

RESTORATION AND PRESERVATION OF DOCUMENTS

A Summary of a Report prepared by Churchill Fellow, Jim Bruce

PART III

In the previous two issues of *Archives and Manuscripts*, Parts I and II of the summary of a report of Jim Bruce's Churchill Fellowship study on the Restoration and Preservation of Documents were published. Part I dealt with the author's stay at the Public Record Office, London. Part II covered his work at the India Office Library and India Office Records, also in London, and dealt in brief with the Wolvercote Paper Mill at Oxford, the Guard Bridge Paper Mill in Scotland, the Imperial College of Science and Technology, the Scottish Record Office and the National Archives and Records Service, Washington. Part III, which completes the publication of the author's report, deals with the Public Archives of Canada, in Ottawa.

PUBLIC ARCHIVES OF CANADA

I was at the Public Archives of Canada from 9th - 20th July, 1973.

PROGRAMME

As I had been concentrating on hand restoration at previous centres visited, it was decided that I spend the two weeks in Ottawa on laminating procedures and deacidification.

The matters investigated included:—

- (a) Lamination and deacidification by aqueous method;
- (b) Deacidification by non-aqueous method;
- (c) Deacidification—lamination for library purposes (Part restoration only);
- (d) Lamination of maps.

CONDITIONS AND EQUIPMENT

Working conditions are very favourable with fluorescent lighting and piped music is relayed through the restoration room at certain times. There is plenty of space in each working area, hot and cold water, air conditioning, central heating, no natural lighting, and grey-topped formica benches. The light tables are built in, and there are table lamps on all benches, and high backed swivel stools. Fire alarm systems are installed. The map tables have hinged wings. Other equipment includes paper trimmers, guillotine, glueing machines, and three lamination machines (two large and one portable). The two large Arbee laminators have fume extractors built over them. There are four stainless steel sinks twenty-four inches by eighteen inches by eight inches deep, with stainless steel trays four inches deep to fit into each sink. A deacidification plant, a fume chamber, a Simplex dryer, felt pads eighteen inches square, a stand for holding rolls of lamination tissue (these rolls are fairly heavy) double sided teflon .010 gauge, a range of pH meters and indicators, and a staple tacker for mounting calico on to board are also available. Restoration tables are made

specially for the cleaning, erasing and sorting of documents, with a grey top and drawers set in the one foot two inch side with a slide out plate at the top of the drawers.

LAMINATION

Lamination has achieved wide popularity and acceptance in Canada. The Public Archives has two large Arbee lamination machines and one small Apeco portable machine, plus tacking irons.

They have several types of tissues for lamination:—

- (i) Acetate tissue
Advantages: It comes in rolls and has a high tear resistance, good pliability, is fold resistant, and is economical to use. It is used extensively in the repair of tears in sheets.
Disadvantages: It requires a lot of heat (350°F, or 175°C) at forty-seven seconds, which could be detrimental for preservation purposes. The operator has to use four separate pieces in the laminate process. The fumes produced in the process are toxic. It is soluble in acetone only.
- (ii) Lamatec tissue
Advantages: It comes in rolls, has a high tear strength, good pliability, operates at 180°F to 250°F, at thirty-one seconds, and is a faster laminate process. It uses less heat than other processes and is non-toxic and water soluble.
Disadvantages: Higher cost than acetate tissue.
- (iii) Lamatec double sided tissue
Details as for Lamatec tissue, but is more expensive. It is a great time saver as it will laminate calico or backing to maps in one operation.
- (iv) Matt finish mylar tissue
This is a plastic coating not used on valuable documents, but used as a protective coating for brochures, etc. It is applied at 250°F, at thirty seconds, and the process is irreversible.
- (v) Glossy mylar tissue
Details as for matt finish and is used on small identity cards and the process is irreversible.

DEACIDIFICATION

- (a) *Restoration procedure of documents with aqueous deacidifier and lamination*

Documents are sent in to the restoration section boxed, accompanied, if necessary, by damaged fragments contained in a separate envelope, with their classification slip, job sheet denoting the method of work to be undertaken, plus a sheet to be filled in by the restorer on completion.

As far as the particular job with which I dealt is concerned,

inspection of the documents revealed dust adherence and tears on several documents: all were written in Indian ink on both sides, and were foolscap in size. They were cleaned with an eraser and the inks proved stable in the aqueous test. A pH reading was taken.

Deacidification is achieved with an aqueous solution of magnesium carbonate. Documents are placed in the stainless steel mesh trays individually, then placed in the warm water. This allows the paper to relax and also cleans off any surplus dust. The documents are allowed to soak for a few minutes then are removed and placed in a sink of deacidifier where they remain for twenty minutes. They are then removed and are drained on the sink. The documents are removed separately from the stainless steel mesh and all surplus moisture is removed with a sponge. The documents are placed between felts to dry. After the drying period overnight, tears in the documents are repaired with acetate tissue. Strips of acetate tissue are cut to one-half inch by one-eighth inch and these are picked up by means of tweezers and dipped in a solution of acetone then applied to the tears and smoothed down. Documents are then ready to be laminated.

The lamination machine used is an Arbee Model C which has already been switched on with thermostat set to 180°F, or 80°C. The packing to hold the documents in the laminating process (16 ounce cardboard, teflon layer, teflon, cardboard layer) is passed through the machine first to remove all moisture. The teflon is double sided, designed to control and spread the heat evenly and to prevent sticking.

The lamination of the documents is done by placing the mill board, teflon, silicone release, lamatec tissue, documents, lamatec tissue, silicone release, teflon, millboard, all in that order, and known as the sandwich. This is placed in between the two platens on the lamination machine. A button is pressed which operates the machine and lowers the top platen and presses the sandwich on to the lower platen for thirty-five seconds, and then automatically releases and rolls the sandwich out on to the bench at the rear of the machine. The bench has a half-inch piece of dowling placed along the centre and tied to each end of the bench. This makes it easier to pick up the sandwich. Documents are then removed and trimmed, and placed in acid free boxes.

(b) Restoration procedure of documents with non-aqueous spray deacidifier

Documents are inspected. The sample documents with which I dealt were found to be torn, with pieces out of them, slight dust adherence, and all were written in black ink, with some red lines under names. The documents are cleaned with an eraser making sure no pencil marks are removed. In the case of the document with which I was dealing, the black ink tests proved stable, but the red ink tests showed signs of feathering, so a non-aqueous spray deacidifier WEI T'O was selected and sprayed on to the documents. The documents were dry in a matter of seconds with no cockling of paper. Then with a tacking iron the tears were mended with strips of acetate tissue. Then the documents were laminated as in (a) and returned to acid-free boxes.

(c) *Deacidification-lamination of library material and bleaching (where the pH test had already shown acidity)*

This job was carried out on a sample which the book-binders had already pulled down, and the subsequent inspection showed that it had fox markings and dust adherence. It was printed on both sides of the page. Tests were carried out on the ink and it was proved to be stable.

The dust adherence is reduced by use of an eraser. The removal of foxing is begun by placing pages in between several frames of stainless steel mesh and washing in a mixture of chloramin T for thirty minutes. (Rubber gloves are used for this process, which is not advisable for written documents as the writing could become distorted). Then the stainless steel mesh with the pages is removed and washed in a clean warm bath. The pages are deacidified in the process described in (a) and are left to soak for twenty minutes. The deacidifier magnesium carbonate is renewed after it has turned a dark yellow caused by the acids in the inks. The mesh with the pages in between is lifted out and left to drain on the sink. The pages are removed to the table and laid on paper towels. After this process the pages are placed in a Simplex dryer, but sufficient moisture is left in the paper to avoid cockling. The pages are then placed in a press overnight or placed between felts. Next day they are removed and trimmed down to size to be made up into sections again for rebinding.

(d) *Lamination of maps with lamatec double sided and single sided tissue*

Procedures for inspection and deacidification are carried out as previously described. The materials are cut and placed on a bench in the following order: calico, then a sheet of double sided lamatec tissue, map, then a sheet of single sided lamatec tissue. The lamatec tissue is then tacked on to the calico and the map with an iron. This sandwich is inserted in between the teflon sheets and then laminated. The maps are then removed and either attached to hangers and hung in vertical cabinets or stored flat in drawers.

N.B. Repair of small holes in documents

A wad of acid free paper is placed in a vice and sand-papered on the edge to obtain a powder. This powder is mixed with a paste. The documents are laid on grease-proof paper, and the small holes filled with this mixture, which is allowed to dry under weights.