

GUILD OF BOOK WORKERS JOURNAL

Volume XIV

Number 3 · Spring 1976

The Friar “For it so falls out  
MUCH ADO ABOUT NOTHING, ACT FOUR, SCENE ONE.”

That what we have  
we prize not to the worth  
Whiles we enjoy it;  
but being lack'd and lost,  
Why, then we rack the value;  
then we find  
The virtue that possession  
would not show us  
Whiles it was ours.”

WILLIAM SHAKESPEARE

When George Cunha wrote to me in October, 1973, offering me a position with his newly formed staff of the New England Document Conservation Center, I had to re-evaluate to some degree my life as hermit-monk book restorer on Vancouver Island. What better way to enlarge my abilities and knowledge in the field of paper conservation than to accept his proposal. The sixteen months spent in North Andover learning from, and sharing with the splendid NEDCC staff was an experience of inestimable value. As chief-of-the-bindery and director of Field Services I was able to contribute and grow in the fascinating field of book and paper restoration and conservation. Gradually, however, there grew the desire to spend a year in Europe, studying and working in the fields of book and paper conservation—and yes, creative binding as well. And it seems that where there is a will, there is a way. Herr Martin Jaegle, teacher and master-binder at Centro del Bel Libro, Ascona, Switzerland, accepted me for a six months period of study. In turn, George Cunha wrote several of the outstanding conservation centers of Europe on my behalf. And before I left NEDCC in April, 1975, he had received confirmations from these institutes welcoming me either for a brief or longer period of study and work.

Since it is my intention in a subsequent article to describe my work and studies at Ascona, it is enough here to express my admiration for this center of creative binding and to express my esteem for Herr Martin Jaegle as teacher and master in the whole range of binding—commercial as well as creative fine binding—and to encourage interested binders to study with him.

In August my Ascona studies were interrupted by a telephone call from Ottawa with an invitation from the Canadian

Rev. Charles A.E. Brandt is a Paper Conservator at the Canadian Conservation Institute, Atlantic Conservation Centre, P.O. Box 272, Moncton, N.B. E1C 8T6, Canada.

Editor's Note: At the time of printing the Atlantic Conservation Centre has closed and Rev. Brandt has been transferred to the Canadian Conservation Institute, 1030 Innes Road, Metro Block "C", Ottawa, Ontario, K1A, 0M8, Canada.

Conservation Institute to be flown from Europe to Ottawa and return for the purpose of being interviewed for the position of conservator: book/paper with C.C.I. The interview successful, and hired as conservator by C.C.I. to begin work on January 1, 1976 (in four and one-half months time), I returned to Ascona.

The report that follows is necessarily abbreviated and at times severely terse in its descriptions of various procedures and operations, using a minimum of words to describe techniques that are often complex and elaborate.

## ITALY

My first visit was to the International Centre for the Study of the Preservation and the Restoration of Cultural Property, Via San Michele 13, 00153 Rome, under the Directorship of Paul Philippot. It was through this Centre and Dr. Philippot that all arrangements were made for visiting various institutes in Italy.

ROME: September 3-14, 1975

INTERNATIONAL CENTRE: Director, Dr. Paul Philippot; Assistant Director and Chemist, Dr. Giorgio Torracco; Scientific Training Assistant, Gael de Guichen; and an additional staff of about four. They maintain a training program for professional conservators and museum curators and call in outside lecturers, supposedly the best in their field, for the training sessions. De Guichen advised me that most institutes in Italy were secretive and were not too willing to share their findings and knowledge. The training sessions at the Centre last from two to three weeks. The one planned for that autumn was concerned with safety, climate control, and lighting in museums, a course designed to meet the needs of museum curators and enable them to make choices regarding conservation policy in these areas. In addition, their basic courses offered from time to time are (1) architectural conservation—monuments and historic centers, (2) conservation of mural paintings, and (3) fundamental principles of conservation.

ISTITUTO CENTRALE DEL RESTAURO: Piazza S. Francesco di Paola 9. Director, Prof. Giovanni Urbani; Assistant, Rita Cassano. The Institute offers a five year course of study taking fifteen students a year, nine from Italy, six from outside Italy. The Institute consists of three principal divisions: Archeology Department, Painting Department, and the Laboratories.

Archeology: Classes were not in session during my visit. I ob-

served several examples of their restored pottery. In the examples they showed me they were using gypsum and brick powder with a resin glue. The missing areas were filled in and there was no attempt to camouflage the restored areas with matching colors.

**Painting:** There are three sections—mural, canvas, and polychrome sculpture. They work slowly. Several paintings that I observed had been at the Institute for over two years.

**Laboratories:** These seemed to be very well set up—chemical, physical (they had much concern for control of humidity and temperature, etc.), and microbiological.

**S. MARIA DI GROTTAFERRATA:** This is a Greek Monastery outside of Rome at Grottaferrata. Padre Josephat is the chief conservator and works with a staff of five. The monks specialize in parchment repair and restoration. They soften and clean the parchment with water and alcohol. They would not reveal the adhesives used in parchment repair. For vellum repair they used mostly young goat from the Florence region. Their vellum mending was superb. They were doing some paper restoration. They bleach with Chloramine-T. Sodium borate is used for deacidification.

**ISTITUTO DI PATOLOGIA DEL LIBRO:** Via Milano 76. Director, Prof. B. Galante. I had a very interesting discussion with Dr. Santucci, their chief scientific officer. All bleaches, he says, break down the cellulose fibers to some extent; there is the initial breakdown and then the action proceeds much more slowly. He prefers the hypochlorites as being the least damaging. Chlorine dioxide he considers about the same, but it is toxic and explosive. They did not have a fumehood or fume chamber. He finds that magnesium methoxide turns even pure cellulose a little yellow. For fumigation, ethylene oxide is used: this kills both plants and animals.

**Parchment (vellum) repair:** To soften and clean vellum pure alcohol is applied with cotton swabs, and while still slightly damp the vellum is placed between clean carton (very thin cardboard) and pressed. Then they mend. Their technique is to skive off the surface of other parchment and use this for mending, holding it in place with a Glutofix (almost pure cellulose) and Vinavil (PVA) mixture.

**Paper repair:** I will discuss this method under State Archives. Most institutes in Italy follow the methods of the Patologia del Libro.

**Lamination:** This is called plastification and is used as a last resort. Cellulose acetate is used only on one side of the document and is applied with a heat press at 50°C.

**CENTRO DI RESTAURO DEL ARCHIVO DI STATO:** Via Costanza Baudanna 14. Director, Dr. Erica Ormani. The State Archives is set up to train students, and they encourage outside participation on a short or long term basis. All conservators who work in the various state archives in Italy have been trained in Rome, so that techniques are pretty well standardized throughout Italy. The Director turned over two of her top technicians to me and they worked with me for several days, demonstrating methods of repair, showing me films, and supervising my own restoration work there.

**Equipment:** This is the most modern and complete that I saw in Europe.

**Fumigation:** They have a special chamber and use formaldehyde for 72 hours.

**Washing:** They have marvelous sinks where water enters from the bottom and is controlled thermostatically, with a water clock controlling the amount of water. Sometimes in washing documents they use Lyssapol (soap), 1/10% in water at 30°C.

**Deacidification:** Barrow's two-phase system is used.

**Bleaching:** Chloramine-T is used, 5%, 50 grams in one liter water for one-half to one hour, then wash in water for a few minutes, then in an anti-chlor. They sometimes bleach with calcium hypochlorite.

**Parchment:** They clean and disinfect by using an 80% solution of alcohol plus one teaspoon of glycerin, applying with cotton swabs. Mending parchment: The adhesives used are Sintelin (PVA) plus Vinavil.

**Backing documents:** They used an adhesive of Vinavil (10%), Glutofix (20%), and Glutolin (70%). This mixture is applied very thinly.

**Maps:** They have a very large table with a foam rubber top. Over this foam rubber is placed silicone release paper. The linen which is to be used to back the map is moistened and placed over the silicone paper and clamped to the underside

of the table. It dries tight. Paste is added to the linen and the map is placed down on this.

**Backing documents or leaves:** The adhesive used is the mixture described above (Glutofix, Vinavil, and Glutolin). They call the backing operation *veiling*, using Velo, a thin, almost transparent Japanese paper almost like lens tissue. If guarding is necessary and if corners are missing, these pieces are first torn to size and placed in the proper position under the document. Over the document is placed a sheet of Velo, large enough to cover the complete document. The Velo is pasted directly onto the document so that the adhesive goes through and attaches the pieces under the missing corners and/or the guard area. This is then placed in the press between silicone paper and carton for a few minutes, then removed, and placed back in the press. The next day it is removed, turned over, and with a scalpel the excess guard and corner mend paper is removed and the fibers pasted down.

**GABINETTO DELLE STAMPE E DEI DISEGNI:** Farnesina Gallery, Via della Lungara. Director, Dr. Catelli; Chief Restorer, Bartolucci. The workshop is very small, 60' x 35'.

**Treatment of graphics:** First they dry clean, then wash; usually don't deacidify, thinking washing is enough. They bleach with Chloramine-T; don't immerse, but just put the border into the solution at an angle. They use cotton and spot bleach and sometimes use a sponge and let bleach run over the print at an angle, then wash with running water, then anti-chlor (add 1/20% of acetic acid), then wash again. Sometimes they bleach with ozone (have a special machine) and also bleach with hydrogen peroxide.

**Mending:** They never press with a machine, but put under glass; use Japanese papers. For adhesives they use Glutofix (600) in water or methyl cellulose. The mending techniques are the same as at Patologia del Libro.

**Watercolors:** They are first tested for solubility of colors, then humidified. For bleaching they use hydrogen peroxide and ether put on with swab-sticks and cotton. They do not use fixers and do not deacidify.

**ISTITUTO RESTAURO SCIENTIFICO DEL LIBRO, Vaticano:** Director, Don Placido; Staff of six. For paper and parchment they follow the procedures of Patologia del Libro.

FLORENCE: September 16-22, 1975

**BIBLIOTECA NAZIONALE CENTRALE:** Piazza Cavalleggeri la. Director, Dr. Garroni; in charge of Restoration, Dr. Bonanni. She was most helpful, and even though the Library and Restoration Department were on strike while I was in Florence, she made it possible for me to visit all of the workshops and speak with most of the persons involved with the restoration work. There are some books there that have never been touched since the 1966 flood and are still covered with mud. Many books received their first wash and then were packaged and are waiting on shelves. About 1,000,000 older books, magazines, and modern books were injured by the 1966 flood, which included 80,000 antique books. Of these between 20,000 and 30,000 have been restored. Immediately after the flood all books were disinfected with ethylene oxide, then mud was removed, the books washed, dried, collated and put into envelopes to await restoration.

**Washing:** Washing is done in thermostatically controlled stainless steel sinks containing a mixture of water and 0.05 Preventol as a fungicide at approximately 40°C. The books are washed on floating wooden boards held still by stainless steel angle irons. They are washed page by page with very soft brushes. Between the pages are placed sheets of wet-strength paper. When washing has been completed the book is put into a Preventol bath at 0.07% for about thirty minutes. It is then pressed to remove excess water and passed to the drying section.

**Drying:** The book is laid out section by section onto netted frames which fit into drying trolleys. The trolleys are pushed into the drying ovens where hot (approximately 38°C.) filtered air is blown over the sections through perforated tubes.

**Bleaching:** The book is interleaved with wet-strength paper. First the pages are put into a water bath, tepid, to relax the paper fibers; then sheet by sheet it is passed into the bleach bath from thirty seconds to five minutes until the stains disappear. They like to use sodium hypochlorite, from 3% to 10% concentration depending on the intensity of staining. Oxalic acid is used to remove rust stains at a percentage of up to 5% and locally up to 15%. As soon as the leaf is bleached it is passed into an anti-chlor solution of sodium thiosulphate, then into rinsing sinks where it stays for at least four hours, under cold, running water. Chloramine-T is used

occasionally for mild stains. For grease and oil stains there are a wide range of organic solvents to choose from: trichloroethylene, benzene, petroleum ethers. Pyridine is used for very old stains of vegetable oils. They utilize a fume cupboard.

**Deacidification:** To render the paper slightly alkaline and furnish a buffer to prevent acidity at a future date, generally they use the Barrow One-Shot method of magnesium bicarbonate. Sometimes the Barrow Two-Shot, done with two baths, first a solution of calcium hydroxide, and a second of calcium bicarbonate is used.

**Sizing:** If the paper needs re-sizing, they use different solutions, including methyl cellulose, carboxymethylcellulose, polyvinyl alcohol, and nylon in alcohol. Nylon is used when paper is weak or when it is considered undesirable to use an aqueous size. This process is carried out in a bath, with a brush, or by spraying.

**Heat-set tissue used for mending:** They prepare their own heat-set tissue. It is made with acrylic resins. The brand currently used is Primal or Rhoplex. These are emulsions manufactured by Rohm & Haas, Philadelphia. It is diluted with water and the emulsion painted onto a clean piece of glass. A sheet of lens tissue is lowered onto the emulsion. Any air bubbles that appear are dabbed with a pad of cotton so that all of the tissue is in contact with the emulsion. The plates are allowed to dry vertically. When dry the tissue is removed by lifting one corner with the aid of a spatula and peeling it off. It is then used for mending documents, tearing off what is needed and putting it down with a tacking iron through silicone release paper.

**Binding:** The following specifications are samples of those bindings most commonly encountered in the Biblioteca Nazionale bindery:

1. Full tanned goatskin or alum-tawed goatskin, handmade paper endpapers, the book sewn on double cords laced into good quality millboard. Headbands of unbleached linen thread tied down at frequent intervals. Spine lined with linen and/or leather.
2. Full limp vellum (goatskin), handmade paper endpapers, the book sewn on double alum-tawed goatskin thongs. Linen headbands tied down at every other section. Thongs and headband cores laced through the vellum

cover to give a sound mechanical adhesion between the book block and the vellum cover. Fore edge ties of alum-tawed goatskin.

3. Quarter goatskin with buckram or handmade paper sides and vellum tips, handmade paper endpapers, the book sewn on linen tapes inserted into split-boards, headbands of linen thread tied down frequently. Leather or linen lining, tight back (except where original label or spine must be replaced, when a hollow back is used).

## AUSTRIA

VIENNA: September 22-29, 1975

OSTERREICHISCHE NATIONALBIBLIOTHEK, Institut für Restaurierung; Josefsplatz 1. Conservation Officer, Prof. Otto Wachter; Chief Rare Book Restorer, Frau Hildegard Kuhn. Over the past several years she had restored a sixth century manuscript on parchment, Dioscorides' treatise on plants, insects, and birds (Cod. Med. Gr.). Their method of parchment restoration is as follows:

1. Dry clean (with erasers and scalpel, etc.)
2. Spray with alcohol (use atomizer).
3. Spray with parchment size while still damp with the alcohol. The alcohol makes the size penetrate. First they spray on a little, then more until the parchment is completely relaxed. If it does not flatten, then they use a stretcher frame.

Formula for parchment size (parchment here means vellum): Greasy and fatty parchment are best, especially from along the edges of the skin. Cut this into very small pieces, like noodles; put in a pan of cold water and soak overnight (2/3 water, 1/3 parchment). In the morning, skim off waste and scum, put in a doubleboiler; heat to 65°C. and cook for 24 hours. Too much heat will destroy the size. The cooking can be interrupted and done in shifts, with water added as needed. After 24 hours, strain and you will have liquid parchment size. To this add 7% vinegar and methyl-alcohol, 1/3 the quantity of the size each. After spraying the parchment with the size, press it between silicone and thin binders board using light pressure as too much causes the parchment to become shiny.

Mending parchment: Hair side to hair side; fleshside to fleshside. The underside of the parchment tear or hole is pared

around the edge, and the new piece to be added is also pared.

Adhesive for parchment mending: Use starch paste which is prepared by adding cold water to make a thin paste; then adding boiling water to this and stir rapidly. This starch paste is mixed with the parchment size described above, 50% of each. A little MC is added as an insecticide.

Mending materials: Goldbeater's skin (from appendix of animals) is used, and can be gotten from Klein in Furth, West Germany; also imitation parchment is used, available from Firma Carl Wildbrett, in Bobingen, West Germany. This is very thin and is put on the same way as the parchment mends described.

Coloring mends: Various colored pencils are used, putting on a little color first with a graphite pencil. Colored pencils are (Decoro) Faber.

OSTERREICHISCHES STAATSARCHIV KKEIGSARCHIV: Stiftsgasse 2. Restaurator, Franz Antonicek with staff of two or three binders. Frank Mowery was interpreter. Here I studied their liquid-pulp repair without the use of a machine.

Procedure: Tear up old paper (they have much paper from very old discarded books) about the same age as book to be mended. Add water and boil. Pour out water. Repeat three times; last time add Nipagin (fungicide) to the boiling water. Then add fresh cold water. Place in the blender and beat, three times through the blender. Place large felt on heavy wire screen support. Dip silk chiffon in water and place on felt. Spray document to be mended (with mixture of 70% alcohol and 30% water). Place document on silk chiffon; spray again with alcohol (kills fungi). Straighten out document so it is free of wrinkles. Add liquid pulp (as prepared above) to a plastic bottle that will fit comfortably in your hand and which has a long spout. The pulp is added to the plastic bottle by dipping the open bottle into the pulp which has been poured into a plastic bucket. With plastic bottle in hand gently shake or squeeze the pulp over the area to be mended. Press this pulp added to the document down with a small scrub brush (nail brush), gently tapping it. Usually when you can no longer see the pink color of silk-chiffon through the mended area this is indication that enough pulp has been added. At the Staatsarchiv they tend to overlap considerably and put the pulp on quite heavily. One can also mend small tears and

holes and large weak areas. After the pulp is in place, add second felt and then piece of binders board. Turn over the whole sandwich. Remove the screen, felt, and silk chiffon. Study the document to see that all holes are filled; if not add more pulp. Add felt to this side. Build up pile of mended sheets between felts and binders board. Put in large press and nip for one second. Take out, remove felts and place between silicone paper. Press overnight. Following day size with methyl cellulose.

## WEST GERMANY

MUNICH: October 1-November 15, 1975

BAYERISCHE STAATSBIBLIOTHEK, INSTITUT FÜR BUCH UND HANDSCHRIFTEN RESTAURIERUNG: Abhofach 34. Director, Dr. Helmut Bansa; Chief Conservation Officer, Karl Jaeckel; Masterbinder, Herr Helmut Maier. During my seven and one-half weeks at the Staatsbibliothek I completed the restoration of three books, all early sixteenth century, two with paper leaves and wooden boards covered with full leather; one with parchment leaves, and wooden boards covered with full leather and with clasps. Herr Maier was my instructor and worked with me eight hours a day for the first five weeks. Herr Jaeckel was my instructor the last two and one-half weeks. On the three books I carried out the complete restoration-conservation process: taking down, washing, deacidifying, bleaching, sizing, mending, sewing, rounding, making new boards or repairing old, dying leather, paper and headband materials, sewing headbands, covering, making clasps, leafcasting, filling in missing areas on leather with powdered-dyed hemp cord.

Bleaching: Chlorine dioxide. Use sodium chlorite 20g. per liter of water, plus 37% formaldehyde (25 cc/l). Water to prepare bleach is run into a large tray in a fume hood chamber. Waterclock controls the amount of water. The temperature of the water is maintained at 60°C. To prepare the bleach, add the sodium chlorite crystals to the 60°C. water in the fume-hood tank. Mix well. Then add formaldehyde. A yellow color appears immediately. Documents to be bleached are first soaked in warm water (40°C.) for five minutes in a separate sink, four sheets at a time, each supported on a nylon screen. The document is immersed in the bleach (document in this case refers to a book); leave in for about one-half minute;

around the edge, and the new piece to be added is also pared.

Adhesive for parchment mending: Use starch paste which is prepared by adding cold water to make a thin paste; then adding boiling water to this and stir rapidly. This starch paste is mixed with the parchment size described above, 50% of each. A little MC is added as an insecticide.

Mending materials: Goldbeater's skin (from appendix of animals) is used, and can be gotten from Klein in Furth, West Germany; also imitation parchment is used, available from Firma Carl Wildbrett, in Bobingen, West Germany. This is very thin and is put on the same way as the parchment mends described.

Coloring mends: Various colored pencils are used, putting on a little color first with a graphite pencil. Colored pencils are (Decoro) Faber.

OSTERREICHISCHES STAATSARCHIV KKEIGSARCHIV: Stiftsgasse 2. Restaurator, Franz Antonicek with staff of two or three binders. Frank Mowery was interpreter. Here I studied their liquid-pulp repair without the use of a machine.

Procedure: Tear up old paper (they have much paper from very old discarded books) about the same age as book to be mended. Add water and boil. Pour out water. Repeat three times; last time add Nipagin (fungicide) to the boiling water. Then add fresh cold water. Place in the blender and beat, three times through the blender. Place large felt on heavy wire screen support. Dip silk chiffon in water and place on felt. Spray document to be mended (with mixture of 70% alcohol and 30% water). Place document on silk chiffon; spray again with alcohol (kills fungi). Straighten out document so it is free of wrinkles. Add liquid pulp (as prepared above) to a plastic bottle that will fit comfortably in your hand and which has a long spout. The pulp is added to the plastic bottle by dipping the open bottle into the pulp which has been poured into a plastic bucket. With plastic bottle in hand gently shake or squeeze the pulp over the area to be mended. Press this pulp added to the document down with a small scrub brush (nail brush), gently tapping it. Usually when you can no longer see the pink color of silk-chiffon through the mended area this is indication that enough pulp has been added. At the Staatsarchiv they tend to overlap considerably and put the pulp on quite heavily. One can also mend small tears and

holes and large weak areas. After the pulp is in place, add second felt and then piece of binders board. Turn over the whole sandwich. Remove the screen, felt, and silk chiffon. Study the document to see that all holes are filled; if not add more pulp. Add felt to this side. Build up pile of mended sheets between felts and binders board. Put in large press and nip for one second. Take out, remove felts and place between silicone paper. Press overnight. Following day size with methyl cellulose.

## WEST GERMANY

MUNICH: October 1-November 15, 1975

BAYERISCHE STAATSBIBLIOTHEK, INSTITUT FÜR BUCH UND HANDSCHRIFTEN RESTAURIERUNG: Abhofach 34. Director, Dr. Helmut Bansa; Chief Conservation Officer, Karl Jaeckel; Masterbinder, Herr Helmut Maier. During my seven and one-half weeks at the Staatsbibliothek I completed the restoration of three books, all early sixteenth century, two with paper leaves and wooden boards covered with full leather; one with parchment leaves, and wooden boards covered with full leather and with clasps. Herr Maier was my instructor and worked with me eight hours a day for the first five weeks. Herr Jaeckel was my instructor the last two and one-half weeks. On the three books I carried out the complete restoration-conservation process: taking down, washing, deacidifying, bleaching, sizing, mending, sewing, rounding, making new boards or repairing old, dyeing leather, paper and headband materials, sewing headbands, covering, making clasps, leafcasting, filling in missing areas on leather with powdered-dyed hemp cord.

Bleaching: Chlorine dioxide. Use sodium chlorite 20g. per liter of water, plus 37% formaldehyde (25 cc/l). Water to prepare bleach is run into a large tray in a fume hood chamber. Waterclock controls the amount of water. The temperature of the water is maintained at 60°C. To prepare the bleach, add the sodium chlorite crystals to the 60°C. water in the fume-hood tank. Mix well. Then add formaldehyde. A yellow color appears immediately. Documents to be bleached are first soaked in warm water (40°C.) for five minutes in a separate sink, four sheets at a time, each supported on a nylon screen. The document is immersed in the bleach (document in this case refers to a book); leave in for about one-half minute;



PARING LEATHER WITH DRUM SANDER

rinse in next tray of running water for one minute; place in next tray of sodium thiosulphate (anti-chlor) for one-half minute; then wash for thirty minutes in the final tray. Leaves are placed on large zinc screens and piled on top of one another, one screen on top of the other to the top of the sink and washed in this manner. The sink is drained and zinc screens are stood up on end to dry. Then the documents are transferred from the screens to large pieces of carton (thin binders board) and placed in large racks to dry.

**Sizing:** Sizing with *Hasenleim* (rabbit skin glue which comes in a fine powder).

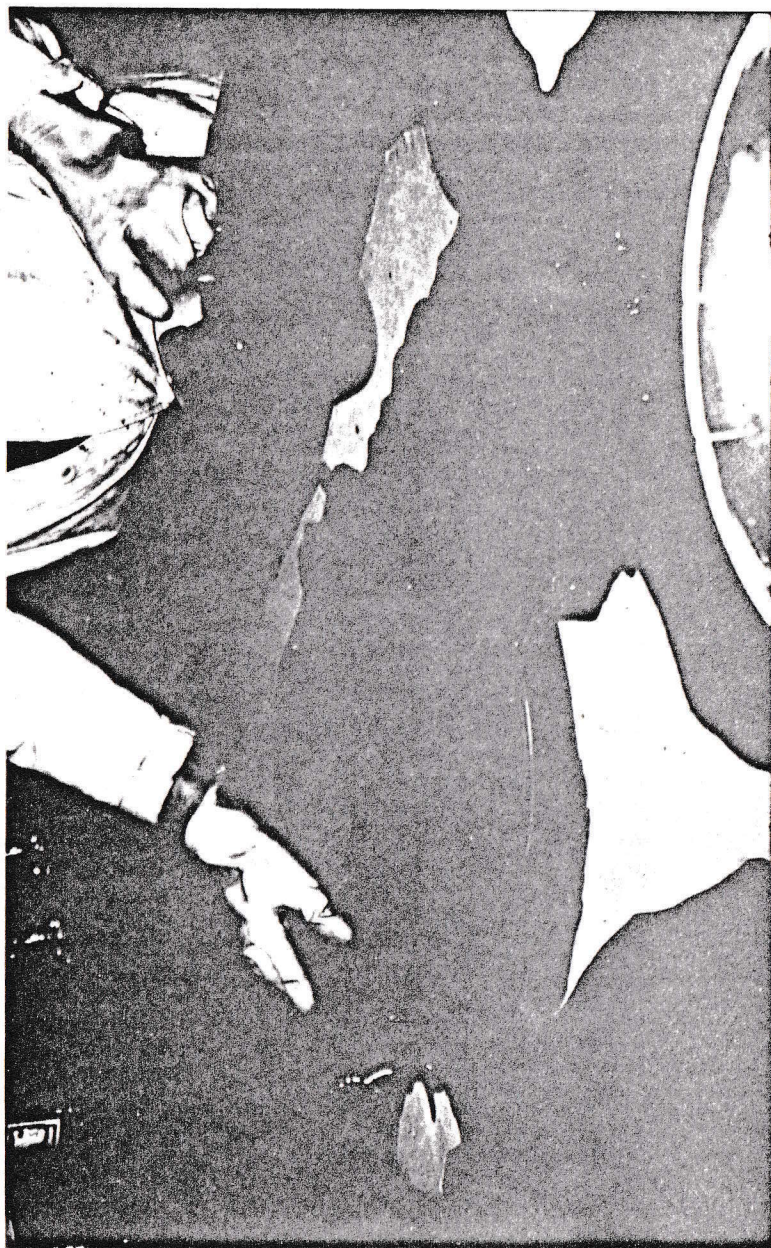
Prepare size: 900 grams of *Hasenleim* in 50 liters water; soak overnight so it becomes soft. To this add 333 grams of Nipagin-T (fumigant). This 50 liters is in a metal tray which in turn is in a large sink into which very warm water is running. When the *Hasenleim* becomes the same temperature as the water-bath (about 40°C.), it is ready for use. Into this warm size the sheets of paper are inserted, pulled through and out. The top edge of the sheet is then placed on narrow strips of wood which have been waxed and held to this stick with clothespins. These are hung up on clothes lines until documents are almost dry, then transferred to large sheets of carton to air dry.

**Paring leather, parchment, and paper:** The Institute utilized electric drills with long flexible shafts into the end of which are fitted small sanding drums. The sanders themselves were coarse or fine depending on their use. The rubber drum supports that support the sanding papers come in various diameters.

**Leather dyeing:** The Institute has great expertise in mixing dyes and dyeing leathers of goat, pig, calf, and parchment. Five skins require approximately five liters of mixed dye.

1. Soak leather in warm water (30-35°C.) for about one-half hour, working and manipulating leather with hands during this time. This washing cleans the leather, washes out some harmful tanning chemicals, later helps the dye to be absorbed, and prevents leather from being spotted later.
2. Mixing the dye: 10 grams of dye powder for each liter of pure water; e.g., weigh out 50 grams of dye; heat 5 liters of water to boiling. Place the 50 grams in a separate pot and add a little cold water and then a little warm water. Stir with a stick until you have a good slurry. To this add the 5 liters of boiling water. Place this pot on hot-plate



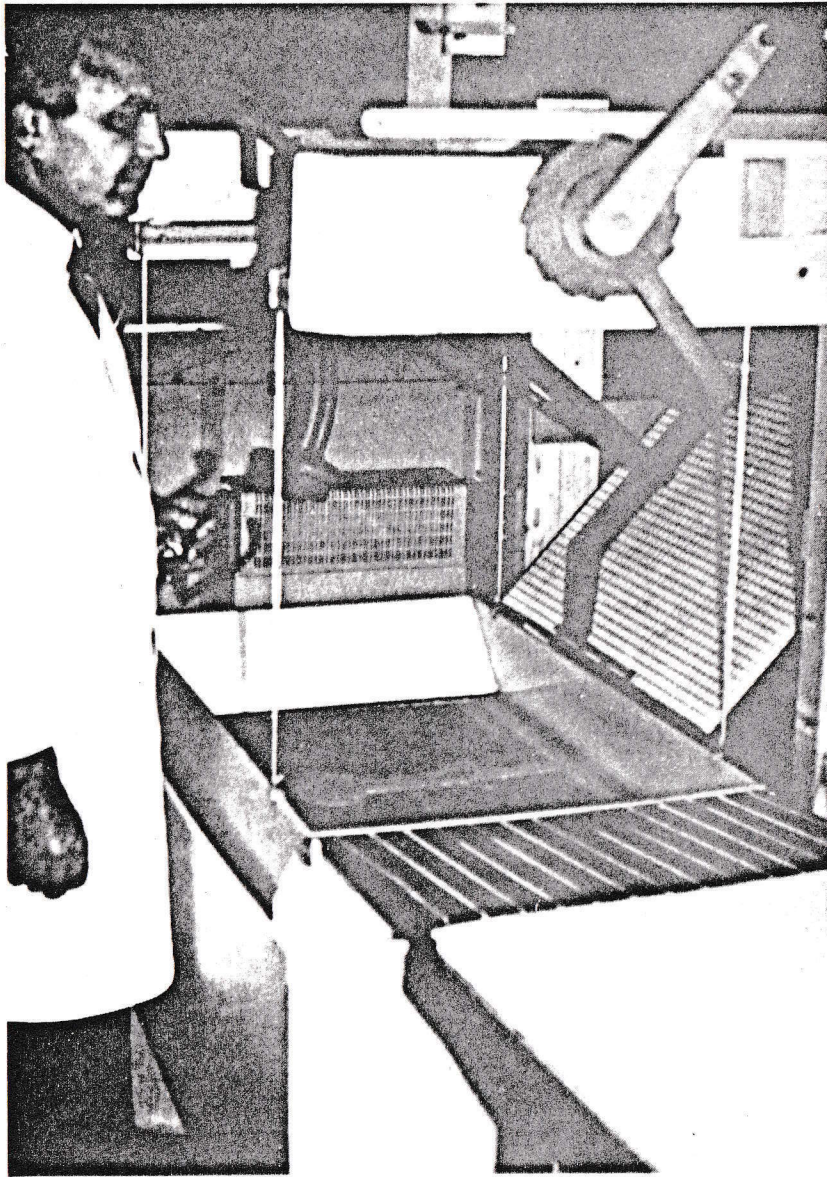


LEATHER DYEING

and boil for two minutes. Warm a large bowl by filling it with hot water; empty the bowl and pour in the dye-mix and let cool to 30-35°C.; now ready to apply to leather.

3. Mixing the formic acid (85%) 10 cc in 1 liter cold water. Add the acid to the water, not reverse. The formic acid fixes the dye. Once this is applied, no additional dye will take.
4. Mixing Bastamol: 30 grams per liter hot water (60°C.). The Bastamol keeps dye from going too deeply into the leather and also gives it a certain tonal splendor.
5. If using several dyes, mix at the same time, making certain that all is clean and spotless.
6. To dye skin: Squeeze water from the skin that has been soaking, and place it on glass in the dyeing tank. With massette (wedge-like ebony tool) get leather completely flat and drive out excess water under the skin. Pour on dye, dipping from the bowl with a small pint container. A large shoe brush is used to spread the dye evenly; then use the massette to even out color and remove excess dye. Depending on the formula, there may be as many as eight different dyings for one skin, using several different colors, and repeating the same color several times.
7. Add the Bastamol. Must be done quickly, brushed on and the massette used.
8. Finally the formic acid is added. It is brushed on (no massette). But the skin is turned over and the massette is used from the back side. This fixes the colors. The skins are then hung up to dry for several days. When dry, the leather is boarded by pulling it over a rounded piece of metal, back and forth, until it becomes supple. It is then treated with a mixture of lanolin and beeswax.

**Leaf casting:** In Europe I examined several types of liquid-pulp machines and worked with them. The one developed at the Staatsbibliothek was superior to any other that I worked with. It could be built for about \$1,000. Plans for this machine are available on request. The machine is made of wood and plastic, with only a few metal parts. The tub is plastic and has two compartments: one large compartment where the leaf is cast or mended and a smaller one into which the mixed pulp is placed and which contains a small pump which pumps this pulp into the leaf-casting compartment. The unit contains no vacuum pump, but works from gravity—the principle of pull-



LEAF CASTER DEVELOPED BY INSTITUT

ing a glass jar from a bucket of water and thus creating a vacuum. The pulp is pre-dyed and pre-sized. This results in an excellent blending of color of the original leaf and the added area.

**Size (Solvitose from Holland is used):** The plastic tub holds 150 liters of water. To this is added 300 grams of Solvitose. The same water is used all day.

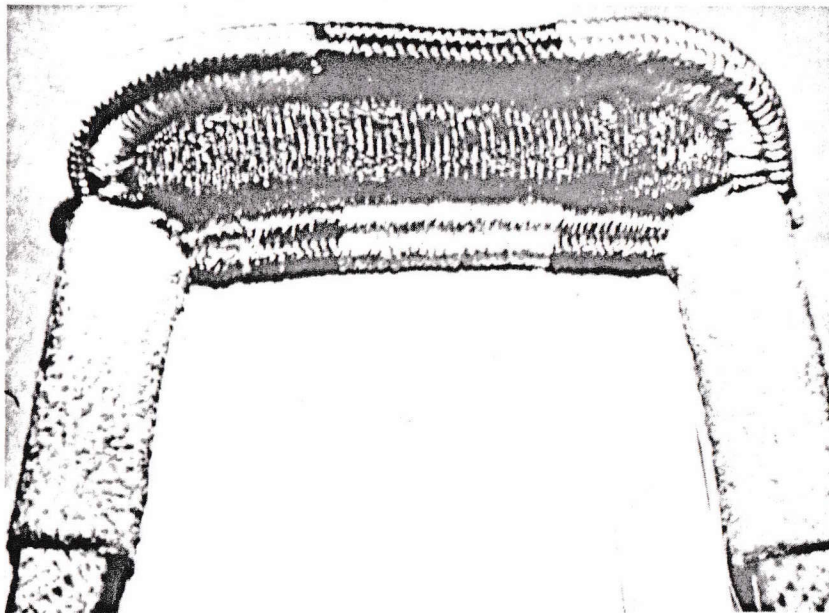
Calculate needed pulp for the leaf that is being mended. Roughly an area of 100 square centimeters requires one gram of pulp: e.g., if you need four grams of pulp to fill an area, they use a mixture of cotton and sulphate. The sulphate is cut up into inch squares that weigh one gram. These are pre-dyed, so you select two of these chips of the correct color and two grams of cotton pulp, place these in the blender and add the Solvitose size at a ratio of 10:1. In this case you will need forty grams.

Place nylon screen down into the main tub on a plastic platform. On this screen place a cardboard frame, a bit larger than the leaf to be mended (the machine is large enough to mend four fairly large leaves of a book at one time). Within this frame place leaf, leaves, or document to be mended. Lower the platform with the crank a bit so water will flow over the leaves and thus make them easy to get into proper position. Lower the clamp from above to hold the document in place.

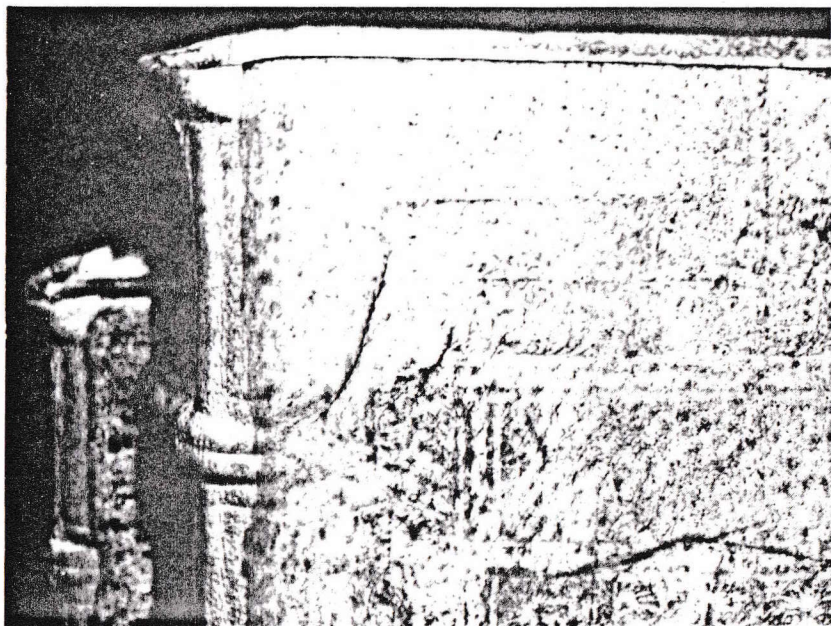
Empty the mixed pulp into the smaller left hand compartment in which there are already about ten liters of water. Turn on the pump and with the long hose pump the pulp and size from the small compartment over the top of the leaf or document, moving in rapidly around the edge, mixing the pulp well. Remove the clamp. Then crank slowly up; this creates a vacuum and pulls the fibers down into the missing areas of the document.

The whole screen with the mended document is then slipped out of the tub onto a sideboard. A felt pad is placed above and below and it is placed in press for ten minutes, then taken out, the screen removed, fresh felts placed on either side of the document, and pressed for one-half hour; then felts removed again and pressed overnight between dry felts.

**Dying paper or chips for leaf-casting:** They use substantive paper dyes from Farbenfabriken Bayer, 509 Leverkusen, principally three colors: siriusschwartz, papiergelb, and siriuss-



TENTH-ELEVENTH-TWELFTH CENTURY HEADBAND



RESTORED SIXTEENTH CENTURY ALUM-TAWED PIGSKIN. NOTE SETTING OF HEADCAP.

lichtbrun. Take forty liters of warm water in a large photo tray; surround by a water bath at 35-40C. To this add Emulgator U (this helps color go on evenly). Then add colors to the tray (requires very small amount). Mix well, insert paper, turn over several times, and rinse immediately in tank of warm water. Dry, and size if necessary.

## AUSTRIA

VIENNA: November 17-30, 1975

AKADEMIE DER BILDENDEN KUNST: MEISTERSCHULE FÜR KONSERVIERUNG UND TECHNOLOGIE. Schillerplatz 3. Director, Dr. Kortan; Professor of Archival and Graphic Restoration, Otto Wachter.

Bleaching with chlorine dioxide gas: I had the privilege of bleaching a number of watercolors under the supervision of Professor Wachter. The gas is very gentle and he uses it on some of the most delicate watercolors. Professor Wachter has tested chlorine dioxide and calcium hypochlorite to see which is the least destructive to paper. He found chlorine dioxide to be far less damaging. For chlorine dioxide gas bleaching he utilizes a chamber manufactured by George Becker and Co., Konigsklosterg. 5, Vienna, at a cost of about \$1,000. With the gas he accomplishes three things: bleaching, fumigation (chlorine dioxide is a fumigant), delignification (removal of the lignin from paper). The chamber is lined with plastic so that it does not corrode.

Bleaching procedure: First all parts of the chamber must be immaculate, especially the formalin beaker.

Preparation of documents for bleaching: Spray both sides, as the bleach works best when the document is moist. Documents are sprayed on the netted frames on which they will enter the chamber. One frame is stacked on top of the other. The heaviest bleaching will occur on the bottom frame, so that the position of a document within the chamber controls the amount of gas bleach it will receive, also the wetness or dryness of the document.

Place five to seven grams of sodium chlorite in a glass tray in the chamber and add 200 cc of almost boiling water.

Place the graphics to be bleached, on their frames, into the chamber and spray again.

Place 60 ml of formaldehyde (37%) in a beaker outside the

chamber, but don't open the valve to allow it to enter the chamber.

Remove air from chamber. This is done by the use of a water pump. The air is pulled through two bottles of sodium thio-sulphate (10%). Take out and air for one minute.

Open valve of nitrogen tank and fill the vacuum of chamber with nitrogen (replacing the oxygen with nitrogen to prevent explosions). Allow to flow for three minutes.

Stop pump and close off nitrogen valve.

Open valve of beaker and allow the formaldehyde to flow into the glass tray within the chamber where the sodium chlorite is. Close the valve. Bleaching occurs immediately.

Bleach for one-half to three hours. Bleaching progress is visible through the glass top.

After bleaching, open water pump for one minute and pump out chlorine dioxide fumes through the sodium thiosulphate bottles.

Open the formaldehyde beaker valve and pull air through the chamber.

To precipitate lignin: Already, in the bleaching process, the chlorine has combined with the lignin to form chlorinelignin, but it is still in the paper. To precipitate the lignin, remove the document from the bleaching chamber. Prepare a solution of 500 ml of water and ten grams of ammonium. Let the document soak in this for one-half hour. This precipitates the lignin. Rinse in cold water.

## ENGLAND

LONDON: December 2-19, 1975

I visited most of the professional hand binders and several institutions involved in restorative binding work, among them the Research Laboratory of the British Museum, the Public Records Office, and the India Office. Generally the paper work in these institutions was somewhat the same. I was very impressed with Fred Marsh and the India Office operation.

**THE PUBLIC RECORDS OFFICE:** Assistant Keeper, Mr. Evans; Chief of Conservation, Mr. Norman Smith.

Parchment repair: Clean document to be repaired, using eraser, opaline pad, etc.

Prepare backing parchment: The Office has a sanding ma-

chine through which you can run a whole skin, and reduce the thickness to a half thickness or almost to paper thinness.

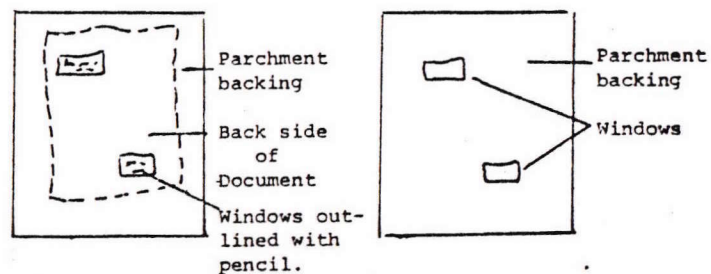
Dampen document: Roll up in a damp cloth for about one hour, or place in a humidity chamber.

Provide a carrier for document: Put down a polyethylene piece larger than the document on top of a light table and moisten with a sponge. Put down document to be repaired; arrange and position it properly.

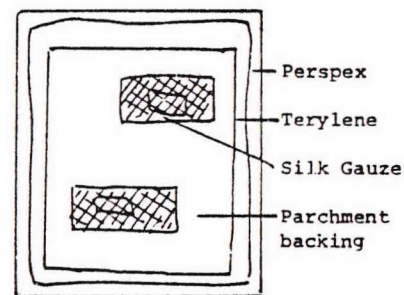
Place a second piece of polyethylene on top of document to form a sandwich, and set aside.

Choose parchment for backing, larger than document. Use sanding machine and thin down.

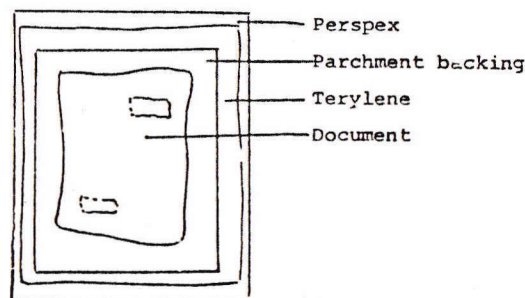
If there is writing on the back of the document, over a light table mark windows in the new parchment with a pencil. Cut these out with scissors and allow about one mm overlap. Erase the pencil outline and pare around edge.



Then sponge off parchment backing to relax it, just a little or it will become transparent. Take a piece of Perspex (thick plastic) larger than document and backing and moisten. Dip a piece of Terylene into water and ring out slightly. Paste off Terylene on Perspex. Dampen the parchment slightly and place it on the Terylene and paste off parchment:

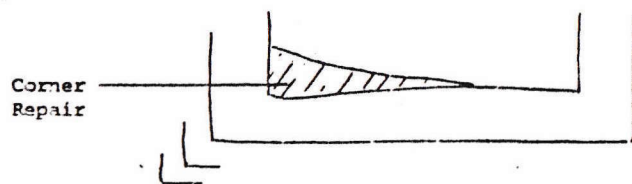


Prepare silk gauze to cover windows and paste on.  
 Return to document to be mended which is in a polyethylene sandwich.  
 Remove the polyethylene from the back side and position the document on the parchment backing.



Remove polyethylene from front side of document. Position document exactly so windows are lined up. When all is in place, rub down through Terylene or polyethylene protector with a bone folder. Remove this protector, clean off excess paste, and let sit overnight.

Filling in missing areas and borders on front side of document: With pencil mark along right to the edge of missing area. Then cut out with scissors one mm outside this line. Pare this with a scalpel. Prepare all mends working on a light table.



When ready to put into place, paste off document area, not the mend. It goes on dry. Work on with bone folder and large needle. Allow to dry. When thoroughly dry (two or three days), remove from Terylene and Perspex.

In a future article I hope to write about the various bookbinding studios in the greater London area where restoration work is being done, studios which I visited and where I received the warmest hospitality: Roger Powell in Froxfield, Douglas Cockerell at

Grantchester near Cambridge, Bernard Middleton in London, Bill Bull at the India Office, and the Camberwell School. England is alive with interest in fine binding. One of the special highlights for me was an evening spent with the Philip Smiths at Redhill, Surrey, where I saw first hand how Philip Smith creates his Oasis canvases using leather parings instead of oils.

#### PRESIDENT'S ANNUAL REPORT TO THE MEMBERS FOR 1975-76 / Mary C. Schlosser

In reviewing the activities and progress of the Guild of Book Workers during the past year, I find that much has been accomplished, but much remains to be done.

Just after the 1975 Annual Meeting, we received the distressing news that the AIGA was raising all dues by 10% due to steadily rising costs. Thanks to the loyalty and understanding of our many members who took this raise in stride, our financial condition, ably tended by Treasurer Grady E. Jensen, remains satisfactory with income approximately equal to expenses despite unusual outlays for our major exhibitions at Yale and at the New York Botanical Garden and the publication of the *Opportunities for Study* list. A fairly substantial year-end balance represents, unfortunately, only the delay in paying for the publication of some issues of the *Journal* rather than a comfortable surplus of funds.

Major accomplishments of the year have been the successful mounting of the exhibition of members' work at the New York Botanical Garden in the fall, the researching and publication of our booklet, *Opportunities for Study in Hand Bookbinding and Calligraphy*, and the inauguration of a quarterly *Newsletter* for members. It would be hard to express adequately thanks for the time, thought, and energy of those responsible for these accomplishments—Sylvia Anderle and Judith Reed as Exhibition Chairmen, Polly Lada-Mocarski and Helena Wright as Study Opportunities Chairmen, and Lansing Moran as Publicity Chairman and instigator of the *Newsletter*, not to mention the many others who so ably assisted them.

To this list of outstanding achievements must be added a completely revised twenty-two page Supply List, the first since 1968, which is now at the printer, thanks to the Herculean endeavors of Supply Chairman Mary E. Greenfield and her devoted co-worker, Angela Chapnick.

We have had an unusually active season of programs, seven