

GNY-e.indd 1 05-04-20 14.00.02

ANCIENT NORTHERN EUROPEAN AXES GRÄNSFORS BRUK

Project Management and Text: Lovisa Brånby Layout: Roman Pixell, Karmatic Experience Group Translation from Swedish: Rosemary Hollis

Illustrations: Natella Nikolaevna Eremina-Enander
Photography: Lars Enander page 4, Olga Nielsen page 17 (upper picture)
and Svanthe Harström pages 2, 3, &17 (lower picture)
Pictures of the Bayeux Tapestry are taken from Mogen Rud's book:
Bayeuxtapeten - om slaget vid Hastings 1066, Tidens Publishing 1994

Printed in Sweden by Joma Tryck AB, Ljungby

ISBN 91-972266-4-5 © Gränsfors Bruks AB 2005

GNY-e.indd 2-1 05-04-20 14.00.02



Gränsfors Bruks – Learning From Times Gone By

Knowledge of past practice in the own area of work is essential for developing and changing a company. At Gränsfors Bruks we manufacture axes. The design of an axe is based on knowledge of axes accumulated over many generations.



At Gränsfors
Bruks,
we take it
upon ourselves not
only to
produce
axes of
high qua-

lity but also to sustain and spread knowledge about axes. This concerns both the manufacture of axes as well as the uses, handling and history of different axes. The motivation for this stems partly from our conviction that a continual building up of knowledge and skills is a prerequisite for the harmonious development of Gränsfors Bruks and partly from our passionate interest in axes.

A small part of Gränsfors Bruks' production consists of the forging of a series of replicas of *Ancient Northern European Axes*. The booklet you are holding in your hand, like the reproduction of ancient axes, is an effort to pass on a part of what we have learned from others. By spreading knowledge about axes we hope to create an interesting exchange of information.

We would like to thank all of our "axe friends" - including those of you who we have never met - who have helped us in the past and who hopefully will continue to help us expand our knowledge of axes in the future.

Gabriel Brånby, Gränsfors Bruks AB



Page 2

GNY-e.indd 2-3 05-04-20 14.00.06

Axe Lore – Knowledge to Maintain

During the latter part of the 20th century, the use of axes declined rapidly. This was due to the invention of the chain saw and other technical innovations used in areas such as forestry, the construction industry and energy production. Consequently, axe lore also decreased. Knowledge was lost not only within a dwindling group of users, but also among axe manufacturers and axe traders.

The smiths' tools



The axe has been developed over many thousands of years. Knowing about the culture and social history of the axe provides us with a better understanding of the design and function of axes used today.

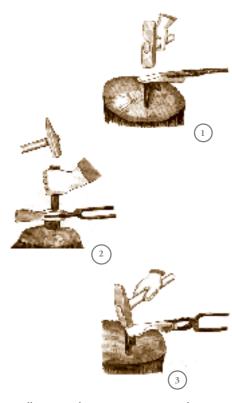
Gränsfors Bruks, which is situated in the northern part of the Swedish province of Hälsingland, has taken this particular aspect to heart, and axe lore manifests itself in a number of ways. For instance, through the tradition of axe manufacturing; the actual manufacture of axes today; the Gränsfors

different areas.

discerning "axe enthusiasts" at home and abroad, as well as documentation of knowledge. Past knowledge has been researched, applied, documented and learned by the smiths so that old knowledge is blended with modern techniques in

A consequence of Gränsfors Bruks' wide knowledge of axes and the forging of axes is that the company has become standard setting within the axe industry. An example of this is the elimination of unnecessary and resource-hungry, in some cases environmentally harmful production processes. This development has been welcomed from an environmental perspective by axe users and by other axe manufacturers, the result being that a number of competitors have tried to imitate Gränsfors Bruks' axes. Plagiarism is perhaps the best testimonial a product can receive, but an original remains forever an original.

The axe is still regarded as a useful tool in today's society, even though it is used less and axe lore has decreased considerably. Axes are still used and will continue to be used in the foreseeable future. This is why it is important that knowledge is revived, recorded and passed on.



Illustrations by N.N. Eremina-Enander from the book, Klassiskt Järnsmide, in which the axe-smith, L. Enander, demonstrates how different ancient axes are forged.

Page 5



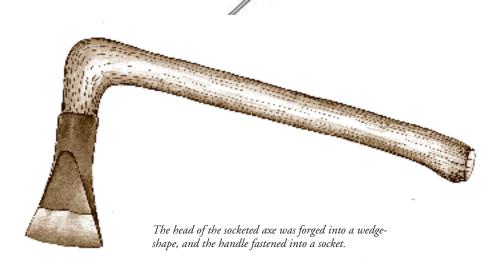
Development of The Iron Axe

Axes have been around for thousands of years and seen from an historical perspective may have been the most important tool used by man. Primarily, the axe has been used as a utility tool, but it has also served as a weapon and as a cult artefact to symbolise status and power. For many years, stone, bronze and copper were the most important materials used to make axes.

When iron extraction first began in Europe around 500 BC, iron became the predominant material for axe production. The art of iron extraction and use of iron brought about great economic and social changes. Agricultural work was intensified, which led to an increase in the population and a greater need for new equipment and better tools. The axe became a precondition for both development and survival.

A major problem for the smiths in those days seems to have been the uneven quality of iron, with regard to its properties and carbon content. Eventually, however, progress led to the refinement of iron into steel that could be hardened which resulted in a better end product. But, it took until the 20th century before steel could be produced industrially thus ensuring an even quality and carbon content.

Scandinavian smiths were influenced by craftsmanship in Europe during the time of the Great Migration, when both smiths and axes travelled between different countries and regions. In spite of this, regional characteristics of axes and broad-axes can be seen. For instance, some of the shapes of axes, which are typical for the Nordic countries, were developed at this time.



The earliest iron axes were the so-called *socketed axes*. These were forged into a wedge shape from the poll to the cutting edge. These axes did not have an eye - but rather the handle was fastened into a socket, which accounts for the name. This type of axe was a legacy from earlier socketed axes cast in bronze.

Socketed axes had a variety of uses: some

findings indicate that they were not only used as axes, but also as chisels and wood chisels.

In Scandinavia, socketed axes were in use until about the year 600. But, findings at burial places in Jämtland and Härjedalen suggest that this type of axe was in common use in these areas up until the Viking era.

Page 6

GNY-e.indd 6-7 05-04-20 14.00.12

1

During the 7th century, iron axes with oval *handle eyes* became common in Sweden, The

oval-shaped axe eye was a technical improvement, since the handle was firmly fixed and could not twist in the hole.

These handle-eyed axes were also forged into a wedge-shape, and had two exten-

ded lugs on each side of the eye below the axe-head. The lugs, which we now call "ears", enable the axe-head to get a firm grip on the shaft. This type of axe is called the *two-lugged axe*. During this period, the so-called *four-lugged axes* were also developed. These axes were quite common in Norway and Iceland.



The handle-eyed axes had two or four lugs and were forged into a single wedge-shaped piece. Above is a two-lugged axe and to the left an example of a type of four-lugged axe.

From the 11th century, axes were produced with a so-called handle-socket. At this time, axe blades were often larger and of a more even width. The thin-bladed combat axe also became common in the Nordic countries during this period.

Today, there are very few handles preserved from the early Iron Age, although the type of wood was probably the same as that used during the late Middle Ages and up until our time, i.e. beech, birch, ash, and witch elm. Axe handles were normally straight, but during the Viking Age curved handles were sometimes found on carving axes, for instance, to achieve a better balance. The handles on the felling axes probably remained straight until the end of the 19th century when American- style axes with curved handles became common even in Europe.

The socket and the blade were forged separately before being welded together.

Page 9

GNY-e.indd 8-9 05-04-20 14.00.14



The Axe As An Everyday Tool – The Utility Axe

During the Iron Age, the axe was primarily one of the most important tools used for cultivation. The axe enabled man to transform the natural landscape into cultivated land, and in many ways provided one of the basic conditions for the building up of society and culture.

carving since it only required the use of one hand to work with it. The felling axes were larger, heavier, and weighed between 800-1200 grams. These were used mainly for felling trees and timber to provide material for housing and building boats.

The early iron axes can be divided into the following groups: hatchets, felling axes, and later battle axes, of which hatchets and chopping axes became the most common utility tools. The wedgeshaped axe from the time of the Great Migration was developed into a typical utility axe.

The hatchets had short handles and the axe head seldom weighed more than 600 grams. Because of its size, the hatchet was an ideal tool to use for

The basic hatchets and chopping axes were later developed into new types of axes such as splitting axes and broad axes, which came to the Northern countries from Middle and Western Europe during the 7th century. The broad axe was used mostly for hewing timber and squaring

logs and planks. This meant the broad axe was of great importance in the construction of Viking buildings (skiftesverkhus)** and clinker-built boats***, both of which came into production in the latter part of the 7th century. This form of construction was particularly common

during the Viking Age.

In the first place, the early socketed and handle-eved axes were popular tools used for chopping and woodwork. However, the most common utility axes also had to serve as weapons until special axes more suitable for battle were developed.



Parts of The Bayeux Tapestry* illustrate that the axe was frequently used as a utility tool for felling trees and boat construction.

*The Bayeux Tapestry is approximately 70 meters in length (231 feet). It is embroidered in clear colours with scenes that depict the preparations for battle and the Battle of Hastings, 1066. The tapestry, woven in the 11th century, is preserved in the town of Bayeux in the west of France.

Page 10 Page 11

GNY-e.indd 10-11 05-04-20 14.00.16

^{**}Skiftesverksystemet denotes a type of house-building technique characterized by horizontal planks placed one on top of the other.

^{***} Clinker-built is a term used in boat building. In wooden boats, external planks overlap downwards.



1

The Axe As A Weapon – The Battle Axe

The Viking Age was between 800 and 1050 AD in the Northern countries. When the Vikings went into battle, the axe was an important weapon. It is sometimes difficult to separate the axes that were used in battle from craftsmen's axes

because during the early years these hand axes were at times also used in battle.

It would be quite wrong to describe the smiths' craftsmanship during the Viking Age as primitive. On the contrary, the methods used to

produce axes and other tools were well-developed. The axes were often distinctly wedge-shaped, functional and had a

balanced feel to them.

Gradually, the Nordic smiths developed a specific type of axe more suitable for battle. This axe became the predecessor for the future development of axes used in battle. The *battle axes* had wide edges and thin

blades and were often attached to a long handle by four lugs above and below the eye. In addition, the long curved blade was equipped with an accentuated steel edge. These thin-bladed battle axes were kept intentionally lightweight and the axe head seldom weighed more than 500 grams. The relatively slow development of the battle axe is probably due to its initial unpopularity as a weapon. People felt more at home using traditional weapons such as spears and swords, and at the

same time associated the axe with the traditional work of the craftsman.

Production of the thin-bladed battle axe began in the 10th century, and during the Viking Age these weapons became the

height of fashion. In all probability, axes were used in battles in Northern Europe long after the Viking Age had ended.



The battle axe was frequently used in great battles, which can be clearly

seen in the Bayeux Tapestry's depiction of the Battle of Hastings, 1066.

Page 12

GNY-e.indd 12-13 05-04-20 14.00.18



The Cult Axe – A Symbol of Power and Status

The axe has been a cult accessory and a symbol of power in many cultures since prehistoric times: in China, the Inca Empire, and Ancient Greece to name a few. That the axe was regarded as an object that possessed power and instilled fear was especially plain in ancient times. As an emblem of authority and the power to administer punishment, Roman officials wore a so-called fasces which consisted of a bundle of rods bound together around an axe with the blade projecting. The same symbol is found today on the coat of arms for the Swedish police and military police, the emblems of which show a bundle of rods with a projecting axe-blade.

During the Stone Age and Bronze Age, the axe was regarded as a cult accessory in Northern Europe, and remained so throughout the Iron Age and Viking Age up to present time. During the Viking Age, the battle axe was regarded primarily as a symbol of status and dignity in Northern Europe, which was most apparent in Norway and Iceland. The thin-bladed, four-lugged battle axe appeared on ceremonial occasions where it became a symbol of power and status for its owner. These axes were often elegantly decorated with, for instance, silver thread inlaid in the metal, and shaped both to please as well as to show the prosperity of their owner.

The battle axe acquired a particularly prominent role in Norway, since it was King Olav the Saint's attribute. King Olav the Saint of Norway, who reigned during the latter part of the Viking Age, later became Norwegian patron saint.

The battle axe as a symbol of power and status is illustrated clearly in several scenes on the Bayeux Tapestry. The picture shows Harald, who later became King of England, being offered the crown in the year 1066. He holds in his hand a characteristic battle axe as a manifestation of his power.



Page 14

GNY-e.indd 14-15 05-04-20 14.00.22



Replicas of Ancient Axes

Replicas are forged by hand at Gränsfors Bruks by the axe-smiths Lars Enander (LE)*, Claudia Kowalek (CK) and Ulrika Stridsberg (US). Lars is a fourth generation smith who for many years has had a special interest in the work of Viking Age smiths. He has been commissioned by various museums to forge replicas of iron findings from archaeological excavations.

The *Old Northern European Axes* in this series are based on original axes from the Iron Age and the Viking Age. The originals can be found at different museums. The design and final shaping of replicas is adapted so that it corresponds as far as is possible to the original.

From a social historical point of view, these replicas are useful because the quality of design means that we can actually try out some of the types of axes used by our ancestors. In the production process, the smith forges the replicas by hand shaping the glowing iron, heated to 1200 degrees Celsius by pounding it with hammers or sledgehammers. The smith's knowledge and craftsmanship is vital in this process. Not only should the replica resemble the original as closely as possible but it should also fulfil the demands for quality expected of a utility tool today. (The replicas are probably of better quality than the originals ever were).

After forging, the replicas made at Gränsfors Bruks are sharpened, tempered, annealed, and finally simply made handles are attached. Replicas are not kept in stock but are made to order.

*In co-operation with Karl-Gunnar Norén, Lars Enander has also written two textbooks on forging: Järnsmidesboken and also Klassiskt järnsmide, Nielsen & Norén publishing, 2001. Lars holds classes in the art of forging on a regular basis at Gränsfors Bruks.



The smith, Lars Enander, heating iron in the furnace.

After forging, the edge of the axe is sharpened



Page 16

GNY-e.indd 16-17 05-04-20 14.00.29







A Swedish axe developed during the 7th century and first used on the island of Gotland and in central parts of Sweden. The two lugs below the eye give the axe its characteristic look. The edge is short and straight.

The chopping axe is thought to have been used primarily for felling trees as well as for timbering when building houses and boats. Axes with a short edge, about 7 cm long and weighing about 1 kg had been used for felling and lopping trees right up into the 20th century.

This replica, forged by hand, is based on an 11th century axe discovered at Mästermyr on Gotland. The axe was found lying in a carpenter's toolbox, which indicates that it belonged to a versatile craftsman. The original axe is exhibited at the Museum of National Antiquities in Stockholm.

Straight handle, 75 cm Length of edge, 7 cm Weight including handle approx., 1.3 kg

Two-Lugged Beard Axe (Broad Axe)

A Swedish axe developed during the 7th century. The broad axe originally came to the Nordic countries from Western and Central Europe and was subsequently developed into two basic axe types: the twolugged and the four-lugged. The two-lugged broad axe is characterised by two lugs below the eye and was often quite big and heavy. It had a short handle and a long extended edge.

The beard axe was used primarily as a tool for woodwork and for cutting and smoothing planks, for example. This type of axe was an essential tool used for boat building and in the construction of Viking buildings (skiftesverkhus) which were built using horizontal planks.

This replica, forged by hand, is based on an 11th century axe found in Gothem on the island of Gotland. The original axe is exhibited at the Museum of National Antiquities in Stockholm.

Straight handle, 75 cm Length of edge, 15 cm Weight including handle approx., 1.6 kg

Page 18 Page 19







Four-Lugged Chopping Axe

A Norwegian axe from the 7th century which was developed into a western Scandinavian type. It is characterised by its four eye-lugs: two above and two below the eye. The axe has a relatively wide, curved edge.

Archaeological findings indicate that this type of axe probably formed part of people's personal equipment. It was used both as a hatchet and as a working axe, but also as a weapon in battle before the actual battle axe was developed.

This replica, forged by hand, is based on an axe dating back to the 9th century, and was found in Skåne in the southern part of Sweden. The original axe is exhibited at the Museum Kulturen in Lund.

Straight handle, 60 cm Length of edge, 12 cm Weight including handle approx. 1 kg

Battle Axe

This style of axe was developed in the Nordic countries during the 10th century. It is characterised by its four eye-lugs: two above and two below the eye. The axe has a wide, thin blade with a long curved blade with its accentuated steel edge.

The battle axe was common in the Nordic countries during the Viking Age and was considered the height of fashion. The axe was primarily used in battle, but also signified the power and dignity of its owner.

This replica, forged by hand, is based on an axe used during the Viking Age. The original is exhibited at Jämtlands Läns Museum in Östersund.

Straight handle, 85 cm Length of edge, 20 cm Weight including handle, approx. 1.2 kg.



Page 20

GNY-e.indd 20-21 05-04-20 14.00.35







Adze

A Scandinavian style axe from the Viking Age characterised by its transverse edge. The adze, or *tväryxa* as it was also called, was a type of axe with a wide range of uses such as in carpentry and as a cutting tool used to make boat frames.

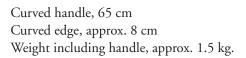
This replica, forged by hand, is based on several originals.

Straight handle, 65 cm Straight edge, 7 cm Weight including handle, approx. 1.3 kg

Gutter Adze

A Scandinavian style axe similar to the regular adze apart from its edge which is shaped differently. This adze is characterised by its sharply concave, bowl-shaped edge. The gutter adze was mainly used to hollow out timber, which this particular type of edge made possible.

This replica, forged by hand, is based on several originals.





Page 22

GNY-e.indd 22-23 05-04-20 14.00.37







Broad Axe

A Danish style axe from the 11th century, although the original type is in all probability much older. The axe is characterised by its long extended edge and its curved handle.

The broad axe was first and foremost a tool used for woodworking, such as in cutting and smoothing planks for house and boat construction.

This replica, forged by hand, is based on an original from the 11th century. The original axe is on display at the Viking Museum in Roskilde, Denmark.

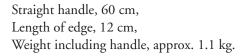
Curved handle, 50 cm Length of edge, 37 cm Weight including handle, approx. 1.3 kg.

Bearded Axe With Eye-Socket

A northern European axe dating from the early part of the 12th century. Axes with eye-sockets made their breakthrough in the early Middle Ages in Europe. A characteristic of this axe is the long, sturdy eye-socket, and also its wide edge.

The bearded axe with its eye-socket was developed from the two-lugged axe type and was used for timbering and splitting logs. It was probably also used for carpentry.

This replica, forged by hand, is based on a number of similar axe types from the early Middle Ages.





Page 24

GNY-e.indd 24-25 05-04-20 14.00.39



The Axe Museum

Adjacent to Gränsfors Bruks is the Gränsfors Axe Museum. The museum's collection consists of approximately 2000 axes, both old and new, mostly from Sweden.

extensive information is also available. This museum is not run for profit. The collection came about thanks to the many gifts received and voluntary work.



The exhibition includes everything from early iron axes and replicas of old models to brand new industrially manufactured axes. Besides the many axes displayed, The Axe Museum in combination with the ongoing production of axes at Gränsfors Bruks form the basis of our holistic approach - an approach that provides an understanding of the cultural background and social history of the axe.

The museum is situated at Gränsfors Bruks' Axe forge between Hudiksvall and Sundsvall, 10 km

from the E4 highway, on the road between Gnarp and Bergsjö. The museum is almost always open.

Phone Sweden: +46 652 71090

Page 26



References and Bibliography

Greta Arwidsson och Gösta Berg: *The Mästermyr Find* Larsson Publishing Company, 1999

Lars Enander and K.G. Norén: *Järnsmidesboken* Nielsen & Norén publishing, 1998

Lars Enander and K.G. Norén: Klassiskt Järnsmide Nielsen & Norén publishing, 2001

John Haywood: Historical Atlas of the Vikings Penguin books, 1995

Lars Holmblad and J. Leonardsson: *Vikingarnas värd*Museum of National Antiquities, 2001

Tomas Johansson: Forntida teknik ICA publishing, 1993

Susan M. Margeson: Viking Dorling Kindersley Ltd., 1994 Karl L. Mörkved: Oksa som skogsverktoy Reprinted from the yearbook, The Norwegian Forestry Museum, 1961-1962

Carin Orrling: Vikingar The Swedish Institute, 1997

Mogens Rud: Bayeuxtapeten - om slaget vid Hastings 1066 Tidens publishing, 1994

G. Steinsland and P. Meulengracht: Människor och makt i Vikingarnas värd Ordfront publishing, 1998

Håkan Strotz: Yxans utveckling från stenåldern fram till i dag. Thesis written at Skogshögskolan in Umeå, 1994

The exibition *Vikingar* held at the Museum of National Antiquities in Stockholm, Autumn 2001

Gränsfors Axe Museum

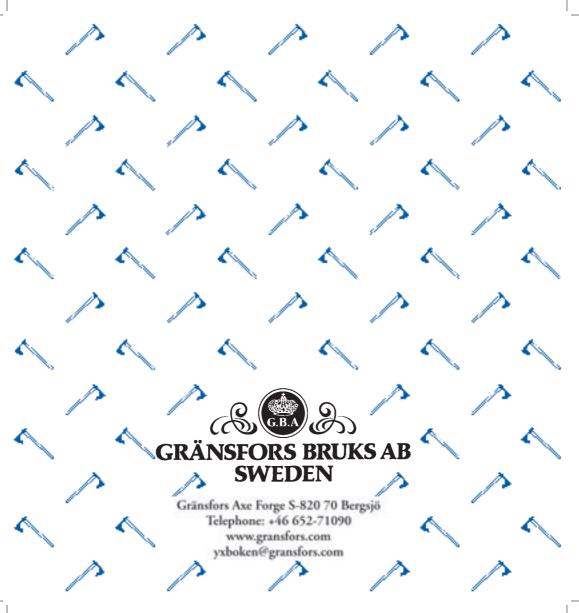
Sidan 27

GNY-e.indd 26-27 05-04-20 14.00.41



Gränsfors Bruks has manufactured axes since 1902. In addition to the book of *Ancient Northern European Axes*, Gränsfors Bruks also publishes *The Axe Book*, translated into four languages, and also the book: *Yxa med dubbelegg* (Double-Bit Axes) in co-operation with The Swedish Axe Throwing Society. The Axe Book can be ordered through: www.gransfors.com

GNY-e.indd 28-3 05-04-20 14.00.44



GNY-e.indd 4 05-04-20 14.00.46