Pippa Cruickshank and Vanessa Sáiz Gómez

An early gut parka from the Arctic: its past and current treatment.

Introduction

A parka made to be used whilst out hunting in a kayak, was collected around 1890, probably in Alaska. The sea mammal gut is particularly thin and translucent. In 1987 it was conserved for storage, and in 2009 for storage and display. The repair materials used over 20 years ago were still proving effective and it was decided to use goldbeaters' skin again for the smaller repairs. In 2009 some larger holes were infilled, for which mulberry paper was used. In 1987 a polyvinyl butyral adhesive soluble in an organic solvent was chosen. However, since the late 1990s water-based adhesives have generally been used for gut at the British Museum as they allow the repairs to be secured whilst the gut is humidified and relaxed. A lightweight internal support was devised to protect this extremely light and delicate parka in storage. A clear Perspex tube was used as a support for display.

Description

The parka, British Museum Registration Number 1890,0908.2, is an early example of the gut frocks, kamleikas, made for use as raincoats and at sea by Eskimoan peoples across the arctic. This example dates to around 1890 and was collected by Hugh Cecil Lowther, the Fifth Earl of Lonsdale whilst he was in the arctic.[1] Parkas of the Aleuts and Pacific Eskimos were constructed of horizontal strips of gut. In Greenland, and often in North Alaska, the strips were joined vertically. The body of this parka was made from horizontal strips of gut with continuous strips running from cuff to cuff; short vertical strips form the back of the hood (Figure 1). This style suggests that it originates in South-West Alaska, from the Yuit or Yupiit.[2] The construction seems very simple, and is not tailored apart from some shaping by inserting additional small pieces of gut as gussets at the underarms, neck and shoulders. The seams are elaborately stitched with sinew and double folded to form a watertight join.[3]

Figure 1. The gut parka before conservation. ©The Trustees of the British Museum.

It is functional in design and, unlike some of the more elaborately decorated ceremonial parkas, is very simply adorned with small loops of blue and red wool, probably obtained from trade cloth, inserted into the seams. This was a common form of decoration, especially south of the Norton Sound.[4] The neck and cuffs have sinew drawstrings adorned with black and blue glass beads that could be tightened to keep out the water and such parkas could be secured around the hatch of a kayak, making them ideal for travelling in Arctic waters. They were not very durable and were replaced at frequent intervals; an active man was said to get through two or three parkas a year.[5] They were very light in weight, and when dry the parkas can weigh as little as 85 to 200 grams.[6]

Materials and Technology

The gut could be from seal, sea-lion, walrus or whale. It is most likely to be of seal or sea-lion gut, and was described as seal intestine when it was acquired. Seal gut was most popular north of the Aleutians and in Greenland, whereas in the Aleutian Islands sea-lion gut was the most common material for hunting parkas.[7,8] The small intestine of such sea mammals is extremely long, small in diameter and coiled. It is a sheet of smooth muscle bound by connective tissue fibres such as collagen. The very dense structure makes it impervious to water. The gut is oriented as it would have been in the body with exterior surface of the gut used for the outside of the waterproof parka.[9] The parkas were said to keep clothes underneath dry unlike nylon parkas.[10] The gutskin clothing appears to be breathable and, like today's Gore-Tex® raincoats, to allow humidity to escape from the inside whilst preventing water from entering.[11]

Burns comments that: "Identifying the kind of gut used in a gut parka involves three things: a knowledge of the characteristics of gut from different animals, some knowledge of the animals available at the different villages where the manufactured items were obtained, and preferences of use by the local people. Proper identifications are sometimes very difficult because there is overlap in the dimensions of gut strips from some animals".[12] In addition, both the small and large intestines were used, and they differed in width.[13] The width of intestine when split varies according to the animal species, roughly between 7.5 – 15 cm.[14] Sea-lion gut is about 7.5 cm wide, black-bearded seal is about 10 cm wide, and that of the beluga whale is narrower than black-bearded seal gut showing that the width is not necessarily dependent on the size of the animal.[15] Analytical methods to try and identify the gut from different sea mammals have been investigated.[16]

The processing of gut by the Inuit has been described elsewhere.[17, 18] After preparation, the gut only stays flexible whilst it is moist or saturated with water. Before putting on the parka there are references to it being moistened with water[19] and when the gut became wet in use it "gets so soft that it clings to you".[20] However, there are accounts of gut parkas being hung up in the smoke of an alder-wood fire to prevent the parka becoming too soft when it got wet in use.[21] There is some mention in the literature of the use of oils to keep the gut supple and waterproof, although it seems uncertain how widely such oils were used. Issenman states that "The split processed intestines must be well oiled and rolled up to prevent loss of pliability".[22]

In the 'Journal of a Voyage on Discovery in the Pacific and Beering's Straits on board H.M.S. Blossom Capt. F. W. Beechey',1826, it is stated: "They had several 'kamlaikas' a sort of shirt made from the intestines of the whale, walrus, or seal, some almost as fine as goldbeater's skin, they were secured with sinews and being well oiled, became completely waterproof".[23]

An account by Veniaminov published in 1840 states: "They smeared the kamleika with sea

mammal oil (but not that of fish!) to better preserve it, and at the time of each wearing, they sprayed it with water".[24]

Conservators need to be aware of the possibility of original oils having been applied so as not to remove them during conservation as they are evidence of use. However, natural oils may oxidize and become rancid, and Morrison suggested that it might be unsafe "to leave deteriorating, oxidized oils on the object".[25] In some museums, including the Canadian Museum of Civilization, gut parkas that have been oiled are kept in a cool environment to try and slow down the oxidation of the oil. However, cold temperatures may make the gut more brittle, and the choice of any repair adhesive and its glass transition temperature (Tg) would have to be considered if cold storage, or freezing for pest control, is used.[26]

Conservation for storage in 1987

The 1987 treatment was carried out by one of the authors [PC]. The conservation record states that the parka felt dry and brittle, and was dusty, but in surprisingly good condition. Apart from a few small holes in the gut, there were just two larger holes under one arm. The parka did not appear to have had any oils applied. After removing loose dirt with a soft brush whilst vacuuming, it was cleaned of post collection soiling with a 50:50 solution of industrial methylated spirit and distilled water containing a few drops of Synperonic® N non-ionic detergent using moist cotton wool swabs. During cleaning the gut relaxed, enabling the parka to be gradually padded out with crumpled acid-free tissue paper. This eased out the firm creases that had formed as a result of being stored flat.

Early conservation treatments of gut parkas at the British Museum often included washing by immersion in water, followed by the application of a humectant such as PEG 400 (polyethylene glycol).[27] However, by mid 1980s the British Museum's approach had changed in line with current thinking. The desirability of such treatments was questioned, as it was uncertain that the gut was meant to be flexible and supple whilst not in use.[28, 29] It became generally accepted that it was preferable not to try and make the gut more flexible, but rather to provide good storage and to minimize handling.[30] The effectiveness of such humectants in the longer term was also questioned.[31] Consequently, no attempt was made to soften the gut in the 1987 treatment.

Goldbeaters' skin was introduced as a repair material for gut at the British Museum by one of the author's [PC] in the early 1980s; previously dyed nylon tissue had been used for repairs. Whilst working on a group of model Inuit boats, goldbeaters' skin had proved an ideal material for small repairs to the gut.[32] It is the prepared outer membrane of the large intestine of the ox and so is very compatible for repairing gut artefacts as it is also composed of collagen. It is thin, quite glossy, transparent and reasonably strong and has a long history of use in book conservation for repairing tears and holes in parchment. It is transparent but was found to dye successfully with protein dyes. A piece of goldbeaters' skin was immersed in a beaker of Ciba® Lanacron® protein dye diluted in a 1:1 solution of industrial methylated spirit and cold distilled water and stirred briefly for a few minutes before removing, rinsing in cold water and drying against Teflon-coated glass cloth to give a matt finish.

A quick-drying adhesive was desired to make application easier. A 20% w/v solution of Mowilith® 50 (polyvinyl acetate resin) in acetone was used in the treatment of the gut components of the model boats, as it had been in previous work at the British Museum, as it adhered well following the application of the humectant PEG 400. However, it tended to be

rather shiny in appearance and so, for the treatment of this parka, a 15% w/v solution of Butvar® B98 (polyvinyl butyral adhesive) in industrial methylated spirit was chosen. It was found to adhere well to the untreated gut of the parka.

It was decided to repair the small holes in the body of the garment and tears along the lower edge, but to leave the two large triangular holes (one on each side) under one arm unfilled as their full repair was not structurally necessary and visual infill was unnecessary as the parka was not being conserved for display at this time. Small pieces of the dyed goldbeaters' skin were gently eased into position using fine pointed forceps and the adhesive applied with a fine sable paint brush to repair the small holes and to enable the fragile gut around the edges of the underarm holes to be strengthened and secured to the seams around the holes.

Conservation for display and future storage in 2009

1. Evaluation of 1987 treatment

The 1987 treatment was evaluated and the small goldbeaters' skin repairs were found to be still fully effective. The dyed goldbeaters' skin was visually successful, being virtually imperceptible; the adhesive used in the treatment was not failing and did not appear shiny. These repairs were therefore left untouched. Although the larger underarm holes had been left unfilled in the previous treatment for storage, it was decided to fill them during this treatment for aesthetic reasons, and in case of any strain from hanging whilst the parka was on display. The parka had been stored in a drawer and did not require any additional cleaning.

The parka was required for display in the rotation of the Wellcome Trust Gallery *Living and Dying* exhibition opening at the British Museum in July 2009. In addition, a desire to improve the storage of all the gut parkas in the museum's collections led to an investigation into suitable internal supports.

2. Repairs for storage and display in 2009

The parka required relaxing by humidification to lessen the creases at the sides of the body and sleeves. It was placed in a Lascaux humidity cabinet and the RH was slowly raised to 80% over seven hours. During this time the parka was gradually padded out with crumpled nylon net to allow the humid air to circulate easily (Figure 2). At 80% RH the gut was flexible and the hard creases and fold lines could be manipulated and significantly reduced. Additional local humidification with an ultrasonic humidifier was carried out in more inaccessible or delicate areas, such as the hood, the underarms and the lines along the sleeves.

Figure 2. Padding out with crumpled nylon net during humidification in humidity cabinet. ©The Trustees of the British Museum.

One of the authors [VSG] carried out trials of possible repair materials using collagen sausage casing to represent the gut of the parka. Different repair materials are suitable for different thicknesses and qualities of gut and by the late 1990s fine mulberry *kozo* paper coloured with acrylic paints had been introduced at the British Museum as an alternative patching material for larger repairs or where greater strength was required. Goldbeaters' skin and fine *kozo* paper were therefore both included in the tests. Consideration was given to the strength required by the repair material and its visual qualities with regard to the translucence of the gut. Larger patches than are structurally necessary are sometimes applied for aesthetic reasons, as the repair can be less visible if the patch is extended from seam to seam.

Finally, it was decided to use a fine *kozo* paper rather than goldbeaters' skin for the large repairs at the underarms, to provide greater structural strength when hung on display (Figure 3). Nevertheless, goldbeater's skin dyed as described above was used on the small infills as it is more sympathetic to the original material and almost visually imperceptible.

Figure 3. Large underarm hole prior to repair. ©The Trustees of the British Museum.

Both Vinamul® 3252 (vinyl acetate ethylene copolymer) and isinglass (fish glue made of sturgeon swim bladders) were tested. Both adhesives are water-based and so can be applied whilst the gut is humidified and supple. Although Klucel® G (hydroxypropyl cellulose) at 10-15% w/v in acetone has been successfully used for temporary facings, and to secure initial tabs to align and hold gut tears in place prior to repair at the British Museum, it was not included in these tests as it was felt that it might be too weak as an adhesive for permanent structural repairs.

Vinamul 3252 has a Tg of 3°C and remains slightly tacky at room temperature, but the adhesive is not left exposed and the parka is not going on open display. Isinglass is an interesting option to consider as, like gut, it is mainly composed of collagen. It is often used as a paint consolidant or flake laying adhesive, and has been used in the treatment of fish skin coats which have similarities to the gut parkas.[33] It has also been used in the treatment of parchment, where both Japanese paper and goldbeaters' skin have been used as repair materials.[34] Acrylic resins and isinglass can be mixed, and dried films of isinglass can be re-activated with moisture.[34] For these tests, the Vinamul 3252 was diluted to a 50% v/v solution in distilled water as used in previous treatments. The isinglass was trialled as a 5% w/v solution and was soaked in the cold de-ionised water for about two hours, before heating to approximately 55°C in a water bath until it had fully dissolved, which took about 30 minutes, and left to cool before it was applied.

Vinamul 3252 was finally chosen over isinglass as it gave a flexible, strong bond. Although the isinglass also gave a matt, smooth bond which seemed equally strong, it was decided that more research, experimentation and testing was required before applying it to an object, especially considering that the infills were going to be exposed to some strain. Isinglass has been reported to be highly sensitive to changes in relative humidity, brittle in relative humidities below 50% and prone to elongation and creep at high humidity, although this

seems to depend on the source, supplier and method of preparation.[35, 36, 37] It is also susceptible to biological attack.

The Vinamul was applied with a fine sable paint brush along the edges of the paper, working gradually section by section, to enable the exact size, shape and tension of the repair patch to be ascertained. Prior to adhesion the gut had been made more flexible by local humidification using an ultrasonic humidifier. This enabled the gut to be safely manipulated and the join adhered by the application of gentle hand pressure. The paper patches were extended to the seams to minimize their visibility through the translucent gut (Figure 4).

Figure 4. Large underarm hole after repair. ©The Trustees of the British Museum.

3. Internal storage support

Alternative materials for an internal support were investigated by one of the authors [VSG] as it was felt that balls of crumpled acid-free tissue paper were too heavy for use inside such extremely lightweight gut parkas and did not provide an even and firm support that would ensure safe handling. The support needed to be as lightweight as possible, smooth so that it would slip in and out of the parka easily without creating friction or damage, and capable of creating volume inside the parka in order to prevent the edges from forming creases and potentially splitting. An inert material was required that would not attract insects.

A padding material such as polyester wadding covered in silk was rejected as the wadding is quite heavy and the silk could attract moth (although the gut and materials used to decorate gut parkas, such as wool and feathers, would be likely to be eaten before the clean silk). Rolls of Melinex® (polyester film) and polyester screen mesh were considered but ruled out due to the possibility of sharp edges cutting the gut. After experimentation with different materials, it was decided to use thin sheets of Plastazote® (polyethylene foam) to create a hollow three-dimensional form within the parka. A 2 mm thickness was chosen to be as light as possible and thin enough not to be too stiff.

It was decided that a four-piece support would be required to enable a good fit and to allow it to be removed from the parka with least disruption (Figure 5). The largest piece would support the main body of the parka, another would support each sleeve and a fourth the hood and neck area. As one arm was wider than the other and the garment was not completely symmetrical, a two-dimensional tissue paper template was made for each of the four sections. As the arms tapered, some trial and error was necessary before the exact shape was reached.

Each piece of the mount was made from one piece of Plastazote, which was cut to the shape of the template, so that it could be bent round to the shape of the inside of the garment. The Plastazote was then joined by heat-sealing with a Crosswell polyester sealer, adapting the welding and cooling time until a satisfactory bond was achieved. The settings needed to be continuously readjusted as the jaws retained some heat after repeated use.

Figure 5. Four sections of internal mount. ©The Trustees of the British Museum.

The hollow three-dimensional supports were then covered with a sheet of fine non-woven polyester Bondina (30 g) on both sides with the shiny surface outwards. The Bondina was wrapped around the three-dimensional Plastazote mount and pinned in place with pins along the join, inserting the widely spaced pins at right angles to the seam. This tube of Bondina was then taken off the internal Plastazote shape and heat-sealed along the join. A strip of non-stick Teflon-coated glass-cloth was inserted within the Bondina tube so that only the overlapping join in the Bondina would be sealed. The few pins were then removed and a second seal made alongside the first, about 1 cm apart to ensure a durable seam. All the external seams in contact with the gut parka were joined by heat-sealing to ensure they were completely smooth. The internal seams were hand stitched due to problems of access. This method was used for the body and both arm sections (Figure 6).

Figure 6. Bondina covering has been heat-sealed twice to form a tube and slipped over the heat-sealed hollow 3D Plastazote form tailored to fit the inside of one sleeve. Finally the internal seams are hand stitched. ©The Trustees of the British Museum.

To provide support for the rim of the hood and neck area, 'sausages' were made from tubes of Bondina, heat-sealed down one side as described above, and filled with small pieces of polyester wadding. These 'sausages' were also used as an additional padding to ensure that the main body area did not flatten over time and to provide extra padding to the sides of the parka, areas where hard fold lines were likely to recur. A simple bag made of Tyvek® with a Velcro fastener was made to store the internal support sections while the object was on display.

The resulting internal support was suitably lightweight and inert (Figure 7, 8). It is felt that this storage support method could be adapted to different sizes and weights of gut parkas or capes as necessary by varying details such as the thickness of the Plastazote used, or the combination of 'sausages' and hollow Plastazote forms.

Figure 7. Parka after conservation with internal mount in place. ©The Trustees of the British Museum.

Figure 8. After conservation showing volume created by internal mount. ©The Trustees of the British Museum.

4. Method of display 2009

From a conservation viewpoint it was considered desirable to display the objects with outstretched arms to prevent creasing of the material that might lead to eventual splitting of the gut. The parka is likely to remain on display for three years. A clear Perspex tube was inserted through the arms from cuff to cuff and the tube suspended by attaching wires to either end, notches having been cut into the tube at each end to hold the wire and prevent the tube from turning. The hood was very simply supported with one strip of 12 mm wide white Rigilene® (polyester boning) bent into a loop and secured to the Perspex tube. This method of displaying gut parkas has the advantages of showing the construction method of the parka, and emphasizing the translucency of the material, which both attract admiration
However, some people would prefer that they were displayed in a more natural posture.

Figure 9. Parka on display in the Wellcome Trust Gallery Living and Dying at the British Museum. ©The Trustees of the British Museum.

Conclusion

It was useful to have the opportunity to re-evaluate the repairs carried out some 20 years ago, and satisfying to find that they were still proving effective and still appropriate for similar repairs today. The repair methods finally chosen have all successfully been used on gut artefacts at the British Museum previously. Isinglass has only been tested for use as a consolidant at the British Museum, but initial trials showed that it may be worth further investigation for use as an adhesive both on its own and in mixtures with synthetic resins. The storage system devised fitted the desired criteria for this exceptionally lightweight parka, and it is felt can be adapted for parkas of different weight or design. The simple method of display with clear Perspex tube provides adequate support for this very lightweight parka but the parka will be monitored whilst it is on display for the next three years.

References

1. S. Krech III, *A Victorian Earl in the Arctic. The travels and Collections of the Fifth Earl of Lonsdale 1888-9, Shepard Krech III with a biographical introduction by J.V. Beckett* (London: British Museum Publications,1989) 113-5, Figure 27.

2. Krech, 115.

3. J.C.H. King, B. Pauksztat and R. Storrie, *Arctic Clothing of North America - Alaska, Canada, Greenland* (London: The British Museum Press, 2005) 51.

4. Krech,113.

5. D.J. Ray, *Aleut and Eskimo Art, Tradition and Innovation in South Alaska* (London: C. Hurst and Co. Ltd, 1981) 56.

6. P. Hickman, *Innerskins/ Outerskins: Gut and Fishskin* (San Fransisco: San Francisco Craft and Folk Art Museum, 1987) 8.

7. L.T.Black, *Aleut Art. Unangam Aguqaadangin Unangan of the Alleutian Archipelago*, (Anchorage Aang Angaĝin, Aleutian / Pribilof Islands Association, 1982) 158.

8. Ray, 56.

9. B.K. Issenman, *Sinews of Survival, The Living Legacy of Inuit Clothing* (Vancouver: UBC Press, 1997) 73.

10. R.P. Blumenstein, 'Fishskin and Gut the Yup'ik way', *Innerskins/ Outerskins: Gut and Fishskin*, ed. P. Hickman (San Fransisco: San Francisco Craft and Folk Art Museum, 1987) 24.

11. Issenman, 74.

12. J.J. Burns, 'Arctic Marine Mammals: An inside look', *Innerskins/ Outerskins: Gut and Fishskin*, ed. P. Hickman (San Fransisco: San Francisco Craft and Folk Art Museum, 1987) 28.

13. Burns, 29.

14. Issenman, 74.

15. Blumenstein, 27.

16. P. Cruickshank, 'The conservation of a model Eskimo kayak involving the treatment of gut', *Leather Conservation News*, **4**, 1 (1987) 1-12.

17. Cruickshank, 6.

18. Blumenstein, 8, 25-6.

19. R.G. Liapunova and N.N. Miklukho, *Essays on the Ethnography of the Aleuts (at the end of the Eighteenth Century and the first half of the Nineteenth century)* (Fairbanks: University of Alaska Press, English translation, 1996) 208-9.

20. Blumenstein, 24.

21. Cruickshank, 6.

22. Issenman, 82

23. J.R. Bockstoce, *Eskimos of Northwest Alaska in the early nineteenth century: based on the Beechey and Belcher collections and records compiled during the voyage of H.M.S. Blossom to Northwest Alaska in 1826 and 1827*, University of Oxford, Pitt Rivers Museum Monograph series, 1 (Oxford: Pitt Rivers Museum, University of Oxford, 1977) 92.

24. Liapunova and Miklukho, 208.

25. L. Morrison, 'The Conservation of Seal Gut Parkas', 1986, *The Conservator*, **10**, 17-24.

26. M. Kite, 'Freezing Test of Leather Repair Adhesives', *Leather Conservation News*, **7**, 2 (1992) 18-19.

27. L. Hill, 'The conservation of Eskimo seal-gut Kagools', 1986, *SSCR Bulletin*, **7**, 17-20.

28. A.R. Hoveman, 'Preservation of fishskin and gut', *Innerskins/ Outerskins: Gut and Fishskin*, ed. P. Hickman (San Fransisco: San Francisco Craft and Folk Art Museum, 1987) 31.

29. H. Dumka, 'The conservation treatment of three gutskin parkas', *Journal of the International Institute for Conservation of Historic and Artistic Works - Canadian Group*, 16 (1991) 17-22.

30. Hoveman, 31-2.

31. D. Sully, 'Humidification: The reshaping of leather, skin and gut objects for display', ICOM *Conservation of Leathercraft and Related Objects*, ed. P. Hallebeek, M. Kite, and C. Calnan, (ICOM Committee for Conservation, 1992) 50-54.

32. Cruickshank, 1-12.

33. M. Kite, 'The Conservation of a 19th century salmon skin coat' (ICOM Committee for Conservation, 1999) 691-696.

34. A.B. Quandt, 'Recent developments in the conservation of parchment manuscripts', The Book and Paper Group Annual, AIC, (1996),15.

35. M. Haupt, D. Dyer and J. Hanlan 'An investigation into three animal glues', *The Conservator*, 14 (1990) 10 – 16.

36. S. Foskett, ‘An investigation into the properties of isinglass’, *SSCR Journal*, **5**, 4 (1994) 11-14.

37. Schellmann. N.C., ‘Animal glues: a review of their key properties relevant to conservation’, *Reviews in Conservation*, 8 (2007) 55-66.

Acknowledgements
The authors would like to thank Jonathan C H King, Keeper of the Department of Africa, Oceania and the Americas (AOA) at the British Museum, for advice on the cultural context, and Ian Taylor, curatorial assistant in AOA, for suggesting some additional references. Carole Dignard at the Canadian Conservation Institute in Ottawa, Heather Dumka at the Glenbow Museum in Calgary, Caroline Marchand at the Canadian Museum of Civilization in Hull and Anne Mackay at the McCord Museum in Montreal kindly provided some general information on the storage of gut parkas at their museums in Canada.

Abstract
This parka is one of a group of seven collected by the Earl of Lonsdale in about 1890 now in the collections of The British Museum. It was made for use whilst out hunting in a kayak and is perfectly constructed to keep out the water. The gut is particularly thin, translucent, lightweight and delicate. The design is beautiful in it simplicity, with small loops of red and blue wool sewn into the seams.

The parka was first conserved for storage in 1987. Recently, it has been conserved for display in the Wellcome Gallery at The British Museum. This gave an opportunity to evaluate the previous treatment, and consider current treatment options. The 1987 repairs of dyed goldbeaters skin were still proving effective, and it was decided to use the same material, with a different adhesive, for some of the smaller new repairs. In 2009, it was decided to infill the large holes at the underarms as the parka was now destined for display. For these larger holes coloured Japanese paper was used. A water-based adhesive was chosen so the repairs could be secured whilst the gut was humidified and relaxed.

Although this parka was being conserved for display, the desire to improve the storage of the entire collection of gut parkas in the museum led to an investigation into possible internal support methods. Some of the parkas are currently stored without any padding, leading to the formation of creases at the sides. Others have crumpled tissue paper inside which is rather heavy. The criteria for the new internal support were that it was lightweight, it would slip in and out easily, and that it was inert and would not attract insects.

Biographies
Pippa Cruickshank
Manager of Textile and Fibres Studio, Organic Artefacts Section, Department of Conservation and Scientific Research, the British Museum, Great Russell Street, London WC1B 3DG.
Pippa has worked on a wide range of organic artefacts. Her dissertation for the Museums Association Conservation Certificate in Ethnography, completed in January 1985, focused on the conservation of a group of model Inuit boats with miniature gut parkas and manhole

coamings, and she has also worked on a number of full-sized gut parkas. Her main specialism is in textiles, from archaeological to ethnographic.

Vanessa Sáiz Gómez
Trained at the Institute of Archaeology, University College London, where she received the MA in Principles of Conservation in 2007, and the MSc in Conservation for Archaeology and Museums in 2009, both passed with distinction.
This project was completed whilst working as an intern in the Organics Artefacts Section of the Department of Conservation and Scientific Research of the British Museum during the last year of her training. She is now employed as an organics conservator at the British Museum.

Contact address

Pippa Cruickshank
The British Museum
Great Russell Street
London WC1B 3DG
pcruickshank@thebritishmuseum.ac.uk

Vanessa Sáiz Gómez
The British Museum
Great Russell Street
London WC1B 3DG
vsaizgomez@thebritishmuseum.ac.uk

Materials and suppliers

Goldbeaters' skin
Bill Lewington Ltd
No longer available from this supplier, but now available on request from:
Preservation Equipment Ltd
Vinces Road
Diss
Norfolk,
IP22 4HQ
UK
Tel: +44 (0)1379 647400
Fax: +44 (0) 1379 650582
E-mail: info@preservationequipment.com

Isinglass
Cornelissen &Son
105 Great Russell Street
WC1B 3RY
London
UK
Tel: +44 (0) 20 7636 1045
Fax: +44 (0) 20 7636 3655

E-mail: info@cornelissen.co.uk

Lanacron® dyes manufactured by Ciba® now replaced by
Lanaset® dyes
Huntsman Textile Effects
Unit B,
Adlington Court,
London Road,
Adlington,
Cheshire
SK10 4NL
UK
Tel: +44 (0) 1625 875577
Fax: +44 (0) 1625 875080
http://www.huntsman.com/Textile_Effects/

Tengujo Japanese paper
Shepherds Bookbinders Ltd (formerly Falkiner Fine Paper)
76 Southampton Row
WC1B 4AR
London
UK
Tel: +44 (0) 0207 831 1151
E-mail: shop@falkiners.com

Vinamul 3252
De Asselen Kuil
20 6161 RD Geleen
Netherlands
Tel: +31(0)46 438 9898
Fax: +31(0)46 438 9710
E-mail: europe@vinamulpolymers.com