

Chapter 4

From Gammelbo Bruk to Calabar: Swedish Iron in an Expanding Atlantic Economy

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Introduction

On 27 April 1737, the Bristol merchant Graffin Prankard sent a letter to his “esteemed friend” Francis Jennings, a merchant in Stockholm. They were both deeply involved in the international iron trade. Prankard was considered by far the largest trader along the British west coast. A Hull merchant informed a Stockholm correspondent that “The Bristoll Chester & Liverpool Traders are but Slippery except one Prankard of Bristoll” (Maister to Broadley, 25 Aug, 1729, Hull City Archives, DFB/78). As for Jennings, he had become in a few short years in the early 1720s one of the most important iron exporters in the Swedish capital. At the time of the letter, he was the greatest. The letter contains Prankard’s instructions to Jennings regarding a load on one of his ships that was soon to arrive in Stockholm:

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To ship on y:e ship Carolina as under mentiond

Tons	
60	(Leufsta) and (Åkerby) flats part of it 2 ¼ and 2 ½ wide including 2 or 3 tons of 2 inch squ: and 4 or 5 tons 4 inch w:d clean and free from flaws
20	fine narr: flats about 64 to y:e ton
10	¾ squares
20	voyage
15	(Strömsberg) part 4 inch w:d and thin
15	CDG part 4 inch w:d and thin
10	2 ½ and 2 ¾ w:d thin comm: iron but good mettle all lile rose
10	3 inch w:d 7/8 thick box iron lile rose
5	1 ¼ and 1 ½ squ:
5	4 or 5 inch w:d and strong drawn with 1600 of deales w:ch will make in all about 230 tons
170	

(Prankard to Jennings, 27 Apr, 1737, SA, DD/DN 426)

This letter was one of a sequence that detailed a commercial relationship going back to the late 1720s. We are dealing with two major actors, but this was not an equal relationship; it was one where Prankard set the agenda. He issued credit to Jennings; he expected to be repaid with Swedish bar iron. Jennings was Prankard's commission agent and had to follow the latter's instructions. Using this letter we can start a discussion about the place of Swedish iron in the Atlantic economy and do so in a number of different spatial directions. One starting point is the place where the iron bars were made: the *bruk* (ironworks). Swedish iron will then be linked to the manufacture of steel and weapons in England and then to the slave trade. First, however, something must be said about the place of iron making in Sweden's economic development.

Iron in the Swedish Economy

Early modern Europe (and Sweden *a fortiori*) was a place of subsistence agriculture where the market economy was limited in extent. Towns were few and small; the rate of urbanisation at the onset of the eighteenth century was only about 5%. This pattern was only broken in two regions, the Netherlands and England, where the metropolises of Amsterdam and London acted as Europe's economic hubs, where market relations prevailed and trade held sway over agriculture (De Vries 1984).

The rate of urbanisation is one possible measure of Europe's development. Another might be to contrast agricultural production with that of the non-agricultural sector. Much research has been devoted to textile manufactures, most notably by students of proto-industrialisation (Ogilvie and Cerman 1996), but the metal trades could be studied with equal profit. This is especially so with respect to Sweden, for the Swedish iron industry, both in relation to size and its European importance, is the one that best illustrates the distinctiveness of Sweden within the European economy.

From the middle of the seventeenth century, Swedish iron production grew significantly, and the export of bar iron followed suit. During the century that followed, up to three quarters of Swedish exports consisted of bar iron. Sweden's iron surplus, together with that of Russia from the 1730s, went west. During the seventeenth century most of this iron was exported to the Dutch market and Amsterdam, but from the end of the century Britain became the main recipient of the Swedish exports and ultimately Russian iron as well (Hildebrand 1992:25–42). For the eighteenth century one can speak of a structure where most of Europe was more or less self-sufficient in iron, but with the British market as a deficit area, filled with Swedish and Russian iron.

Earlier research by Eli Heckscher, Karl-Gustaf Hildebrand and Staffan Högberg mapped out Swedish iron exports in scope, range and volumes and documented a gradual transition of the export from Amsterdam to London (Heckscher 1949; Hildebrand 1992; Högberg 1969). However, their analysis to a large extent concluded with the iron bars being loaded on to ships departing for foreign ports. The markets on which the iron was sold were discussed in only a limited way. No research was undertaken to determine whether, or how, this foreign demand influenced the workings of the Swedish industry or how the ultimate consumers of this iron were linked to the producers. In terms of comparison and connections, one can say that the Swedish iron industry has only been examined from its domestic circumstances and conditions. The industry needs to be appreciated within a much wider global perspective—its true setting, considering how much of the output that was destined for distant markets.

Contemporary actors were certainly well informed and familiar with the importance of the global integration. The eighteenth-century proponents of Swedish iron making knew well that most of its output was destined for the British market and that brands of Swedish iron were evaluated by very demanding consumers. The quality and the price of the iron were frequent topics of discussion in official Swedish circles, and Sweden's political class took all of this into account when regulating the trade. Swedish economic policies were, in common with those of other European states, mercantilist. The state sought to regulate shipping and foreign trade and to promote domestic industry. Foremost under this last heading came state support of the textile trades, but iron making was also well attended to. A government agency, the *Board of Mines* (Sw. Bergskollegium), had been established as early as the 1630s, and in the eighteenth century it was given the authority to penalise any *bruk* that exceeded the production quota it had been awarded. The *Board of Mines* also exercised quality control. Both the volume and value of bar iron were assessed at the so-called *Jernvägar* (iron weighs) in the staple towns to which the export of iron was restricted (Evans and Rydén 2007:32–33).

The Ironworks

Swedish metal making has a long history. Ores of silver, copper and iron have been extracted in the *Bergslagen* region since the Middle Ages. The sector has often been at the technological cutting edge; one can, for instance, point out the very

early establishment of blast furnaces in Sweden for the production of pig iron (Sw. *tackjärn*). It is also clear that Swedish iron-making peasants were connected to major iron markets beyond Sweden from an early date, with German merchants in Stockholm acting as intermediaries.

During the late Middle Ages and up until the sixteenth century, the entire iron production process lays in the hands of the peasantry from the central Swedish district of *Bergslagen*. Free peasants (*bergsmän*) dug ore, smelted it and forged wrought iron at water-powered hammers in the forests. For centuries this meant the manufacturing of osmund iron, which was sold by the barrel in the Hanseatic towns along the Baltic coast, but in the sixteenth century the King Gustav Vasa recruited German forgemen to teach Swedish workers how to make bar iron, the standard form in which wrought iron was sold at European markets. The development was slow, but from the beginning of the next century bar iron began to expand at the expense of osmund iron. It is likely that this process was influenced by another process in which the Swedish Crown started to establish production units in its own name, the so-called *kronobruken*, where pig iron was refined into bars and not to smaller osmund pieces that were sold in barrels (Hildebrand 1992:43).

The early modern Swedish iron industry emerged from its medieval shell in the early decades of the seventeenth century. This was when the *Board of Mines* was established with the explicit aim of imposing a radically different organisation on the trade. A new division of labour was to be enforced—a division of labour that had social, spatial and technological dimensions. The *bergsmän* were still to be responsible for the mining of the ore and its smelting. Villages of free peasant miners were to continue working in the time-honoured fashion, with the communally owned blast furnace at their centre. However, these peasants were no longer to have anything to do with the making of wrought iron, whether shaped as bars or as osmund pieces. That became instead the task for entirely new communities, the *bruk*, which were established on the outskirts of the mining regions where ore was extracted and pig iron made. The rationale behind this was to economise on timber, as firewood was used in the mines and charcoal in both the *bergsmän*'s furnaces and the forges at the *bruk* (Hildebrand 1992).

The *bruk* was a completely new sort of community, far removed from the relatively egalitarian villages of the *bergsmän*. The *bruks* were owned by the gentry or by wealthy merchants (*brukspatroner*) and peopled by skilled forge workers (*hammarsmeder*) whose task was to process the pig iron that the *bergsmän* supplied. The development of the *bruk* was promoted by the Crown (which leased the older *kronobruken* to private owners) and by powerful Dutch capitalist merchants and entrepreneurs, who took a keen interest in Swedish resources. With the demand for iron, copper and brass growing across the continent, just as supply declined in central Europe amid the chaos of the Thirty Years' War, the rich mines, large forests and ample water power of *Bergslagen* became increasingly attractive. Prominent Dutch families like the De Besches and the De Geers brought capital, expertise and manpower to the Swedish metal making trades and thereby hastened Swedish industrial development.



Fig. 4.1 Leufsta bruk viewed from south, painted by Elias Martin c. 1794

This new framework for the Swedish mining industry, with *bergsmän* working at the mines and furnaces and with bar iron being made in the *bruk*, was never completely put in place. In some places *bergsmän* continued to make bars in their small forges, while elsewhere *brukspatroner* built their own blast furnaces. The intrusion of *bruk* into the business of smelting was especially common in the county of Uppland, around the large Dannemora mine. Here, every *bruk* had its own furnace. This area was the main exception to the pattern that the *Board of Mines* tried to enforce, and there are two reasons for this. First, the Dannemora mine gave a particularly rich ore of high quality, which enabled forgers to produce bars of a correspondingly high quality. Second, it was in this region that Dutch influence came to be concentrated. The larger *bruk*, with Leufsta, Österby and Gimo to the fore, fell into the hands of the De Geer family at an early stage; it is also here where we find the highest concentration of skilled Walloon immigrants, hence the designation *Vallonbruk* (Florén and Ternhag 2002) (Fig. 4.1).

The Walloons' influence was such that the method of producing iron at the *Vallonbruk* came to differ from the rest of Sweden. They built a different style of blast furnace, they used a forging technique that was distinct from the German method employed outside Uppland, and they produced charcoal in a new and individual way. It should be remembered though that the *Vallonbruk* occupied an enclave that produced just 15% of Swedish bar iron production (Rydén 2002).

The early modern Swedish iron industry grew relentlessly. Measured in exported bar iron, we can detect a rise from about 11,000 tons during the 1640s to above

40,000 tons a century later. This can be attributed to increased demands from Dutch and British consumers, but we must not forget the internal reorganisation of the trade that made it possible to respond to increased demand. Central to this domestic refurbishment was the *Board of Mines*, which enforced stringent regulations, but the emergence of a group of *brukspatroner*, with a new, more rational approach to running the business of making iron, was also important. The combination of state regulation and powerful owners underpinned the export of ever-growing volumes of Swedish iron, which was disposed of on markets in the more advanced parts of Europe.

To return to the letter from Graffin Prankard to Francis Jennings, it contained an unspoken—yet obvious—demand from the Bristol merchant that Jennings should contact the owners of specific *bruk* to supply him with their bars. More precisely, Prankard demanded that Jennings dealt with the owners of Leufsta and Gammelbo, and it is now time to pursue these relationships. It is time to follow the Leufsta and Gammelbo iron from their forges, via Stockholm and Bristol, to the various markets to which Prankard had access.

From Gammelbo to Calabar: And Beyond

In early February 1736 there was a shift in production at one of the Gammelbo forges, that at Berg. Since the previous November the master forgerman there, Hans Hansson Palt, and his forge crew had made bars of regular dimensions. Letters with new instructions, however, now arrived, and the forgermen began to make the so-called voyage iron. In 1788–1789 the Swedish metallurgist Sven Rinman defined voyage iron in his *Bergwerkslexicon* as bars folded twice over so that they “at foreign places could be taken on difficult roads on donkey backs” (Rinman 1789:1180). Voyage iron’s main destination was Africa where the bars were exchanged for slaves. Master Palt was at the far end of a trading chain that began in the city of Calabar on the Bight of Biafra but which had Graffin Prankard of Bristol as its centre. It was Prankard who provided the slave ships with iron. During the early spring months, he sent letters to his commission agent in Stockholm, Francis Jennings, with instructions on what kind of iron he wanted and in what quantities. This was the starting point for the complicated process that linked Gammelbo to Calabar.

As soon as Jennings received Prankard’s letter, he, in turn, contacted Jacob Feiff, Gammelbo’s commission agent in Stockholm, who then notified the owner of the *bruk*, Greta Tilas. It was her task to make sure that the forgermen adapted to the new instructions. A delicate logistical arrangement ensued. The bars made by the Gammelbo forgermen had to be carted to the town of Arboga and then, as soon as the winter ice broke up, shipped across Lake Mälaren to Stockholm. Prankard had the previous autumn sent his ships from Bristol, “the metropolis of the West”, across the Atlantic to Charleston loaded with hardware and steel. As a return freight the ships carried rice, South Carolina’s most important export commodity. This cargo had to be delivered and sold in Hamburg in the last months of the spring so that the

ships could arrive in Stockholm in early June. In July, they should be back in Bristol loaded with iron, including the bars of voyage iron from Gammelbo, so that Prankard was well supplied for the important St. James's Fair.

It was in the late summer that most of slave ships left Bristol, and it was thus important that Prankard was furnished with voyage iron before these ships left for Africa. For master Palt and the other forgemen at Gammelbo, the shipment of these special bars of iron on the *Carolina* for Bristol did not mean the end of this production cycle. At the Gammelbo forges the making of bars for the African market continued until the autumn storm season, i.e. until that they could no longer be shipped safely out of Stockholm. At this time, during the late autumn months, the forgemen at Gammelbo resumed the making of common bar iron (Evans and Rydén 2007:166–173).

The standard passage from Bristol to the Guinea coast was about 10–12 weeks, depending on winds and the final destination. Arrival on the coast was timed to coincide with the maximum supply of slaves as well as when the harvest of rice and yams was completed. These crops were an important food source for the slaves on the voyage across the Atlantic. It was in the period between August and November that European slave traders purchased most slaves. The actual market transactions in Africa were not as simple as the traditional image of this trade has made us believe, and a more complex picture has emerged in recent research (Richardson 1979; Behrendt 2001). Two features should be noted. On the one hand, the trade was dominated by African traders who fully controlled the supply of slaves, and on the other hand, it took quite some time, often over 6 months, to fill a ship with slaves. Small groups of slaves were brought from the interior to the towns and trading centres along the coast by African traders. They prepared their captives for the first sale by feeding them and oiling their skin. Very often, the African traders had obtained European goods on credit. The number of transactions needed to fill a ship was high, as it was not infrequent that only one or two slaves were purchased per day. Once the prison-like decks had been filled with their human cargo, together with food supplies and stocks of water, the so-called Middle Passage, the voyage across the Atlantic, could begin (Rediker 2008). The slaves were to be transported to markets in the New World, where they would produce sugar, tobacco, rice, indigo, etc. The average length of this passage was between two and 3 months at sea.

The African market for imported commodities is often somewhat simplistically seen as uniform and dominated by a few goods like textiles. Nothing could be further from the truth; we are dealing with quite distinct markets, each with a specialised profile (see Weiss this volume). In the traditional analysis bar iron has been given a quite limited role. Generally, bar iron was a relatively minor item in Euro-African trade. However, in specific markets, this is not the case. If general figures point towards a situation where bar iron constituted a few percent of all the commodities sent to Africa, some regions show much higher figures; in the Bight of Biafra, for example, Swedish iron made up about 12% of the commodities brought in, and in Cameroon the corresponding figure was 18% (Richardson 1979:312–314). These two markets developed somewhat later than the markets further west, and in this slave traders from Bristol were pioneers. It is, thus, not difficult to assume that

the demand for Gammelbo iron rose as the slave trade penetrated further east along the African coast, and Graffin Prankard had a crucial role in this process.

If we scrutinise this link between Gammelbo and the slave trade along the Bight of Biafra, it is clear that we are dealing with close-knit relationships, originating in the emergent British Empire with tentacles all around the Atlantic. Iron production at Gammelbo was governed by market signals derived from Calabar and its hinterland but mediated via Bristol. A number of interesting features can be picked out. For a start, it is clear that the production of voyage iron at the *bruk* was directly related to the demand for slaves in the New World. Prankard's sales of Gammelbo iron are mirrored in the number of slave ships leaving Bristol. There was also, as we have seen, a close relationship between the seasonality of the slave trade and the production cycle at the *bruk*; production of voyage iron only took place in the spring—early autumn months, when it was possible to send it to Bristol. A third interesting feature relates to the design of the bars hammered out by the Gammelbo forgemen. The Swedish bars that reached the African coast were often used as means of exchange: they were a form of currency. They had therefore to be made in specific dimensions and to have a specific weight. These dimensions, however, changed over the years, and the bars became increasingly smaller and lighter. That this was so, and had an impact on master Palt and the other forgemen at Gammelbo, is clear from a letter from Prankard to Jennings, written in February 1733. He emphasised that Jennings should “press hard on Feiff for Striking the Voyage of [Gammelbo] much Wider & to run about 90 to ye Ton” (Prankard to Jennings, 28 Feb, 1733, SA, DD/DN 425). That these new instructions were followed by Feiff and the forgemen is clear from a glance at the account books from the following year; in 1734 the forgemen made lighter bars. Swedish producers responded as directly as they could to the instructions filtered through Bristol from Africa.

The European slave trade, and New World slavery, is one of the most dramatic and tragic events in the making of modern society. The debate over the moral and the economic impact of this trade has been intense. Some scholars have claimed that it created the very foundation upon which the West could build its dominant global position, while others have tried to downplay the significance of this human oppression (Williams 1944; Inikori 2002). The discussion has also been intense about where to put the blame for it all. Are we discussing a phenomenon that is the outcome of some countries' oppression of the African continent, or Africans, or should the burdens be distributed in a different way? Sweden was scarcely involved in the slave trade from Africa or in slavery itself, but the links discussed here suggest that one must take a broader perspective when the moral and financial debts of slavery are discussed. In any case it is clear that Swedish actors were well integrated in the eighteenth-century slave trade.

From Leufsta to Birmingham's Steel Furnaces

In his letter to Francis Jennings, Graffin Prankard not only ordered voyage iron from Gammelbo; he also ordered large consignments from two *bruk* in the county of Uppland: Leufsta and Åkerby. He also urged Jennings to fill his warehouse

with “common iron”, ahead of his ship’s docking at Stockholm. “Common iron” was, as the name suggests, iron that could have originated at any *bruk* employing the German forging method. It could have been from Gammelbo, made at times when voyage iron production was suspended. Prankard sold this iron to merchants and artisans in the many regional markets served by Bristol, with large volumes of iron being sold at St. James’s Fair in July, the high point in the city’s commercial calendar.

Much of this metal was used to make wares for the domestic market—nails, horseshoes and the like—but “common iron” was also used by British artisans in making commodities that had a market outside of Britain. Bars from Gammelbo were, for instance, required by gunmakers in Birmingham, the town that had surpassed London as the foremost British gun making centre at the end of the seventeenth century, making muskets, rifles and pistols for overseas markets (Evans and Rydén 2007:151–158). Gammelbo bars were suitable for the making of the barrels, which would later be assembled with the locks and stocks in small workshops close to the city centre. The export trade was extensive, and with names such as “Angola Musquets”, it is obvious that many of these guns arrived in Africa. The Swedish traveller Samuel Schröder bore witness to this. The Birmingham gunmaker Thomas Hadley, he reported, “makes in great abundance a sort of musket which is sold to the Barbarians in Africa on the coast of Guinea”. Schröder also noted that the gun could be an article of conspicuous consumption in Africa: “the barbarians dig them into the Earth, as it is seen as wealth to have many of them” (Schröder 1748–1751, Kungliga Biblioteket). The arms trade, with guns made out of Swedish iron, was an integral part of the African slave trade.

If the Swedish iron of the “common sort” had a rather imprecise market, the same could not be said about iron from the *Vallonbruk* and in particular the iron from Leufsta and Åkerby. This was an iron Prankard was willing to do almost anything to get his hands on. The *Vallonbruk*, as noted above, were Dutch in inspiration. They had been created in the first half of the seventeenth century, and even a century later, we still find a large number of *brukspatroner* who were of Dutch origin and a workforce of Walloon descent. These skilled workers had also retained their Walloon forging technique. Furthermore, *bruk* in the county of Uppland remained closely attached to the Dutch market.

The beginning of the eighteenth century, however, brought changes as increasing quantities of iron from the *Vallonbruk* entered the English market. Behind this development lay a rapid expansion of English steel making. Before the introduction of bulk production methods in 1860s, steel was made laboriously in small batches and commanded a high price as a consequence. In Britain steel making was done in cementation furnaces, which sprouted up around Newcastle, Sheffield and Birmingham in the late seventeenth century, using high-quality non-phosphoric bar iron. It was soon clear that the best iron for making steel was from the *Vallonbruk*. Because steel was an exclusive material, the treasured bars from Leufsta and Åkerby were in correspondingly high demand. “[N]o other marks will answer here for steel”, as Prankard reminded Jennings in 1732 (Prankard to Jennings, 16 Aug, 1732, SA, DD/DN 425).

Prankard was very active in diverting *Öregrund Iron*—as bars from the *Vallonbruk* were called in Britain—from Dutch ports to English steelmakers. During the 1720s, a growing amount of this iron came to pass through Bristol on its way up the Severn to Birmingham, where the steelmaker John Kettle was one of Prankard's main customers. Kettle would not settle for anything other than *Öregrund Iron* and so Prankard sought to purchase the iron directly from Stockholm. In the 1730s he importuned Swedish intermediaries such as the Grill family and Francis Jennings, although without immediate success.

The early decades of the eighteenth century were not tranquil in the county of Uppland. Quite apart from rapidly changing external markets, there were internal difficulties. The region had stagnated since a major cave-in at the Dannemora mine at the end of the previous century. Then came the Russian raids in the last years of the Great Northern War. Leufsta, for instance, was burned to the ground by Russian troops in 1719, and many large bar iron warehouses along the coast were destroyed. Everything was rebuilt, but it took time and money. The De Geer family had both and used the situation to enhance its position in the region. The brothers Charles and Jean Jacques De Geer, with the latter's three sons, purchased *bruk* from weaker *brukspatroner* in the 1730s and came to control as much as three-quarters of the region's output of bar iron. Buying new facilities and investing in those they already owned, the De Geers aimed to monopolise the supply of *Öregrund Iron* (Evans and Rydén 2007:71–78).

The De Geer family was prepared to sell the entire annual production of the most coveted brands of iron to one buyer, and in some cases contracts were made for several years at a time. Accordingly, Prankard authorised Jennings to bid for the entire production of Leufsta and Åkerby, a bid made in cooperation with the Sheffield steelmaker Samuel Shore. The idea was to split the English domestic market, with Prankard taking control over Birmingham and the western parts of England and Shore taking the eastern region. At first they had no luck, as a rival London/Birmingham consortium won the contract, but in the mid-1730s Prankard and Shore won the contract.

Such was the situation when Prankard wrote to Jennings in the spring of 1737. Prankard had the contract for the lucrative bars from Leufsta and Åkerby. Jennings was his commission agent, charged with ensuring that the iron was delivered to the Iron Weigh Yard in Stockholm, where it would be weighed and checked. Jennings's task was to ensure that this happened at the earliest possible date. In the case of Leufsta, this meant that once the forgemasters had drawn out the bars, they were taken to the small port at Ängskär whence they were shipped to Stockholm as soon as the sea was ice free (Fig. 4.2). This was arranged to coincide with the arrival of Prankard's ships.

The sailing season in the Baltic Sea began at the end of April or in May, and from then on small ships loaded with Leufsta and Åkerby bars left Ängskär for Stockholm where Jennings had begun to stockpile iron in compliance with the instructions sent by Prankard. "Common iron" had to be rushed to Bristol in time for the St. James's Fair. There was not the same time pressure when it came to *Öregrund Iron* as this iron was sold to a select few buyers and had probably been ordered in advance. Most went to John Kettle's steel furnaces at Steelhouse Lane, Birmingham.



Fig. 4.2 The “järmboden” storehouse for bar iron in Ängskär (Photo by the courtesy of Antiquarian Topographical Archive, National Heritage Board, Sweden)

The early 1730s was a difficult period for Graffin Prankard. He was excluded from the access to the best iron from Uppland. The frustration is evident in a letter to Jennings from 1732. It was hard, he noted, to see this iron “pass by me here & up into ye Markett & Sold by a Person that wont Sell it on any reasonable terms or really not at all to my best Chapp [i.e. Kettle]” (Prankard to Jennings, 16 Aug, 1732, SA, DD/DN 425). Yet as soon as Prankard managed to seize hold of the key *Öregrund* brands, another problem emerged. The Leufsta iron did not live up to expectations. Samuel Shore complained that “the Proprietor of Said Works [Leufsta] is very Defficient in keeping it to Its usual Goodness” (Shore & Son to Worster..., 15 Aug, 1735, SA, DD/DN 426). Prankard was even franker: the iron was not “Clean from ye drossy part ... which causes it to be so rotten [and] not fit for Conversion into Steel” (Prankard to Jennings, 13 Dec, 1735, SA, DD/DN 426).

For Prankard, the situation was very serious. Unless the iron from Leufsta and Åkerby regained its old quality, Kettle would have to stop making steel and Prankard would lose his best customer. He responded instantly. He fired off a letter of protest to Stockholm and this eventually found its way to Eric Touscher, *Directeur* at Leufsta *bruk* and the man responsible for the production of bar iron at both Leufsta and Åkerby. Just as with Gammelbo, the concerns of the international market were communicated rapidly to the direct producers, ultimately to the forgemmen themselves.

In answer to the complaints of Prankard and Shore, Eric Touscher convened a meeting to which the forgemen and the clerks at the *bruk* were summoned. On 18 August 1738, six iron workers, eight clerks and two clergymen met in the office at Leufsta in the presence of *Directeur* Touscher. The latter began reading out “an austere and earnest letter” from Louis De Geer, requiring “a truthful proof and a reliable story how it goes with the pig and bar iron making” at both *bruk*. Three letters from Prankard and Shore, complaining about the quality of the iron, had been translated and enclosed with De Geer’s letter; Touscher wanted to hear the forgemen’s response.¹

The forgemen were indignant. They insisted that the iron they made was as good as it ever had been, and as evidence they wanted “that the bar iron made this year, and of which the majority ought to still be at Stockholm Iron Weigh, should be inspected”. They added that no changes had been made in relation to the work in the forges, but added that no one “ever had heard of any fault with the bar iron” before Touscher’s predecessor had started to consort with “an Englishman” (in fact, a Scot) named Campbell. The problem, thus, had its origin in the close connections created between the *bruk* and the English market. The forgemen were asked to make a greater variety of bars, which required working in a rush, which adversely affected the quality:

for first is ordered so much of these sorts [of bars], then of others, [and] then the clerks throw back the iron made by the hammermen, as it is too long, then too short and then too thick, although this has never been asked for in bygone times (Leufstaarkivet, vol. 43B).

Iron from the *Vallonbruk* was no longer a generic material, fulfilling a variety of functions on the European market; it was increasingly yoked to the steel-producing sector in Britain.

Steel in the eighteenth century was an exclusive material and commanded a high price. It was used in small volumes for specific and important purposes in tools that carried a cutting edge, such as axes, knives and scythes, and when hardness was required in files, anvils and hammers. Steel was also used for purely aesthetic purposes, in buttons, polished clasps and buckles. The metal was thus well integrated in eighteenth-century everyday life. To this, one can of course add that weapons could not be made without the use of steel, either in the form of a blade or as a material incorporated into gunlocks. The markets that British manufacturers served in the eighteenth century were not just domestic. On the contrary, they catered for rapidly growing colonial markets (Evans 2012). The emergence of Britain as the most dynamic centre of steel production and consumption in Europe in the eighteenth century signalled the incorporation of the *Vallonbruk* into the Atlantic world at large.

The Swedish Economy in an Atlantic Context

Swedish iron production had long been integrated into an international iron trade. Ever since the Middle Ages, when iron from *Bergslagen* was transferred to Stockholm for further transport across the Baltic, Sweden looked abroad for markets.

¹For this quote and the following, see Leufstaarkivet, vol. 43B, Leufsta Bruksarkiv, Lövestabruk.

For most of the seventeenth century it was the Dutch market that dominated, but from the 1670s London became the main destination for Swedish bar iron. British domination continued in the following century, but with some important changes. London's position declined in favour of "the outports", with Hull and Bristol as the most important ports, and it became apparent that Swedish iron making developed in concert with the expansion of the British Empire.

Iron and steel are often taken to be the material expression of modernity. They are there in the Eiffel Tower and the steel-framed skyline of Manhattan. Yet it is important to stress that iron and steel were already crucial during the early modern period. For a start, empires would be unthinkable without a ferrous content; weapons are made out of iron and steel, and the many Swedish *bruk* were willing suppliers to the armament workshops in and around Birmingham. This expanding metropolis in central England became something of a "workshop of the World" or perhaps a "workshop for the Empire". This was also the place where many of the bars from Leufsta and Åkerby were turned into steel. Swedish bar iron of a totally different quality was sent to Bristol where it was promptly transhipped onto slaving vessels and thence to Africa where the iron was exchanged for slaves.

As much as three quarters of Swedish iron production was destined for foreign markets, sometimes more. Most of this iron came from forges using the German forging technique to produce "common iron" of ordinary quality, but this played its role in the globalising market. Gammelbo bars became gun barrels at workshops outside Birmingham. *Öregrund Iron* represented a significantly smaller proportion of Swedish iron exports, at most 15%, but its global position was much clearer. From the 1720s this iron was intimately tied to English steel production, and this pattern persisted for more than a century.

The connections between the steel produced in Yorkshire, Newcastle and Birmingham, the creation of the British empire, and plantation agriculture based on slave labour is largely overlooked. Yet every hoe and machete wielded by a slave in the British sugar plantations was edged with steel that originated in ore from the great mine at Dannemora in Uppland. Similar connections were materialised in the voyage iron, which at least from the beginning of the eighteenth century was of major importance for Bristol slave traders as they began to trade along the Bight of Biafra where demand for this metal was notably strong. One can assume that this link, between some *bruk* in the interior of Sweden, Bristol and the Bight of Biafra, remained important as long as slaves were taken from this part of Africa.

It is crucial to stress that the Swedish iron industry should be viewed from a global perspective, not just because large quantities of bar iron that were sold on foreign markets but because this trade came to have an important influence on Swedish *bruk*. As the examples from both Gammelbo and Leufsta reveal, it is clear that Swedish forgemen had to adapt to market signals that had their origin as far away as Birmingham and the Bight of Biafra. When the African market demanded lighter bars master Palt and the other forgemen at Gammelbo had to comply and when English steelmakers wanted bars made in specific dimensions, Leufsta's forgemen were obliged to adjust working practices that had been in place for a century. In 1730, when the *Directeur* signed a trade contract with "an Englishman", a new

era began. If Global History is about “comparisons and connections” and if these entanglements promote change, then the links between Swedish *bruk* and various places within the British Empire are good examples of far-reaching scope and consequences of early modern economic and colonial ambitions.

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DFB/78, William Maister to Thomas Broadley, 25 August 1729

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X:303, *Dagbok rörande Handel, Näringar och Manufaktururer m.m. Uti Danmark, Holland, England, Frankrike och Tyskland. Under verkstälde resor, åren 1748–1751 förd af Samuel Schröder*

Leufsta Bruksarkiv, Lövestabruk, Sweden

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Somerset Archives (SA), Taunton, UK

DD/DN 425

Graffin Prankard to Francis Jennings, 16 August 1732

Graffin Prankard to Francis Jennings, 28 February 1733

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