manufacture in the American colonies was a cause of concern to Midland manufacturers, who feared the loss of markets for their products. As a result, a clause prohibiting the erection of any further slitting and rolling mills, plating forges, and steel furnaces was included in the 1750 Act that took duty off the import of American pig and bar iron to London.<sup>125</sup> However, this colonial manufacture meant that the amount of ironware imported by the northern colonies was considerably less than they consumed. This explains why the amount imported into America per head remained at 4-6 *lb.* throughout the early 18th century and fell after 1750, whereas it grew in the West Indies from about that level to over 8 *lb.* per head between 1700 and 1770 (see figure 7.21 and table with it).<sup>126</sup>

### *Conclusion*

For both the export of nails and other manufactured ironware and the re-export of bar iron, the most important markets were outside Europe. Re-exported bar iron went to Africa, the East Indies and to British Colonies in the West Indies and North America. The most important export markets for nails and ironware were also the British colonies. However for both bar iron and ironware (but not nails), southern Europe was also a significant market. Nevertheless the quantities exported were quite small compared with the amount of iron (whether English or imported) that entered the English market. It therefore follows that the most important market for English iron manufacturers was England, a conclusion that will be considered more fully in the next chapter.

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<sup>124</sup>. Bining 1933, 65-72. There were plating forges in Maryland, New York, Pennsylvania, Massachusetts and Connecticut, slitting mills in all these except Maryland and New York, and steel furnaces in Pennsylvania, and Connecticut: P.R.O., CO 5/1273/V71-88; CO 5/886/GG36; CO 5/1063/Hh132; CO 5/889/Ii59. The existence of these works implies that manufacture was taking place.

<sup>125</sup>. Statute 23 Geo. II, c.29. The certificates cited in the two preceding notes resulted from this Act. The duty-free importation was extended to the rest of the country in 1756 (Statute 30 Geo. II c.16). The passage of 1750 Act produced considerable agitation in the iron trade, which is discussed in Pelham 1953; see also Bining 1933; Ashton 1924, 118-25. The same agitation resulted in the production of the 1749 list of forges: see Hulme 1928; King 1996b.

<sup>126</sup>. These figures include bar iron re-exported from England, which must have been manufactured into ironware in the colonies, but not iron made in the colonies. Re-export figures before 1700 are uncertain and those used here are no more than crude estimates. It would be possible to break down the American figure further by extracting more detailed figures from the Customs Ledgers, rather than relying on the sample published in Schumpeter 1960, but time has not been available for this to be done.