13.45 Digital reconstruction of the Sadler Partbooks and introduction to the edition (15)

5 minutes = 850 words OR 170 w.p.m.

15 minutes = 2550

If we were ever in any doubt about the value of the digital reconstruction of the Sadler books, the detail that has emerged regarding the palaeography and ownership of the books entirely justifies the time and effort spent in recovering them. Indeed, we now have a brand new set of partbooks to add to the canon,

<multiple fade-throughs>

and the material coming out of the books, now that we can see them, threatens to eclipse the visually spectacular reconstruction work that made it possible.

This work could not have been completed without the input of a small army of volunteers, many with no background in using digital editing tools and many with no prior experience with manuscripts of any description, never mind damaged ones. Some of those people are here today to see the fruits of their work.

We really owe the decisions about the final appearance of the books to Andrew Honey, who looked at one of our first 'restored' pages, and said, 'this is reconstruction'. That was liberating, since 'restoration' was something we couldn't hope to achieve, as we had nothing to restore *to*. By rethinking the work as 'reconstruction' we found it much easier to define the extent of what we were going to do and to achieve parity of style across all pages.

The end result had to serve a useful purpose because the books cannot be handled in person: so the images needed to allow examination of the manuscripts in a meaningful way, as well as enable us to use and appreciate them in the way that their original owners might have done.

<half-and-half>

We aimed to repair – or remove – the damage caused by the acid ink, and that meant *all* the damage, not just that which was preventing a reading, in effect reversing at least some of the effects of aging.

<Dow>

We had various models that gave us a baseline for what the books ⋆should⋆ look like: the Dow and Baldwin partbooks were reasonably contemporary.

<Baldwin>

To say nothing of the other set of books associated with Sadler,

<W&B>

Wilmott and Brakenridge, all of which demonstrated just how different things could have been with a different ink recipe. There were also a number of pages in Mus e 1–5 themselves that were relatively undamaged,

<good Sadler>

which provided the best possible template for the final appearance of our edited images.

So we didn't need to worry about what to edit and what to leave -- something that was also difficult to communicate to our volunteers --

<moderate page from Sadler>

this page doesn't need editing to be readable, but we repaired it because we were removing all the effects of the acid damage, not just some.

If the books were to be useful in communicating the palaeographical information they contained, cloning pen strokes was out of the question. We needed to retain all of the original pen strokes, and all of the original mistakes and other accretions, including the intensity and colour of the ink,

<ink layers>

since (as it emerged) CLICK there were several different layers of copying and inks in use. CLICK that were sometimes quite subtle and difficult to see.

<slide showing different layers and inks 5 clicks>

Here the colour response in the new colour images is flattened by the tissue overlay, but both the infra red and CLICK Photostat images clearly show that the composite four-note final was written in one ink CLICK and a long tail of additional notes was added in a second, paler ink CLICK. The showthrough CLICK is in the wrong place to cause the disparity in the colours. CLICK Sadly since our reconstruction draws around the note shapes to leave the original ink exposed, we can only create a repaired version of what exists now, which is covered by tissue, so the ink disparity is lost.

<slide crystalline deposits>

Crystalline deposits on the ink surface were a big help in working out where notes began and ended.

<slide showing difference between tissue and not with blue lines >

Many pages had been stabilised by a complete or partial overlay of tissue (here, the lower part of the page is covered), so any help we might have had from crystals was lost, and it cancelled out much of the colour separation that was so useful on other pages.

The tissue had, of course, been applied to pages that were the most damaged, compounding an already difficult situation on those leaves.

Apart from difficulties with tissue overlay, it was possible to differentiate between the darker ink notation and the rust-coloured bleed and showthrough on the majority of pages. However just deleting burn-through leaves a void, and that has to be replaced with something. We could have done something like this:

<White sheet with notes dropped onto it>

But where's the fun in that? So in order to take something unwanted off the page we had to leave a piece of clean page behind. This was done by creating a paper pattern fill from a clean area of page, so that when you delete, instead of getting a void, you get a section of clean paper. CLICK By using the paper pattern as a mask we could, in effect, paint it over anything on the page

<slide: Laurie's short video here>

By holding the stave mask above the pattern fill layer, we could sweep through large areas of mess at speed because we didn't have to avoid the stave lines, the staves remained unaffected. Because everything is done in layers, so the original image remains untouched, it is possible to delete and then recover anything by changing the painting tool from subtract to add, because the information has not really gone, it is just hidden under the paper layer.

This pattern can be painted using brushes of various sizes depending on the context. You can see, though, that by the time you had done this level of work across a whole page, you would have an extremely intimate awareness of how the scribe had constructed each note, shape and letters, pen-stroke by pen-stroke.

<slide: long video>

This video shows a drastically speeded up screen capture of the initial reconstruction of a reasonably readable page. The first process is to eliminate the more obvious colours of showthrough and bleed using global pattern fills of select colours. These first stage coarse fills could be scripted and run in a matter of seconds. In this example, though,

they are done manually with selections starting from the obvious rusty showthrough and drilling down to the residue of the bleed edges. By the time we had removed the rust-coloured ink, we had also removed most of the stave lines and quite a lot of other essential detail.

Stave lines had to be recovered manually by knocking out the mask with a tool the same width as the line. This process highlighted just how wayward some of the stave ruling was.

The staves weren't the only things that had been knocked out: any writing in paler ink, particularly that of some of the decorators, had to be retrieved, as did finer elements on both the text underlay and the notes, such as otiose strokes on letters and notes, sharps, erasures and other markings. We found that over-removing and then reclaiming things that had been covered was a lot quicker than under-removing and then adding to the mask. Retrieving these elements was simply a matter of making the pattern fill slightly transparent, and then deleting it where we could see ink marks showing through that had been hidden.

We also removed the mask from the edges of the page, since this discolouration was not due to the ink and was part of the natural ageing of the books.

The next process addressed the showthrough that had not been removed by the large pattern-fills, and this used successively smaller tool shapes with varying softness to the edges, to edit the mask area. This is pretty fiddly, not least because these were the areas where the showthrough was very similar in colour to the surface ink.

You will notice in the video that some of the notes are not perfectly recovered, and shapes not always faithfully retained, so once this first stage was complete, the page was worked through note by note and letter by letter, flipping the pattern-fill on and off for each item, refining the masks and checking and correcting any errors.

This flipping on and off was also used to check for very light pen marks outside the music and text that had been accidentally eliminated such as playing marks and erasures. There are no erasures on this page, but you will have noticed the word added in a paler ink that had been eliminated by the large pattern fills, but recovered by the editor.

The last part of this stage involved repairing stave lines that looked lumpy because the stave mask had allowed the showthrough behind the lines to come through, so 'normal' areas of stave lines were cloned over damaged areas.

There were unintelligible areas on many pages, and even if we knew from concordances what the notes should be, we couldn't recover the note forms themselves.

<slide of main image then fade through to photostat overlay>

Help was at hand in the form of the TCM Photostats. However they were cockled and had irregular shrinkage. The manuscript had also suffered some movement, both from natural shrinkage and as a result of the conservation. CLICK Once imported into the master image as a layer, the photostat scans had to be rotated to line up with the RGB master, and then selectively stretched or compressed so that noteheads and staves also lined up accurately.

Once the image was in place, the shapes of the notes revealed on the photostat could be drawn around in the pattern mask, so that when the photostat was removed, what was left behind was an accurate tracing around the original pen strokes.

<CLICK fade through of IR overlay>

The same process was used for the small number of infra-red images taken by DIAMM, although alignment was a lot easier. These images revealed not only notes that were difficult to read, but also a more refined picture of the original penmanship.

<CLICK fade through to reconstruction>

We still had the problem of the holes that were present even in the 1920s, and this was one that had no easy solution.

<slide with nasty options> SET UP AUTO-RUN

After many suggestions about how to present missing areas of the page to ensure it was clear that they were ‘faked’, we went back to the over-arching concept of 'reconstruction', opting to clone the missing notes from music on the same page and as closely adjacent to the missing areas as possible,

<slide with nicer options>

Having made that decision we again had to explore ways of signalling those edits visually.

<slide with green boxes>

While we were dithering around unable to decide, we were boxing these edits in green so that they were easily visible to editors, and in the end we decided the green boxes were the best solution. If you really hate them, now is the moment to say.

<slide tissue overlay>

Another question was whether pages with tissue overlay should be colour-adjusted to make the ink look more like adjacent pages. By the time we had repaired the paper part of the page the overlay was a lot less obvious. In the end we decided to leave those notes looking cloudy as it serves to show where the tissue overlay is in the manuscripts and alerts users that the reconstruction of these notes is not as reliable as elsewhere, but also because the ink colour was often crucial to understanding scribal behaviour, so it had to be trustworthy. None of the ink colours have therefore been adjusted.

<slide of that nice band of pen work across the page 5/15v including the A>

Having recovered the body of the pages, we turned our attention to the decoration. It wasn't really necessary to repair this given that it did not affect the reading of the music, but leaving the damage looked odd, so decorative pen-work was reconstructed CLICK, and painting or gilding that had cracked and dropped off areas of capitals was replaced with a pattern-fill CLICK created from the surviving material on the same letter.

<Finals 5/10r 1/21v; 1/19r; 3/15v>

Missing finals were designed to fit the style and space as best we could, given the huge variations throughout the books, CLICK

don't get annoyed: we had to have SOME fun!

<dog with caption>

and coloured ribbons damaged by showthrough or ink decay on the surface were repaired unless the result of a deliberate deletion by the scribe.

Once we had the notes where we wanted them, we went through all the things that were messes, but not attributable to the acid ink,

<several pics of corrections>

and we made sure those had not been edited out,

<>

taking particular notice of erasures <> which inexperienced editors sometimes <> mistook for showthrough.

<library stamp CLICK>

We also retained accretions of time like library stamps,

<fingerprints CLICK>

and signs of use such as fingerprints.

These were actually some of the most complex pieces of editing work,

<slide: 3/29>

particularly where there was water damage. The retrieval of the water stains on the leaf I showed before, and this one By graphic designer Laurie Clifford-Frith required an extraordinary level of expertise that simply isn't evident in the end result -- which of course was precisely as it should be.

<Checking>

The checking process involved the painstaking note-by-note reading. Then the content was checked against contemporary concordances and reliable modern editions to check not only our mistakes but to locate errors in the Sadler readings that could not be considered local variants. Finally the books were used by singers and viol players CLICK (some of whom are here today) who fed back issues for us to check, correct, or footnote as copying errors in the edition. The footnote figure is imposed on the page, since we are not pretending this is a facsimile: it is most certainly an edition.

<Targets for the edition>

So to the edition – a collaborative reconstruction. Have we managed to achieve what we set out to do? It was important that the reconstruction created a usable and 'handle-able' version of the books that would facilitate both scholarly examination and the use for which they had been intended. Having been involved in the recovery of every page to some degree, I'm confident that the edition will allow people to study the palaeography of these books with confidence, especially as the unedited images are also accessible.

Each page has been allocated a damage or intervention score which is printed at the foot of each page, along with the initials of the editors who worked on it. We have brought our working mockups with us so that you can take a look at them.

<>

We still cannot handle these manuscripts, but we can get close to them with a faithful representation of a better version of them. I don't think any of the team will miss staring at a screen for hours on end though.

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