



CONSERVATION REPORT

P&O/013/002

Letterbook: Egypt Letters 1862-1865

By Anna-Klara Hahn,
Conservator P&O Heritage Collection

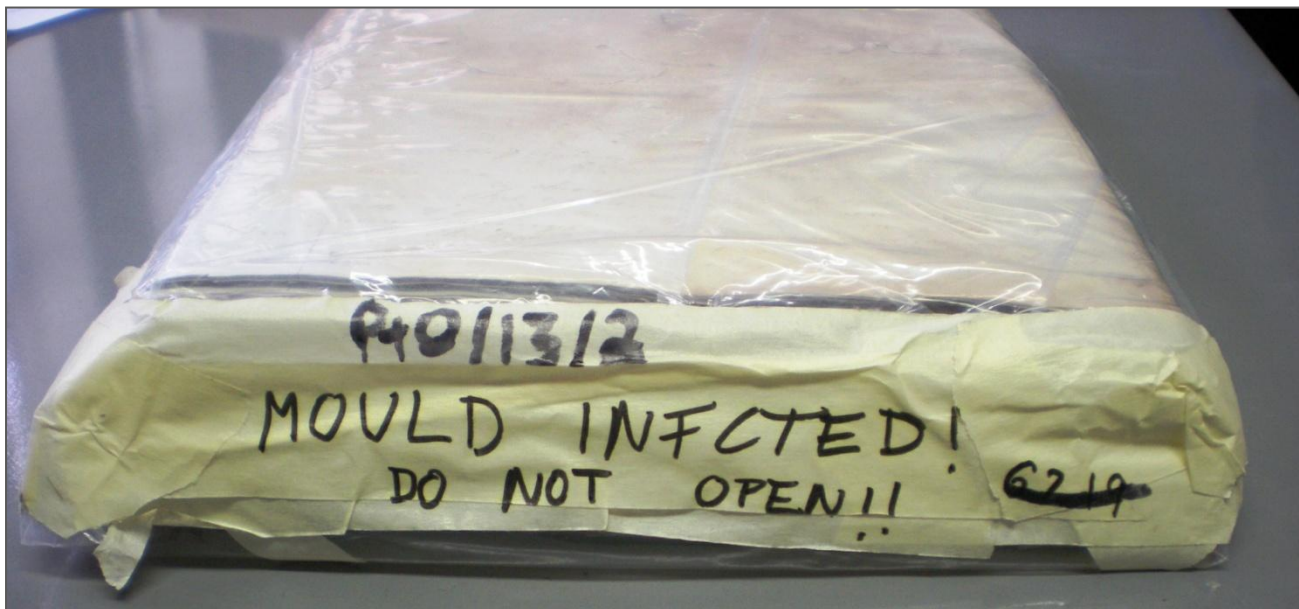
EXAMINATION & TREATMENT PLAN

The sealed polythene package contained three double sealed polythene bags; one containing the cover and the index, one with the untreated unbound loose sections and one with treated sections.

Bag 1 – incl. the cover and index pages

Bag 2 – incl. 62 untreated unbound sections

Bag 3 – incl. 27 treated unbound sections



The contents of each bag was further examined and discussed to devise an appropriate and efficient treatment plan. After further in-depth examination and tests of the pages in Bag 2, any active mould growth was ruled out. It was therefore decided that extensive vacuuming with HEPA filter and surface cleaning with chemical sponges would be sufficient to remove any loose desiccated mould spores and improve the visual appearance of the pages. Extensive aqueous disinfection treatments for all pages were deemed inappropriate as this would risk jeopardising the stable condition of the inks and paper. Only a few pages, where possible active mould spores were believed to exist, were set aside for separate treatment to desiccate any possible active spores.

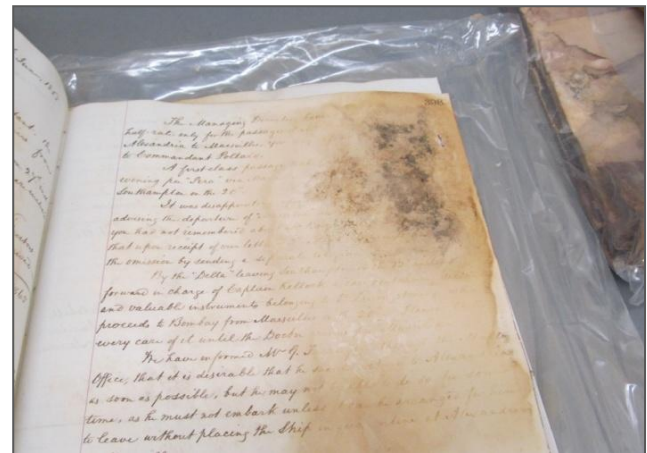
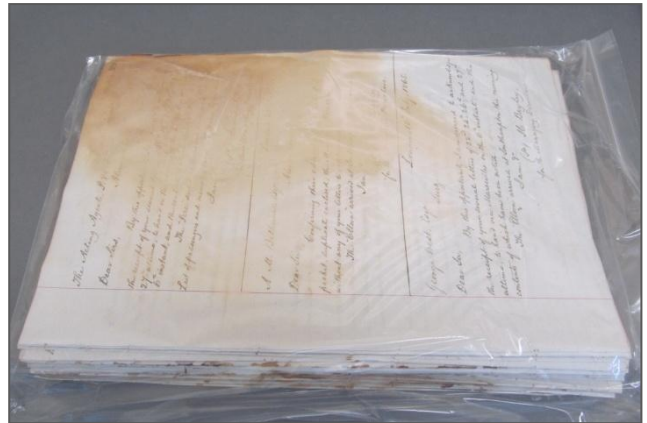
It was decided that re-sizing and extensive repairs would be needed to stabilise and secure the weakened paper for handling and digitising.

The paper of the pages that had been disinfected previously at the NMM* (Bag 3) were found to be very weak and highly brittle, with large areas of tears and damage. It was decided to re-size all of these pages with Methylcellulose before repair. A few pages in Bag 3 had also been fully lined on both sides. Some thought was given to possible removal of this heavy lining, but the risk of damaging the paper further was higher than any benefit gained from its removal. A few of the pages from this batch were also vacuumed again to remove some surface spores and dirt.

The pages in both Bag 2 and 3 were divided into separate treatment categories according to their individual needs: e.g. re-sizing only, re-sizing and repair, adhesive removal, aqueous disinfection etc.

The contents of Bag 1 were once again examined but deemed to be beyond salvage. The paper, board and cover are severely damaged by the mould to the point of disintegration and no further information could be drawn from them. These pages have not been treated and their disposal is now recommended.

*National Maritime Museum



CONDITION RATE: VERY POOR “Confirmed unfit for production - Sealed in polythene bag as mould infected”

MEASUREMENTS: sheet size: 36.5 x 44 cm ($\pm .5$ mm)

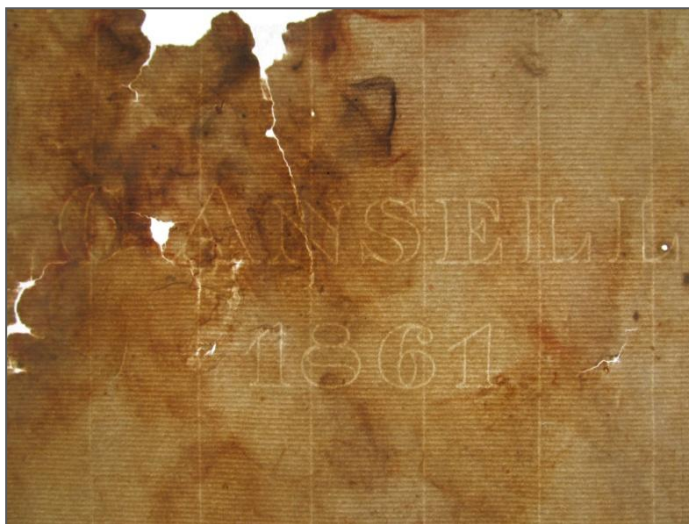
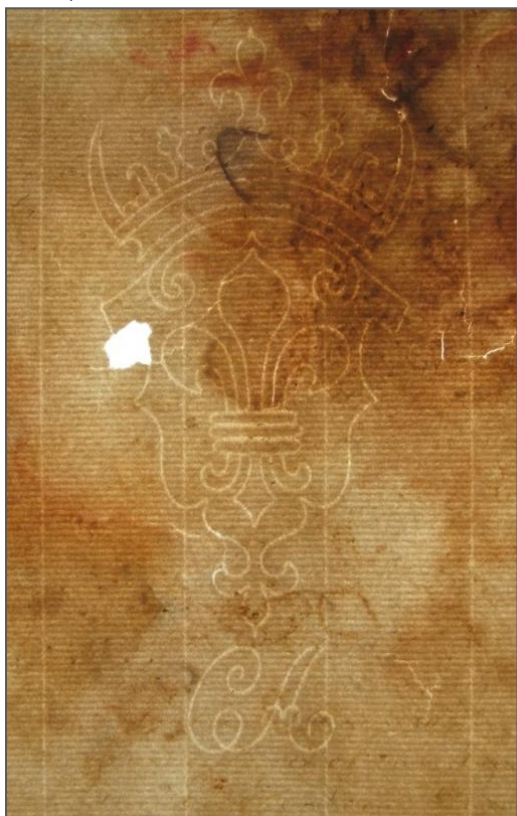
(volume prior to treatment: approx. overall 48x 28x 6cm; folded page size: 36.5 x 22cm)

MATERIALS: 89 unbound sections from leather bound letterbook – paper with ink handwriting

From the fragments in the Bag 1, one could see that the book would have had a red-brown leather cover spine with some gold tooling and marbled paper cover. The sheets are folded once vertically and where originally stitched together through four pair of stitching holes plus one hole at both head and tail, e.g. 10 holes in total. The folded pages and all threads have been removed from the binding.

PAPER: Fine quality thick, (mean thickness: 1.5mm ($\pm .5$ mm))sized, hand-made laid paper with a blue/grey tone; red and blue writing lines and page numbers printed at the top corners.

Watermarked; with an ornamented *fleur-de-lys* crown emblem and ‘C. Ansell 1861’ (as seen in the photos below)



The presence of this particular watermark in an English papermill is often an indication that the paper mould would have been made in “copy” size paper mould i.e. 20” x 16” (roughly 508mm x 406mm).

MEDIA: The writing can be found on both side of the paper in various writing inks (mainly carbon-based inks and iron-gall inks, but also a warm brown toned sepia ink and some purple ink had also been used). Traces from a blue ink stamp were found on one page.

CONDITION SUMMARY:

The dark mould staining is predominately seen at top right corner of the pages, both pinkish and black in colour. Here the paper is weakened, brittle, torn and fragmented with some losses. Where not affected by the mould the paper is in good condition, slightly discoloured, stained and covered in surface dirt. Light edge cockling at top and bottom was also noted. Crusty adhesive residue (animal based glue) remains along the fold edge from the binding.

The inks are faded to various degrees where directly in contact with the mould, however, at least 85% of the text is still legible. The majority of the inks seem to be in a stable condition; no obvious bleeding or smudginess was observed; only minor strikethrough was noted.

CONSERVATION TREATMENTS

I. Mould removal & Surface cleaning

The desiccated mould spores were eliminated by vacuuming each page on both sides using a Museum Vac with a special HEPA* filter. Thorough surface cleaning with chemical sponges and special erasers followed this labour-intensive process. All surface mould spores were removed successfully. The extensive surface cleaning has also improved the visual appearance.

The very few pages classified as 'possible active spores present' were treated with a low concentrated alcohol solutions (IMS**/ H₂O) to desiccate and exterminate the spores. The sensitivity of any media in relation to water or alcohol was initially tested.

All work was carried out with strict adherence to health and safety regulations working in a controlled and well ventilated environment wearing protective clothing (incl. correct mask and latex gloves) to prevent any health risk and spread of mould spores.

* a high-efficiency particulate air filter respirator ** IMS industrial methylated spirit



2. Re-sizing

The mould had weakened the paper significantly. Some pages needed to be strengthened again and so re-sized. Sizing of selected softened page were conducted using a low concentrated *Methylcellulose** solution (2%). This was gently brushed on both sides till saturated, after the paper had been overall humidified (sprayed with fine mist of water).

Although traditionally paper of this period, would have been sized with gelatine, it was decided to use a non-proteinous solution to avoid the possibility of re-stimulating any mould growth again.



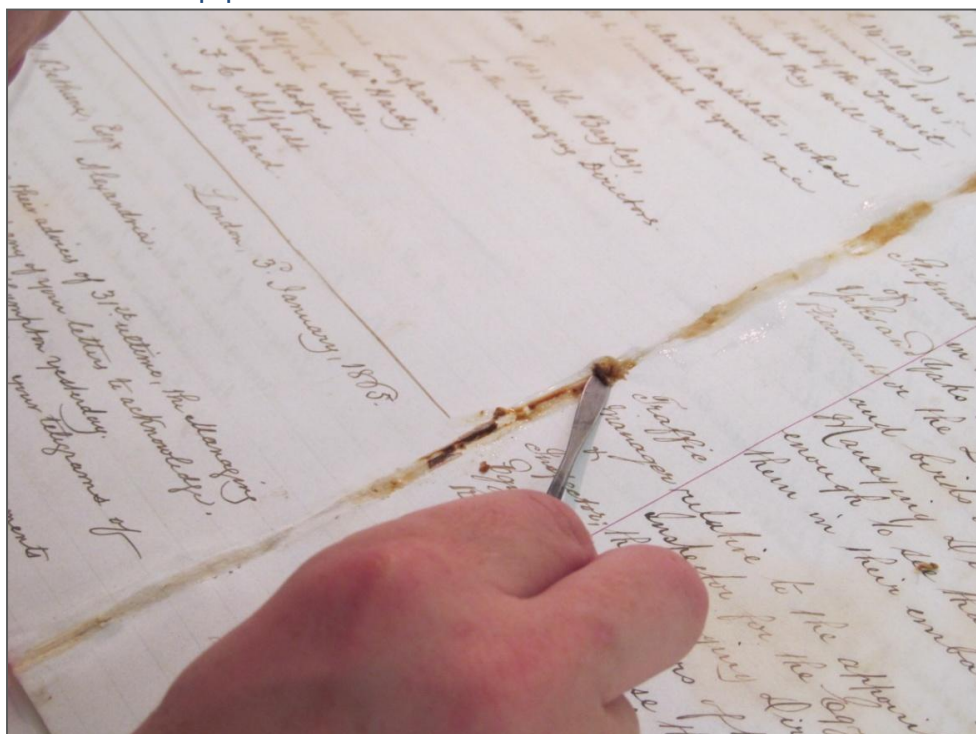
* Methylcellulose is cellulose ethers made from alkali cellulose polymer; non proteinous adhesive commonly used in paper conservation. It is high quality, water soluble and reversible.

Cont. 2. Re-sizing



3. Adhesive removal

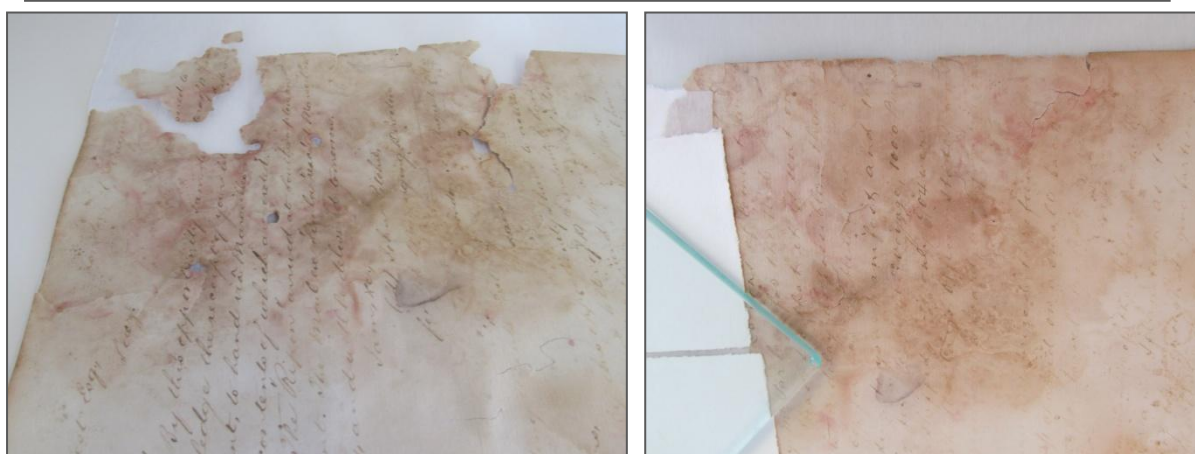
The remaining adhesive crust (animal glue) at the spine edge was removed mechanically and with a Methylcellulose poultice (6%). Minor staining will remain but no further action to reduce it was taken as it was deemed not to be overly obstructive to the text. Furthermore there was no desire to jeopardise the condition of the paper further.



4. Repairs

The mould had weakened the paper making it very brittle, causing it to tear and break easily, especially along the edges and corners. It was decided that localised repair of the numerous small tears and weakened areas was the most appropriate course of action particularly since the writing was present on both sides of the pages. Overall lining* would have obstructed the interpretation of the text and made digitisation harder.

Localised humidification was used where appropriate to relax the paper to allow rejoining of some tears. Due to the fragile nature of the substrate and the presence of iron-gall ink, only areas to be repaired were humidified with H₂O. This was conducted using a variety of methods dependent upon the humidification level required. These were palm spray, local blotter and *Ultra Sonic* humidifying machine applications. Loose pieces were re-attached where possible.

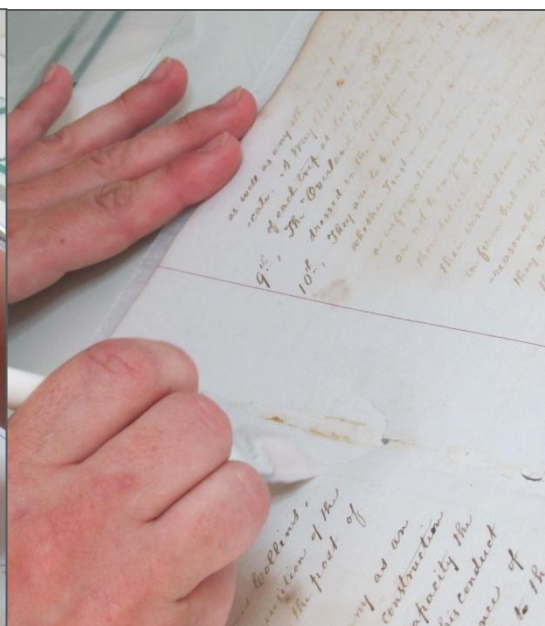
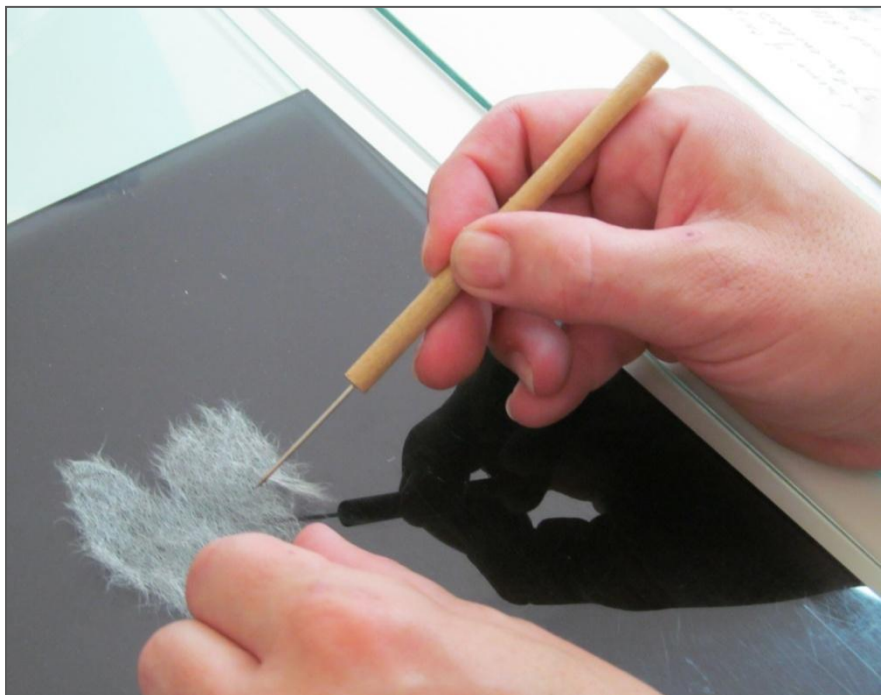


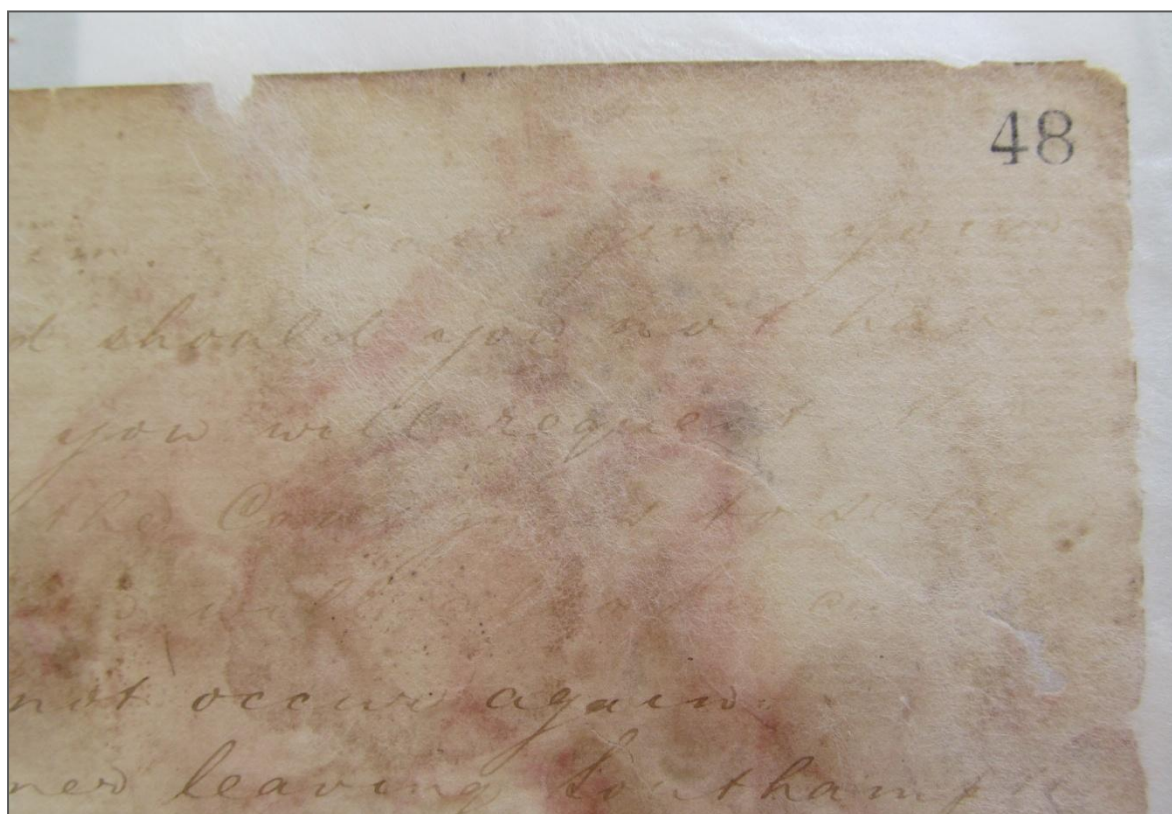
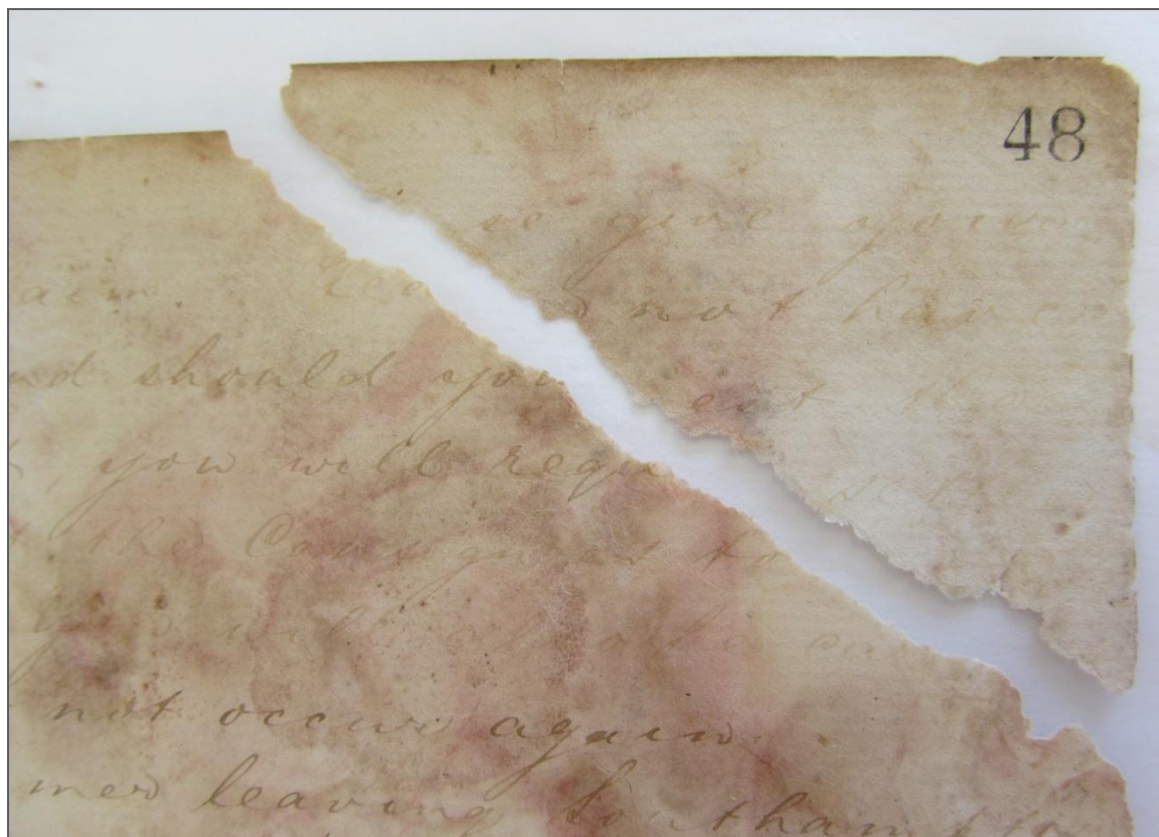
* Traditionally fragile archival documents have tended to be fully lined or sandwiched between thick repair tissues, to allow safe handling. This changes the characteristic of the original paper significantly and can obscure the access to the written text and is no longer recommended. Nowadays we aim for minimal interference where possible. With the increasing advantages of digitisation the approach now is to stabilise and secure the weakened paper for minimal handling during digitising.

Cont. 4. Repairs

Thin Japanese repair tissues, *Tenjugo* (in thicknesses of 5gsm and 13gsm) and together with fine grade *Shofu* wheat starch paste (25%) were used for the repairs. Toning of the repair tissue was considered, but ruled out due to time and the archival nature of the documents. The tissue was applied on the side where it was the least intrusive to the text, and only where necessary on both sides using the thinner tissues. The wheat starch paste was dried slightly on blotters before application to reduce the level of moisture added to the substrate. Where repairs overlay text, adhesive was applied to the repair tissues and then gently remoistened upon application to ensure minimal moisture introduction.

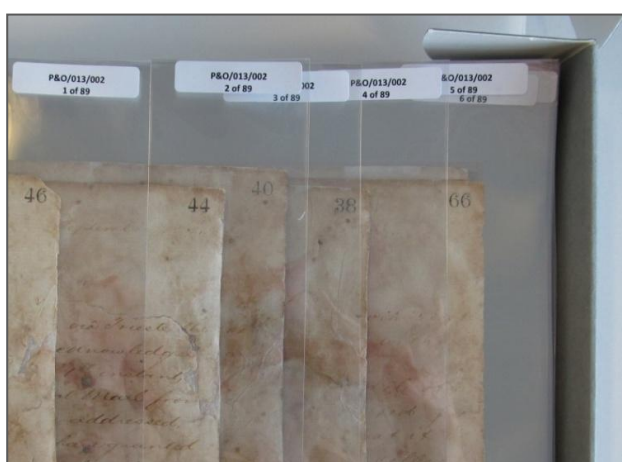
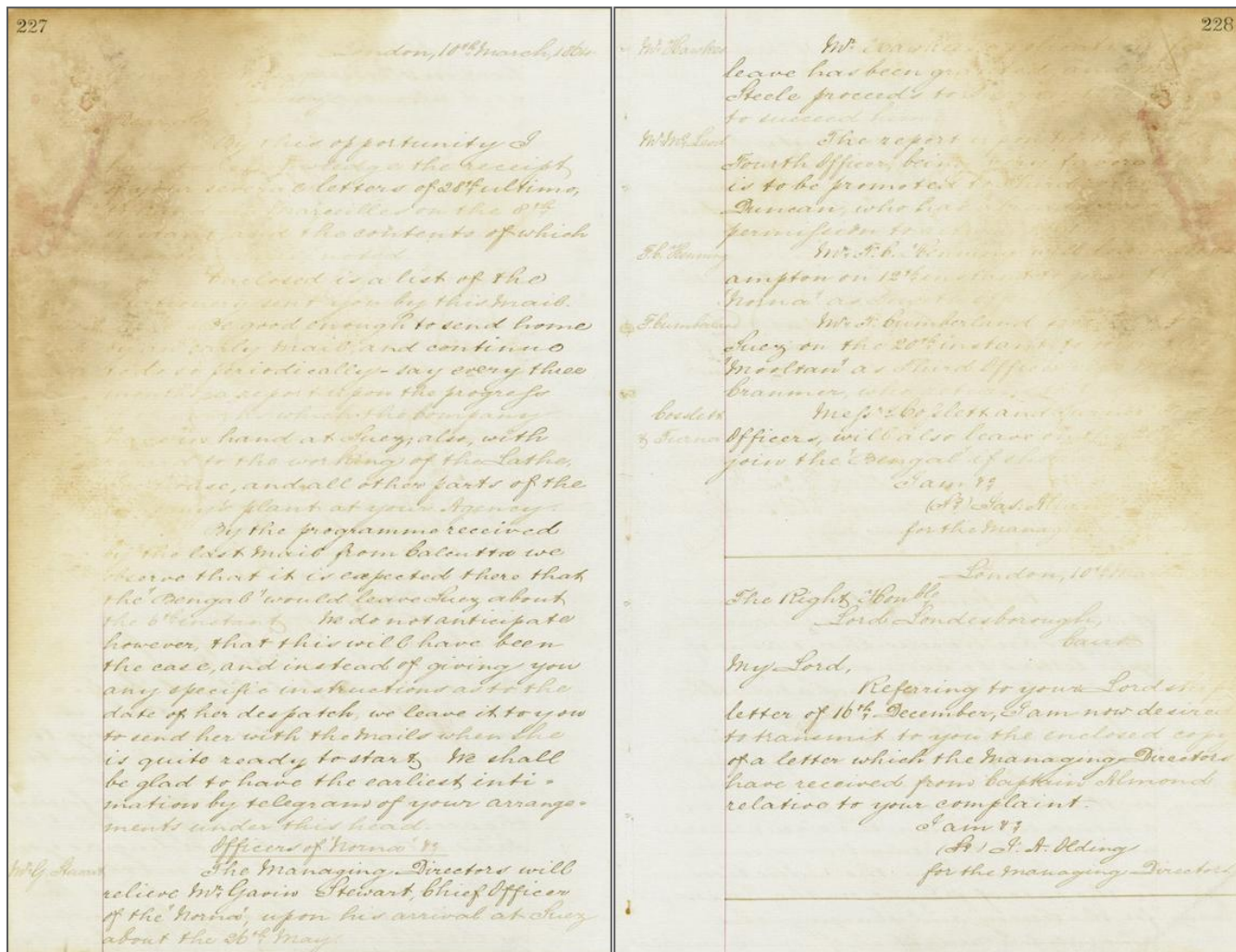
Pages were air dried between layers of Bondina and then pressed under weights.



Cont. 4. Repairs

5. Rehousing & Storage

To minimise the handling of the still weakened paper it was decided to store the pages in their folded out state in individual Melinex sleeves and not to re-bind the letters into what would now be an incomplete volume. Furthermore the Melinex sleeves will now facilitate safe access to both sides of the document without handling the actual paper.



CONDITION RATE AFTER CONSERVATION: FAIR-STABLE

CONCLUSION:

Although the mould has permanently stained the paper it will not jeopardised the condition of the paper for the long-term. As the treatments required to reduce the staining itself would have endangered the stability of sensitive inks, it was decided to digitise the letters and use modern technologies to enhance the images and make the letters more legible. The long-term preservation of the letters has been assured by this conservation project.

The conservation carried out by Anna-Klara Hahn (P&O Heritage Collection) & Anthea Henton (Twelve Quarters Studios) at Twelve Quarters Studios, Telford, Shropshire; 23rd -27th July 2012

REFERENCES:

- Baker, C. (1982) *Methylcellulose& Sodium Carboxymethylcellulose: Uses in Paper Conservation*, AIC Book and Paper Group Annual vol. 1
- Eusman, E., Mensch, K. (2000) *Washing and Humidifying Iron Gall Ink on Paper: Effects on Iron Migration*, AIC Book and Paper Group Annual vol. 19
- Florian, M-L. E. (2002), *Fungal Facts*, Archetype Publications Ltd, UK
- Berrie B.H.(ed.) (2007) *Artists' Pigments: A Handbook of their History and Characteristics, Volume 4*, National Gallery of Art, Washington/ Archetype Publications Ltd., UK
- Price, L.A. (1994), *Line and Shadow: The Role of Ink in American Architectural Drawings prior to 1860*, AIC Book and Paper Group Annual vol. 13
- The Ink Corrosion website: <http://irongallink.org/>
-