

Report of the first seven months

1st of Sep. 2018 – 31st of March 2019

Introduction

The 1st of September 2018, the *Fashioning the Viking Age* project, funded by THE VELUX FOUNDATIONS, was launched at the National Museum of Denmark, Department for Ancient Cultures of Denmark and the Mediterranean (NM). The project is a collaboration between NM and Centre for Textile Research, University of Copenhagen (CTR) and Land of Legends, Lejre (LL). The general aim of the three-year research and outreach project is to create new and archaeologically well-founded interpretations and reconstructions of Viking Age textiles and clothing.

The main participants:

- Ulla Mannering (UM), Project Leader, NM
- Charlotte Rimstad (CR), Project Coordinator, NM
- Eva Andersson Strand (EAS), Director of CTR, UCHP
- Ida Demant (ID), Leader of the Textile Workshop, LL.
- Irene Skals, Conservator (IS), NM

Other participants:

- Anne Lisbeth Schmidt, Conservator, National Museum of Denmark: Microscopy of skin and fur
- Arne Jouttijarvi, Materials Scientist, Heimdal-archaeometry: Analyses of iron and gold objects
- Carsten Gundlach, Physicist, Technical University of Denmark: CT scanning
- Freja Astrid Petersen, University of Copenhagen: Student
- Fria Gemynte, Textile Technician, Land of Legends: Dyeing of textiles and clothing items
- Henriette Lyngstrøm, Archaeologist, SAXO-Institute, University of Copenhagen: Analyses of iron
- Ida Andersen, University of Copenhagen: Student
- Ina Vanden Berghe, Scientist at KIK-IRPA, Brussels: Dye analyses
- Inger Heebøll, Ceramist, Land of Legends: Production of spindle whorls and loom weights.
- Irene Skals, Conservator, emerita: Fiber analyses
- Jens Barnkob: Production of spindles
- Lise Ræder Knudsen, Conservator, Vejle Conservation Centre: Analyses and production of tablet weaves
- Luise Ørsted Brandt, Archaeologist, National Museum of Denmark: Species identification of skin and fur
- Mette Stener Hoe, Sheep Breeder: Provider of Spelsau wool
- Signe Nygaard, Conservator, National Museum of Denmark: X-ray
- Signe Vind, University of Copenhagen: Student
- Stiftung Schleswig-Holsteinische Landesmuseen Schloss Gottorp: Textile samples from Hedeby
- Søren Ravn, Craftsman, Land of Legends: Production of “Mästermyr” chest and wood tools.
- Theresa Emmerich Kamper, Archaeologist, University of Exeter: Analyses of tanning methods and sewing of skin garments
- Torben Sode, Conservator, Glass Bead Trading: Production of bead replicas
- Ulla Lund Hansen, Archaeologist, emerita: Analyses of the beads

- Vivi Lena Andersen, Archaeologist, Museum of Copenhagen: Analyses of shoes
- Åse Eriksen, Weaver, Bergen: Production of samite and silk tabby weaves

Status of the sub-projects

The project consists of three parts that are interlinked and produce knowledge to each other.

Part 1: Viking Age Textile Production

The aim of the first part of the project is to make Viking Age textile production visible and tactile. This part has its starting point in analyses of known archaeological finds of textile tools, textiles, skins and fibres from graves and settlements. By using controlled fibre sorting, spinning and weaving experiments we recreate a selection of textile samples that convey tactile and visual aspects of the Viking Age cloth culture.

ID and EAS are responsible for Part 1. In spite of the employment at the National Museum of Denmark, ID is working at Land of Legends in Lejre with whom a formal collaboration agreement was signed. In order to decide which textiles we wanted to base the reconstructions on, we visited Stiftung Schleswig-Holsteinische Landesmuseen Schloss Gottorp in Schleswig in September 2018 where a formal collaboration agreement was signed. Here we saw a selection of the Hedeby textiles and took out samples for fibre and dye analyses. The Hedeby textiles are suitable for reconstruction purposes as they represent a great variety of textile techniques and types and further a large part of them have been identified as parts of known garment types, made for everyday use.

In the autumn 2018, IS made fibre analyses of all the Hedeby textile samples, comparing the wool qualities to samples from modern sheep breeds that we collected on a study trip to the Swedish farm, Bonderup in Scania. In general, the sampled Viking Age wool proved to be much coarser than the wool earlier recorded from the Danish Bronze and Early Iron Ages. In general, it has a fibre quality that matches a modern Spelsau fleece, among other fleeces. ID searched for suitable fleeces for the reconstructions and ended with a Spelsau fleece from a sheep farmer, Mette Stener Hoe, in Western Zealand.

The following Hedeby textiles were chosen for reconstruction:

- Sample 1: H14, fragment of a dress in tabby
- Sample 2: H2, fragment of a hose in 2/2 twill
- Sample 3: H39AB, fragment of trousers in diamond twill/ herringbone twill

Several different replicas of textile tools were needed to make the reconstructed textile samples. Wool combs were produced by craftsman Søren Ravn Stadsholt from Land of Legends, based on a Norwegian find of wool comb iron teeth. Eight spindles were produced by craftsman Jens Barnkob, and spindle whorls and loom weights of clay were produced by ceramicist Inger Heebøll, also from Land of Legends. She created seven different sizes of spindle whorls, weighing from 5-48 grams as well as 76 doughnut-shaped weight looms of 200 g, 56 of 400 g and 48 of 600 g.

From mid November to mid December 2018 the warp for Sample 1 was spun on a drop spindle with a 20 g whorl on a 19 cm and 21 cm spindles. The weft was spun from 3rd to 6th January with a 15 gram whorl/19 cm spindle. The warping of the warp-weighted loom and the weaving was done in January and the weaving speed was about 3 cm/hour. Especially the changing of the shed was time consuming. Sample 1 was taken off the loom the 12th of March during a project meeting. At that time, the weave was more open than the original textile H14 from Hedeby, but it is estimated that after washing, the textile will shrink to the desired density.

Until the month of May, ID continues the spinning and weaving processes with Sample 2 and 3. In this spinning process, a distaff was introduced. Meanwhile, Søren Ravn Stadsholt is working on a wooden chest, the so-called "Textile & Tool Box" that will contain textile samples as well as the used tools and different fibre samples. The chest is based on the chest from Mästermyr, Gotland in Sweden.

In November ID was assisted by intern Julia Hopkin (JH) from Exeter University, who is doing a MA in experimental archaeology. JH helped separating and combing wool for the warp of sample H14.

In January, February and March ID was assisted by intern Mia Lohse (ML). ML helped washing, sorting and combing the wool for sample H2, and she wove an extra piece of sample H14 using up the last of the warp. During their internship both JH and ML also helped creating costumes in LL.

Part 2: Viking Age Male and Female Clothing

The aim of the second part of the project is to reconstruct a male and a female outfit, based on textiles from two Danish inhumation graves. The male grave is from Mammen, near Viborg in Jutland, dated to AD 970-971 and the female grave is from Hvilehøj, near Randers in Jutland, dated to the late 900s. The textiles in both graves are fragmented, but still much larger than in preserved average Viking Age graves in Denmark. UM and CR are responsible of Part 2.

The analyses of the textile fragments began in September 2018 in the Conservation Department, NM in Brede. First, we created an overview of all objects from the graves, not only the textiles, but also accessories and tools as well as preserved feather/down layers. All objects were photographed by Roberto Fortuna and Jenny Sundby from NM. They used a high resolution camera to take standard object photos as well as photos with light from beneath which revealed an until now unrecognized world of stitch holes in the textile fragments, representing degraded and now lost sewing and embroidery.

The textiles went through technical analyses where measurements of size, fibres, thread diameters, thread density, twist directions ect. were recorded separately for each grave. The analyses were done with an analogue as well as a digital microscope. Analyses of skin/fur, tanning methods, tablet weaves, silk samite, beads, iron objects, shoes and feathers/down are still ongoing and done by specialists (see list above).

One of the textiles from Mammen has embroideries, but it consists today of 64 fragments that have never been reunited since the unprofessional excavation in 1868. In order to puzzle the pieces back together, CR transferred the photos of the fragments to Photoshop and marked all the embroidery pattern with color codes, giving each pattern its own colors. The photos were then printed and the fragments cut out. The puzzle is still ongoing and it has already been possible to put several pieces together.

During the excavation in 1868, a lot of downs and feathers were also found, presumably from a mattress underneath the deceased. The blocks of feathers/downs are preserved at NM, some still with impressions of bones. A small box of feathers proved to contain tiny gold threads that have never been recorded before.

In 1986 the Mammen grave was re-excavated and more small textile fragments were found. These are kept at Viborg Museum today and a study trip to the museum enabled us to photograph the small fragments which were from the embroidered textiles. We also recorded the famous "Viborg shirt" of flax, dated to around 1000 AD which will probably be used as inspiration for our reconstructed shirt.

Altogether, textile, skin and leather have been recorded from the Mammen grave.

The Hvilehøj fragments differ from the Mammen fragments in being much smaller and having more complicated micro stratigraphies. Each and every fragment was analyzed in order to establish a general stratigraphy for the textiles, fur and feathers in the grave. The fragments consist of many different components, such as tablet-woven bands, samite bands, silk tabby, fur, wool tabby, wool twill and

feathers/downs. The grave finds also included a pair of shoes, a bead necklace, a large pair of scissors, two knives, a whetstone and a spindle whorl; all of which will be replicated.

Altogether textile, skin and leather have been recorded from the Hvilehøj grave.

The analyses of all the textiles are nearly done and samples for dye analyses will be taken in the nearest future. The next step is to decide the clothing patterns for each garment and find suitable materials for the reconstructions.

Part 3: Viking Age Clothing and Textile Catalogue

The aim of the third part of the project is to create an overview of the many different sources linked to Viking Age clothing design. The archaeological sources consist of preserved skin and textiles, but also jewelry and other accessories. Iconographic sources, such as gold foil figures, pendants and tapestries contribute with knowledge about visual appearance and combinations of clothing items. Other important sources are contemporary and later written sources, such as the Icelandic Sagas, travel descriptions and chronicles. As many sources as possible are gathered in order to show the variation of Viking Age life and avoid garment stereotypes.

The product will be an online open-access catalogue that can provide a new and updated foundation for future interpretations and reconstructions of Viking Age clothing in different societal and status segments.

Though part 3 is scheduled to begin in the autumn of 2020, EAS and CR have already begun reading the Icelandic Sagas, extracting all words about textile, clothing, sails, general looks and hygiene. The words are entered into an Excel data sheet, but the future plan is to create a proper database for the terms that can easily be accessed.

Meetings and collaborations

Until 31st of March, we have had nine project meetings, either at NM, UCPH or LL. Minutes were taken at all meetings. Further we have held many different meetings with our collaborators (see above) in Brede to show them the relevant objects.

At the Saxo Institute, UCPH, we announced a meeting for the students who wanted to be involved in the project. The meeting was held at NM the 11th of December 2018 and three students attended, Ida Andersen, Freja Astrid Petersen and Signe Vind. They also attended a meeting in LL the 23rd of January 2019 and in the upcoming months, they will have different tasks in the project. We have furthermore made an agreement with Associate Professor Henriette Lyngstrøm, UCPH, that her students can use the project as starting point for their assignments about iron objects and experimental archaeology.

In September we had a meeting with Nanna Nielsen, a visual anthropologist who was interested in making a short movie (3 minutes) about the project. This is still an open offer and will cost about DKK 40.000.

A collaboration with Copenhagen Fur was declined and it was decided to work with Theresa Emmerich Kamper, UK, instead for the production of the fur and skin garments. Theresa can provide the needed furs and skins, tanned in the correct way. Furthermore, she is an experienced skin maker and has sewn many skin garments before.

On the 12th of March we had a meeting in Land of Legends where archaeologist Stella Macheridis from University of Lund attended. Stella is working on a post doc about sheep breeding in the Late Germanic Iron and Viking Age and her research will be valuable to the project when it comes to mapping the evolution of the sheep breeds and wool types.

Photography, X-ray and CT scan

We have had two photography sessions with Roberto Fortuna and Jenny Sundby at NM in Brede. The first took place from the 2nd-4th of October 2018 where all the textile from Mammen and Hvilehøj were photographed. The second took place the 28th of January 2019, where the exhibited Mammen textiles were brought to the photo studio in Brede and back in one day. Also, the textiles, fibulae and bones from the graves of Slotsbjergby and Fløjstrup were photographed.

Signe Nygaard from NM took X-ray photos of a selection of textile finds from Mammen and Hvilehøj with gold and silver threads included.

One of the textile fragments from Hvilehøj was CT scanned at the Technical University of Denmark (DTU), in order to observe a precise layer sequence. The data of the scanning is still being processed at DTU.

Study trips

We have been on four study trips to collect knowledge and samples:

- 30th of August 2018: Visit at Den Gamla Skolan, Bonderup, Scania to look at wool from modern, primitive sheep breeds (UM, EAS, CR, ID). We thank Inger Sommarin for the warm welcome.
- 13th-14th of September 2018: Trip to Stiftung Schleswig-Holsteinische Landesmuseen Schloss Gottorp, Germany to look at the textiles from Hedeby and take samples for fibre and dye analyses. We thank Dr. Volker Hilberg and Conservator Gerhard Stawinoga for the warm welcome.
- 15th-17th of October 2018: Workshop at State Historical Museum in Stockholm and Sigtuna, Sweden. (UM, EAS, ID, CR). The workshop was arranged by our collaborative network *Cloth Cultures in and Beyond the Viking Age*, Amica Sundström, Historiska Museet Stockholm and Charlotte Hedenstierna-Jonson, University of Uppsala. The workshop included looking at textiles from Birka and Sigtuna as well as talks from different participants.
- 22nd -23rd of January 2019: Trip to Viborg Museum to look at textile fragments from Mammen and the Viborg shirt (UM, CR). We thank Margit Petersen for her kind help and sharing her great expertise.

Media and publications

Instagram

Our Instagram profile, @fashioningthevikinage, was created the 13th of September 2018, with 39 likes for the first post. On the 31st of March 2019, the project had about 300 followers and 42 posts, the latest being the 27th of March about the puzzle of the embroidered Mammen fragments, resulting in 73 likes. Our followers generally seem to like the profile and comments have only been positive.

Facebook

The project has posted five new feeds on the Facebook site of DMO, NM until 31st of March, the latest being a post about a radio interview with CR, resulting in 71 likes. As the future of this Facebook profile is currently uncertain it has been decided to use the CTR Facebook profile instead. The latest post from 11th of March resulted in 229 likes, 7 comments and was shared 108 times. The post reached 15.566 people.

Media

The general high interest in the project has resulted in a number of articles and radio interviews in different media.

- 15th of August 2018: Article in *Historie-online*, <http://www.historie-online.dk/nyheder-og-aktiviteter-2-2/vikingetiden-bliver-klaedt-paa>
- 10th of October 2018: Article on Natnet about the new project: *Velklædt i Vikingtiden*
- 3rd of December 2018: CR on the radio in *Kulturen på P1*, <https://www.dr.dk/radio/p1/kulturen-pa-p1/kulturen-pa-p1-2018-12-03#!01:15:26>
- 10th of December 2018: Lærke Flindt Mathiesen. Forskere vil lave online videnskatalog med alle kilder til vikingernes klædedragt. *Science Report*, 10th of Dec. 2018.
- January 2019: Metter Stener Hoe. Spælsau I vikingetiden? *Spælsau Nyt* 1/19
- March 2019: Tine Bonde Christensen (Communication Officer at NM), 2019. Fra tenvægt til vikingetidsdragt. *Fund & Fortid*, no. 1, 2019, pp. 21-22.

Lectures

Six lectures were given, linked to the project. These were:

- 16th October 2018: Workshop on Household Textiles, Sigtuna, Sweden (UM, EAS, CR, ID, IS) invited through the network Cloth Cultures in and Beyond the Viking Age. Lecture *Introduction to Viking Age Household textiles* (EAS)
- 30th of November 2018: Celebrating the beginning of the project at UCPH (EAS, CR, ID, IS)
- 12th -14th of December 2018: Conference *Weaving War: New perspectives on violence and society in the Viking Age*, University of Oslo. Lecture: *Fabrics of War* (EAS)
- 20th of December 2018: Presentation of the project to the DMO colleagues at NM (UM, CR)
- 15th of March 2019: Lecture about Late Iron Age iconography and clothing, SAXO Institute, UCHP (UM)
- 23rd of March 2019: Lecture about Fashioning the Viking Age at Trelleborg, Slagelse (UM)

Publications

One article was published in 2018:

- Mannering, U. (2018) Fashioning the Viking Age, *Archaeological Textiles Review* 60, 114-117.

Preliminary results and future goals

Especially the fibre analyses have proven to be very important for the understanding and visualizing of Viking Age textile appearance, high-lighting the differences of the fleece types and the variations of the Viking Age textile qualities. The quality of the reconstructed textiles will therefore always depend deeply on the chosen wool types.

The project is working with archaeological finds that were excavated many years ago and which have thus been analyzed and interpreted several times before. By using new methods, such as high resolution photography with light from beneath, digital microscopy, Photoshop, CT scanning and fibre analyses, it has been possible to extract new information about production, use and original appearance of the textiles.

The project thus demonstrates that old finds may contain new knowledge when the right research methods are used.

Until September 2019, we will be focusing on finishing Part 1, including all three textile samples, the wooden chest and the textile tools. Part 2 is entering its next phase, moving from analyses to construction of the actual garments. In June 2019 we will arrange a clothing workshop in Brede and Lejre where inputs from Scandinavian colleagues will be much appreciated, and hopefully the garments will be finished in the beginning of 2020.

You can follow us on Instagram [@fashioningthevikingage](#)

5th of April 2019/ Charlotte Rimstad