

## Conservation newsheet 3: The conservation of the Mercator maps

### Background

The National Archives of Scotland (NAS) collects records from various sources, including gifts from members of the public for the benefit of the people of Scotland. One recent such acquisition was three early maps of Scotland by Gerhard Mercator (1512-1594) of Duisberg. Mercator issued the first part of his atlas in 1585, and the third part which contained these three maps was published in 1595 by Rumbold Mercator, Gerhard's grandson, who was the first to use the term atlas. These maps were Mercator's first ones of Scotland alone, with Scotland in one sheet and Scotland on a larger scale on two sheets. The maps show a greater improvement on his map of the British Isles of 1564, with more accurate details of the interior and a better outline.



NAS ref. RHP 141279/1



NAS ref. RHP 141279/2

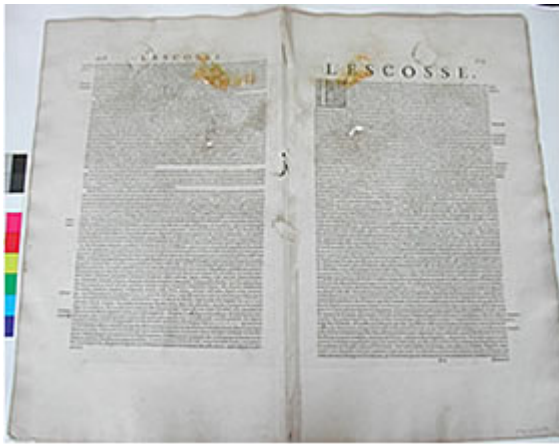


NAS ref. RHP 141279/3

In 1604 the Mercator plates were sold to Josse Hondt, an Amsterdam engraver and map dealer, and from 1606 the atlases were published by the Hondt firm all over Europe. Editions appeared with text in Latin, French, Dutch, and German, with the maps remaining unchanged until 1635. The examples here are in French.

### Condition

All three maps are in a similar condition. As they have come from a bound volume *Atlantis Pars Altera*, they are folded in half, with the remains of a thin strip of paper adhered to the fold, possibly a guard which held the sheet into the volume. They are engraved with the plate mark visible, and have been hand coloured. It is thought that they were coloured for the customer, maybe at a slightly later date, as other examples that exist show some uncoloured, and colouring in different areas. Unfortunately some of the pigments are friable, and therefore there has been some loss of colour.



Shows text on reverse of NAS ref. RHP 141279/1



Remains of paper guard on NAS ref. RHP 141279/1

The paper is cream coloured, handmade, antique laid with a countermark and watermark visible, which indicates that these are folio sheets. Looking closely at the sheets there are also water spots formed during the paper production. Due to previous water/mould damage the paper surface is soft in places and has small areas of loss. The paper is discoloured, with staining, particularly some dark yellow marking.



Example of weak area and loss on NAS ref. RHP 141279/1

### Analysis

It was decided to use a non-destructive method of analysis to help identify the pigments, namely Multi Spectral Imaging, MuSIS® (see news sheet 1 for more information on this process). Following examination of the maps the greens were identified as malachite and verdegris and the reds as vermilion, but there was still some uncertainty with the pinks, yellows and brown. Analysis of all three plans shows that they were likely to be coloured from the same pallet, with contemporary pigments to the printing.

Colour in visible light	Absorption in infra red	Appearance in UV	Appearance in false colour	Infra red inference
Light green	Absorbs	Dark blue/purple	Blue	Malachite
Light pink	No absorption	Pink	Yellow	[Rose madder]
Yellow, island	No absorption	Fluorescence, bright yellow	White	Indian yellow
Yellow, border	No absorption	Darker yellow	Whitish	Inconclusive
Green/blue	Absorbs	Dark blue	Blue	Verdegris
Red	No absorption	Dark red	Egg yellow	Vermillion
Dark pink	Absorbs	Pink	Dark yellow	[Rose madder]

Table: Results of Multi Spectral Imaging listing colour in visible light, absorption in infra red, appearance in UV, Appearance in false colour and infra red interference.

The yellow staining was also examined, but showed no colour change or absorption, so was not identified.

### Treatment

Mechanical cleaning was carried out to remove dirt on the surface of the paper. Pigments were tested for fugitivity in various mixtures of water and water/alcohol. The yellow around the islands and the verdegris green proved to be very fugitive in water. It is possible to 'fix' these pigments in various ways to enable direct aqueous treatments which will remove staining and discolouration from the paper, but due to the areas to be covered and the sensitivity of the colours it was felt to be inappropriate on this occasion. The maps were gently 'relaxed' using Goretex®, which allows the paper to take in water vapour slowly. Controlled washing was then carried out on the bench using damp blotting paper with the map face up. Although this method of washing is not as efficient as submersion or float techniques, a fair amount of discolouration was removed, although some staining remains, in particular the unidentified yellow marks. This technique also enabled the remains of the guards to be lifted off and retained.

The pH of the paper measured 4, which is lower than is desirable and has a damaging affect on the paper. Calcium bicarbonate solution was applied to the reverse of the sheets to raise the pH to 5.5. Care was taken not to increase it drastically due to potential colour changes in the pigments.

As areas of the paper were still soft due to previous damp damage, a size of 0.5% methyl cellulose with a little alcohol added was applied to the reverse of the prints.

Repairs were made using handmade Japanese papers, selected for their strength, flexibility and quality, and were adhered using wheat starch paste.



Example of weak area and loss repaired, NAS ref. RHP 141279/1



Repaired and mounted, NAS ref. RHP141279/1

Finally the maps were mounted using museum mount board and stored in a solander box. Full photography has been undertaken on all the maps, obverse and reverse, for use in the search room.