https://doi.org/10.12685/pczvnh97

Remains of early industrial sites in woodland areas – antiquarian problems concerning sites with continuos production over long time periods

Mathias Bäck

Central Sweden; industrial archaeology; excavation method; antiquarian assessment

This essay deals with the results from an archaeological investigation of the remains of an early complex industrial site. The site consists of a blast furnace and a hammer situated between two lakes in Kärvingeborn, in the mining district of central Sweden (fig. 1). Kärvingeborn is one of eleven historical iron mills in the region. The area is a typical mining area with forests and desolate lakes, located far from the agricultural settlements. Small iron works were extremely important for early industrial Sweden. This type of site is however often difficult to investigate and I will therefore briefly discuss some strategies in excavating proto-industrial sites.

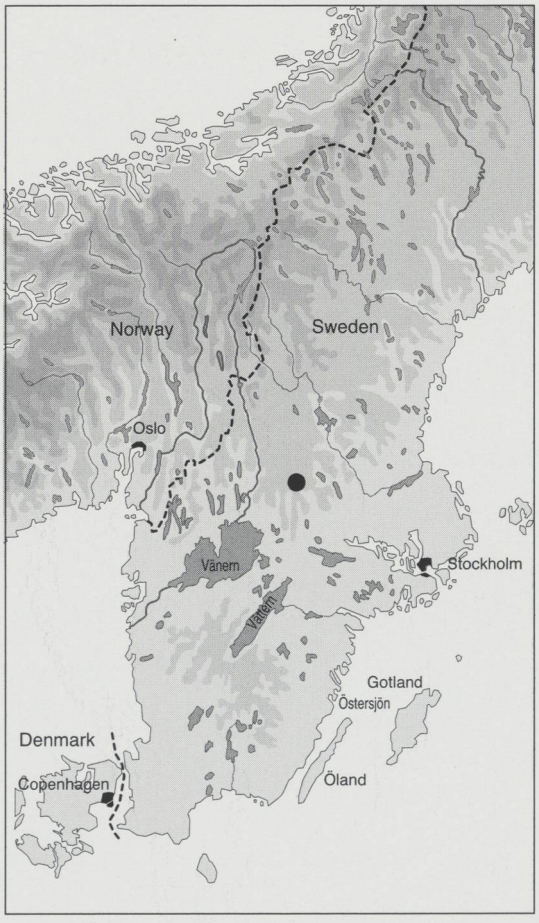

Fig. 1: Map of Sweden. Kärvingeborn marked.

The blast furnace was built in 1633 and was thus one of the first that appeared in the parish. The raw material for the many blast furnaces and steel mills that belonged to Grythyttans Bergslag (Mining Co-operative) came from various mines in the area. The finished iron from Kärvingeborn was sold to customers both regionally and abroad.

The area was surveyed in 1957 and 1987. Building remains that were recorded in the area around the blast furnace correspond, on the whole, to the buildings extant today. The results from the hammer site were less satisfactory, as only the hammer itself and the foundations of two other buildings were recorded. The site was mapped in May 2000, and it could then be established that it was both larger and more complex than what was stated in the Sites and Monuments Record.

Through the archaeological investigation, 35 buildings and other constructions could be documented. Four embankments dating from different time periods were found along the stream. There were also remains of a blast furnace, a saw, a (flour?) mill, a hammer-mill, domestic buildings/annexes, warehouses, a possible inn with a cellar, and walls that had served different functions on the site. A comparative study between archaeological and historical/cartographic source material was carried out in order to trace structural and social changes over time in the district. The investigators were not altogether surprised to find that levees had created bodies of water in different places at different points in time. Three plateaux or terraces

had also been constructed on the rocky and morainic slope that led down to the lake of Halvarsnoren. The purpose was presumably to enlarge the area of the site. This particular part appears to have been used primarily for storage of fuel, raw material and finished products.
It is essential to view blast furnace-, hammer-, and mill sites in the context of the riverscapes, lakes and dams that normally constitute their immediate environment. Around larger steel mills, there was tendency for small communities of people with specialised professions to emerge. The iron working site in Kärvingeborn is not of such proportions, since the blast furnace in the beginning was owned by five miners. The number of buildings nevertheless indicates that the production must have been of quite a considerable size. Due to the characteristics of the site it is not known at what points in time production was at its highest, nor how production developed over time. Remains of early industrial sites of this kind are by definition more or less self-obliterating. This is a consequence of continuos technological developments that cause large structural changes to take place while the site is in use.

Method and Investigation

Archaeological sites of this kind often contain large numbers of buildings with various functions, such as iron refining and domestic buildings/annexes. The majority of the remains that are visible today are likely to belong to the final stages of activity on the site, i.e. the mid 18th and 19th centuries respectively. It has previously been established that the earlier components of this type of construction can be extremely difficult to trace. To be able to identify these parts at Kärvingeborn, the whole area would first have to be totally stripped, in order to receive a complete picture of the disposition of the site. However, it was not possible in this case and another method had to be employed. The area was therefore mapped. Without this mapping, a final investigation could not have been justified in neither economic nor antiquarian terms. After mapping and detailed map analysis, the constructions with the greatest potential could be identified for archaeological investigation. These were then documented by means of a total station and the digital information and documentation system *IntraSis* (Intra-site Information System) that is provided by the National Heritage Board. Information from older maps was then transferred to ArcView (GIS) and was rectified against a modern map. Elements and structures that were found on this map and also on the older maps (land division maps from 1767–1768 and 1866) were then identified. The different generations of maps could be used to analyse topographical and cultural changes during almost 250 years. Finally the results from the archaeological investigation was added to these maps.

Kärvingeborn in the historical source material

Information about the origins of the mineral industry in Kärvingeborn is vague. The oldest written evidence for iron working in the vicinity dates from 1539. It has however been assumed that production began during the 15th century. According to written evidence, the history of the site is brief. A privilege was issued in 1750 and it appears that the blast furnace remained in use only until 1755. It should howev-

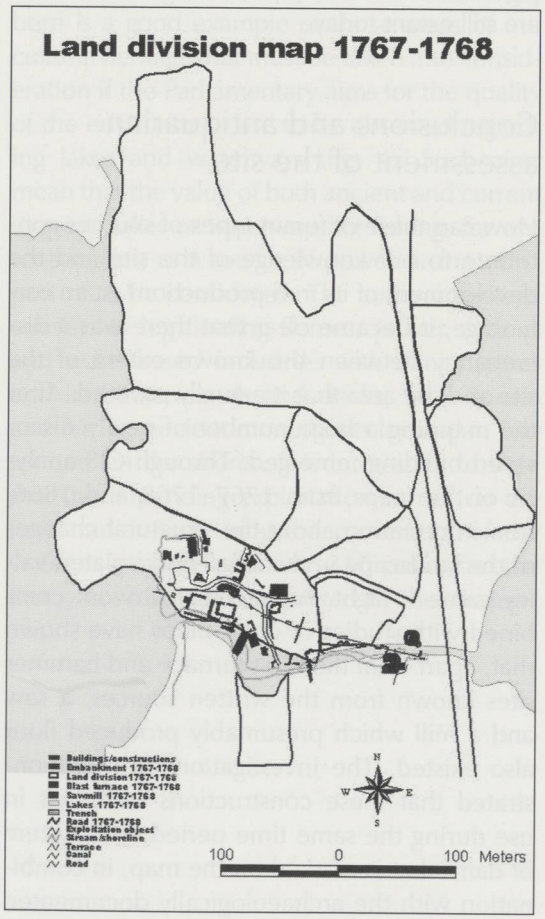

Fig. 2: Rectified land division map from 1767–1768 in conspectus with the mapped results of the archaeological investigation.

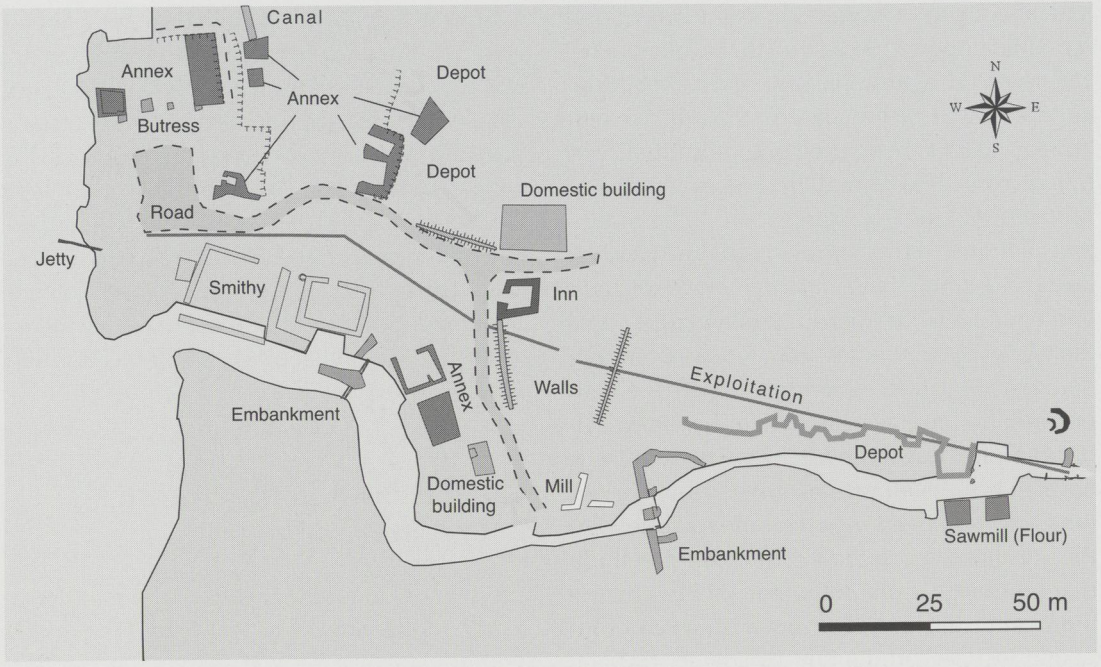

Fig. 3: Buildings and constructions recovered during the short archaeological work on the site.

er be noted that the blast furnace is marked on a land division map from 1767–1768 (fig. 2). The archaeological investigation demonstrated that the oven was almost totally dismantled and was not allowed to fall into decay. Only smaller parts of the chimney pipe and the external wall are still extant today.

Conclusions and antiquarian assessment of the site

How can these different types of sources contribute to our knowledge of the site and the development of its iron production? At an early stage, it became clear that there was a discrepancy between the known extent of the site and the area that it actually covered. After the mapping a large number of newly discovered buildings emerged. Through GIS analysis of the maps from 1767–1768 and 1866, new information about the structural changes of the landscape in the small and isolated valley came to light. Archaeological work combined with studies of older maps have shown that, apart from the blast furnace and hammer sites known from the written sources, a saw and a mill which presumably produced flour also existed. The investigations also demonstrated that these constructions were not in use during the same time period. The system of dams that is marked on the map, in combination with the archaeologically documented buildings, exclude the possibility that the flour mill was in operation at the same time as the hammer, in the 1760s. It is also known from written evidence that the activity at the blast furnace had by this time been discontinued. Moreover, the sawmill that was previously believed to be from a later date is marked on this map. The position of the saw in relation to the stream indicates that it must have been in use during the time when the water level was at the height that is indicated on the map. This means that the saw was constructed before the 1760s and that it was in operation at the same time as the hammer.

On the map of 1866, a dam was marked by the central mill (fig. 3). This indicates that some type of industrial activity was carried out in this part of the stream. According to written evidence the activity at the hammer site was discontinued seven years before the map was drawn. However, an embankment was located by the saw, at the eastern end of the stream. It thus seems that the stream was never used to run more than two mills at the same time. It is however possible, that the majority of the buildings that are visible today, date from the reconstruction of the hammer around 1850. The smithy itself can be dated to 1848. The archaeological investigation has provided us with a picture of the structure and extent of the industrial site. It seems certain that there are further buildings on the site and in its close proximity, that are yet to be discovered. From

a traveller's diary, it is known that there was an inn in this area at the end of the 18th century. The location of the inn has been established by the finds from the central area of the site. The pottery gives us a chronological time span from the middle of the 17th century to the end of the 19th century.

Production of e. g. frieze (roofing) shingles, wooden planks, flour, bar iron, and wrought metal products has in the past been largely connected to places with water power. Consequently, site continuity stretches over long periods of time. In many cases there is written evidence from the Middle Ages. However, in those cases when investigations have been carried out, what has been most commonly found are the remains from the last generation, i.e. those that normally represent the buildings of the 19th century. Therefore certain methods of investigation are required. It also means that the antiquarian assessment of the conservation value of the monument and/or the extent of future archaeological investigations in the event of exploitation may be underestimated.

In connection with the erection of new buildings, as a result of technological developments, ground-levelling work has often changed the local topography to such an extent that a considerable amount of work by excavators is required before the original topography can be traced. Consequently the assessment of the need for mechanical excavation becomes very important.

Due to the nature of the industrial activity, it is rare to come across large amounts of datable finds. This is mainly due to the high specialisation on industrial sites where different types of production processes constitute the major part of the activity. Such sites often contained (domestic) buildings/annexes such as stables, barns, warehouses, crofts and places to stay overnight (or an inn, as in Kärvingeborn) (fig. 3). These buildings were however often erected somewhat on the periphery in relation to the area of production.

Fig. 4: View towards the west over Lake Halvarsnoren and the terraces in the smithy area.

In conclusion it could be stated that this type of ancient monument is subject to a kind of geographical determinism based on water- or wind power. This means that physical continuity is a key concept for the planning of investigations. An archaeological site like the one at Kärvingeborn is a good example of those areas of our cultural heritage that must be taken into consideration if the Parliamentary aims for the quality of the environment are to be observed regarding lakes and waterways (fig. 4). Such aims mean that the value of both ancient and current usage of lakes or waterways for fishing, for water supplies, as a source of power or for transport must be considered. The cultural heritage consists of log floating flumes, power stations and water-based industries with dams, jetties and harbours, canals and docks, ferry flumes and ferries, ancient monuments located in water and on the shores. It is interesting to note that the impending exploitation carries on the long tradition of using the movement of the water as a source of power, 350 years after the first water mill was constructed by the stream.

Address

Mathias Bäck
Riksantikvarieämbetet (National Heritage Board)
Instrumentvägen 19, S–12653 Hägersten
mathias.back@raa.se