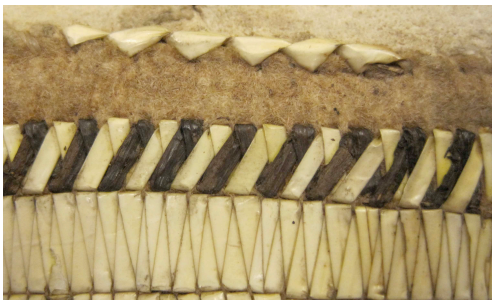
Identifying the plant material in the quillwork

When Heather Richardson, Jeremy Uden and Kate Jackson were cleaning and stabilizing the shirts for travel to Alberta, they noticed that not all the quillwork was actually quillwork. On two shirts, plant fibre was used in the same way as porcupine quills. This was photographed under magnification, but we were not able to identify the plant used.



Darker plant fibres used alternately with porcupine quills at edge of large chest panel, 1893.67.1

Crumbly dark brown lane on chest rosette, 1893.67.3

A review of published literature on Blackfoot use of plants, and emails to Blackfoot quillworkers, also didn't solve this puzzle. So, we took it to Alberta with us.

During the handling sessions in Alberta, we asked elders and artists about the plant material and showed them the magnified photographs that the conservation team had provided. No-one could remember using plants in this way. We all agreed that the plant fibre looked like a kind of grass, and elders suggested it might have been buffalo grass. Several people kindly sent samples of this for later analysis.

After the shirts came back to Oxford in September 2010, Heather Richardson arranged for Dr Stephen Harris, Curator of the Oxford University Herbaria (Department of Plant Sciences), to see if he could help. He suggested that we take small samples of the plant material for examination under a microscope; this would allow him to tell what type of plant was used.

Museums are very cautious about the removal of samples of material from artifacts in the collection; they are concerned about damage, about loss of material over time with repeated testing, and with changing the object. However, we had tried all other ways of solving this puzzle and felt that it was important to be able to return this information to Blackfoot people. Heather Richardson identified several tiny areas where the plant material was damaged and could be removed without noticeably changing the look of the shirt. Dr Michael O'Hanlon, Director of the Pitt Rivers Museum, and Dr Laura Peers, Curator for the Americas collections, gave permission for the samples to be removed.

These tiny pieces of the plant material, about 1 mm wide and a few mm long, were placed in

dry and wet mounts, and examined under a light microscope in Dr Harris' lab at 400 times magnification, as well as under phase optics. On the dry slide, a leaf fragment with parallel veins could be seen with some little black dots on the surface; the dots were probably a fungus that was present on the leaf before it was harvested). The leaf seemed to be flattened laterally (ie. folded in half lengthwise along the leaf axis) rather than folded across the leaf (in the abaxial-adaxial direction). The leaf had also shrunk a great deal as it dried, which suggests that it was used—applied with the porcupine quills—in a fresh state.

A second fragment was soaked in boiling water for 20 minutes, and then soaked in 1% aqueous sodium hydroxide before being mounted in water on a microscope slide. As it soaked, the leaf fragment became triangular in shape. There were two types of vascular strand visible: a wide strand towards the centre of the leaf and narrower strands below the epidermis. There were also enlarged cells with a thickened cuticle above the subepidermal vascular strand.

Dr. Harris felt that one of the plant samples was from a leaf blade—a fairly delicate fibre—and another was from the central part of the leaf, which is a tougher fibre. Given the nature of the vascular strands and the thickened cuticle, the most likely plant genus was *Typha* (Typhaceae). Given the area over which the shirt may have been made, the most likely species is *Typha latifolia* L. (bulrush or cattail), a plant which was also used in many other ways by Blackfoot people.

We have sent word back into Blackfoot communities that this plant has now been identified, and we are hoping that some artists might begin to experiment using it alongside quills in the future.

Heather Richardson
Laura Peers

With special thanks to Stephen Harris