

The following was culled from patent leather research notes and images produced by Laura Brill during her Kress-funded fellowship at Shelburne Museum in 2009. Supplemental funding for this project was provided by a FAIC Take a Chance Grant.

Although trade literature from the 19th and early 20th centuries describe the production of patent leather for use on horse drawn vehicles, little technical analysis has been carried out to determine whether the descriptions are accurate. Given the wide variety of degradation that is evident on these surfaces, it is hoped that such study of these coatings may assist conservators in understanding this material and how it deteriorates.

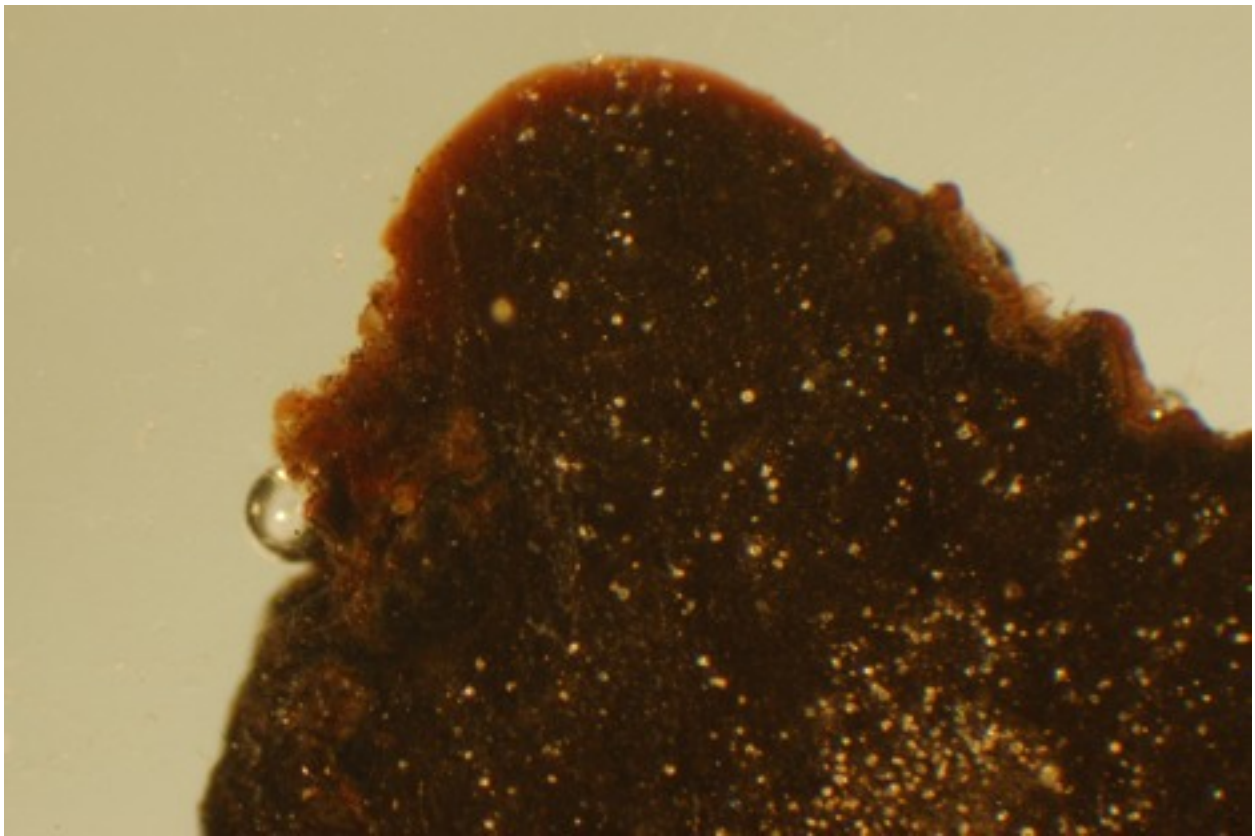
The horse-drawn vehicle collection at Shelburne Museum contains 11 vehicles made by the New York firm Brewster & Co. between about 1885-1904 for Dr. and Mrs. Seward Webb. These vehicles remained in family hands until Shelburne Museum founder Electra Havemeyer Webb used these vehicles and her own collections as the foundation for the museum in 1947. None of these vehicles has been restored.

Brill surveyed the condition of the patent leather on these vehicles and chose to concentrate on elements from two, a Victoria sleigh made c. 1886 (Brewster serial number 746; Shelburne Museum accession number 1947-18.27) and a Slat-side Shooting Cart c.1895 (Brewster serial number 23034; Shelburne Museum accession number 1947-18.8). Samples were taken for examination in cross section. Some larger samples were divided for extraction tests.

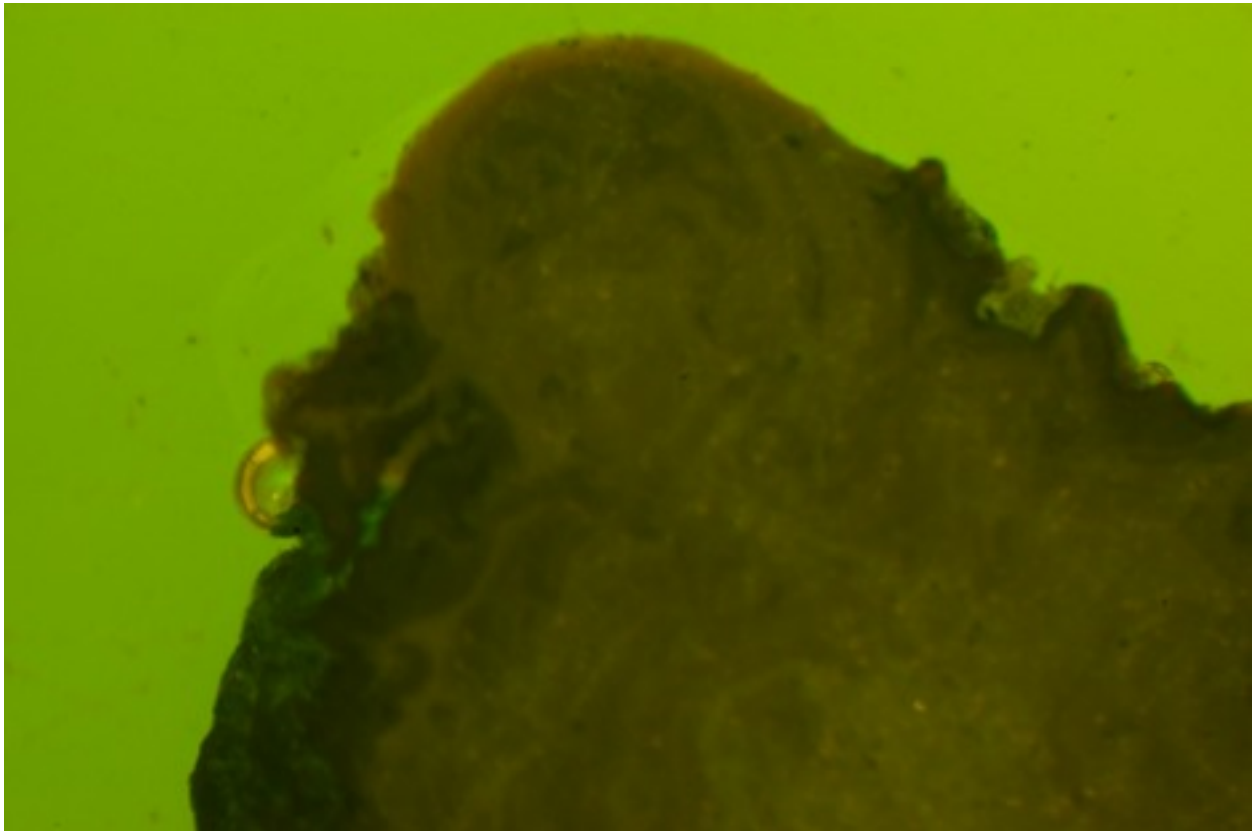
One sample from trim on the Slat-side Shooting Cart's back seat was divided; a portion was embedded for examination in cross section, and the second portion was taken to James Martin, Orion Analytical for FTIR . On an area of the sample with a glassy fracture surface, peaks consistent with natural resin and Prussian blue were noted. In another area of the sample, peaks consistent with a fatty material as well as natural resin were noted. Prussian blue could be seen under the microscope in this area of the sample as well as quartz, sand, or dirt but spectra for these materials were not perceived.



Rear seat on the Slat-sided Shooting Cart and the location of the sample A, characterized using FTIR



Sample A, 100x, visible light. The sample consists of a drip of coating material with no leather substrate. Note that the sample is layered.



Sample A, 100x, uv light. Not only is the coating layered, the layers are rather convoluted.

The extractions were undertaken as preparation for separating out portions of the coating material for thin layer chromatography and/or FTIR, however, due to other projects and time restrictions, neither TLC nor further FTIR were undertaken. The samples from both the Slat-

sided shooting cart and the Victoria sleigh, both mounted and unmounted, are available for further study.

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Objects Conservator
Shelburne Museum
15 August, 2011

Cross sections, locations and observations
Shelburne Museum Cons. No. 09-14-2701
Victoria Sleigh, 1947-18.27

Sample ID: s31 E

Location on Object: On top of the edge of the passenger 'dash' from an 'island' of not shiny material

Observations: Sample E was taken very near to sample H. This area would have been exposed to the sun, but not to the wear of being closer to the ground. There are many small fairly smooth 'islands' on the surface.



Extraction: A portion of sample E was divided into 7 parts and each part placed into a small vial containing a solvent either acetone, ethanol, water, chloroform, xylene, hexane, or petroleum ether.

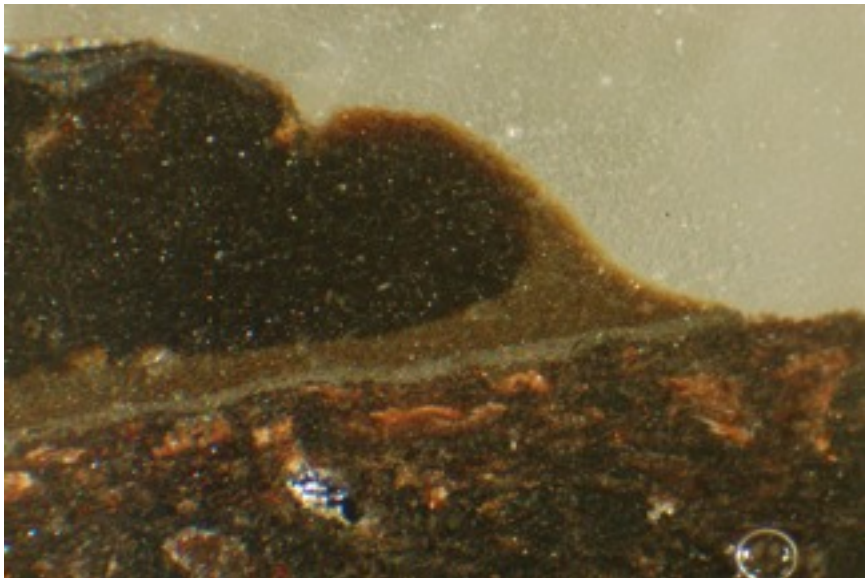
acetone	dark orange liquid; sample remains
chloroform	liquid colorless; sample stuck to bottom
ethanol	light orange colored liquid; sample remains
hexane	liquid colorless; sample stuck to bottom
Pet. Ether	liquid colorless; sample stuck to bottom
xylene	liquid colorless, sample stuck to bottom, still black

Sample ID: s31 F

Location on Object:

On the proper left side of the sleigh on the bottom of the front dashboard, towards the proper left bottom corner. Very near to Sample G

Observations: This sample should be a whole sample. It was taken from an area that has significant loss of leather, and I was able to take a small whole cross section. It is from the area of an 'island' or 'drip'



100x, visible light

Sample ID: s31 G

Location on Object:

Proper left side, proper left bottom corner of the front dashboard. Very near to sample F

Observations: This sample should be a whole sample. It was taken from an area that has significant loss of leather, and I was able to take a small whole cross section. It was taken as half an 'island' and half a smooth area. Not sure if this will come through in the cross section.



Extraction: A portion of sample G was divided into 7 parts and each part placed into a small vial containing a solvent either acetone, ethanol, water, chloroform, xylene, hexane, or petroleum ether.

acetone	sample partly broken up; light orange colored liquid
chloroform	liquid slightly brown; sample stuck to bottom; particulates
ethanol	light orange colored liquid; sample remains
hexane	liquid very slightly yellow; sample slightly broken
water	liquid slightly reddish brown
xylene	liquid slightly yellow; sample may have broken up

Sample ID: s31 H

Location on Object:

Proper left side of the sleigh on the top of the passenger 'dash'. This sample was taken very near to sample E

Observations: This sample was taken from the end of the folded edge of the patent leather. It should be a whole sample, although it may be fairly deteriorated.



Sample ID: S31 L

Location on Object:

Towards the proper left of the vehicle, along the strip of deterioration that occurred on the patent leather between the flap under the drivers seat and the carpet.

Observations: This sample is not a complete sample. It is from a 'island' and it fractured from the surface. The area at the break was very glassy. The patent leather under the seat is very interesting because it appears to be in very good condition under the carpet, fair condition under the flap, and in poorer condition in any area where it is exposed- between the carpet and flap and along the edges. Sample N was taken from an area under the flap, and Sample M was taken from an area under the carpet.

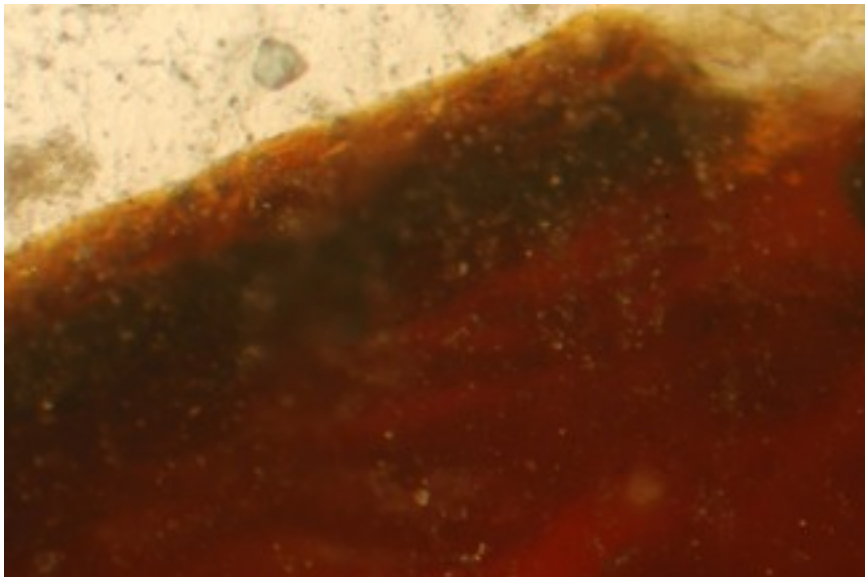


Sample ID: s31M

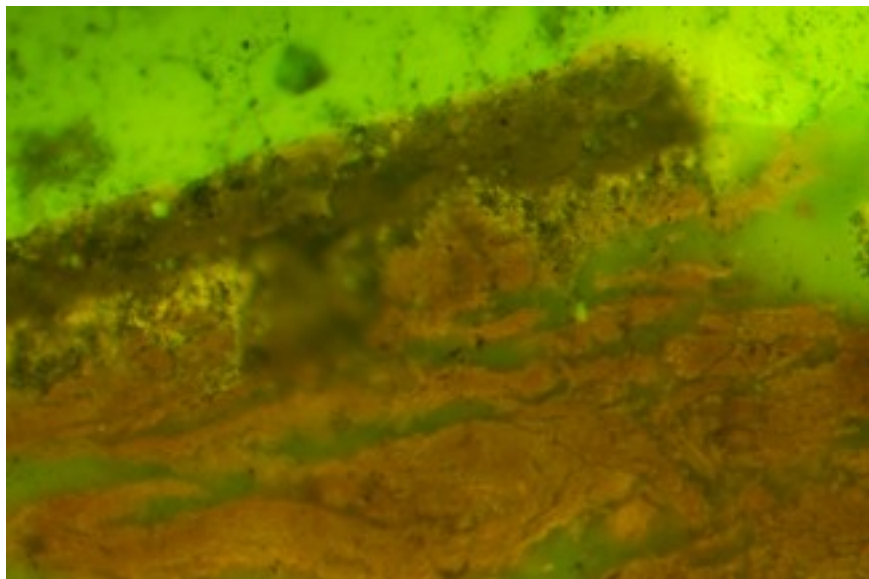
Location on Object:

Towards the middle/left of the patent leather under the carpet. It was taken from an area of the folded edge that was in fairly good condition.

Observations: This sample probably includes some leather, but should include all of the patent leather layers. The coating layer appears to be quite thin. The patent leather under the seat is very interesting because it appears to be in very good condition under the carpet, fair condition under the flap, and in poorer condition in any area where it is exposed- between the carpet and flap and along the edges. Sample N was taken from an area under the flap, and Sample L was taken from an area between the flap and the carpet.



S31M, 100x visible light



S31M, 100x, uv light

Extraction: A portion of sample M was divided into 7 parts and each part placed into a small vial containing a solvent either acetone, ethanol, water, chloroform, xylene, hexane, or petroleum ether.

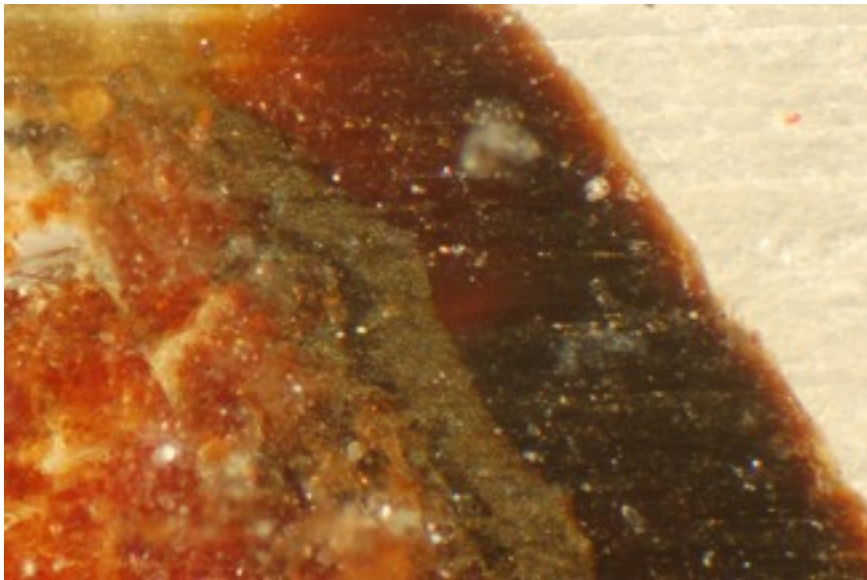
acetone	liquid colorless; no change to sample
chloroform	sample floats; liquid colorless
ethanol	slightly yellow liquid, sample remains, not swollen
hexane	liquid colorless; nothing evident
Pet. Ether	liquid colorless; sample stuck to bottom
water	much of sample dissolved in water; tinged reddish brown
xylene	liquid colorless; nothing evident

Sample ID: s31N

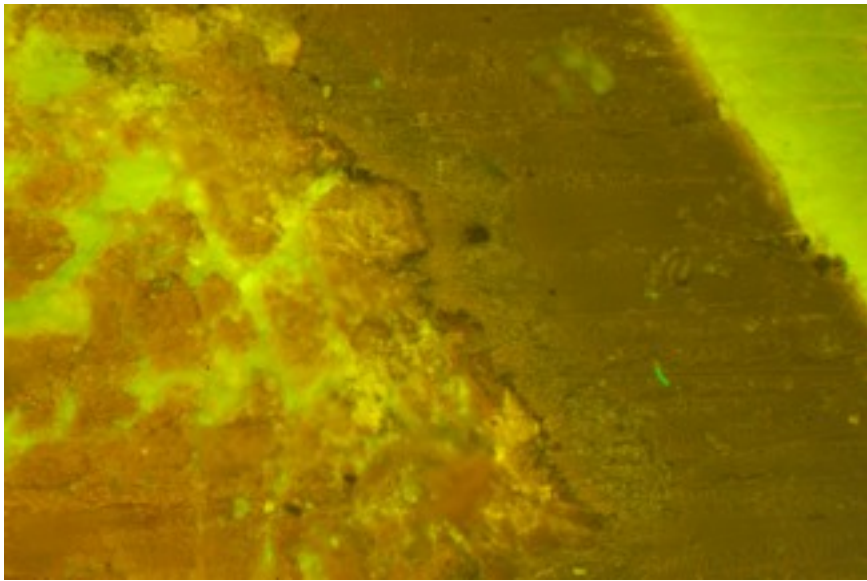
Location on Object:

Along the proper left top edge of the patent leather under the drivers seat.

Observations: The sample should be whole and has coating material both on the back and the front because it is an edge. It is not a folded edge. The patent leather under the seat is very interesting because it appears to be in very good condition under the carpet, fair condition under the flap, and in poorer condition in any area where it is exposed- between the carpet and flap and along the edges.



S31N, 100x, visible light



S31N, 100x, uv light

Extraction: A portion of sample N was divided into 7 parts and each part placed into a small vial containing a solvent either acetone, ethanol, water, chloroform, xylene, hexane, or petroleum ether.

acetone	light orange colored liquid; sample remains
chloroform	liquid slightly yellow; sample in tact and floats
hexane	liquid colorless; nothing evident
Pet. Ether	liquid colorless; nothing evident
water	liquid has a slight tinge of color. Particulates
xylene	liquid colorless; nothing evident

Sample Id: s31 O

Location on Object: Proper left side of drivers seat

Observations: The sample should have all the layers of the patent coating but not the leather. The coating is a fairly thin layer. This was taken from an area that had both a matte 'island' and a shiny smooth area next to it.



Sample s31P

Location on Object: Proper left side of the underside of the passenger 'dash' It is a matte 'island' with smooth shiny areas around it. It is probably not a whole sample: it does seem to have all the layers of the coating plus some leather still attached.

