

Were there medieval ironworking contacts between Sweden and Namur?

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Abstract

Tapping and blowing arches in adjacent sides are features which the Lapphyttan furnace in Sweden has in common with Walloon furnaces. Swedish influences perhaps predominated in Namur, where German immigrants produced steel rather than iron. Such influences arose because King Magnús Eriksson and Count Willem I of Namur were brothers-in-law, a specific instance being the charter granted by Willem I to the ironworkers of Marche. Other contacts were the export of a large proportion of Swedish iron to Bruges via Sluys, then a lordship of the count of Namur. Further technological transfer is speculated upon.

When one looks at the ground plan of the Lapphyttan furnace in Norberg, central Sweden, excavated some ten years ago, one is immediately struck by its similarity in ground plan to Walloon furnaces of the 16th century. Like them it had blowing and tapping arches in adjacent sides and the presence of a tapping arch suggests that it had a forehearth. In contrast, 15th and 16th century Italian blast furnaces, which had no forehearth, and the Vandœuvre furnace in Champagne, described by Nicolas Bourbon in 1517, were tapped and blown from opposing sides. The Lapphyttan furnace appears to have been blown by an undershot wheel with the bellows positioned on the downstream side of the furnace, which was the Walloon alternative, depending on the terrain, to the more common overshot wheel located on the upstream side, often between the furnace stack and the pond bay, or dam. Even more curiously, tapping at Lapphyttan was done towards the stream or mill race, despite the need for culverting that this might entail; and this is also the case with the Le Becquet furnace (c.1450-1550) in the pays de Bray, with many 16th century Wealden furnaces and with the Hola furnace in Franchimont, painted by Jan Bruegel of Velours around 1615. In the Weald the same layout is actually persisted with even in cases where a gun pit for ordnance casting had to be accommodated too. Lastly, the dimensions are so similar as to be easily accountable for by two centuries of development — Lapphyttan 4.6m square at the base, Panningridge in the Weald (1542) 5.2m square, and Le Becquet 5.2m broad at the top of the tapping arch (the base now being submerged)¹.

And technological similarities are not the only ones. Alphonse Gillard, the historian of the Namur ironworks, thought that the charter granted by Willem I, count of Namur, to his forgermen at Marche-les-Dames in 1345 had no precedent and he pointed to the charter granted to French ironworkers by Charles VI in 1413 as its earliest close parallel. But much closer in date to the Namur charter is the one granted by king Magnús Eriksson of Sweden (1319-1364) to the workers of the Western iron mines in Närke in 1340, and whilst noting that this charter was issued five years prior to that of Marche, it should be observed that it was granted because the workers of the Eastern mines in Närke already enjoyed privileges of their own before 1340². In fact the fashion for codifying mineral laws and privileges was probably set by the regulations (*Constitutiones iuris metallici* Wenzeslai II), devised between 1295 and 1305 by Grotius of Orvieto for Wenceslas II of Bohemia. They were particularly needed to regularize privileges claimed by the German miners who were attracted to the expanding mineral industries of the Bohemian mountains.

Magnús Eriksson of Sweden, traditionally dismissed as a 'weak' king, calumniated by the Swedish nobility, by the German regime of the duke of Mecklenburg which ultimately drove him from his throne, by the church and, particularly maliciously, by his distant relative St Birgitta, was in fact the opposite. Recent historians have rehabilitated him as a far-sighted lawgiver who had the interests of his country more truly at heart than did his detractors. His were the land laws of 1350, and the city laws from the period 1353 to 1360, which for centuries formed the framework on which the development of Swedish commercial law and central and local government law was based. Even the devaluation of the Swedish mark against that of Lübeck enforced by the usurping Mecklenburg regime only confirmed the rate fixed by Magnús himself immediately prior to his overthrow. And the metal trades particularly interested this king, which is understandable because the export, first of copper and then, as his reign wore on, of iron, was the main source of revenue for the country. It seems likely that his enemies and detractors, who finally won the day, were those who found the measures by which he sought to bring order and efficiency into a primitive society irksome because they were inimical to their private interests.

Magnus was only three years of age at his accession. In 1332, the year when he came of age, Scania, the southernmost province of Sweden, which until 1658 was part of the kingdom of Denmark, came temporarily under Swedish rule, thanks partly to the machinations of the archbishop of Lund, who was the most influential person in the province. Scania's political importance rested in the control it gave to the Danish kings of the entrance to the Baltic Sea. Economically, the revenue derived from its fisheries has usually been thought of as its most important asset. However, the backward area of Göing, which adjoined the Swedish border, had three castles in the 14th century and recent excavation has shown that these castles were all connected with the manufacture of iron. It is thought that they were the centres from which an iron-tax imposed on the farmers of the area was administered. One of the castles (Skeingeborg) was in existence by the middle of the 12th century as the administrative centre of the county of Björkeberg, a possession of the archbishop of Lund. The other two castles, Vittsjöberg and Losborg, have been shown by the coin finds to have existed only from 1332 to 1360, the period when the area was under the control of Magnus Eriksson. Each castle has been shown by excavation to have contained a smithy and slag. In 1360 Scania was reconquered by Waldemar IV of Denmark. The castles were destroyed by fire and the hundreds of cross-bow heads embedded in the charred timbers show that they were taken by assault³.

As far as the charters of Magnus Eriksson are concerned, the 1340 charter was followed in 1347 by a similar measure relating to the Falun copper workings, and in 1354 by regulations controlling the ironworks of Norberg, though in a quite authoritarian spirit, very different from the 1340 charter for Närke; for instance, provision was made for the building of a prison for the incarceration of absconding ironworkers⁴.

It seems reasonably certain that the idea of issuing ironworking charters was transferred from Sweden to Namur because the count of Namur was brother-in-law of the king of Sweden. In 1334 Magnus Eriksson had married Blanche of Namur, sister of count Willem I (1337-1391) who issued the charter of Marche-les-Dames eleven years later. Magnus was the first Swedish king to take a bride from western Europe and though this may have had something to do with the fact that he was also king of westward-facing Norway, it was also a result of Sweden's decreasing isolation. Birger Persson, for instance, St Birgitte's father, had made the pilgrimage to Santiago de Compostela and his tombstone — he died in 1328 — was of Flemish workmanship, possibly ordered when he passed through the Netherlands on his pilgrimage. St Birgitte made the same pilgrimage herself in 1341 and we know that she visited Arras in Artois on her return journey,

because it was there that her husband was taken seriously ill⁵. We do not know whether Magnus himself ever visited Namur, but we do know that following her marriage, Blanche of Namur's two youngest brothers became courtiers of the Swedish king. Both Robert, future Marshal of Brabant, and Louis, later governor of Namur, were still in Sweden in 1345, and Louis was there still in 1353, because he then received confirmation of his stipend of 100 marks per annum for services rendered and those still to come⁶.

Trade links between Sweden and the Netherlands went back at least a century, the earliest mention of the small billets of iron in which Swedish iron was typically exported, osmund, being found in Sluys customs regulations of 1252⁷. Detailed customs rolls for the Mecklenburg period (1365-1388) and later show that both copper and iron exports from Stockholm were directed to Lübeck, which acted as a staging point for the copper, almost all of which was sent on via Hamburg to the Netherlands, and as a distribution point for the iron, about a quarter of which was consumed in the south Baltic towns, whilst the remainder was despatched like the copper through Hamburg, the bulk of it to the Netherlands, but some of it destined for England too⁸. Most of the Netherlands trade was directed to Bruges, the great medieval entrepôt of northern Europe, and in return Flemish cloth made its way to Sweden. The port of Bruges was still Sluys, its harbour not yet silted up, and the particular point of contact of Namur with this trade was that during most of the 14th century, the count of Namur was also lord of Sluys; this continued up to 1386, when Philip the Bold of Burgundy persuaded Willem I to give up the lordship of Sluys in exchange for that of Béthune in Artois⁹.

It was during the second two-thirds of the 14th century that the iron trade from Sweden made its greatest advance, overtaking copper exports, not merely in volume but in value too¹⁰. The dates of Magnus Eriksson's effective rule were 1332-1364 and coincide exactly with the first half of this advance in ironworking. It will also be recalled that thermoluminescence dating of deposits from the Lapphyttan furnace gave 1390 as the latest date around which it could have been operated.

Might there have been a flow of metallurgical expertise from Sweden to the Netherlands in parallel with the flow of metal exports? Unfortunately, there seems to be no positive evidence in Gillard's book on the Namur ironworks to indicate this. He makes the point that the forges at Marche, seven in number, had all been erected recently and that Willem I was anxious to recruit ironworkers to operate them¹¹. One of these forges was of two hearths (a deux feus), but so was one of the forges at Jausse to which the charter did not apply, a

forge which could also produce steel. The names of the first workers to take the forges at Marche all seem to be local — Lambert le feron, Robines son of Colchon de Florennes and Jacquemin his uncle; Jean le Moine and Colart l'Hoste; Liénart le fevre; Lambert Mathinias (who had the two-hearthed forge); Pyeme [Pyreme?] le feron; the abbess of Marche. The only foreign workers mentioned were not at Marche but at Jausse. They were Germans, who perhaps not surprisingly, were the steel producers (les acherons). They shared the two-hearthed forge with Colart Loste (who also worked at Marche) and are not listed by name¹².

But there are certain factors which suggest that technological transfer is more likely to have been directed from Sweden to Namur, than vice versa. Firstly, the count of Namur certainly had his spies in Sweden, in the persons of his two younger brothers and their entourages. Secondly, except when driven to do so by shortage of raw materials, it is normal for ironworks to move nearer to markets rather than away from them. Thirdly, the evidence is clear from Gillard's book that the industry in Namur was of very recent origin. Of the 28 forges listed in the county for the period 1345 to 1400, apart from the seven new forges at Marche, only the two forges at Jausse existed in 1345. The industry began further expansion some ten years later: by 1356 two further forges had appeared at Jausse, the first occupied by Maître Gérard le fondeur and the second by Colart and Gobert de Nymes (presumably Nismes, with its Forest, south of Philippeville). In the entre-Sambre-et-Meuse, though the ferrons of Oret were already mentioned in 1355, it was not until the 1370s that more forges began to appear — at Ermeton (1370), Acoz (1371) and Serville (1376)¹³.

The first indication of really new technology is from around 1370 when forges which smelted both lead and iron begin to be mentioned, for which the nomenclature used is both forge and forneal¹⁴. If the forehearth was introduced along with the blast furnace from Sweden, was its use now transferred not from lead smelting to iron, as suggested by Ludwig Beck and others, but back from iron to lead¹⁵?

Turning back to the early Swedish furnaces it should be noted that though the furnace process was quite astonishingly efficient — the Vinarhyttan slags had high silica contents (69%) and very small iron loss (6%)¹⁶ — the fining, such as it was, was carried out at eight very small hand-blown hearths. This could have been the case in Namur too, because after the use of furnaces to smelt both lead and iron, the first indication of further technological advance comes not until the 1390s, when both hammermen (martelleurs) and 'great hammers' (grands marteaux) appear. For the first conclusive evidence of separate fineries (affinoirs, rolettes) we

have to wait until the 1440s¹⁷. Could it be that before this, part of the fining, or de-carburizing process, was accomplished in the furnace hearth by directing the blast strongly across the surface of the molten metal in the fashion of the Walloon process of the Eifel, as described by Virmond in the 1890s? This was considered by Ludwig Beck to have been a survival from a quite primitive stage in the development of the indirect process; he thought it might have originated in the 16th century¹⁸. Could this practice also have had its origin, not in Wallonia, but in Sweden?

References

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- 2 A Gillard, *L'industrie du fer dans les localités du comté de Namur et de l'entre-Sambre-et-Meuse de 1345 à 1600* (1971), 228-233. *Svenskt diplomatarium*, 4, 3526.
- 3 A Ödman, 'Iron and castles in Scania', in *Bloomery ironmaking during 2000 years: Seminar in Budalen, Sør-Trondelag, Norway, August 26th-30th 1991* (1992), 45-53. David Starley kindly drew my attention to this article.
- 4 K Kumlien, *Sverige och hanseaterna: studier i svensk politik och utrikeshandel* (1953), 153-244. For text of the Norberg regulations see *Svenskt diplomatarium*, 6, 5003.
- 5 J Jørgensen, *St. Bridget of Sweden* (1954), 1, 115-16, 278, note 5.
- 6 H Schück, *Rikets brev och register* (1976), 113 and note 17.
- 7 'Steel, iron, osmund' (stael, yser, osmont) are listed together in rules for shipping and tariffs on the Zwin from the year 1252, discovered in the Sluys archives by J H van Dale (*Bijdragen tot de oudheidkunde en geschiedenis, in zonderheid van Zeeuwsch-Vlandern*, comp. H Q Janssen and J H van Dale, 5 (1860), 32)
- 8 W Koppe, *Lübeck-Stockholmer Handelsgeschichte im 14. Jahrhundert* (1933), 32-3.
- 9 R Vaughan, *Philip the Bold* (1962), 170.
- 10 Koppe, *Handelsgeschichte*, 30-1, 34.

- 11 Gillard, *Namur*, 203.
- 12 Gillard, *Namur*, 60-64. A deux fers is a misreading of a deux feus (sic).
- 13 Gillard, *Namur*, 60-9.
- 14 Gillard, *Namur*, 65, 73-4. Examination of the MSS shows that where, as below Sclaigneaux, the furnace was originally for lead smelting, it continued to be referred to as forneal, but where, as at Marche, it originally smelted iron, the terminology forge is adhered to. There is not necessarily any great significance in this; technical processes were obscure to the clerk and such words he indiscriminatingly transferred from one rental to the next, especially if no change was made in the amount of the rent.
- 15 Beck and Johannsen considered that it was transferred from the smelting of ores which yielded large amounts of slag (lead is cited) to the smelting of iron. In the first place it could have been transferred from copper smelting to iron in Sweden.
- 16 Tylecote, *Early metallurgy*, 329.
- 17 The first grands marteaux appeared in the entre-Sambre-et-Meuse at Biesmes (1395), Faing (1397), Acoz (late 1390s), Sart-Eustache (1406), and east of the Meuse at Jausse (1407). The hammermen named were Gérard Nicotelle dit le Martelleur (Acoz, 1410) and Ulrik le Martelleur (Jausse, 1409) (Gillard, *Namur*, 66-8, 71-2, 79, 82, 86). The first fineries are noted after 1442: at Jausse (rollette, 1449), Ermeton (rollette, before 1455), Acoz (affinoir, before 1456), a second forge at Ermeton (affinoir, before 1456) and at Morville (affinoir, by 1460) (Gillard, *Namur*, 72, 95-7, 100).
- 18 E Virmond, *Geschichte der Eifeler Eisenindustrie* (1896), 21. L Beck, *Die Geschichte des Eisens* (1890-95), 2, 204-5.

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