Felt is beautiful

*New possibilites for underutilized wool*

Thesis submitted in partial fulfillment of the requirements for the degree of Master of Design

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Autumn Semester 2016
Department of Design and Architecture
Master of Design

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Abstract

In this thesis I talk about my roots, I have worked with natural materials and worked towards sustainable living for the past twenty years. I also research ideas from like-minded authors who want to make the environment matter and are an inspiration for a designer working in the present who wants to be responsible and work with sustainability. I talk about the Icelandic sheep, how a lot of unused wool is exported and the sellers lose sight over the production, and don’t knows completely what happens to it. I look at the Icelandic sheep and its’ wool which is a product and a lot of it isn’t used. The opportunities that lie in the unused wool and its’ product-value are enormous.

The world is big and wool is used in so many places in a various production, such as architecture, interior design and product design. I talk about a few artists using wool in various and beautiful ways, making it into something that us, Icelanders who have so much wool, have never thought about. Many of us in Iceland overlook the possibilities of wool production. I want to change that. I want to change wool into gold.
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01 The roots

The starting point of this thesis lies in my interest in the design of textile materials from Icelandic wool, and my interest in finding a new role for the wool as a product and to make the production more sustainable. I want to develop a totally clean production and answer the demands of the present for thinking about and being concerned about nature, the environment, the community and which attitude we have towards economical growth. Many aspects have to be explored and there is a lot that one designer can contribute to the coming generations in her work keeping sustainability in mind.

The roots of this interest of mine lie in my childhood experiences with my foremothers who worked a lot with wool. My grandmother spun the wool at the spinning wheel after having washed the wool and separated the coarse wool from the fine wool. She also dyed the wool with colors from plants which she hand-picked herself. She then used the yarn for woolen garments which she knitted, and she also weaved textile fabrics in a loom. My grandmother also used woolen card which she made fine with her hands only using warm water and a soap, which she had made herself. My mother did the same, but more as a hobby. She was a master of women’s dresses and ran a small sewing unit and the woolen materials that she used were produced in a factory.

I have a beautiful memory of my mother since I was very young. We, the family had just bought a new home in a new house. The funds where nonexistent and we could not construct interior walls yet so all sounds in the house echoed enormously. My mother then had this grand idea. She weaved textile fabrics from leftover materials and put them on a large frame on wheels being made from leftover timber. This created an interior wall which dampened the sound indoors and in order to allow some light through the wall, she cut a hole into the fabric with her design-knife. This memory is very dear to me, and could become a part of my final project on how to find new purpose for using wool.

I have conducted many experiments with fine wool when mixing together natural materials. In the year 2000 I received a research grant in order to carry out the
research which involved exploring whether it was possible to make handmade fine woolen textile materials enter the production phase. This research led me to a machine which separated fine wool from coarse in a company that was then in operation in Seyðisfjörður, Frú Lára, which had the machine built and which serviced designers in the production of woolen items. The conclusion was that most handmade materials could be processed with this kind of machine.

My roots also lie in the running and direction of a design company, amongst the projects of the company was the production of a product line abroad. During the production process prices had to be negotiated in units, there more units there were, the less was the unit price. The explanation from the production company was that it was more efficient to run the machines full speed over a long workday period and that the staff was more efficient if it worked as quickly as possible.

Later I entered the commercial ideas unit of Reykjavik University, which is a course for building up new innovative companies. There it was taught that this way of thinking was normal and a part of the sales- and marketing process, as it is expected in the planning process that a part of production will not sell at all, and it is only considered normal that there is a certain amount of waste generated.

I was lucky however when I was admitted to the MA studies in design, and when I learned right away in the first course that you should never take more from nature than was absolutely necessary. This way of thinking sent me back to my childhood roots, to my grandmother’s and my mother’s vision of using everything well and treating nature and raw materials with caution.
In order to find a reflection of the root concept and in order to see sustainable development in a wider context, I incorporated some ideas from E.F. Schumacher from his book *Small is beautiful*. In the book Schumacher considers the attitude of man towards nature, he describes economical and machine production from various angles and expresses his concern of the welfare of mankind after the Industrial revolution. I also read *Cradle to cradle* by William McDonough and Michael Braungart in order to get ideas, but they also discuss the journey of mankind after the Industrial revolution. The book discusses waste, energy waste of both resources and manpower, and McDonough and Braungart try in their book to make the modern world more aware of how things are made, which materials are used and what happens to the items after use, are they reusable and what is the real environmental price that we are paying.\(^1\)

The viewpoint of Janine M. Benyus in the book *Biomimicry: Innovation: Inspired by nature* is very interesting. In the book Benyus encourages us to think in new venues and to look for solutions in nature by using innovation, as nature is in fact perfect in the way that she builds up her bio systems.\(^2\)

Schumacher, McDonough, Braungart and Benyus are in their books trying to push us towards sustainable development.

As is stated here above I have deep roots in wool processing with tools used for separating the fine wool from the coarse wool, both by hand and my machines. During my BA studies in textile design at The Iceland Academy of Arts, I loved this technique right away, because it is both clean and ecological. Therefore I will in the last chapter of my thesis discuss the designer and artist Claudy Jongstra which uses fine wool techniques in her design. She runs her production at a farm in the northern part of the Netherlands. Claudy´s main objectives are to promote sustainable development and production and to develop old techniques and culture to suit the modern world. I will also discuss the Canadian designer Kathryn Walter which runs

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\(^1\) William McDonough, Michael Braungart, *Cradle to cradle*. (New York, A division of Farrar, Straus and Giroux. 2002)

the design company FELT. Kathryn uses factory made woolen felt for interior design, keeping sustainable development in mind.

03 What can be done?

The definition of the concept Sustainable development, was first introduced in the Brundtland report of the UN in the year 1987 as “a human activity which meets the needs of the present without diminishing the possibilities of coming generations in order to meet their needs”. The concept entails that a balance has to be found between economical, social and environmental factors. To connect these three factors in decision making for the countries of the world keeping sustainable development in mind, could be complicated as human thought in general does not comprehend what the concept in fact means, and also because the economical system that we live in does not give us the full option to understand sustainability (is not transparent). Therefore a change of thinking is required both on behalf of the financier, politician and each individual participant in society.

Schumacher discusses these three things in his book *Small is beautiful* where he discusses the wrong way that people view and deal with nature, which again impacts how man views society and his economical well-being. Schumacher says that modern man does not experience himself as part of nature. Instead nature to him is almost an alien, outside force which he has conquered in his effort to tame it and use it for unlimited mass production. Until recently mankind has been of the opinion that it has conquered nature in some sense. However more and more people realize however that mankind will eventually loose and that without nature’s resources, if we do not restrain ourselves in using them, it will have far and long lasting consequences for the continuing life of mankind here on Earth.

McDonough and Braungart are of the same opinion as Schumacher, however they

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4 Definition of Sustainable Development, Eastern Sustainability Initiatives, (download: October 2016)
characterize mankind in a more humorous way. Mankind is by nature a curious species and these days it is popular to discuss the possibilities of whether the Moon or Mars could become our new homes after mankind has with its excessive consumption and disregard for nature destroyed the Earth in such a way that life is no longer possible. They challenge mankind in their ponderings that if mankind wants to experience Mars on Earth, then people should go to Chile and live in a copper mine. Because in the mine there are no animals and all the natural environment there is inherently hostile to mankind. Or if people want to experience the Moon they should dwell in a Nickel mine at Ontario in Canada, which is even worse than in Chile.

“Seriously speaking, folks, we developed here on Earth and here we are intended to stay”.

Schumacher also thinks that mankind is on the wrong track in it’s attitude towards economics, as everything is always done for financial gain and man does not relate his actions towards the environment or society as such. He also discusses that mankind thinks about everything in her near environment as an investment, and that the sense of ownership is so strong that it blocks community liability.

Sustainable development is no magic concept which carries simple solutions to complex problems, this is the definition of an ideology which incorporates a useful approach which the countries of the world have agreed on using in their efforts to solve many of the challenges of the 21st century.

But Schumacher asks what can be done in order to step away from this unhealthy path? Who shall lead the nations of the world to changed attitudes and a new lifestyle? “I think every one of us, whether old or young, powerful or powerless, rich or poor, influential or uninfluential. To talk about the future is useful only if it leads to action now.”

McDonough and Braungart discuss the natural curiosity of mankind which sometimes get laughable and unreal ideas which lead them astray. They however

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8 Definition of Sustainable Development, *Eastern Sustainability Initiatives*, (Download October 2016)
9 E.F.Schumacher, *Small is beautiful*
encourage people to stay curious, but also to think and ponder how things around them are being produced.

But wait a minute - you care about the environment. In fact, when you shopping for a carpet recently, you deliberately chose one made from recycled polyester soda bottles. Recycled? Perhaps it would be more accurate to say downcycled. Good intentions aside, your rug is made of things that were never designed with this further use in mind, and wrestling them into this from has required as much energy – and generated as much waste – as producing a new carpet. And all that effort has only succeeded in postponing the usual fate of products by a life cycle or tow. The rug is still on its way to a landfill; just stopping off your house en route. Moreover, the recycling process may have introduced even more harmful additives than a conventional product contains, and it might be off – gassing and abrading them into your home at an even higher rate.¹⁰

They are saying that when you design a product in the first place you have to think far ahead and decide what kind of material to use depending on lifetime of the product, life cycle and possibilities for reuse. The new life of the product must not entail detrimental costs for nature or for the environment, designers and producers also have to be aware of the energy being used both when producing a new product as during reuse. Respect should be shown to the World’s resources and towards people working in the production process. There are many angles to explore and many things that have to be kept in mind while innovating.¹¹

Benyus agrees with McDonough and Braungart in her book on *Biomimicry*. She worries about the narrow measures and narrow principles that the financial powers use for new innovations and that in innovating financial gain is almost never coupled concommitantly to the environment and society. Benyus wants us to ask: Does this have a purpose? Will this last? Is there a precedent for this thing in nature? If the answers are positive, you can go on and ask:

- Does it use only the energy it needs?
- Does it fit form to function?
- Does it recycle everything?

¹¹ William McDonough, Michel Braungart, *Cradle to cradle
Does it reward cooperation?
Does it bank on diversity?
Does it utilize local expertise?
Does it tap the power of limits?¹²

Schumacher, Benyus, McDonough and Braungart all worry about climate change, emissions from production, energy waste, CO2 exhaust from planes, ships and cargo planes that transport products produced in excess to and from countries and continents. They all encourage designers to work sustainably within their near environment.

04 Icelandic wool production

The concept “sjálfbæni” is a translation of “sustainability” and the meaning is similar as in sustainable development. However the focus is narrower and then you are talking about sustainable production, for instance in a certain project. What can one designer do by using sustainability as a goal in his/her work, having a great passion for the unique qualities of the Icelandic wool and possessing a great longing for finding new possibilities for using that wool? You have to discuss things with other people, which leads to action in the present, says Schumacher.¹³

With this in mind, I interviewed the specialists and producers of Icelandic wool, the sheep farmers, executive of the Sheep Farmer´s association, Svavar Halldórsson and the executive of Ístex Guðjón Kristinsson. Ístex receives over 90% of all wool which is produced within the country and uses 50% of it in the company´s products. The wool that Ístex uses is classified as class I and is mainly white wool that has been dyed. The undyed wool is mixed with dyed wool. Guðjón says that the original sheep wool colors fade in the sunlight. The other 50% of the wool are classified as class II and are exported unprocessed abroad. This is an example of lack of foresight during production as based on Cradle to cradle. When the wool is sold away the producer and the seller loose both overview and power over the production process. It is known

that carpets are being made, but not where. Neither is it known whether the carpets are reusable or have any detrimental effects on the environment.\footnote{William McDonough, Micheal Braungart, \textit{Cradle to cradle}, (New York A Divison, Farrar, Straus and Giroux 2002)}

![Lambs crossing river white. On their way to be stripped for Istex product](image)

Picture 1: Lambs crossing river white. On their way to be stripped for Istex product

Who controls which wool goes into the first or second class? The producers sets the standards to be used during classification, but the farmers themselves classify the wool. Guðjón says: “There are farmers that are ambitious in classification and do this very well, but most farmers are not really interested in treating wool and do this not very well. We have offered courses in wool classification but it is my feeling that only motivated farmers show up on such courses”\footnote{Guðjón Kristinsson, (Director Istex) answers author questions in e-mail, 27 October 2016, gudjon@istex.is}.

The farmers I spoke to amongst themselves and say that these courses of Ístex, are to enforce strong rules on what wool should be classified as first class and also on how to treat the sheep in order to fulfill the criteria of the company. One farmer said “Treating and classifying wool is such great work as Ístex demands it, and payments are minimum, so farmers hesitate to do all this work and try to use their work and energy for work that is better paid”.\footnote{Ásta Sigurðardóttir, (Farmer) in discussion with author, 28. September, 2016} McDonough and Braungart say that managers have to be aware of staff energy waste. Here the farmers are simply not interested which is creating some problems with the wool. It is however not only the policy of Ístex which is to blame. “The price of wool has gone down considerably for political
reasons. The support for the wool has been transferred to support of meat production”. More possibilities are needed, and a new policy on the use of wool, also a higher price is needed in order to get the farmers interest growing again.

I was also curious about how clean the Icelandic wool really is, and how far it is from ecological certification. One of the farmers interviewed said: “we get a lower price for our products than those who have certification, but as all farmers know we have a clean product”. Svavar Halldórsson at the Sheepfarmer’s Association says that the policy is to encourage more certification and therefore those who are certified get a higher price. He says furthermore: "We are only one small step away from ecological certification”.

Guðjón executive at Ístex says: “I examined the possibility of processing certified wool, but the quantity was too small for anything to happen. We at Ístex see wool production in Iceland as the cleanest you can get in the world because no pesticides are being used here”.

Ístex runs a wool washing facility at Blönduós where all the wool is washed after having been collected from the farmers and classified. According to information from Guðjón the wool is pre-washed with light Soda, which forms a natural soap with the wool-fat. The later washing is done with a German soap approved by EU.

When I summarize what caught my attention in interviewing the sheep farmers, I find it was interesting how the farmers themselves see their work. “To be a sheep farmer is intertwined with nature”. One of them said, and another said “I never see any of my chores or work actually end, the work seems endless, thats why I think only one day at a time”. The oldest farmer in the group said “the best and most rewarding time of the year is the birth of the lambs in the spring. I always go with my sheep to the slaughterhouse, I want to ensure they are well treated to the very end”. There is a kind of general acceptance in the attitude of the farmer towards nature and the animals and there is a kind of beauty in the paradox that even though

17 Hulda Þóra Steinsdóttir, (Farmer) in discussion with author 28. September, 2016
18 Svavar Halldórsson, (Director, Sheep Farmers), in discussion with author, 4 October 2016
19 Guðjón Kristinsson, (Director Istex) answers author questions in e-mail gudjon@istex.is 27. October 2016
20 Þórir Þórsson, Sigurborg Stefánsdóttir, (Farmer) in discussion with author,27. September 2016
21 Sigrún Halldórsdóttir, (Farmer) in discussion with author, 10 October 2016
the sheep and her lamb are cultivated as a product, the farmer is connected to his sheep, shows care, respect and gratitude. It is like the sustainable farming of olden days is transmitted from one generation to the next.

I was also impressed when the farmers told me about the lead sheep. The farmers respect their leader sheep and are very proud of the sheep in question. Leader sheeps are a special Icelandic phenomena. Why they are not known in other countries is not found. Maybe it is because of constant weather changes in Iceland, and the farming of olden days, when the sheep were outside most part of the year, that the quality of the leader sheep in sensing weather changes was very important, as the quality to find their way home in bad weather, darkness and in a winter storm.\footnote{Ásta Sigurðardóttir, (Farmer) in discussion with author, 28 September, 2016}

The farmers I spoke to said that if the conditions arise that their sheep need shelter, then they find their way home. This is in line with the use of leader sheep in olden days and it is clear that this instinct is also valuable in modern farming. Like one of the farmers said, “they know where they live”.\footnote{Stefán Aðalsteinsson, Sauðkindin landið og fjööðin, (Reykjavík, Bjallan hf., 1981)} Leader sheep usually have mixed color wool and today their wool is almost without worth. “It causes me pain to see how little respect is held for the mixed color wool, as she is from the leading sheep and has been the same since the Settlement of Iceland”.\footnote{Hulda Þorsteinsdóttir, (Farmer) in discussion with author, 28. September, 2016}

Ásgeirs Jónsson's book \textit{Forystufé} has beautiful descriptions of this special type of sheep and is enlightening concerning how much the farmers loved their leading sheep in former days.\footnote{Ásgeir Jónsson, \textit{Forystufé}, (Reykjavík Búnaðarfélag Íslands 1953)}

The leader sheep Hæra

Hæra is black like her closest kin, and has grey patches on the sides. She is medium built, has high feet, is rather thin, with a long neck and she carries herself with dignity, the head rather large, the horns rather large and long and they go out and aft. The eyes are large and they bulge a little, changing the way the look depending on mood and movements. Hæra is very still and well behaved in houses and moves very smoothly when you are feeding the sheep. All her movements are light and secure, polite with a certain sense of dignity. The walking movement is dignified and her trot is very beautiful.\footnote{Ásgeir Jónsson, \textit{Forystufé} page 293-294}
This shows how each leader sheep is seen as a person by the farmers, with her own special character and way of being. In order to gain a deeper understanding of the special qualities of the Icelandic wool I examined the books *Ull verður gull* by Magnús Guðmundsson from 1988, and the writings of Stefán Aðalsteinsson on special wool color in the Icelandic wool.  

05 The special qualities of Icelandic wool

The first Icelandic sheep came to Iceland with Norse settlers more than 1100 years ago. Settlement sheep were prior known around all of Northern Europe, but in the 19th century interest in breeding grew amongst sheep farmers in Europe and in Britain. This interest never came to Iceland, so it is maintained that the Icelandic sheep has kept it’s own settlement qualities. The Icelandic wool thus has special qualities that are different from wool from sheep in most parts of the world. The wool from the Icelandic sheep is called *fleece*. In the woolen fleece there are usually three types of hair. Inside the fleece are fine and soft hairs called *pel-hairs* and at the outside border of the fleece are long and rather coarse hairs called *tog-hairs*. In some types of fleece there are also very coarse hairs, different in length that are called *illhærur* in Icelandic.  

The tog-hairs grow amongst the *pel-hairs* and are different in coarseness depending whether they are a part of the inner layer or the outer layer of the hair. Some sheep have tog-hairs that are soft, fine and silky while other sheep have tog-hairs that look like horse hair, brittle and without shine. The finer part of the tog-hairs has been used for clothing, yarn, chair materials, carpets for covering and on the floor and also for picture-weaving.  

The *þel-hairs* are the finest and shortest hairs of the wool fleece. The Icelandic wool contains a different amount of fine-wool, and it depends on the gender of the sheep. The *pel-hairs* are light, feathery and stretchable. They are airy and always want to take on their prior form. *Pel-hairs* can be compared with wool from merino wool in how fine it is but merino wool is

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27 Magnús Guðmundsson, *Ull verður gull*, (Reykjavik, Hið Íslenska bókmenntafélag, 1988)
28 Magnús Guðmundsson, *Ull verður gull*
considered amongst the finest and softest wool in existence.  

Merino wool is one of the oldest and most widespread wool in the world. It has a long history to 3000 B.C. and it is known that it was used for clothing and interior design. Modern Merino wool comes originally from Spain and the Merino sheep have been used in breeding with sheep from many different European countries. Australian sheep farmers have made great progress in breeding Merino wool and 80% of the world market comes from them. If we compare the Australian wool to the Icelandic one, then the Australian wool only has white colour and only one hair type, þel-hair which is very fine and very soft.

*Ilhærur* are the third type of hair in the Icelandic wool. They are either white in colour or reddish-yellow. White *ilhærur* are dead hairs, they are much coarser hairs than tog-hairs but are short like þel-hairs. These hairs are chalk white in color, irregular in shape and are often very rough to the touch.

The Icelandic wool is warm and stretchable, does not accumulate static electricity and is not prone to catch fire. The Icelandic wool collects moisture, and if she gets wet she absorbs the water as steam and gets warm. Moisture and warmth have a special effect on the wool. They make it pliable, so it can be formed in various ways and after the wool cools down, it keeps the shape it has been formed into. The Icelandic wool is thus very pliable and that is a huge advantage.

As with other natural materials the wool cleans itself by being aired in fresh air outside, with the precondition that in all pre-treatment there are not used any chemicals which diminish or destroy the qualities of the wool. The Icelandic wool is rich in natural fat, which can easily be destroyed by washing the wool in the wrong way. Therefore it is important to use ecological, certified soap for wool, if this is not done the wool eventually looses its natural qualities.

If wet wool is rubbed it thickens, also the temperature of the washing water has to be kept in mind as the wool shrinks if the water is too warm. A good reference is that the water not be.

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30 Merino wool, Oviedo, Florida: Numel, (Retrieved 27 November 2015)

32 Magnús Guðmundsson, *Ull verður gull*, (Reykjavík, Hið íslenska bókmenntafélag 1988)
warmer than body heat.  

Another feature of the Icelandic sheep stock is the variety in color. The sheep’s wool colors vary widely, including shades of black, brown, white, and even those that resemble the colors of the Icelandic landscape, such as green and grey. The variety in color not only serves an aesthetic purpose but also plays a crucial role in the sheep’s survival, providing camouflage against predators and the harsh conditions of Iceland’s climate.

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Picture 1: Icelandic sheep colors.

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33 Magnús Guðmundsson, Ull verður gull
can be divided in three classes, types of colors, pattern and double colors. Here is an example of how Ásgeir describes the personal characteristics of specific sheep.

“Four types of colors exist:
White (yellow or reddish yellow)
Grey
Black
Brown (rust brown.)

The patterns are six:
White
Grey (greyish rust brown)
Golsótt (rust brown golsótt)
Botnótt (rust brown botnótt)
Grábotnótt (greyish rust brown botnótt)
Black (rust brown)”

The patterns have certain rules for color mixing, white and black have no effect but keep their initial color. The grey color has the effect to change black into grey. The other patterns, golsótt, botnótt and grábotnótt change other colors to a much larger extent.

Double colors: is the phenomenon called when white patches, exist in sheep that have other colors than white or yellow. Types of double colors can be many or up to 32 variations of colour.34

Breeding the fleece and colors in sheep
As has been stated here above the Icelandic sheep breed has a special Icelandic variety with regard to color and hair type. This variety has stayed largely unchanged since the settlement of Iceland. However some efforts have been made in order to breed a special type of fleece in grey sheep, in a few flocks here in Iceland. Those sheep are called feld-sheep. The main aim is to breed sheep with woolen qualities which give a special look to tanned skin, and in this

34 Stefán Áðalsteinsson, Litauerfðir í íslensku sauðfé, (Íslenskir landbúnaðarrannsóknir 2 Árg., Download oct.2016) visindavefurinn.is
feld-sheep breeding the aim is to have the same type of hair everywhere, and that the hairs form moderately large, shining locks that reach right to the skin.

The breeders are looking for a wide variety of grey color, from light grey to very dark grey. Rock grey has been the most popular color. The main point is that the color of the sheep has to be even all over so that the tanned skin is as equally colored as possible. Black sheep can be necessary in this kind of feld-sheep flocks so that the grey color does not get too light.35

Golsóttar, botnóttar and patchy sheep are not feasible in this kind of breeding for obvious reasons, as was explained in the description here above. Feld-sheep are nevertheless just as Icelandic as all other sheep in the country

It is stated in the description of the hair-types of the Icelandic wool in the book of Magnúsar Guðmundssonar, Ull verður gull that the wool differs in fine texture, the question is what causes the variety? It is thought that four factors impact wool quality: 1) sheep-race 2) weather 3) soil 4) nutrition.36 Wool is made from egg-yolk, not unlike human hair and human hair is very variable as known, and is determined by genetic factors.

When interviewing farmers, one farmer said “our sheep are markedt digitally so we can see where they are, some go to the shore, others up the mountain and the third part stays down by the river. I can confirm that the meet differs depending on where the sheep graze, but I cannot confirm whether the wool is affected, but I find it likely”.37

06 The felt people

The separation of the fine wool from the coarse wool creating woolen felt is amongst the oldest textile handiworks of the world. The oldest remains of woolen felt date from 6000 years BC. In Southern-Russia there was a tribe called the Felt-people. In year 1929 a grave of a king, Pazaryk was found from the age of the Felt-people, with magnificent felt ornaments.

35 Bændablaðið, Feld breeding (Download 20 september 2016) bbl.is
36 Bergsteinn Kristjánsson, Fenntar slóðir, 15 þættir um sunnlenska þjóðarhætti, (Reykjavik, Ísafoldarprentsmiðja hf., 1955)
37 Lilja Grétarsdóttir, Lýður Matthiasson, (Farmer) in discussion with author, 5. October 2016
In Asia carpets were made with complex and colorful patterns, but in Scandinavia it was common to create felt-slippers, mittens and hats. In Iceland felt was common and the one who created the felt from the wool was called Pófarinn. It was a position of high prestige. Pófarinn worked with water and soap, beat the wool using his hands and feet. This job stopped to exist around the year 1800.

In 1970 a renaissance of old handiwork methods started, including of the separation of the fine wool from the coarse wool. The interest of designers, artists and people in handiwork and crafts in working with woollen felt has increased steadily and has become a whole industry. We see the results of this industry in architecture, where textile designers work with architects on creating buildings and with interior decorators in creating space. We see the felt in the design of chairs and product design. Felt is also popular for clothing and in accessories.

From the start of this Felt-renaissance, artists and designers have worked on researching the cultural heritage in wool separation. This can be seen in the development of both hand felting and factory made felt. All this research was shown publicly in Fashioning Felt Exhibition in September 2009, in Cooper Hewitt National Design Museum New York City.

One of the most interesting works at the exhibition was an installation by the artist Janice Arnold who travelled to Mongolia in order to research Mongolian felt-making both past and present. She also studied ancient patterns which she recreated for her installation. Arnold used old techniques and tools for preparation, preparing the wool from the day it was taken from the sheep, until it was ready for card and separation, which was done by hand using water and soap. The only modern instrument that Arnold used, was an electrical spinning wheel in order to make wool felt, which was then applied by hand in patterns on silk. The idea of the three-dimensional space of the installation came from the tents of the nomads in Middle Asia, but the tents were made of felt. Arnold’s installation was installed in a huge glass chamber, the hole space and the outcome was a play with daylight when the sun shone through the silk and framed the beautiful felt patterns. The outcome was an Ode to the

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38 May Jacobsen Hvistendahl, Úllar og silkipæfing, Anna sæmundsdóttir, Translation, (Reykjavik, Vaka Helgafell 2004)
39 May Jacobsen Hvistendahl, Úllar og silkipæfing
cultural heritage created into the present in a gallery in New York.\footnote{A video profile The Mharta Stewart show, \textit{Fashioning Felt}, A video Profile of exhibition, (Chelsea Studion in New York City, New York 2009) marthastewart.com/artic/cooper-hewitt-feltexhibit?xs=ch}
Amongst the artists at the show where Claudy Jogstra and Kathryn Walter, they both work with woolen felt. She uses her hands and produces all the felt herself. She then uses the felt for design and arts. Kathryn uses factory made felt in her design.\footnote{Claudy Jogstra and Kathryn Walter, \textit{Convergence of craft and industry}, (New York Cooper Heweit National Design Museum, Apr 27, 2009 youtube.com/watch}
Claudy Jogstra is a Dutch textile designer. She runs a studio and a processing company at her farm where she designs and produces textile work, made from natural materials with sustainability as a goal.

*Farm of the world* is based on hers ideas. It is a movement that works on sustainable future for the community and the local environment, where Claudy lives in Northern-Netherlands.43

On her farm is sheep farming, Drenthe sheep, which is the oldest and rarest sheep found in Europe.

The wool is then processed and a yarn made which she uses in design. Also a woolen card is made which is then mixed with other natural threads made from herbs, in order to enrich and soften the texture of the textile materials and also in order to create visual beauty she also mixes Merino wool, cashmere-wool and silken card wool with the Dutch Drenthe wool. All colours that she uses to dye the textile materials and woolen yarn are produced in her workshop. The colours are processed from local herbs both wild and cultivated, cultivated especially due to beautiful coloring.44

In her work Claudy tries to make people more aware of Nature’s beauty and she recreates landscapes into the textile that she produces. She says she used a fine wool separating machine before, but now she only uses her hands. To use the hands comes from the idea to create softness and care in the interaction between the people that makes the raw material with the people that use it and lastly with the people that will eventually enjoy the textile materials.

Her’s enthusiasm of the human hand touching all production of her work has challenged her to research the cultural heritage, the handiwork, such as spinning, separating of fine wool, carding and weaving. She has researched how technology has changed and this old technique is only used in making the raw material itself.

44 Claudy Jogstra, *Art and Sustainability interview*, Exhibition SF MOMA, (San Franciscan, February 2016)
She often cooperates with architects. She works into specific spaces inspired by the architecture of buildings, operations of the building, light, softness and color. Claudy’s customers are public buildings, and individuals all over the world. She also works as an artist and then works especially into specific spaces.

She has received acclaim from all around the world for her work and her work is coveted and exhibited in famous galleries. She has worked with wool separation techniques for 20 years, initially she learned clothes design and worked as a designer, but right at the beginning of her carrier she started separating wool and working with wool. 15 years ago she started the incredible work that she is known for today.

Claudy has always been very much connected to nature, as she is born and raised on a farm in Fresland, where sustainable farming was practiced. She really is a woman of the felt-renaissance and a role model. She has along with her peers managed with passion, clear vision and a lot of work to drive her community towards sustainable development, which encourages young people both for work and study in their home district for longer or shorter periods.

Kathryn Walters was raised in Toronto, Canada, where she works and lives. She works like Claudy both as a textile and product designer and also as an artist using factory made woolen felt. Kathryn Claudy has created her own name as a role model. Her work has been shown in
famous galleries and architects and interior designers love to work with her. Her customers are the same as Claudy’s. Public institutions, buildings and individuals.

She studied visual arts and her background is in visual arts. That is clear when she is designing large works of art into buildings or on their exterior. She builds up walls into spaces. The walls are like a three dimensional artwork where she used woolen felt, that she cuts into definite form and then positions and glues together, layer by layer or side by side, layer on top of another layer. When she uses repetitive forms they are also three-dimensional. She is also aware of the impact of the woolen felt on sound and in large spaces the wool softens all high, belling sounds.45

Kathryn only uses earth colors, brown and grey tones which she enriches with yellow and red color. The idea is that the experience is like you are experiencing elementary materials,

45 Claudy Jogstra and Kathryn Walter, convergenge of craft and industry (New York, Cooper Hewitt, National Design Museum, Apr. 27, 2009) www.youtube.com/watch
natural materials like wood or rock which resonate with the wool.

She has run a Studio and a company under the trademark *FE*LT since 1997. The company works on product design, for the home and also she has a product line of handbags. In product design, she allows the material and simple forms to guide her.46

Kathryn has knowledge and sensitivity for the material which she works with. She senses the natural quality as she has deep roots in using factory made woolen felt. Her great-grandfather moved to Canada from Germany in the 19th century. He was an entrepreneur that sensed the opportunity in the country's cold climate. He founded the felt production company which is still working and is run by her family.

**07 Summary and facts**

Here above I have written about two designers: Claudy Jogstra and Kathryn Walter. The reason that I wanted to write about these two designers is that they are in my opinion worthy role-models. Claudy is an entrepreneur in sustainability within her own field. Like Schumacher points out in *Small is beautiful*, it so often happens that one single person decides to make work talk, now and then another person comes along and does the same and due to wonderful coincidences these two people "find each other". Thus the group is created and becomes a movement that can change attitudes and norms leading to action. Claudy is one of these persons, and what is so endearing about her, is she is very loyal and deeply connected to her roots, which she cares for and respects.

Kathryn touches other strings of the heart. She has a very sophisticated connection to the material she is working with. She has deep roots in factory made woolen felt, which goes through combing machines and is then pressed in thin layers. The binding in the material is steam and warm water. She almost exclusively uses the natural colors of the wool. Thus she takes a clear stand with nature. Her treatment of natural colors, the sheep-colors, connects me 46 Kathryn Walter, Designer, Canadian House and Home, (an Episode of online TV. Download website oct. 2016 feltstudio.com
to her, Kathryn respects the natural variability of sheep colors; brown is not only brown, there are all types of shades and hues. Kathryn uses this fact of variability in her work.

Like Stefán Aðalsteinsson describes in his book, *The sheep, the land and the nation*, Icelandic sheep is rich in color combinations and even though the fundamental sheep colors are only four, the patterns are six and the double colors and their variations are numerous. It is an exiting possibility to follow in Kathryn’s footsteps and to work with the many-colored wool and see what happens.

As has been stated, a large part of Icelandic wool is today exported unprocessed and there is not much interest amongst farmers regarding multi-colored wool as it is almost worthless. Sheep farmers have therefore lost interest in the wool which is sad to think of, because the sheep is a product which is slaughtered for human consumption and a part of the wool is not being used. It would be worth it to do as Claudy that is that I would as a designer, start working with unused wool, clean and undyed and see if I cannot get some farmers to support me. Hopefully eventually there would be more interest in sustainability and a large diverse group of people could be formed that would make their work talk in the present.

The designers Claudy and Kathryn inspire me. Claudy’s work independently and sustainably and Kathryn is a call to think about the possibilities of factory production. But what possibilities do we have here in Iceland to work sustainable and to produce woolen felt?

We have sheep with unique wool, sheep farmers with centuries of experience in producing wool, unused wool being exported and a washing facility in Blönduós that is ecological, run by Ístex. Ístex buys almost all wool produced in Iceland, wool which comes classified from the producers, the farmers themselves.

When discussing with farmers one farmer said the following: "Like in all work, people are not all as good at it. Some farmers are good breeders, others only medium and then there are farmers that are not good farmers at all”. Then his wife adds: "therefore I wonder about how the washing facility of Ístex works, the wool comes in classified and marked with source farm, but when she enters the washing facility everything is mixed together both class I wool and class II wool." I am not really aware of whether this matters a lot.
The only textile center of the country where you can do research is in Blöndós. Also there is located museum in Iceland which only exhibits textile.

I’m going to take advantage of research facilities in Textiles centers on Blöndós, because within reach are sheep farmers, wool washing run by Istex, there is large part of all wool in Iceland washed. It is also precious to have the textile Museum in the research work.

What more do we have in Iceland? We have one fine wool separating machine which was made here in Iceland, located at Höfn in Hornafjörður. I have processed woolen felt in this machine and it works, so it can by used to begin with to process and make woolen felt.

We also have Ístex, which owns production machinery like a combing machine, and I know that Guðjón Kristinsson, the company’s executive and a mechanical engineer designed a fine wool separating machine that could be connected to the combing machine. That machine has not yet been built, but it is possible to encourage Ístex to partake in this project.

In Southern Iceland, outside Selfoss there is a small company called Þingborg which is run by a cooperative of Icelandic wool enthusiasts, people like farmers and craftsmen, people that have extensive knowledge in processing and working with wool.

In this research journey, I have, succeed to frame all ideas and facts to expand my sight on the world, so it will be possible for me to work on, what is closest to my heart. I have read and learned about ideas and facts, worth taking with me on this journey, witch I am about to start. Be aware about production, show prudence and think ahead in design process, and I have learned, what is sustainability.

I have talked to experienced, professionals people which have given me a new perspective on devotion and love for nature and animals. I am grateful for all the work of those who have taught me in this thesis, the writers and the people who had a conversation with me. I am excited to start working whith this knowledge.
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