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## THE PREINDUSTRIAL POSSESSION OF IRON IN RURAL SWEDEN 1750-1870

This paper is a summary of the main results in my thesis “The age of iron. The total iron possession amongst the rural population in Sweden 1750-1870”, written in Swedish with a summary in English.

### MAIN QUESTIONS

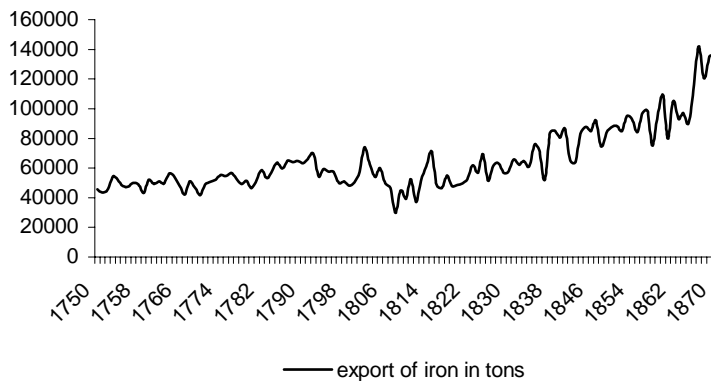
The main purpose of my thesis was to investigate how much iron the rural population in Sweden possessed 1750-1870. The aim was also to try to investigate and to calculate the amount of iron needed to replenish iron stocks lost in each year due to attrition. This secondary question was necessarily to ask in my thesis but difficult to answer.

## BACKGROUND

### Sweden's iron export

For a long time Sweden was one of the most important producers of iron in the world. The export market covered most of Western Europe. Each year 1750-1870 Sweden exported in average 60- 65 000 tons of iron, mostly bar iron.

**Diagram 1.** *Export of iron from Sweden 1750-1870.* In tons



*Source:* Jörberg 1972

During the Napoleon wars, the export fell sharply and during the industrialisation of Western Europe the export rose. The export has been documented through **customs** and taxes.

### Domestic consumption

Many studies of inventories have been conducted in Western Europe and North America. However, these studies have primarily focused on luxuries items such as gold, silver and furniture. Iron objects were different, as households did not consider their consumption as a luxury.<sup>1</sup>

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<sup>1</sup> McKendrick, 1982, Schuurman, 1994, Wijsenbeek-Olthuis, 1994, Carr, 1994, Malanima, 1994, Yun, 1994, Cruz, 1994, Nenadic, 1994. Other investigations into consumption how had influence on my basic work with organization of objects and data is: Farchilds, 1994, Horn, 1994, Dessureault, 1994, Weatherill, 1993, Weatherill, 1988, Ahlberger, 1996.

Households used objects made of iron as cooking pots and other kitchen utensils. On farms the use of iron also increased. During the period 1750-1870, iron steadily replaced wooden parts in almost all farm implements, from spades to ploughs and harrows. The transition from wood to iron parts played an important role as humans gradually took control over the landscape. The new iron tools made digging ditches easier and facilitated large-scale drainage of marches. Iron parts on ploughs and harrows broke the soil faster and deeper and more efficiently than older ones made entirely of wood. Iron tools were not luxuries but they did play an important role in farm economics during the period studied.

### Driving force behind consumption patterns – theory model

Early in the work with my thesis, I read an article by Jan de Vries, “the Z-goods model”. In it he discusses the relationship between goods produced on the farm and the amount of goods bought on the market at different income levels.

The Z-goods model assumes that farmers buy more goods from the market when the price of grain goes up. As the price of grain increases, use of goods (tools/implements) produced on the farm decrease and more goods were bought on the market. This was a part of increasing specialisation during the agrarian revolution.

The Z-goods model also takes into account change in taste. The model does not assume a deterministic relationship between grain prices and goods. Sometimes goods produced locally were bought instead of goods from the market. These goods could be considered better or more tasteful. It has been documented that people sometimes during the early industrial revolution preferred handicraft products instead of industrial products. The handicraft products were considered to be of a higher quality. In a long run scenario, however the Z-goods model points toward increased specialization.<sup>2</sup>

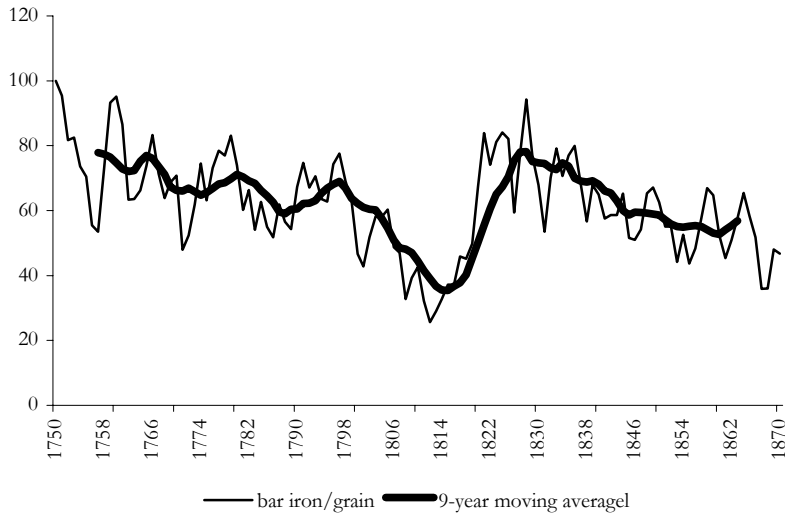
Iron was a product that farmers - with a few exceptions, could not produce themselves on the farm and was thus, bought on the market, it was also a product that increased productivity in grain production. The assumption of this thesis is that the price relationship between grain and iron was an important factor that favoured the introduction of new iron tools and iron parts onto the older wooden tools.

The periods 1790-1812 and 1830-1870 were periods then one could expect high investments in iron objects on farms in Sweden. During these periods, the price of grain relative the price of iron favoured farmers. (See diagram 2).

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<sup>2</sup> de Vries, 1993 p 108-21.

**Diagram 2. Relativ iron price in Sweden 1750-1870**



*Source:* Jörberg, 1972. I. P. 705-708, 632-635, 662-666.

Can one see a relationship between price and position of iron objects? I will return to this question later in this paper.

## METHODS AND SOURCE MATERIALS

In my thesis, the primary source materials used were estate inventory. The inventories listed of almost all items of value in the household - only clothing and the bed were sometimes excluded. Thus, it is safe to assume that the inventories accounted for nearly all iron objects, from the pothook to the iron plough.

Inventories included the number of objects but they seldom revealed the object's iron weight. Information concerning weight had to come from other source materials. For this purpose, I constructed a database of "average weights" for each type of iron object using a unique combination of written sources and museum object's.

First, a large number of object's iron weights were collected from museums. To extract the iron weight of objects containing both wood and iron, the weight of the wooden part of each object was calculated and subtracted from the objects total weight.

Second, the archives of a small ironworks, Ryfors in western Sweden provided information on a large number of iron objects produced to be sold locally as farm implements.

## THE WEIGHTS OF IRON OBJECTS

Mostly the estate inventory's tells one about the objects and their value but not their weight.<sup>3</sup> This was a major problem for me at the start of this work. I did not want to count objects; I wanted to tell the amount of iron in kilos! To answer this I had to use methods that in some aspects are new to economic history.

I had to find weight reports in other source materials. The first attempt was made in museums around Sweden. Everything from ploughs to pots was put on the weighing-machine. This gave plenty of data. But objects in museums constitute some problems.

Most of the objects have unknown age, you can possible tell it is from later or earlier 18<sup>th</sup> to 19<sup>th</sup> centuries, but not more precise. Sometimes the museum did not know from what village or farm the object came.

Another great problem was objects made from both iron and wood. It's not possible to dismantle objects in museums so I had to find another solution. Thirst I had to know the weight of different kinds of wood. Then calculate the total amount of wood and subtract it from the total weight to get the iron weight.

To base everything on this data would be a great risk. The next step was to investigate if the iron producers had left some records that could be used. In the records of a small iron producer, Ryfors, in southern Sweden I found thousands of weights for everything from horseshoes to large iron objects like harrows.

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<sup>3</sup> Sometimes the weight was noted, mostly for blacksmith items.

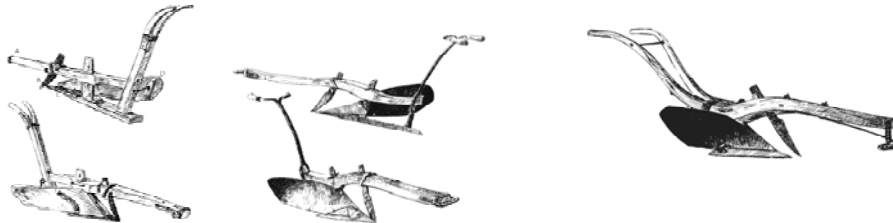
**Tabell 1.** *Manufactured iron objects at Ryfors iron producing plant 1840-41. Weights in kilos.*

Object	Medel	Median	Max	Min	Number of objects
Share	2,9	2,9	7,4	0,9	1792
Plough-share	4,2	4,2	6,0	2,4	132
Iron moldboard (Breast)	7,2	7,1	9,5	4,3	98
Harrow shares without screws	0,5	0,6	0,6	0,2	250
Harrow shares with screws	0,8	0,8	0,8	0,8	30
”Goosefoot” harrow shares	3,0	3,0	3,0	3,0	10
”Mould” harrow shares	2,4	2,3	3,5	1,7	184
Wagon- or cart- axle	11,9	12,5	15,1	8,3	12
Sledge runner	7,1	4,5	7,6	4,0	127
Wagon seat	1,4	1,4	1,4	1,4	105
Horseshoe	0,3	0,3	0,3	0,2	8399
Oxen-shoe	0,3	0,3	0,3	0,2	10
Sledgehammer	3,0	2,6	5,0	2,0	66
Spade	1,4	1,3	3,5	0,3	862
Pickaxe	1,1	1,1	1,8	0,5	25
Pickaxe for use on millstones	1,4	1,4	1,4	1,4	18
Pickaxe for use on greensward	2,3	2,4	2,9	1,8	52
Pickaxe for use on turf	0,9	0,9	0,9	0,9	4
Black- smith	17,6	14,5	37,7	3,5	4
Pot	13,3	13,3	13,3	13,3	2
Pot foot	6,3	7,1	8,9	1,1	37
Damper	2,9	2,6	5,2	1,8	76
Damper, cast iron	7,8	7,8	7,8	7,8	1
Flat-iron	3,2	3,2	2,9	3,5	2
Flat-iron weight	0,7	0,7	0,7	0,7	9

*Source:* Ryfors bruksarkiv, försäljningsjournaler 1840-41. GLA

The table above is only one example of how many different items can be found in this source material from a single year.

## PICTURE EXAMPELS OF IRON OBJECTS



*Picture source:* Gadd 1983 p 154, 156.  
 To the left: wooden plough, small amounts of iron.  
 To the right: Early iron (1800-20) plough from West Sweden, about 21 kg of iron.

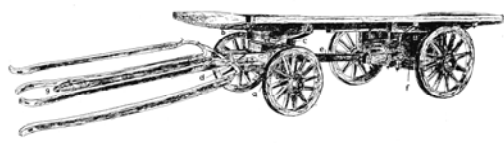
*Picture source:* Gadd 1983 p 161  
 A plough inspired by English ploughs. About 25 kg of iron was used.



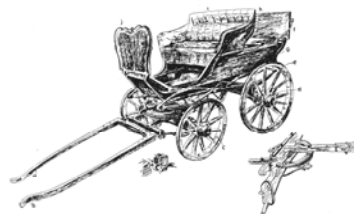
*Picture source:* Gadd 1983 p 162  
 Heavy iron harrow. About 30 kg of iron.



*Picture source:* Erixon 1935 p 109  
 Sleigh. About 15-30 kg of iron



*Picture source:* Erixon 1935 p 114  
 Wagon used for transportation.



*Picture source:* Erixon 1935 p 115  
 Wagon used for traveling.

## Estate inventory's in Sweden

The main source material in my work is the estate inventory. In it one will find a large amount of objects, including iron objects. By the Swedish law of 1734 every person who died must have an estate inventory made by court. But the law was not implemented on a larger scale until around the year 1750. The same year the first large Swedish census was implemented. This makes it possible to check the numbers of estate inventory against the numbers of adults how died, the estate frequency. This has been tested on a number of different areas and time periods. The numbers of estate inventories could in some regions be extremely low around 1750, this problem was most common in the north of Sweden. In the 18<sup>th</sup> century they could have as low as 1-2% in estate inventory frequency. In the southern parts the frequency could be 20-40%.<sup>4</sup> But if one look on difference between social groups you will discover that farmers had a much larger estate inventory's frequency than the landless groups.<sup>5</sup>

## Selection of estate inventory's

In my study I have chosen to use the numbers of cattle in the inventory as a selection method. The inventory should contain at least one cow. This way I will exclude servants and other without their own household. At the same time I will include most semi-proletarianized crofters. This selection method has been developed in 1970 by Jan Kuuse and is now used in several studies of agrarian history.<sup>6</sup>

In every estate inventory that fulfils the criteria of one cow each other large animal gets a point according to the following;

1 horse = 2 points, 1 oxen = 2 points, 1 cow = 1 point.

Using this system one can divide the estate inventory material into four groups:

1-6 points = small farmers.

7-19 points = medium sized farms.

20-49 point = large farms.

Above 50 points = mansion sized farms.

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<sup>4</sup> Gadd, 1983 p 56-57.

<sup>5</sup> Bringéus, 1977. Gadd 1983 p 53-59, 69-75.

<sup>6</sup> Kuuse, 1970; Morell, 2001, gives a detailed bibliography.



## Investigation areas



1. Southern plains
2. The Southern highlands
- 3a. Western plains
- 3b. Forests and iron producing area of Värmland
4. Svealand's forests and iron producing areas
5. Eastern Sweden
6. Nothen coastline and the lakearea around Storsjön.
7. The interior of northern Sweden (not cultivated)

## Iron object groups

In 1750, on average a normal farm possessed about 140 kg of iron objects by 1870 the average amount was more than 500 kg. Furthermore, regional differences were much greater at the beginning of the study. Farming areas on the plains and in iron producing areas usually owned more iron objects than did areas in the forest regions with little agriculture. However, by 1870, the regional differences were less accentuated and iron objects were more equally disseminated across Sweden.

The iron implements and objects were divided into eight groups:

1. Agricultural implements - ploughs, harrows, ards.
2. Farming implements - spades, pickaxes, axes, scythes, and other small tools.
3. Machines.
4. Transport - wagons, carts, sledges.

5. Weapons and hunting - guns, spears, traps.
6. Domestic objects - pots, frying pans, stoves.
7. Handicraft tools, including blacksmith tools.
8. Iron in construction of buildings.

Some important shifts in the amount of iron objects owned took place between 1750 and 1870. In 1750, domestic use of iron, mostly in kitchen utensils accounted for about 40 percent of the total iron on an average farm, by 1870 that figure was only 16-20 percent. Other categories of objects increased in both number and weight.

During the period studied, agricultural tools increased from 15 percent to about 20 percent, while iron used in wagons and carts made up about 30 percent of the farms total iron possession. By 1870, farmers' possession of craftsman's tools had decreased slightly to about 2-3 percent, as market alternatives had become available.

During the period 1790-1850, farmers in Sweden invested in improving different types of wagons and carts, more iron was used on wheels and in axels. This made the vehicles stronger, more durable and capable of carrying more goods. Further, the improvements are an indication of improved roads and of a greater commercial activity among farmers.

Other types of agricultural implements changed in substantial ways between 1750-1870. The most important of these were changes in the construction of ploughs and harrows. In the 1750s, a normal plough used about 5-10 kg of iron primarily in the ploughshare but by the 1830s, a normal plough weighed more than 25 kg of iron. New forms of deep working harrows introduced in the 1790s weighed about 30 kg of iron and even in older conventional harrow models, the number and weigh of iron parts increased.

The new and improved agricultural implements were an indication of farming communities increased farming activity and commercialisation.

## TOTAL POSSESSION OF IRON

To answer the main question of my theses – how much iron did farmers and cottages in Sweden possess 1750-1870 – I had to calculate the numbers for each region. Official Swedish census data for 1751-1870 were used to make the calculation.<sup>7</sup> In 1751 total possession was calculated to 38 000 tons and 1870 to 160 000 tons. However, these aggregated calculations are built on a number of rather weak assumptions and should be treated with caution.

The figures for an average farm (table 2) are easier to grasp and not on such a high aggregation level. They show an impressive increase in iron possession during 140 years.

**Table 2.** *The average possession of iron on an average sized farm 1750-1870*

	1750	1800	1815	1835	1855	1870
Average sized farm	143*	260	318	387	455	514

*Source:* Bouppteckningar från Torna, Kind Källand, Kil, Gamla Norberg, (Bälinge, Ulleråker, Vaksala härad) som tillsammans utgör undersökningsområdet Uppsalaslätten samt Nysätra och Lövångers tingslag. LLA, GLA, ULA, HLA.

\*Only 4 areas out of 7 was investigated.

## DID THE RELATIVE PRICE OF IRON MATTER?

The secondary question in this paper and in my thesis was if the relative iron price (bar iron / grain) had an impact on the possession of iron on farms. As I shown in the beginning of the paper the relative price of iron was falling sharply at the end of the 18<sup>th</sup> century and the beginning of the 19<sup>th</sup>. A steady decline after 1830 can also be observed.

The annual increase in possession of iron (nation wide) in 1751-1800 was 1,0 %, 1800-1815 1,2 %, 1815-1835 0,9 %, 1835-1855 1,4 % and 1855-1870 1,9 %.

In 1800-1815 the relative iron price was at its lowest but the total increase of iron possession was relatively modest on a national scale (1,2%). This was a surprisingly low figure. In 1835-1870 the relationship between agricultural products and the price of iron objects favoured farmers, which stimulated an interest in investment in new iron implements. The increase in possession during that time was 1,4 – 1,9 %.

The relationship between relative iron price and iron possession is inconclusive. To understand the reasons for increased possession of iron it is necessarily to understand not only the shift in price but also the full technological complex surrounding each iron object. At certain times it was not possible to buy new iron objects and use them on the farm. The new tool must fit in and have a place in the cultivation of the farm, in the handicraft etc. But then falling relative iron prices accrued during a time of technological change the shift towards a higher use of iron could be forceful.

<sup>7</sup> The census material was based on figures from each parish. Since I have drawn up “new regions” which represents agrarian regions all data had to be processed by both statistical and geographic information systems.

## A NORTHWESTERN EUROPEAN FENOMEN?

The trend towards higher use of iron in farming tools, craftsmans tools, wagon and carts was of course not limited to Sweden. In no other country, one has investigated the total possession of this metal but there are some indications in other studies.

In southern Norway, in Denmark and in Britain interesting study has shown an introduction of new iron tools on farms around 1800-20.<sup>8</sup>

In France and Germany the introduction of heavy iron ploughs and harrows seems to come later, around 1840-50, about the same time as the eastern parts of Sweden. The pattern that emerges from this shows the need to study wider regions in Europe instead of confine the research to nation states.

## REFERENCES

- Adamson, R., *De svenska järnbrukens storleksutveckling och ansättningsinriktning 1796-1860*. (Meddelanden från Ekonomisk-historiska institutionen vid Göteborgs universitet.) Göteborg. 1963.
- Ahlberger, C., *Konsumtionsrevolutionen I. Om det moderna konsumtionssamhällets framväxt 1750-1900*. (Västsvensk kultur och samhällsutveckling. Rapport nr 5.) Göteborg. 1996..
- Attman, A., *Svenskt järn och stål 1800-1914*. (Jernkontorets bergshistoriska skriftserie 21.) Stockholm. 1986.
- Bairoch, P., "Agriculture and Industrial Revolution 1700-1914." *The Fontana Economic History of Europe. The Industrial Revolution*. Red: Cipolla, C.M. London and Glasgow. 1973.
- Berg, G., *Sleges and wheeled vehicles. Ethnological studies from the view-point of Sweden*. Uppsala. 1935.
- Berglund, B., *Ryfors bruk 1742-1920. Från järnbruk till berggård*. (Skrifter från Skaraborgs länsmuseum 10.) Skara. 1988.
- . *Gjutjärnets tidsålder. Del II. Svensk järngjutning 1850-1910*. (Gjuterihistoriska sällskapets skriftserie 2.) Jönköping. 1989.
- Bergström, E.-J., Magnusson, G. & Raihle, J., *Härjedalen. Natur och kulturhistoria*. Östersund. 1990.
- Bringéus, N.-A., *Bouppteckningar som etnologiska källor*. (Särtryck ur Vetenskapssocieteten. Lund årsbok 1974.) Lund. 1977.
- Britnell, R. H., "Farming practice and techniques: eastern England." *Agrarian history of England and Wales. III 1348-1500*. Red: Thirsk, J. Cambridge. 1991.
- Brown, J., & Beecham, H.A., "Implements and machines." *Agrarian history of England and Wales. Volume VI 1750-1850*. Red: Mingay, G.E. Cambridge. 1989.
- Carr, L. G., "Emigration and the standard of living: the eighteenth-century Chesapeake." *Material culture: consumption, life-style, standard of living 1500-1900. B4 proceedings Eleventh International Economic History Congress Milan, September 1994*. Red: Schuurman, A., & Walsh, L. Milano. 1994..
- Cruz, J., "Elites, merchants, and consumption in Madrid at the end of the old regime." *Material culture: consumption, life-style, standard of living 1500-1900. B4 proceedings Eleventh International Economic History Congress Milan, September 1994*. Red: Schuurman, A., & Walsh, L. Milano. 1994.
- de Vries, J., "Peasant demand patterns and economic development: Friesland 1550-1750." *European Peasant and their Markets. Essays in agrarian economic history*. Red: Parker, W.N., & Jones, E.L. New Jersey. 1975.
- . "Between purchasing power and the world of goods: understanding the household economy in early modern Europe." *Consumption and the World of Goods*. Red: Brewer, J., & Porter, R. London. 1993.
- Dessureault, C., Dickinson, J.A. & Wien, T., "Living standards of Norman and Canadian Peasants 1690-1835." *Material culture: consumption, life-style, standard of living 1500-1900. B4 proceedings Eleventh International Economic History Congress Milan, September 1994*. Red: Schuurman, A. & Walsh, L. Milano. 1994.
- Erixon, S. Skultuna bruks historia. Del 2. Bruksområdet och socknen. Stocholm 1935.
- Devine, T. H., *Transformation of rural Scotland : social change and the agrarian economy, 1660-1815*. Edinburgh. 1994.

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<sup>8</sup> de Vries, 1975 p. 241, Turner, 2001 p. 91-93, Valen-Sendstad, 1964 p. 124, 298-300, Kjærgaard, 1995 p. 116-17.

- Farchilds, C., & Forrester, M., "Determinants of consumption patterns in eighteenth-century France." *Material culture: consumption, life-style, standard of living 1500-1900. B4 proceedings Eleventh International Economic History Congress Milan, September 1994*. Red: Schuurman, A., & Walsh, L. Milano. 1994.
- Fritz, M., *Gjutjärnets tidsålder. Del I. Svensk järngjutning fram till 1800-talets mitt*. (Gjuterihistoriska sällskapets skriftserie 1.) Jönköping. 1989.
- Gadd, C.-J., *Järn och potatis. Jordbruk, teknik och social omvandling i Skaraborgs län 1750-1860*. (Meddelanden från Ekonomisk-historiska institutionen vid Göteborgs universitet 53.) Göteborg. 1983.
- . *Självhushåll eller arbetsdelning? Svenskt lant- och stadshantverk ca 1400-1860*. (Meddelanden från Ekonomisk-historiska institutionen vid Göteborgs universitet 64.) Göteborg. 1991.
- . "Storjordbruken och den första varaktiga lantbruksundervisningen i Sverige: Edward Nonnens Degeberg." *Mellan bronssköld och JAS-plan - glimtar av Lidköpingsbygdens historia*. Red. Lidköping. 1996.
- . "Jordbruksteknisk förändring i Sverige under 1700- och 1800-talen - regionala aspekter." *Ett föränderligt agrarsambälle. Västsverige i jämförande behysning*. Av: Lennart Andersson Palm, Carl-Johan Gadd & Lars Nyström. Göteborg. 1998.
- . *Den agrara revolutionen 1700-1870*. (Det svenska jordbrukets historia. Bd 3.) Stockholm. 2000.
- Grace, D., "The Agricultural Engineering Industry." *Agrarian history of England and Wales. Volume VI 1750-1850*. Red: Mingay, G.E. Cambridge. 1989.
- Gunst, P., *Agrarian development and social change in Eastern Europe*. Aldershot. 1996.
- Hallén, P., *En studie i järn. Metoder att beräkna landsbygdsbefolkningens järninnehav 1750-1870*. (Rapport från Ekonomisk-historiska institutionen vid Göteborgs universitet 15.) Göteborg. 1999.
- Hansson, P., *Sambälle och järn i Sverige under järnåldern och äldre medeltid*. Uppsala. 1989.
- Haushofer, H. v., *Die deutsche Landwirtschaft im technischen Zeitalter*. (Deutsche Agrargeschichte. 5, Die deutsche Landwirtschaft im technischen Zeitalter.) Stuttgart. 1972.
- Helmfrid, S., Sporrang, U., Tollin, C. & Widgren, M., "Kulturlandskapsregioner." *Kulturlandskapet och bebyggelsen*. Red: Staffan Helmfrid. Stockholm. 1994.
- Herlitz, L., *Jordegendom och ränta. Omfördelningen av jordbrukets merprodukt i Skaraborgs län under fribetstiden*. (Meddelanden från Ekonomisk-historiska institutionen vid Göteborgs universitet 31.) Göteborg. 1974.
- Hildebrand, K.-G., *Svenskt järn. Sexton- och sjuttonhundratalet. Exportindustri före industrialismen*. (Jernkontorets bergshistoriska skriftserie nr 20.) Stockholm. 1987.
- . "Gammalt och nytt i det svenska järnets historia, en översikt över fem årtionden." *Svenskt järn under 2500 år. DÆDALUS*. Red. Stockholm. 1997.
- Historisk statistik för Sverige. Del 3. Utrikeshandel 1732-1970. Statistiska centralbyrån, SCB. Örebro. 1972.
- Horn, J., "Domestic standards of living in England and the Chesapeake, 1650-1700." *Material culture: consumption, life-style, standard of living 1500-1900. B4 proceedings Eleventh International Economic History Congress Milan, September 1994*. Red: Schuurman, A. & Walsh, L. Milano. 1994.
- Hymers, S. & Resnick, S., "A model of an agrarian economy with nonagricultural activities." *The American Economic Review*. LIX number 4 part 1 1969.
- Jirlow, R., *Die Geschichte des schwedischen Pfluges*. Stockholm. 1970.
- Jörberg, L., *A History of Prices in Sweden 1732-1914. Volume I-II*. Lund. 1972.
- Kamermans, J. A., *Materiële cultuur in de Krimpenerwaard in de zeventiende en achttiende eeuw*. Wageningen. 1999.
- Kardell, Ö. & Myrdal, J., *Jordbruket som system. Arbetet och gården i ett historiskt perspektiv, Institutionen för landskapplanering Ulltuna. Agrarhistoria nr 1*. Uppsala. 1999.
- Kitsikopoulos, H., "Standards of living and capital formation in pre-plague England: a peasant budget model." *Economic History Review*. LIII, No. 2 May 2000.
- Kjærsgaard, T., *The Danish revolution, 1500-1800. An ecobistorical interpretation*. Cambridge. 1995.
- Kuuse, J., *Från redskap till maskiner. Mekaniseringsutbredning och kommersialisering inom svenskt jordbruk 1860-1910*. (Meddelanden från Ekonomisk-historiska institutionen vid Göteborgs universitet 20.) Göteborg. 1970.
- Lerche, G., *Ploughing implements and tillage practices in Denmark from the Viking period to about 1800 experimentally substantiated*. Herring.
- Malanima, P., "Changing patterns in rural living conditions: Tuscany in the eighteenth century." *Material culture: consumption, life-style, standard of living 1500-1900. B4 proceedings Eleventh International Economic History Congress Milan, September 1994*. Red: Schuurman, A. & Walsh, L. Milano. 1994.
- Marshall, G., "The Rotherham plough. A study of novel 18th century implement of agriculture." *Tools & Tillage*. Vol. III:3 1978.
- McKendrick, N., Brewer, J & Plumb J-H., *The birth of a consumer society. The commercialization of eighteenth-century England*. London. 1982.
- Morell, M., *Jordbruket i industrisambället 1870-1945*. (Det svenska jordbrukets historia. Bd 4.) Stockholm. 2001.

- Myrdal, J., "Agrarhistoriens ämnesbyte." *Rig*. 69 1986.
- . *Medeltidens åkerbruk. Agrartechnik i Sverige ca 1000 till 1520*. (Nordiska museets Handlingar 105.) Stockholm. 1986.
- . "Grep, hackor, spadar och skovlar i hundratal." *Landbon, ladan och lagen och hägnaderna, arbetstiden och bygdelaget samt ytterligare 20 agrarhistoriska artiklar*. Red: Anders Perlinge. Stockholm. 1996.
- . "En agrarhistorisk syntes." *Agrarhistoria*. Red: Morell Larsson B., M., Myrdal, J. Stockholm. 1997.
- . *Jordbruket under feodalismen 1000-1700*. (Det svenska jordbrukets historia. Bd 2.) Stockholm. 1999.
- . *Gustaf Perssons liv och arbete*. Stockholm. 1988.
- Myrdal, J., & Söderberg, J., *Kontinuitetens dynamik. Agrar ekonomi i 1500-talets Sverige*. (Stockholm Studies in Economic History 15.) Stockholm. 1991.
- Nenadic, S., "Household possessions and the modernising city: Scotland c. 1720 to 1840." *Material culture: consumption, life-style, standard of living 1500-1900. B4 proceedings Eleventh International Economic History Congress Milan, September 1994*. Red: A. Schuurman & L. Walsh. Milano. 1994.
- Overton, M., *Agricultural revolution in England: the transformation of the agrarian economy 1500-1850*. Cambridge. 1996.
- Poulsen, B., "Agricultural technology in medieval Denmark." *Medieval farming and technology: the impact of agricultural change in Northwest Europe*. Red: Astill, G., & Langdon, J. Leiden. 1997.
- Resnick, S., "The Decline of Rural Industry under Export Expansion: A Comparison among Burma, Philippines, and Thailand, 1870-1938." *Journal of Economic History* 30. 1970.
- Roehl, R., "Patterns and structure of Demand 1000-1500." *The Fontana Economic History of Europe*. Red: Cipolla, C.M. London. 1976.
- Schuurman, A. & Walsh, L., "Introduction." *Material culture: consumption, life-style, standard of living 1500-1900. B4 proceedings Eleventh International Economic History Congress Milan, September 1994*. Red: Schuurman, A. & Walsh, L. Milano. 1994.
- Schön, L., "Järnet i jordbruksomvandlingen och industrialiseringen i Sverige 1800-1870." *Ekonomisk historiska vingslag. Festskrift tillägnad G. Fridelitzius, L. Jörberg. Skrifter utgivna av Ekonomisk-historiska föreningen, vol LIV*. Red: Krantz, O. & Ohlsson, R. Lund. 1987.
- . *Historiska nationalräkenskaper för Sverige. 2, Industri och hantverk 1800-1980*. (Historiska nationalräkenskaper för Sverige.) Lund. 1988.
- Sporrong, U., "Det äldre agrarlandskapet före 1750." *Kulturlandskapet och bebyggelsen*. Red: Helmfrid, S. Stockholm. 1994.
- . *Odlingslandskap och landskapsbild*. (Studier till kulturmiljöprogram för Sverige. Riksantikvarieämbetet.) Stockholm. 1996.
- Turner, M. E., Beckett, J.V. & Afton, B., *Farm production in England 1700-1914*. Oxford. 2001.
- Utterström, G., *Jordbrukets arbetare. Lennadvillkor och arbetsliv på landsbygden från frihetstiden till mitten av 1800-talet. Del I-II*. Stockholm. 1957.
- Valen-Sendstad, F., *Norske landbruksredskaper. 1800-1850-årena*. (De Sandvigske samlingers skrifter.) Lillehammer. 1964.
- Weatherill, L., *Consumer behaviour and material culture in Britain 1660-1760*. Cambridge. 1988.
- . "The meaning of consumer behaviour in late seventeenth- and early eighteenth-century England." *Consumption and the World of Goods*. Red: Brewer, J., & Porter, R. 1993.
- Wijsenbeek-Olthuis, T., "A matter of taste. Lifestyle in Holland in the seventeenth and eighteenth century." *Material culture: consumption, life-style, standard of living 1500-1900. B4 proceedings Eleventh International Economic History Congress Milan, September 1994*. Red: Schuurman, A., & Walsh, L. Milano. 1994.
- Wohlin, N., *Den jordbruksidkande befolkningen i Sverige 1751-1900*. (Statistisk-demografisk studier på grundval av de svenska yrkesräkningarna. Emigrationsutredningen. Bil IX.) Stockholm. 1909.
- . *Emigrationsutredningen. Bil. 12, Jordstyckningen: [tabellbilagor]*. (Emigrationsutredningen.) Stockholm. 1912.
- Yun, B., "Peasant material culture in Castile 1750-1900 some proposals." *Material culture: consumption, life-style, standard of living 1500-1900. B4 proceedings Eleventh International Economic History Congress Milan, September 1994*. Red: Schuurman, A. & Walsh, L. Milano. 1994.