Sandra Gottsmann

A Gut Skin Parka from the Ethnographic Collection of the Reiss- Engelhorn-Museen in Mannheim, Germany

Introduction

This paper discusses the conservation, restoration and mounting of a Siberian gut skin parka from the Ethnographic Collection of the Reiss-Engelhorn-Museen in Mannheim, Germany. The conservation of the parka became necessary when it was chosen for display in the newly renovated and refurbished Arsenal building of the Reiss-Engelhorn-Museen. Starting in 2004, the galleries were completely reorganised over a period of three years.

The Arsenal was originally built in the 18th Century and had over time suffered from damage and change. During the recent renovation it was partly reconstructed.

The new Arsenal re-opened its galleries in January 2007 for the 400th birthday of the City of Mannheim. Objects are now displayed on six floors, ranging from Classic Antiquities to Porcelain, Furniture, Fine Arts, Textiles, Social History and Musical Instruments to Theatre Costumes and Photography. The parka is on permanent display in the Costumes Gallery, as an ethnographic example of functional clothing among contemporary textiles and associated objects.

Documentation

Although no accession number exists, it is possible to re-trace the parka's history through a number of relevant documents which indicate with certainty that it came to the Ethnographic Collection of Mannheim in 1917 as part of the Sir Gabriel von Max collection. Within the Ethnography Department, a large number of high quality artefacts belong to this collection, among them the outstanding collection of North-East Siberian objects.

1. The Collection of Sir Gabriel von Max

Professionally a painter and professor at the Academy of Fine Arts in Munich, Gabriel von Max had (since his early youth) been a passionate collector of archaeological and ethnographic objects as well as medical anthropology collections. As a contemporary of Charles Darwin, he was most interested in Darwin's ideas and his evolutionary theory. Max was also in regular correspondence with the German natural scientist Ernst Haeckel. In his later years Gabriel von Max lived privately in his house in Ammerland, near Munich. After his death in 1915, the family sold his expansive collection.

In 1917, despite the depression during the Great War, the Reiss-Museum in Mannheim was able to buy the collection for the sum of 265.000 Reichsmark (equalling 1,7 Million € today). Today, Max's complete archaeological and ethnographic collections belong to the Reiss-Engelhorn-Museen in Mannheim. Because of Max's detailed record keeping we know that he purchased the gut skin parka, among other objects, from the company, Umlauff, in Hamburg, which traded in ethnographic objects.

2. The J.F.G. Umlauff Company for the Trade of Ethnographic Objects

J.F.G. Umlauff, a previous sailor and ship's carpenter, founded the company in 1868 in Hamburg. Starting as a public swimming pool and "shop" for over-seas curiosities, the trade with such objects became so successful that the pool was soon closed and Mr. Umlauff re-opened as "J.G.F.Umlauff Company for the Trade of Ethnographic Objects". By the end of the 19th Century his company had become one of the most established traders for ethnographic artefacts in Germany and commissioned travelling traders and sailors to purchase specific ethnographic material from all over the world. At the time, most German collectors, museums and institutions bought and ordered artefacts from the Umlauff Company. At the Reiss-Engelhorn Museen a copy of the company's sales catalogue still exists. It lists a variety of objects and among them, the gut skin parka is mentioned:

> *Chukchi No.3:*
> *Raincoat made of wide, sewn stripes of seal gut and bladder;*
> *Parallel stripes sewn with sinew and regularly decorated with small tassels made of red and black wool;*
> *Hood decorated with small stripes of fur and soft feathers from seabirds;*
> *Hood can be opened and closed via a leather band*
> *Price: 115.- Reichsmark*

The original label is still attached to the parka and confirms the catalogue number and price. The age of the parka remains uncertain. The catalogue dates to the late 19th century, therefore the parka must have been manufactured some time before that.

Provenance

1. Geography

The Chukchi Peninsula stretches along the far North-East of Asia. Politically a part of Russia, Chukotka is an independent province with approximately 15.000 inhabitants. Annual average temperatures are -10 to +5°C. The summer is short and lasts from June to August with maximum temperatures of around 9°C (Wikipedia.org).

The population is divided into two groups: The Hunting Chukchi who live in the tundra and subsist on hunting, fishing and breeding reindeer; and the Coastal Chukchi who live along the coast of the Bering Sea and subsist on hunting sea mammals. There was a frequent exchange of materials and products between the hunting and coastal Chukchi as well as between other Inuit peoples along the Bering Sea. Specific cultural artefacts of one group are found within the other (Hatt, 1969). For example Bogoras, an explorer who travelled the Chukchi Peninsula in the late 19th century, reports a frequent import trade of gut skin parkas from St. Lawrence Island to Chukotka (Bogoras, 1909).

In the museum records, the parka is defined as Chukchi and in comparison with other clothes of similar origin this seems likely. However, the parka also shows some characteristics that can be found on parkas from further East. When compared to a parka from St. Lawrence Island, there are obvious similarities in the pattern, the manner of decoration and the materials used (Fitzhugh and Crowell, 1988).

2. Traditional Materials and Methods of Manufacture

There is varying information about the manufacture of gut skin clothes. It is often not specific to one tribe and the processes seem to be very similar among the Inuit peoples.

As source material, intestines, windpipe, pharynx and bladder of sea mammals such as seals, walrus, sea lion and whale are mentioned; even the membrane of whale tongue is reported.
The procedure of manufacture is mainly described as follows:

- Removing the contents, cleaning and rinsing with water; alternatively rinsing with urine
- Turning and rolling the gut between the fingers and removing the outer material (mucous membrane) with the thumb; alternatively scraping the outer surface with a tool
- Turning the material inside out and removing unwanted tissue with a tool
- Occasionally, repetition of the rinsing process
- Knotting one end and blowing it up for drying[1]
- When dry, cutting the gut lengthwise and rolling it for storage until it is used

One can assume that this procedure was also carried out among Chukchi people.

Description

The parka is almost knee length, with long sleeves and a hood that can be opened and closed by pulling a leather string. Along the seams and the hemline the parka is decorated with animal hair, feathers, yarn, skin and leather. Only the seams of the sleeves are undecorated.

Figure 1: Seal Gut Parka after treatment

1. Measurements

Trunk measurements:

Maximum height:	106 cm
Maximum width (as it is shown in the case):	103 cm
Width across the chest:	60 cm
Maximum depth (at the hemline):	43 cm

Sleeve measurements:

Width (at the armpits):	27 cm
Length:	39 cm

The parka's measurements, particularly the sleeves, are relatively wide. Gut skin parkas were often worn over warm fur coats (Rousselot, 1997). This can also be assumed for this parka.

2. Pattern

The parka is made of several gut strips, each on average approximately 7-8 cm wide. A number of strips at the hemline and the shoulder are narrower. The trunk is made of seven strips that are horizontally sewn together; each strip leads around the complete coat and is vertically sewn together with its opposite end. This vertical seam is always located at the front of the parka. The parka is manufactured in this manner from the bottom hem to the armpit; due to the hood, the front and back are constructed slightly differently.

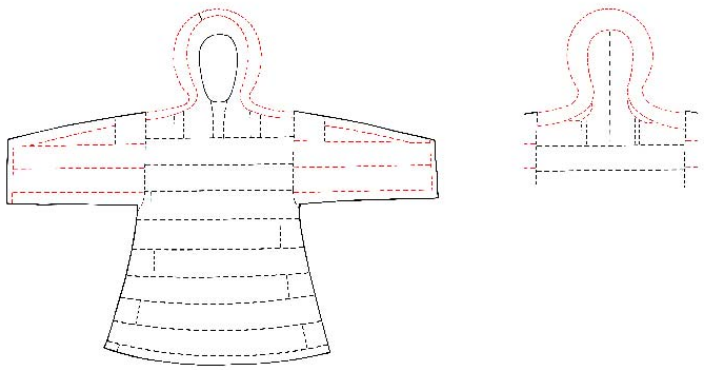

Figure 2:
Pattern of the Parka on the front and back (detailed drawing);
seams visible on the outside are marked black -------
seams invisible on the outside but visible inside are marked red -------

At the front, three strips lead horizontally across the chest. While two of the strips go completely across, the third is interrupted by a vertical strip that forms the front of the hood. To correctly fit in the hood, three small gut pieces cover larger gaps. A fourth strip leads from both armpits across the shoulders and over the head, forming the upper part of the hood. This strip is less wide than the others (approx. 4 cm) and is vertically sewn together just next to the tip of the head.

The back is worked in a similar way. Two strips lead completely across the back; the third strip is interrupted by two vertical strips forming the back of the hood. To fit in the hood, four small pieces cover the gaps. As at the front, the fourth strip leads from the armpits and over the head to form the upper part of the hood. This strip has the usual width of 7-8 cm.

The sleeves are manufactured separately and then sewn to the trunk. Both are constructed in the same way: five strips, each of them 35 cm long and 7-8 cm wide, are horizontally sewn together. To reduce the sleeve's width, two triangular strips and one rectangular strip, all of a lesser length, are inserted. One vertical strip, which stretches from front to back, covers the joints at the shoulder. A narrow vertical strip functions as a cuff.

3. Seams and Decoration

All seams are sewn with sinew, using the running stitch. The seams of the trunk are worked such that they are visible on the outer surface of the parka, whereas the seams on the hood and the sleeves are only visible on the inside. Presumably to gain more stability, the gut material is generally doubled along the seams before sewing it together.

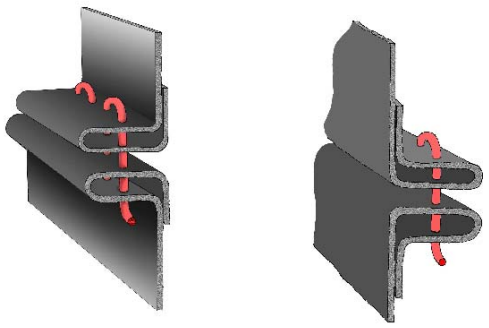

Figure 3:
Abstract drawing of the seams
on the left: seam visible on the outside
on the right: seam invisible on the outside but visible inside

As mentioned above, the parka is decorated with animal hair, feathers, yarn, skin and leather. The decoration follows a certain pattern: the trunk is decorated with animal hair, yarn and fur trimmings. The hood is mainly decorated with feather and fur trimmings. The sleeves remain undecorated apart from some red skin trimmings along their edges. The parka's hemline is decorated with a light grey fur trimming.

Materials:

1. Gut Skin:

The description in the sales catalogue indicates that the material is seal gut.
This has not been confirmed analytically[2], but size, mechanical properties and appearance of the strips are similar to reference material that is also described as seal gut in archival records

and other types of documentation. (Reference material from seals for better assessment of the gut would have been desirable. Unfortunately this was not available at the time.[3]) In the literature (Bogoras, 1909; Rousselot, 1997) the use of seal gut for the manufacture of Chukchi raincoats is frequently mentioned. As source material the intestines of the common seal species around the Bering Sea may be considered, as there are for example Bearded, Ribbon, Ringed and Spotted Seal as well as Sea Lion and Walrus. For the Chukchi the hunt of all these sea mammals is reported (Bogoras, 1909).

2. Feathers

The origin of the feathers remains uncertain. Presumably they are small feathers from the belly or the neck of a larger sea bird. In size, colour and appearance they are very similar to Cormorant and Auklet feathers. There are two Cormorant species living around the Bering Sea, the Red-faced Cormorant (*Phalacrocorax urile*) and the Pelagic Cormorant (*Phalacrocorax pelagicus*). Compared to the neck feathers of both Cormorant species the iridescent appearance of the feathers on the parka trimmings is striking.[4]

According to the literature (Bogoras, 1909), Auklet feathers were regularly used as decorating material. There are a large number of Auklet species living around the Bering Sea. Auklet feathers are similar to those on the parka in size, colour and appearance. The literature (Fitzhugh and Crowell, 1988) specifically mentions the use of feathers and beaks of the Crested Auklet *(Aethia cristatella)* to decorate gut skin coats from St. Lawrence Island and the Chukchi Peninsula.

3. Textile Fibres

The yarns used for decoration were identified as cotton and silk. Both are used for the decoration of the outer seams as mentioned above. The cotton yarn has a mottled appearance and is only used in a few places at the back of the parka. Light microscopy showed that the fibres are partly dyed blue. The cotton fibre's characteristic twist was clearly visible.

The yarn that was primarily used for the decoration was identified as silk. In two places uncoloured silk fibres were found, but generally a dark yarn, almost black in colour with a few pale green and violet fibres was used. Again light microscopy showed that the fibres were dyed blue. Under SEM the fibres' smooth surface was visible, they were unstructured and without any characteristics. Their size in average was 10-20 µm and under polarised light they had a characteristic reflection.
Finding silk was unexpected; however chemical analysis gave the same result. After rinsing with water, the samples were immersed into a solution of chlorine, zinc and iodine. They turned bright yellow, which is a significant indication for the presence of protein fibres. This result and the above described fibre thickness and surface structure confirmed the fibres to be silk.

4. Animal hair

Due to a lack of references, the hair decoration could not be clearly identified.

There is:

- a red-brown curly hair, mainly used on the parka's trunk
- a dark brown, strong hair, used as fur trimmings at the back of the hood and shoulder
- a light grey, strong hair, used as fur trimming along the hemline

All hair seemed to be intermediate or guard hair. Under the microscope the different types showed similarities but also some specific characteristics.
The major similarities were:

- average thickness from 75 – 100 µm
- scales were only little marked, narrowly taught and stretched (almost) around the whole fibre
- cross-sections were oval or slightly flattened
- smooth surfaces
- short fibres lengths
- all samples were found with tips
- none of the samples had a medulla

Additionally the fibres also showed some specific characteristics:

- the red-brown hair was significantly bent and crimped and varied in thickness from 45 µm to 75 µm
- the dark brown hair was very strong and well pigmented and its average size was 100 µm; the oval cross section of one sample became clearly triangular towards the tip
- the grey hair was very short, slightly waved and striped on its surface; its thickness was consistent at approx. 95 µm

Reference material available at the time analysis included the hair of a Saddleback Seal. Its appearance showed some similarities to the investigated hairs, such as average size and smooth surfaces, little marked scales and flattened cross-sections. The Saddleback Seal however does not live around the Bering Sea and can therefore not be used as a reference. As mentioned above, the various seal species in the region may be assumed as source material for the hair decoration. Referring to descriptions in the literature, sea lion might be considered as source for the red-brown hair. Its hair varies, especially during its adolescence, from tan to red or light brown colours and is also described as long and curly. Still, currently the origin of the hair remains uncertain.[5]

Condition before treatment

Until the late 1960's the parka had been on display in the Museum. Since then it was stored on the original wooden clothes hanger used previously as a mount. Photographs in the museum records show the parka hanging flat, unsupported und unpadded at the backboard of a showcase.

The condition before treatment was as follows:

- the parka was completely flattened, distorted, dry and brittle
- the parka was creased along the hemline and the sleeves
- the gut strips were partly torn
- the hood was carelessly folded back and flattened
- the leather string of the hood was dried hard, brittle and partly broken
- the surface was completely covered in dust and dirt
- the decoration material was distorted and flattened, some of it was loose and parts were missing
- there was evidence of previous insect infestations

Two different types of previous repairs were present within the gut skin:

- 2 small tears were sewn with a fine sinew thread using the overcast stitch. This is possibly an old repair of early date. It may also be considered an original repair.
- 7 longer tears were sewn less carefully with a thick thread that was identified as linen. The tension of the thread had caused more tears and sharp creases. This is thought to be an old repair of a different, possibly later date.

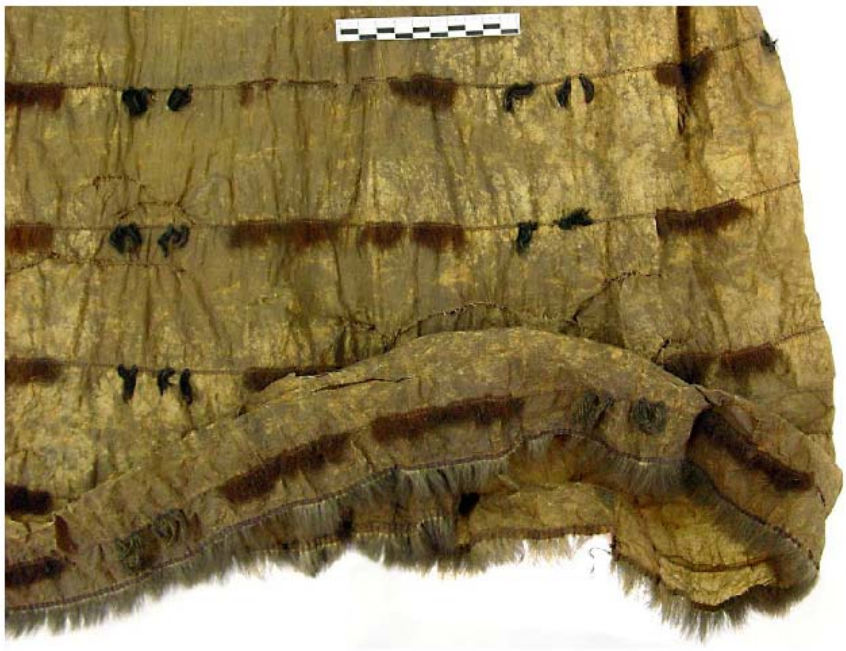

Figure 4:
Detail of the Parka before treatment

The use of a clothes hanger as a mount, followed by a period of neglect in storage and past handling was likely to be the main causes for the parka's condition.
Before the recent conservation work, the parka was stored in a pile of several gut and fish skin coats that were laying flat on top of each other, on a large storage shelf without dust protection. Moving and handling had obviously caused tears and splits, as the coats had gotten caught on one other. Furthermore, this part of the storage facility does not have environmental control and due to a large number of objects and boxes the parkas were difficult to access. As a result, they were exposed to a fluctuating climate and the possibility of undisturbed insect pest infestations.

Conservation treatment
1. Dry Cleaning
In order to remove loose dirt and dust, the surface of the parka was dry cleaned with a vacuum suction unit and soft brushes. Additionally, the gut skin was gently cleaned with a soft latex sponge (smoked sponge). The gut was very brittle and constantly at risk of additional damage. Therefore a humidification process was started soon after dry cleaning, to relax and soften the material before any further treatment.

2. Humidification and Re-shaping

The coat was laid flat on a work bench and covered with a humidification tent that was made of strong polyethylene film (thickness 160 µ) and hung from a hook in the ceiling. The polyethylene film reached well over the edges of the bench but hung slightly loose, such that there was still some moisture exchange possible between the tent and the surrounding area. A large vertical overlap of the film made access to the parka possible during the humidification process. The humidification was carried out over two days, with a maximum of 85% relative humidity achieved using an ultrasonic humidifier. On the second day the parka was lined with a wide Tyvek® sac and gently stuffed with acid-free tissue paper puffs. When the desired shape was reached and the sharp creases were relaxed and reshaped, the humidity was slowly reduced to 55% RH over the following three days.

3. Wet Cleaning

Wet cleaning with deionised water was carried out during and after humidification. The gut skin was cleaned with a moistened soft sponge (Blitz-Fix), various brushes were used to clean the hair, yarns and feathers. Blotting paper was placed underneath in order to pick up moisture and dirt, the hair and yarn were brushed from above with deionised water and a non-ionic detergent (Kieralon®). Afterwards they were carefully rinsed with deionised water. Finally, the gut and the feathers were left to air-dry whereas hair and yarn were left to dry between soft blotting paper and under very light weights.

Figure 5:
Detail during the wet cleaning of the hair applications

4. Stabilisation of damaged areas

The majority of conservation work was carried out during the humidification process because the gut skin was more flexible at a higher RH and stronger as a result. The old intrusive repairs with linen thread were removed and the tears were relaxed. Tears which required repair for structural strength were stabilised with Japanese paper backings. The medium quality of Kozu paper was sufficiently strong but still flexible enough to line well around the creases of the gut material. As an adhesive, methylcellulose Methocel 4AM was used, 2% in deionised water (w/v). This allowed gentle drying with little tension on any of the materials. There were a few areas where the application of a backing on the inside was not possible, for example at the shoulders and the hood. In these areas Japanese paper facings were applied to stabilise large tears. This method was chosen (especially along the shoulder) where a large gap weakened the strength of the parka and where stability was particularly necessary for later mounting. Once dry, the Japanese paper was painted in with water colours.

Figure 6:
Detail of a gut tear backed with Kozu Paper and painted in with water colours

Mounting and Display

The parka was to be hung up among other textiles and objects in accordance to the gallery's new design criteria. The hood was to be shown upright in order to present its pattern and decoration. This implied that a custom made 'clothes hanger' style mount was needed to exhibit the parka, allowing the hood to be mounted in an upright position. The vertical presentation made a complete support of the parka necessary. Therefore a stable but light-

weight construction was needed that served this purpose and that could be securely fastened to the ‘clothes hanger’.

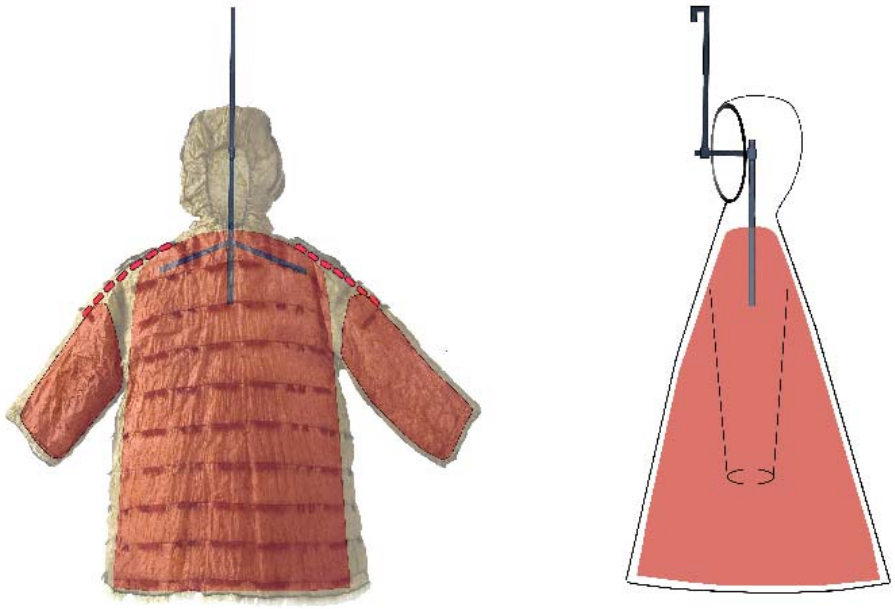

Figure 7:
Abstract drawings of the paper mount and the metal clothes hanger inside

To accommodate the measurements of the re-shaped parka, a conical inner form was made of polyester wadding, which was then completely covered with cling film. This provided a stable and basic mould for the final mount. To make the mount, the mould was then covered with many criss-crossing layers of self-adherent, acid-free paper strips. The adhesive (animal glue) at the back of the paper strips was reactivated by slightly dampening it with a wet sponge.[6] Once all paper strips had dried the mount was removed from the mould. At the neck of the mount a hole was cut to allow later access for the ‘clothes hanger’. Then the outer surface of the paper mount was completely covered with a layer of polyester wadding. Where more volume was needed for the individual support of various parts of the parka, the mount was additionally padded with more layers of wadding. Finally, the mount was covered with a soft cotton fabric (Molton).

The above described paper mount supported only the parka’s trunk. The sleeve supports were made separately. Individually shaped arm models were made of polyester wadding and covered with soft cotton fabric (Molton). They were attached to the trunk mount using Velcro®.

Finally the custom made metal clothes hanger was inserted and securely screwed to the paper mount from the inside, just below the shoulders. This holds the mounted parka in the correct position.

Conclusion

The conservation treatment of the parka was straight forward and without problems. The gut skin and decorative applications responded well to the chosen treatment methods.

Once humidified, the gut skin became very strong and stable and as a result the conservation treatment could be carried out safely.

The cleaning process and its result was most satisfying and without any significant loss of application materials such as single hairs or fibres.

The Japanese paper for the backings and facings was easy and convenient to apply; the colouring of the paper with watercolours was fast and simple. So far it does not show any changes in colour, adherence or stability. In the literature (Dumka, 1991; Morrison, 1986) fresh gut is often mentioned for the conservation of intestines of sea mammals. It was found that compared to fresh gut, the Japanese paper matched the seal gut's appearance and texture much better; especially at a relative humidity of 50-55% (as in the Gallery), when the seal gut appears more like paper or parchment. As well, fresh gut is often too shiny and, once wet with adhesive, difficult to apply correctly. The Japanese paper was in fact easy to handle and lined extremely well around and along all creases within the original gut's surface.

The mounting method was time consuming but it gave the desired result and presents the coat on a stable, lightweight and almost invisible mount.

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Abstract
This article discusses the conservation and restoration of a Siberian Gut Skin Parka. The Parka has been on permanent display at the Reiss-Engelhorn-Museen in Mannheim, Germany since 2007.

According to museum records the Parka originates from the Chukchi, an indigenous group that lives in the far North-East of Russia along the coast of the Bering Sea. The Parka is made in a characteristic manner, sewn together from stripes of gut. The seams and edges are decorated with feathers, yarn, animal hair, skin and leather.

The paper describes the materials and techniques that were used for the Parka's manufacture, its pattern and decoration, the previous condition, damages and their possible causes, as well as the conservation treatment and the mounting for display.

Biography
Sandra Gottsmann studied conservation at the Academy of Fine Arts in Stuttgart, Germany. She completed the course in 1997, specialising in the Conservation and Restoration of Archaeological, Ethnographic and Decorative Arts Objects. During her academic studies she also interned at museums in Frankfurt, Stuttgart and Exeter.
From 09/1997-03/1998 she was Objects Conservator at the Royal Albert Memorial Museum in Exeter and from 04/1998-09/1999 Conservator for organic material at the County Museum of Württemberg in Stuttgart.
Since 09/1999 she has been working in the World Cultures Department at the Reiss-Engelhorn-Museen in Mannheim, where she is responsible for the conservation of organic, inorganic and composite materials.

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Materials and Suppliers

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Water colours

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Endnotes

[1] In the winter the gut skin is freeze dried outside. This apparently leads to a better quality, the material is described as softer and stronger (Rousselot, 1997).

[2] Apart from DNA analysis I am not aware of an appropriate method with which the gut of a specific animal within the group of mammals could be easily identified.

[3] Compared to fresh European pigs, sheep's and horse's gut the material is different: pig and sheep gut is narrower and softer, horse gut has a comparable width, but all three are weaker, thinner and more transparent. However, this might be a result of age, deterioration, the manufacturing process or biological properties.

[4] The use of Cormorant as source material is mentioned. At the Ethnographic Museum in Munich I have seen gut skin objects supposed to be made of the pharynx of the Red-faced Cormorant.

[5] Recent further research into the subject made some more reference material available. Among this are hair samples of various seal species, so hopefully more definite results will be gained soon.

[6] To avoid significant shrinkage or deformation of the paper mount, one should avoid working with too wet a sponge. Furthermore the paper mount should be allowed to dry on the model.