

# RETRIEVAL OF PAPER FIBERS AFFIXED TO CELLOPHANE TAPE

by Phillip B. Gottfredson

The following treatment was performed by the author on the title page of a first edition Beethoven score, *Serenata per Violino, Viola, e Violoncello, Opera VIII* (Vienna: Artaria e Comp., 1797). The title page was damaged when a piece of 3M no. 810 acetate tape from a wrapper adhered to its surface.<sup>1</sup> When the tape was removed by the owner of the score, the tape peeled away a section of the letter "n" in Beethoven's name and a background area approximately 4mm x 1mm. Figures 1 and 2.

## Retrieval of Fibers: Step One

An ethulose mixture<sup>2</sup> was applied with a "OO" sable brush to the adhesive side of the 3M no. 810 tape holding the paper fibers of the manuscript. Then with the aid of a microscope with a wide-angle lens, the tape and fibers were re-positioned onto the manuscript. Blotting paper was placed above and below the damaged area of the manuscript, weighted, and allowed to remain so until the ethulose adhesive was thoroughly dry, bonding the fibers and tape to the surface.

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<sup>1</sup>"3M" registered trademark of Minnesota Mining & Manufacturing Company

<sup>2</sup>Mixture of ethulose (ethylhydroxyethylcellulose): 1/4 teaspoon dissolved into six ounces of deionized water (the mixture should have the consistency of syrup); reagent grade denatured alcohol is then added in a 1:1 ratio to decrease the amount of water by 50% and to thin out the mixture to prevent puckering of the paper when it is applied.



Fig. 1. Beethoven score title page before treatment

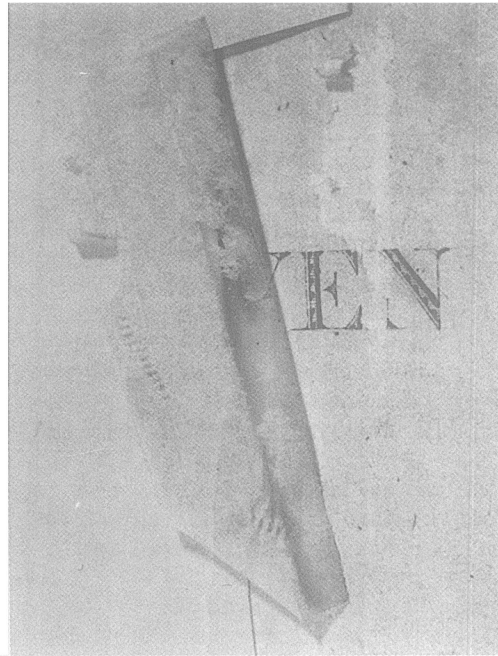


Fig. 2. Before treatment detail

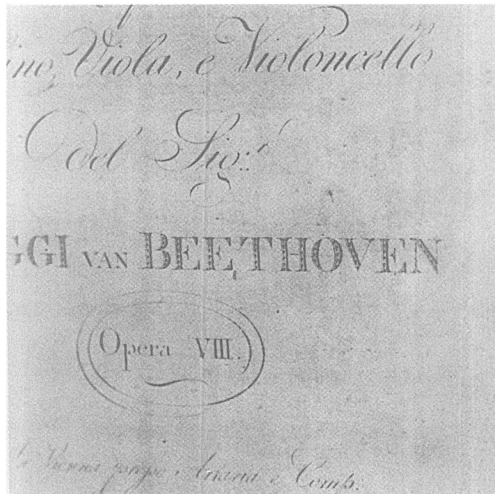


Fig. 3. Beethoven score title page after treatment

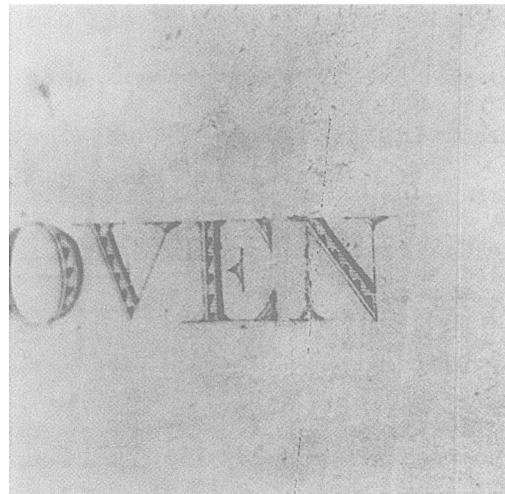


Fig. 4. After treatment detail

## Retrieval of Fibers: Step Two

It was determined that acetone dissolved the 3M no. 810 tape backing; however, the emulsion adhesive of the tape became only a "goeey" mass. In this situation the action of the emulsion was desirable, for it was necessary to have complete control over the dissolving of the emulsion to prevent it from wicking into the manuscript. 3M technicians informed us that the no. 810 tape has an acetate backing, and polymer/acrylic base for the emulsion. 3M further suggested that we could use toluene in mineral spirits to dissolve the tape, however we were satisfied with the slow reaction of the emulsion to acetone, along with the evaporation rate of the acetone, and proceeded accordingly.

Acetone was applied directly to the surface of the tape in amounts controllable to prevent wicking. When the acetone swelled the tape Cabosil (fumed silica) was sprinkled over the area to act as a poultice. This process was repeated numerous times over a four hour period until the tape was dissolved from the surface of the paper. At times it was necessary to use a small bristle brush to work the acetone into the tape emulsion.

The manuscript was placed on a vacuum table so acetone could be applied in sufficient quantities to wash out trace amounts of tape residue in the paper. The results are excellent, the letter "n" in Beethoven is intact and original, the damage is not visible to the naked eye, and no visual reintegration was necessary. Figures 3 and 4.

## Summary

An advantage of this method is that the technician has complete control over the detached fibers at all times. Furthermore, it was not necessary to submerge the entire document in a solvent bath. Whenever self-adhering tapes are removed from paper, however careful one is, some fibers can be pulled away from the surface. The fibers can be reattached by using this procedure. Ethulose 400 is not the only glue that can be used in this method, but two important considerations are: 1) that the adhesive used to bond the fibers to the paper's surface remain unaffected by the subsequent solvent treatments; 2) that the glue is compatible with the structure and chemistry of the paper. This technique was first developed when the author received a document for treatment that had been mended with cellophane tape which had dried out and curled. When the tape had curled it detached large areas of print from the document. This method has been utilized in ten instances since and has produced satisfactory results each time.

*Phillip B. Gottfredson is a conservator, frame maker, and proprietor of Gottfredson Conservation Laboratory, 7158 East Stetson Drive, Scottsdale, Arizona, 85251. He wishes to offer sincere thanks to 3M for their eager support and information, and to note that the Cabosil and Ethulose he used in his treatment were supplied by Conservation Materials Ltd.*