Experimental Viking Shield – Built and tested by Lord Aonghus ill ulfr
750 – 1000 CE – Norse Settled Hebrides, Scotland

Introduction

One of the images most people reference when discussing the Viking age is the sight of a ship with brightly painted shields along the rail. It has become something of an iconic picture, from fantasy novels to television productions. However, one of the fascinating aspects of Viking shields which many laypeople do not know is that their construction methods and materials differed a great deal from many of the shields in period.[1] While many other cultures at the time would build shields from a solid plank of dense wood or even multiple planks of thinned hardwood, the Norse cultures of the Viking age built shields using very thin, relatively soft woods.

While there have been many theories behind why they did this, ranging from maneuverability to trapping weapons mid-swing, we have no solid answers and there has been relatively little testing done on shields constructed using *entirely* period techniques.

Striking the first blow while testing a period shield - the axe became hung up in the shield right away.

[1] Kane, Njord. - Norse Armor and Weaponry; The Vikings : The Story of a People - 2015.

Bearing all of this in mind, I decided that it was important to have a more hands on understanding of how a period shield for my persona would have been constructed and how it would have functioned.
I aimed to use completely period materials, tools and methods wherever possible and, with a certain amount of trepidation, to test the resulting shield out with live, sharpened steel and see exactly what it could withstand.

Shields in period

Shields are one of the several instances in Viking historical study where the literary sources and archaeological sources differ to a noticeable degree. The Norwegian Gulaþing and Frostaþing laws discuss the construction of a shield, confirming it should be made of wood with three iron bands and a handle fastened to the back side by iron nails, with later notes suggesting a double layer of boards and decoration of Red and White paint.[2] We even see saga discussion of shields being made specifically of Linden wood and being bound with iron rims.[3]

However, in the archaeological record we find only shields with one layer of boards and rarely with any kind of iron bands let alone an iron rim. The most in tact shields found were part of the Gokstad ship burial[4] and were of a slightly larger diameter than most other shields found. Most seem to be made of boards held snugly together on a horizontal and pinned in place by at least one wooden grip attached vertically to the boards and sometimes with subsequent supporting bars on either side.
The U-shaped metal edge bindings like those found in Vendel, Välsgarde, and Thorsbjerg were obsolete by the Viking Age and shields tend to survive mainly in parts and pieces. However, we do have evidence of repeated piercing along the edges of more complete shields and most scholars agree that rawhide or leather would have been sewn around the edges. There is some small amount of archaeological evidence to show that leather or fabric would have been stretched over the boards and glued in place and that the shields would have been painted for decoration.[5] The Gokstad shields had no covering and the paint was applied directly to the boards, leading to the belief that they were simply for display as part of the burial.

The Norse had access to various pigments, even in my earlier section of the Viking age, and could produce bright colours.[6] We do have evidence from period images, the Sagas and from the archaeological record of shields being painted, generally with more simple geometric designs or forms. [7]

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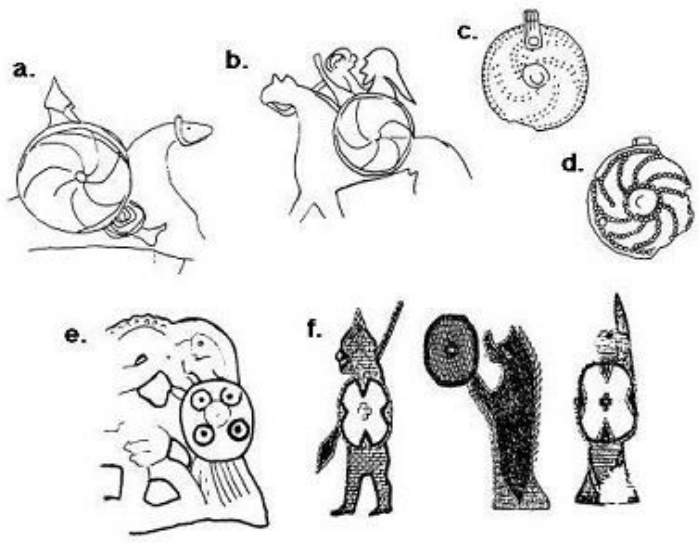
[2] Larson, Laurence - The Earliest Norwegian Laws; Being the Gulathing Law and the Frostathing Law - 1935
[3] Smiley, Jane - The Sagas of the Icelanders - 2005
[4] Nettredaks, P. The Gokstad Burial. UIO. 2015.
[5] Ardwisson, G. - Birka II: Systematische Analysen der Gräberfunde, vol. 2. KVHAA - 1986
[6] Colors, Dyestuffs, and Mordants of the Viking Age: An Introduction - Retrieved from https://www.cs.vassar.edu/~capriest/vikdyes.html - Copyright © 1991, 1997, 1998, 1999 Carolyn Priest-Dorman
[7] Lowe, S. - Everything you wanted to know about Viking shields (and one helmet) but were afraid to ask. - Varangian Voice (issue 17), p. 24-25. - 1990



Shields in contemporary art. a, b. Stones Gotland 7-8th CE, c, d. Silver shield pendants, Birka 10th CE., Bronze pendant, Hedeby 10th CE., f. Tapestry fragments, Oseberg 834AD

Materials and Tools in Period

From the Archaeological finds we can confirm that most shields were generally constructed of seven to eight planks, which were 7 to 10mm thick in the center and chamfered down to 4 to 6mm thick towards the edges. The planks were usually made from fir, alder, pine or poplar wood.[8]

As cited above, evidence suggests that they were laid horizontally and pinned together by vertical bars including the grip. They were possibly also glued together using hide glue, then covered by leather or fabric glued in place before being painted and rimmed with rawhide or leather.

The boards would have been split from the trunk using a mallet and wedges before being smoothed, cut and shaped using a drawknife, chisels, small saws etc. Holes for sewing the rawhide into place could be drilled with a T-handled drill or punched with an awl. Sewing would be done using waxed thread or sinew and the paints would be from natural pigments such as ochre bonded with milk, eggs, pine sap or linseed oil. [9,10,11,12,13]

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[8] Beatson, Peter - The 'Viking Shield' from Archaeology - Retrieved from - members.ozemail.com.au/~chrisandpeter/shield/shield.html - Copyright 1995-2010

[9] Morris, C. Wood and Woodworking in Anglo-Scandinavian and Medieval York. 2000.

[10] Halstead, G. "Interior Wood Finishing in Medieval and Renaissance Europe". Medieval and Renaissance Woodworking Website, "Woodworking Techniques" section. 2001.

[11] Arwidsson and Berg. The Mastermyr find: A Viking Age Tool Chest from Gotland.

[12] Kvamme, R. Anglo-Scandinavian Shoes in the style of Jorvik's Danelaw finds. 2016

[13] Mould, Q, Carlisle, I and Cameron. E. Craft, Industry and Everyday Life. Leather and Leatherworking in Anglo-Scandinavian and Medieval York. Vol. Vol. 17, Fasc. 16 The Archaeology of York.; the Small Finds. 2003.

Materials and Tools I used

- Poplar boards - 6 purchased from Home depot and one split from a trunk and processed by hand using period tools.
- Linen fabric
- Period drawknife, mallet, wedges, saw, chisel and T-handled drills.
- Period hide glue.
- Period appropriate milk paint.
- Pine sap.
- Iron nails.
- Pine boards for grip and shield support bars.
- Pine pegs.
- Rawhide edging.
- Synthetic sinew.
- Metal straight needle.
- Leather scraps for grip.
- Viking wood clamps.
- Viking style two handed axe with fully sharpened blade.
- Metal shield boss.

My Process

- I aimed to make all of the boards myself, but I could only obtain one relatively small Poplar log and it was very knotty and malformed. Using a mallet and wedges I was able to split enough useable wood from it to make one single board.
- I purchased poplar boards from the store which were roughly 9mm thick and then shaved sawed the board I split to roughly the same dimensions.
- The boards were laid flat on top of some other wood and pegged tightly into place with a thin amount of hide glue along the edge of each board and weighted on top.
- Once the glue had dried I used some scrap pine to cut two reinforcing bars and used a T-handled drill to bore holes for pegs. The pegs were hammered in to join the boards to the bars.
- I used some charcoal and a string to roughly mark out the circle for the shield and the hole for the grip, then I sawed this out before using a chisel to roughly chamfer the edges of the shield down to about 5mm.
- The shield was painted with hide glue and then a sheet of linen fabric was tightly stretched over it, held in place with Viking wood clamps, allowing it to be completely soaked through with the glue. This was repeated on the back side, too.
- I heated pine sap and mixed the milk paint into it to create something with a thicker glaze which might be more weatherproof. This was painted on to the front of the shield as a coat of yellow and then three coats of red, then one coat of yellow on the back. The red was painted in such a way as to allow the yellow to show through a cross and block design.
- I used a T-handled drill to bore holes around the edge of the shield then soaked the rawhide

before cutting it into strips. It was then held roughly on to the shield using Viking wood clamps and sewn into place using synthetic sinew.

- The boss was attached using iron nails clenched on the rear.
- The grip was very roughly shaped using a belt knife and then attached using iron nails attached alternately from the front and back of the shield. The small nails attached from the back helped to hold it in place while the longer nails attached from the front were clenched to attach the grip securely.
- The grip was wrapped in leather scraps for comfort.
- The shield was strapped to a pell taught enough to simulate being held by a trained fighter but with enough give to simulate that person moving the shield and using it defensively.
- I used a period appropriate two handed axe to attack the shield, marking each blow with notes on the direction, type, force and damage until the shield was no longer useable.

Observations

I like to think I have spent a lot of time and have invested a lot of myself into creating well researched projects using the most period appropriate tools and materials as much as I can, even making the tools where needed.
It takes a lot of patience and fortitude when you know how much faster you could do something with a power saw, but I have always found it to be a great learning experience and incredibly worthwhile. The idea of spending so much time creating something knowing I was going to destroy it was terrifying. But I was also very excited to see how a shield constructed in this way would hold up and, especially, to see if there was a marked difference between the modern milled boards and the board split by hand.

I was slightly disappointed by the results of the painting. Adding the pine sap to the milk paint resulted in a thick, clumpy paint which wouldn't spread well and didn't cover very easily. It was also hot enough to loosen the fabric glued to the boards and cracked noticeably when drying. If I were to do another similar project I would definitely use the paint on its own or mix my own pigments with linseed oil.

Overall I'm incredibly happy with how the shield held up. For something so thin and light which felt incredibly flimsy, it took 16 full force blows to bring it to a point where it was no longer functional anymore. With one of the final few blows the boss was broken off of the body and this allowed me to smash the grip.

From the early blows my axe got hung up repeatedly, and even when the boards did split the linen and rawhide held everything together strongly enough for it to be still be a fair defensive tool. Had someone had been strategically using and moving it while I was swinging those blows I think it would have lasted a lot longer. Add to that how often my axe got caught up, whoever was behind it would have been taking good shots at me at the same time.

While I do trust my workmanship I was genuinely surprised by how sturdy and useful this shield would have been for defence as well as how light and maneuverable it would have been.
I'd like to eventually repeat the experiment with all of the boards being split by hand and create a number of shields, one each using milled boards with a leather or fabric covering and the same but

with split boards. I think this would let me test them to a further extent, especially if I could rig some kind of pulley system to allow the shields to mimic defensive movements during the experiment.

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APPENDIX

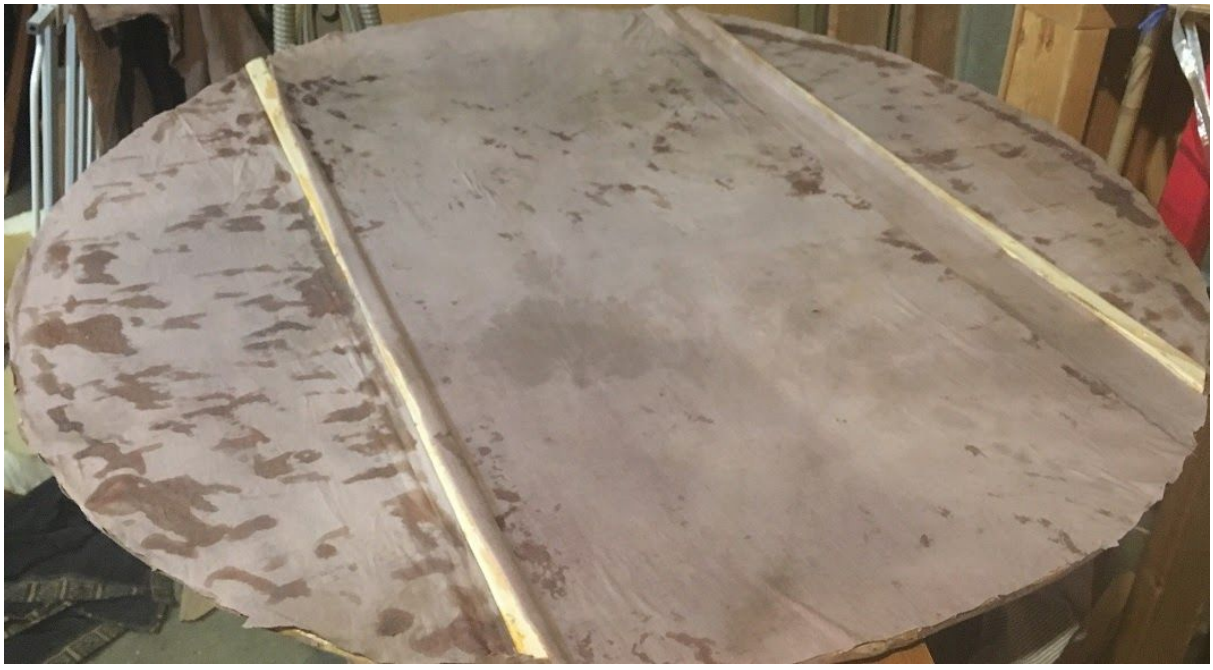
The boards laid flat, glued along the edges and held tightly in place with pegs while the glue dried. Random woodstuffs for weight.

The pine bars pegged solidly into place before excess length was trimmed off.

The body marked for cutting.

After sawing the body out. About to begin chamfering the edges.

Gluing the linen into place and stretching it while held by wood clamps.



The first layer of milk paint mixed with pine sap. It was clumpy and awful to work with but did provide an incredibly glazed look and a very thick, sticky paint after a few layers.

The shield finished and strapped up for testing.

After the very first blow my axe got caught up. In this picture the axe is not being held by a person, simply hanging in the board. It took a certain amount of work to remove it and the board barely

split.

By the third blow the boss loosened, but stayed in place. The axe was hung up in the shield very thoroughly again.

After 13 solid blows the boss fell off and I began to aim blows for the centre while trying to maintain a realistic approach, as if I were genuinely in a fight with an opponent who might also be

moving the shield and aiming blows at me.
On the 16th blow I managed to hit the centre are of the shield and the grip shattered, coming away from the body of the shield in most places.
With this no longer providing central support the boards which had split flopped back and forth, which they had not been doing before.

The back of the shield and the shattered grip.