An adaptable tradition: textile dyeing for book conservation using Magdalen College’s Daubeny Library boardslotting project as an exemplar

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‘A very agreeable substitute’

Bookcloth was developed in the early 1820s primarily in response to the increasing demand for books as literacy rates surged. This was not the earliest example of dyed textiles being used for covering books; it succeeded the historic use of velvet, satin, calico and, for a brief experimental period in mainstream binding, dress and curtain lining fabric. It was, however, the first purpose-made dyed textile binding material. Its development was pioneered by a London-based publisher and binder partnership, William Pickering and Archibald Leighton, who, capturing the mood of the burgeoning book market developed a dyed calico cloth suitable for use as a cheap, enduring covering material. The main breakthrough in its development was Leighton’s use of dyed starch to fill the pre-dyed cloth. Not only did this make it easier to cut and controlled stretch and fraying, but after calendaring it also provided a smooth, durable surface finish. Importantly, this made it impervious to adhesive application whilst at the same time making it more aesthetically acceptable, and ultimately desirable, to a book-buying public more accustomed to the uniform surface characteristics of leather. Notably for the purposes of comparison here, bookcloth was initially produced on a small scale within Leighton’s bindery, rather than as an organised commercial activity. The rationale driving the development of bookcloth mirrors the choice of a dyed, filled cloth as a suitable component in boardslotting.

The Daubeny Library

The Daubeny Library is based on the personal library of Dr. Charles Daubeny (1795-1867) and his acolytes. Daubeny is arguably the first Fellow of Magdalen College who could be described as a scientist in the modern sense of the word. The collection is still housed in his original laboratory and when it was catalogued in 2006, it was found to be in need of extensive conservation treatment. As the books are displayed on open shelving in a historically significant space it was important to employ a treatment where the aesthetic integrity of the collection was maintained whilst causing as little disruption as possible to the fragile binding structures.

Dye options

As with Leighton and Pickering, the development of a dyed textile for the Daubeny project was in response to a specific set of requirements which could not be met through a commercially available product. Both initiatives shared several key priorities, although it is unlikely that long-term material and chromatic stability were significant considerations in the initial development of bookcloth. The criteria that informed the choice of textile dye as a toning agent and then the dye type for the Daubeny boardslotting project were:

- Batch application to allow dyeing in quantity
- Ease of both application and availability of equipment and materials for use in a studio environment
- A high degree of light and wet fastness
- Even colour across the dyed textile, or good levelness
- Full colour penetration of the textile fibres
- Accurate reproducibility

Comparative research and consultation with textile conservator colleagues resulted in reactive dyes being selected as fulfilling the requirements of the project. The materials offered more accurate reproducibility, reactive dyes had the advantage of having excellent water fastness due to the strong bond between dye and fibre. This is an important consideration in library and archive storage environments. The slightly reduced light fastness of certain colours led to light control measures being introduced into the library to the benefit of the whole collection.

Dye cycle and finishing the cloth

Leighton had an unrestricted choice of dye colour, but the Daubeny project required accurate matching of any new material to that of the original leather. Fortunately, most volumes were bound in a fairly uniform mid-brown leather with small variations in shade. 1% stock solutions of Procion Mx™ reactive dyes in red, blue and yellow were prepared to ensure accurate measurements and therefore ease of reproducibility. By varying the proportions of these in the dye liquor, a series of 100% cotton colour swatches were created and these were used to match the colour of the covering leather on the books to be slotted. The most useful colours were batch dyed and a stock of toned cloth was slowly built up.

Being aware of the factors behind Leighton’s early developments in bookcloth production, it was clear that it would be necessary to fill the cotton cloth to prevent stretch and adhesive penetration as well as to ensure a durable, smooth finish. The nature of the dye cycle and the need for high levels of water and light fastness in the finished dyed textile prevented the replication of Leighton’s method of using dyed starch for hinging the cloth. Working with colleagues both within the Oxford Conservation Consortium and at the Bodleian Libraries, a new boardslotting method was developed. A transfer method to fill the cloth using wheatstarch paste was developed. It was found that the smooth surface characteristics of leather could be achieved by pressing the cloth between melinex™ with minimal colour alteration, in a smaller-scale method similar to Leighton’s use of calendaring rollers for the same purpose.

Examples of treatment outcomes

A: C Dauenny 46a c 18 before and after treatment
B: Dauenny 89 a c 18 before and after treatment

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