An unusual decorated skin coat from Canada: aspects of conservation and identification

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SUMMARY A skin coat (Am1949,22.175), which has recently been examined and conserved, belongs to a group of about perhaps 30 surviving within museum collections and made around James Bay and Hudson Bay in northern Canada. They date to around 1760–1860 and were made by the Cree people, with possible additions by the Ojibwe/Anishinaabeg in the region of the northern Great Lakes. As this group of coats is poorly understood and the coat stimulated some discussion while undergoing treatment in the conservation studio, further investigation was carried out on the materials of which it is composed. Fibre samples were identified using variable pressure scanning electron microscopy. The coat is thought to be made of moose skin but as it has been de-haired no moose hairs survived for identification. The few hairs remaining in situ on the collar and cuffs were identified as wolverine and river otter respectively. Conservation treatment enabled the cuffs to be gently folded back outside the sleeves. As the coat would originally have looked very different, before almost total loss of hair on the collar and cuffs due to past insect attack, a digital reconstruction was made to give an idea of its original appearance. The epaulettes have been quite roughly attached to the shoulders of the coat with coarse thread, suggesting that they may well have been added later, possibly from an older garment, as evidenced by the very fine but faded loom-woven quillwork and the presence of clear glass beads. The fur collar and cuffs could also have been added to the coat at this time.

Introduction

The British Museum (BM) holds a number of painted caribou and moose skin coats in its collections. The undocumented example that is the subject of this contribution (Am1949,22.175) is believed to have been created on Hudson or James Bay in northern Canada and entered the BM in 1949 from the collection of William Ockelford Oldman (1879–1949) [1]. The coat has been displayed frequently since 1976.

There are two groups of painted aboriginal skin coats from subarctic Canada. The first consists of approximately 200 painted caribou coats from the Québec-Labrador Peninsula of which five are in the British Museum. These tight-fitting, highly tailored garments were made by the Innu or Montagnais-Naskapi people from c.1700–1900 [2]. The second group, of which around 30 are preserved in museums, are untailored – falling straight from the shoulders – and are usually considered to be constructed from moose skin; they probably date to c.1760–1860 [3; 4; p. 90; 5; pp. 39 and 75]. Coats in the latter group were made around James Bay and Hudson Bay by Cree people, or people of mixed or Métis descent, and may also have additional Ojibwe/Anishinaabeg elements, which were applied further south in the region of the northern Great Lakes. The unusual coat examined here belongs to this second, heterogeneous and still poorly understood group [6].

The choice between moose or caribou skin determines the thermal properties of a coat as – when both have their hair intact – the latter will provide greater warmth. However, there are a number of extraordinary highly decorated thick skin coats in European and North American museums from which the hair has been removed, making it unclear whether they are made from moose or caribou skin. In common with these examples elsewhere, the lack of hair on the main skin of the BM coat means that hair sampling and identification could
not be carried out and species identification would rely on proteomic or DNA analysis of the skin itself. Hairs from the fur of both the collar and cuffs had been sampled previously and identified by one of the authors (CRC) in a recent project to examine hairs and fibres from a group of North American artefacts [7].

When the coat came into the conservation studio for treatment in 2012 it was decided to investigate it further as it seemed to be an important garment about which many questions remained unanswered. The quilwork that was applied directly to the main skin of the coat appeared to be in better condition than that on the epaulettes. The materials used to make the coat, its method of construction and the textile techniques used in the decorative elements were examined. Samples of stitching threads, hairs still attached to the skin, red-dyed hair tassels, quills and woollen cloth were all taken for analysis.

Some original repairs were evident and there was some discussion as to whether there might be some later additions. The skin on the cuffs and collar is extremely thin with a number of tears, holes and weak areas in need of lining to strengthen and protect them and to enable the cuffs to be folded back outside the sleeves. Identifying the surviving animal hairs still firmly embedded in these areas of thin skin was crucial to enable digital images to be produced to show how the coat may once have looked.

Description
The body of the coat is cut from a single skin to form a simple garment that opens at the front and into which the sleeves have been inserted, Figure 1. The skin has been de-haired using scrapers, facilitated by first leaving the skin in a damp state to initiate a rotting process [8]. The coat has a straight vertical line with the lower hem measuring only c.156 cm, excluding the front opening fringes. It is untailed, with no seams or added gussets in the main body. The coat has no waist and hangs from the shoulders and although it would probably have been belted when worn there is no evidence of wear in the middle, which may imply that this coat has never been worn or has been used infrequently.

The simple structure of the coat stands in contrast to its lavish decoration. The cuffs and falling collar are made from the fur of smaller mammals; the skin is much thinner than that of the main coat and there are now very few hairs still rooted in the follicles of the epidermis. The seam joining the cuff to the sleeve was sewn so that the stitching and raw edges would be on the inside when the cuffs were formed by folding them back outside the sleeves. The seam at the neck edge was left exposed but then covered with a narrow strip of dark blue woollen fabric only traces of which now remain. Each sleeve is made from a single piece of skin that appears to have been formed by overlapping the two skin edges very slightly and then securing the remaining raw edge on either side with stitching, making a very neat seam. The sleeves have been joined to the main body of the coat in a similar fashion. There are some stitched original repairs on the cuffs, the collar and the main body of the coat.

The body of the coat is decorated with paint in geometric designs in blue, grey-green, yellow, red and black in a wide strip down the centre back of the coat and around the lower edge of the coat. A thin line of a possibly slightly different red has been applied along the outer edge of the front opening and lower edge of the coat. The edge of the skin has been slit to form fringes down both sides of the front opening of the coat and along the lower edge. These fringes are individually wrapped at the inner end with flattened quills that have either been left in their natural colour or coloured white, red and black (or nearly black).

The shoulders are decorated with epaulettes composed of panels of loom-woven quillwork constructed from flattened quills with an added row of clear glass beads at either end of the woven panel [9]. Strips of skin that have been painted red have been stitched onto both sides of the woven quillwork. The red colouring extends a little onto the skin of the main coat, probably accidentally, indicating that the colour was either applied or renewed after these epaulettes had been attached to the coat. On the neck edge this narrow skin strip is finished with a thin edging of red wrapped quillwork. At the arm edge, the band of skin is wider and it has been cut to form narrow skin strips that have been individually wrapped in flattened quills dyed red, blue, black and possibly naturally coloured at the inner end. These wrapped fringes are re-joined with thread at their far end and bunches of red-dyed hair have been tied and knotted into the ends of the skin strips and extend outwards in tufts at the shoulders, Figure 9.

The identification of hairs and fibres
Care was taken, through examination of the material and accompanying documentation, to establish those areas that might have been restored or replaced with different types of fibres or hairs at any point in the coat’s history. These areas were then avoided during sampling to minimize the possibility of misleading identifications.

A high vacuum scanning electron microscope (SEM) was used in a previous study to provide images of well-preserved caribou and seal hair from Inuit Arctic clothing in the BM collections [10]. However, such good preservation of hairs is not normally encountered when examining historical or archaeological material and only with the advent of variable pressure (VP) SEM examination and imaging has routine identification of hairs and fibres in varying conditions become feasible. Each of the hairs and fibres sampled from coat Am1949,22,175 required minimal, rapid preparation for SEM examination by simple mounting on aluminium SEM stubs using adhesive carbon pads or affixing to the stubs using a tiny pellet of ‘Blu-Tack’. These uncoated samples were examined in the VP-SEM using the backscattered electron (BSE) detector at 15 kV with a working distance of between c.14 and 21 mm. Depending on the condition of the samples the accelerating voltage was dropped to 12 kV or increased to 18 or 20 kV. For all samples, the SEM chamber was partially evacuated (30 or 40 Pa) under VP conditions. The 3D mode (rather than Compositionial) was selected for maximum visibility of diagnostic features on the hairs and fibres, and also to characterize wear due to modification, use or abrasion, as well as dirt, encrustation and fungal hyphae.

During identification of the coat’s hairs and fibres, comparisons were made with reference collection samples, published articles, on-line fibre atlases and databases. The advantages and drawbacks of these sources of comparative
Figure 1. The front of decorated skin coat Am1949,22.175, seen in a black and white photograph taken c.1976, showing the cuffs turned down.
Figure 2. VP-SEM images of wolverine underfur: (a) a reference collection specimen; and (b) from the coat collar. Image Caroline Cartwright

Figure 3. VP-SEM images of river otter underfur: (a) a reference collection specimen; and (b) from one of the cuffs of the coat. Image Caroline Cartwright

Figure 4. VP-SEM image of a porcupine quill from the coat, showing evidence of splitting after flattening for use in the applied decoration. Image Caroline Cartwright
information have been discussed elsewhere and are not repeated here [7]; detailed information on diagnostic features is given in this earlier publication and referenced therein [7].

The embedded hairs from the collar were identified as wolverine (Gulo gulo) underfur (Figure 2) and those from the cuffs as North American river otter (Lontra canadensis) underfur (Figure 3 and also Figure 1d in [7]). Porcupine (Erethizon dorsatum) quills were often flattened (see for comparison, Figures 3, 4b, 4c, 5d and 5e in [7]) for use in decorative quillwork, as described above. Such flattening often results in central splitting, Figure 4. Sinew was used for the main structural seams that form the sleeves and to join these to the main body of the coat, while sheep (Ovis sp.) wool was used for some seam stitching and seam covering (see above and also Figure 2c in [7] for comparison). A sample of the red-dyed hair was identified as white tail deer (Odocoileus virginianus); see Figures 6b, 6c, 7b and 7c in [7] for VP-SEM images of the structure of white tail deer hair. The VP-SEM images that have been selected for inclusion here (Figures 2 and 3) represent a very small selection of those produced, but all the images have been archived for future reference.

The most common use of wolverine fur has always been for the trim or ruff on a parka hood, as it resists matting and frosting in very cold weather [11]. It is less common to find it used for whole collars or larger items of clothing. Decorative pieces of river otter fur trim (with fur trims of other small mammals) are recorded for traditional Athabascan long tunics of softened caribou skin from Yukon Territory [12].

**Condition and conservation**

Although black and white photographs taken in c.1976 show the coat with the cuffs turned down (Figure 1), the cuffs had been tucked up inside the sleeves prior to its arrival in the conservation studio. It soon became apparent that the cuffs must originally have been folded back outside the sleeves as the few remaining hairs indicated that the cuffs once had fur, although only a few single hairs remained in one or two places. Rather more hair survives on the collar, where it is concentrated in patches, indicating that it too was also once fully covered in fur. The fur on both cuffs and collar has been extensively eaten by insect pests at some point in the past, as has much of the blue wool edging covering the seam where the collar is joined to the main body of the coat around the neck edge.

The cuffs were very carefully extracted from inside the sleeves and extended to reveal the full extent of the damage to them. The remaining skin was very thin with many tears and holes as well as some stitched original repairs, Figure 5. The tears and holes in the cuffs were carefully aligned and repaired with patches of a fine non-woven Japanese polyester kasenshi fabric. One of the authors (PC) had previously found this to be a useful repair fabric for other materials, including patch repairs to the reverse of an Ethiopian church painting on cotton [13; p. 13], and an Inuit cape made of sea mammal intestine [14]. It is fine and translucent yet strong, and can easily be coloured with acrylic pigments diluted in water as in this instance. Roughly oval-shaped patches were cut from the 12 g.m\(^{-2}\) weight fabric and secured to the reverse (non-fur) side of the skin using a 15% w/v solution of
Klucel G (hydroxypropyl cellulose) in industrial methylated spirit, applied sparingly to the fabric with a sable brush. The patches were slightly overlapped to cover and strengthen the area around the tears and holes. Finally, the cuffs were very carefully folded back outside the sleeves to their original position so the reverse of the repair patches could no longer be seen, Figure 6.

The firm fold creases on either side of the collar were reduced by the application of moisture vapour through a Gore-Tex membrane, applying gentle pressure once the skin had relaxed using carbon fibre rod clamps with polycarbonate jaws padded with small pieces of Plastazote polyethylene foam. The holes and tears in the collar were repaired using fine mulberry paper in place of the kasenobi fabric, but coloured in the same way and again adhered with Klucel G. Less strength was required for these repairs and the edges of the paper patches could be feathered by water tearing to minimize their visibility on the reverse of the collar. The scant remains of the blue wool edging at the neck edge were secured with repair patches of dyed nylon net by stitching around the original stitching with monofilament silk thread dyed blue. A three-piece internal padded support was made from Plastazote sheet and polyester wadding covered with Tyvek (spun bonded polyethylene), Figure 7.

After conservation and identification of the hairs, it was decided to attempt to produce a digital image of how the coat may once have looked with its fur collar and cuffs. Reference hair samples were sourced in Canada to aid identification and help produce the reconstructed image. Although conservators have occasionally permanently replaced missing fur with new or synthetic fur [15], or suggested temporarily laying new fur over insect-damaged fur for display [16, p. 190], it was felt that a digital reconstruction would be more appropriate in this instance.

The positioning of the remaining hairs on the collar and cuffs was noted. River otter fur, which is often chocolate brown with a silvery sheen, comprises very dense (air-trapping) short-haired underfur protected by longer stiff guard hairs [17, 18]. The few remaining dark guard hairs on the cuffs indicated that the cuffs were originally completely covered in dark brown hair that would have felt smooth if stroked in an upward direction. Wolverine has thick underfur, coarse guard hairs and a characteristic dark brown saddle-shaped marking on the back of the pelt surrounded by a pale fawn colour [19, 20]. The remaining hairs on the collar indicated that it had originally been fully covered in fur. As this fur seemed simply to have been cut from a pelt and left untailedored, it was likely to have included some of the bold, characteristic light and dark coloured marking and this has therefore been suggested in the digital reconstruction, Figure 8.

Cultural background and discussion
The most striking feature of the group of coats, of which the garment treated and examined here is an example, is their structure – they are not of the ‘pull over parka’ type, which were designed to ensure that all-important hot air was trapped next to the body. Instead they are, at least today, rather stiff, highly embellished and extraordinarily decorated garments of limited practicality. The structural concept may have come, in part, from European open front coats. All the thick skin coats
are decorated with impressed designs, floral or geometric, using fat-based paints containing natural, possibly mineral, pigments, which were stamped or rocker stamped with caribou antler tools. The coats were worn by men and women, with breech-cloths, leggings, garters and moccasins and with separate hoods. A few dolls wearing such skin coats, perhaps better described as models, also survive in museums and may help in the understanding of these coats. The most famous of these
dolls is a pair formerly exhibited in the collection of Sir Ashton Lever in Leicester House, London, a sometime royal palace in the 1780s.

The dolls and the coats were probably created in factories or trading posts of the Hudson’s Bay Company, by aboriginal people of Cree descent in James Bay and Hudson Bay. Set up in 1670, this company survived as a British concern until the 1970s, trading fur for the ever-increasing number of commodities sought by Canadian First Nations people in the subarctic and later also the arctic. In the early years of the company young men, often Scottish, would be sent to what was then called Rupert’s Land (after Prince Rupert, the brother of Charles II and an original sponsor of the company). They might spend 20 years in the north, organizing the purchase of furs and they sometimes engaged with women from the area, who might also offer assistance in matters of language, clothing and more generally the learning of appropriate behaviour in an unfamiliar multicultural context. Peers has suggested that Cree and Métis embroidered artefacts were made by wives and daughters for their European menfolk [21]. Often these women would be the descendants of previous liaisons between Cree women and Europeans and the daughters of prominent aboriginal leaders. As a result, a group of people of mixed heritage grew up around the trading centres in James Bay, such as Moose Factory and Attawapiskat. Known now as Métis, their role was to negotiate the needs of traders and to accompany or represent the traders and voyageurs, particularly in the organization of long-distance trading with more remote aboriginal people who were less familiar with Europeans.

The coats were thus created within trading posts that were ‘contact zones’, places where people of radically different ethnicity and background – Scottish, French-Canadian and Native North American – lived, met and worked. Each year a single ship would arrive from Britain during the ice-free summer with all-important trading goods, including metal-bladed tools, beads, cloth, tea and tobacco, and with new personnel. While the First Nations trappers, hunters and women were dependent on the Hudson’s Bay Company for supplies and the Europeans depended on Cree and Canadian voyageurs for survival skills and tradable furs, the relationship is today often viewed as rather more asymmetrical, with power resting with the ‘outsiders’ – the fur traders.

The coats and the even fewer number of dolls fit into a story in which the fur traders responsible for posts in Ontario and Quebec would return to Europe after a decade or two of involvement with Cree First Nations society. They would have become expert speakers of Cree, excellent travellers on snowshoes and might leave behind children, who might have been presented with dolls that were fitted with European ceramic heads. The coats, embellished with glass beads, fur collars and possibly with extravagant swathes of loom-woven quillwork, would have served as eloquent reminders of their lives in the subarctic and become curiosities for their British families. While this version of the history of the coats is speculative, there are few other explanations of why such garments exist, since they are not very practical, and although they express spiritual values in their relationships to animals and the natural world, they are not known to have fulfilled any specific religious purpose. These spectacular coats may,
however, have been used on occasions when their owners needed to impress both Europeans and First Nations peoples. Once in Europe they were seen as emblematic of Native North American exoticism and a coat very similar to that studied here was used in the 1780s by the Swiss painter Phillippe Jacques de Loutherbourg in the pantomime *Omai*, celebrating the Polynesian traveller who came to Britain with Cook on his second voyage [22].

The question remains, however, of when and how the quillwork and fur embellishments were added to this coat. While much of the material traded with Britain was transported north through Hudson Bay, other trade took place upriver and over the watersheds into Manitoba, Ontario and Québec. It may be that some coats were transported south, where they were given fur collars and cuffs, and may have been fitted with quillwork from what are now Manitoba, Ontario and Minnesota in the...
western Great Lakes. The epaulettes on this coat have not been stitched into the seams as might be expected if the coat was made as a single operation, but were sewn on afterwards, suggesting the possibility that the quillwork could have been added later. The very fine, faded loom-woven quillwork and clear glass beads could have been taken from an earlier garment and added later, Figure 9. The fading of the quillwork could indicate the possible use of pre-aniline dyes [23].

On balance, it seems likely that this particular coat was transported south and once there embellished with porcupine quillwork and deer hair ornamentation. The known historical distribution of white tail deer provides some evidence to suggest that the epaulettes were made to the south of Cree country; at the time the coat was made this species was less abundant and its slightly less extensive range did not reach to James Bay and Hudson Bay [24]. Another coat in the BM (Am.7400), that has no collar or cuffs, may have been one of the coats to which these additions were never made and which may have been traded through a different route, Figure 10.

Conclusions
This joint project between conservators, scientists and curators has given new insight into this coat and how it may once have looked. The old black and white images of the coat from around 1976 show it with the now bald cuffs turned down. Prior to arrival in the conservation studio the cuffs had been tucked inside the sleeves in keeping with a suggestion, or assumption, that the fur might have formed an insulating layer for the skin at the wrists. However, examination soon ascertained that the fur hair was attached to the other side of the skin and must have been turned to the outside of the sleeve to form decorative cuffs. Hairs from these cuffs were identified as being from the river otter and would thus have been soft, sleek and dark brown in colour. The few remaining hairs on the falling collar were identified as wolverine, which has longer guard hairs and some very distinctive colouring.

In addition, study and analysis has helped to give a better understanding of how this coat has been constructed and which elements may have been added later. From their style, the loom-woven quillwork epaulettes appear to have been made further south, nearer the Great Lakes, and quickly stitched onto the coat with large stitches. The fur collar and cuffs could also have been added later for decorative effect.

During conservation the cuffs were strengthened to enable them to be returned to their original position on the outside of the coat, but as they are now simply pale coloured skin, they give a very different impression to that of the original dark river otter hair. Digital images offer scope for an audience to visualize the original appearance of an artefact such as this coat, whether in a gallery or on-line, while retaining the integrity of the object.

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