

## Superstorm Sandy: Response, Salvage, and Treatment of Rare Pamphlets from New York University's Ehrman Medical Library

### ABSTRACT

This paper will present a case study in the recovery of a small collection of pamphlets from the Frederick L. Ehrman Medical Library at New York University following Hurricane Sandy. The article will cover the immediate recovery operation, long-term salvage treatment, and lessons learned from the project. The Ehrman Medical Library experienced heavy flooding and sustained extensive damage during Hurricane Sandy. After the storm, Ehrman staff turned to the Barbara Goldsmith Preservation and Conservation Department of New York University Libraries to provide assistance with the recovery of approximately 200 water-damaged rare medical pamphlets. Over the following two years conservators carried out salvage treatment on the materials. While early treatments were intensive, conservators found that the salvage workflow greatly affected their regular conservation program and as a result they significantly scaled back the treatment protocol for the pamphlets. While the salvage project was completed successfully, the impact it had on conservation lab operations led conservators to reconsider how they might approach a similar situation in the future, specifically, carefully weighing the benefits and impacts of handling a salvage project in-house versus employing a vendor.

### INTRODUCTION

Hurricane Sandy made landfall near New York City on October 29, 2012. Sandy's landfall coincided with the local high tide and two other large regional weather systems, earning it the unofficial designation of "Superstorm" and causing a 14-foot storm surge that inundated lower Manhattan and the East Side with billions of gallons of water, while widespread power outages, flooding, infrastructure damage, and transportation shutdowns occurred throughout New York City and the North Atlantic region.<sup>1</sup>

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New York University (NYU) Langone Medical Center, which is situated immediately adjacent to the East River, took a direct hit from the storm surge. Hospital staff and emergency personnel evacuated patients as power grids failed and flooding at the Medical Center caused damage to clinical and research facilities, including the Frederick L. Ehrman Medical Library, which is part of NYU Health Sciences Libraries and serves the NYU Langone Medical Center and the NYU School of Medicine.<sup>2</sup> The Ehrman Library is centrally located within the Medical Center complex and occupies three levels; its Lower Level, a sub-basement, was entirely submerged by the storm surge and its next level up (which is a basement level but is referred to as the Ground Floor), was flooded with approximately one and a half feet of water. The uppermost, or Mezzanine, level did not experience any flooding. As the storm subsided and work got underway restoring power and services to the Medical Center, Ehrman Library staff reached out to the Barbara Goldsmith Preservation and Conservation Department at NYU Bobst Library for help with the recovery of their collections.

### RESPONSE

Three days after landfall, Conservation Librarian Laura McCann and Special Collections Conservator Lou Di Gennaro of the Barbara Goldsmith Book and Paper Conservation Laboratory at NYU's Elmer Holmes Bobst Library arrived at the Ehrman Library to assist with the recovery effort. At that time, there was still no power in many parts of the city, including at the Medical Center and throughout most of lower Manhattan, and much of the subway and bus system was still not functioning. In addition, there were widespread restrictions on car travel throughout much of the city, so McCann and Di Gennaro made the two-hour walk from their neighborhoods in Brooklyn to the Ehrman Library.

On arriving at Ehrman, the conservators observed the lack of power in the space but little physical damage on the Mezzanine level. Most of the library's rare bound materials were housed on this floor and were therefore not affected



Fig. 1. Staining on stairwell walls indicating the highest level reached by floodwaters.

by the floodwater. On the Ground Floor, there was staining from floodwaters on cubicle walls, and in the stairwell, more staining on walls indicated the highest level that the water had reached (fig. 1). In the stairwell leading to the Lower Level, several feet of standing floodwater, polluted with sewage and various medical contaminants, completely blocked access to a storage room where map cases and filing cabinets housed prints, photographs, paintings, records, and archival documents.

Although the floodwater had subsided from the Ground Floor, humidity levels in the building were very high. It was early November, but the weather outside was quite mild in the days after the storm so conservators opened up as many windows as possible to promote air movement and reduce the potential for mold growth. Nearby, workers from the disaster recovery firm Belfor were at work on the larger Langone Medical Center recovery; Ehrman Library did not have an existing disaster response contract in place but administrators quickly contracted Belfor to conduct the library recovery effort. To aid Belfor and the conservators in focusing their efforts, Ehrman staff hastily drew up maps to help locate items that had been identified as salvage priorities during a recent inventory of Ehrman's collections. Belfor would handle the removal and safe storage of all unaffected collections—both special and general—as well as disposal of affected general collections designated as irrecoverable by Ehrman staff. It was also agreed that Belfor would conduct the salvage of the contents of the submerged Lower Level at such time as it was deemed safe to be entered. With Belfor's role well defined, Ehrman Library staff were able to concentrate on salvaging vital computer equipment and restoring basic library functions to provide continuity of service to the Medical Center community.

The majority of affected collections at Ehrman were from the general collection; nearly all of the special and rare



Fig. 2. One of two cartons containing rare medical pamphlets that were submerged in the floodwater.

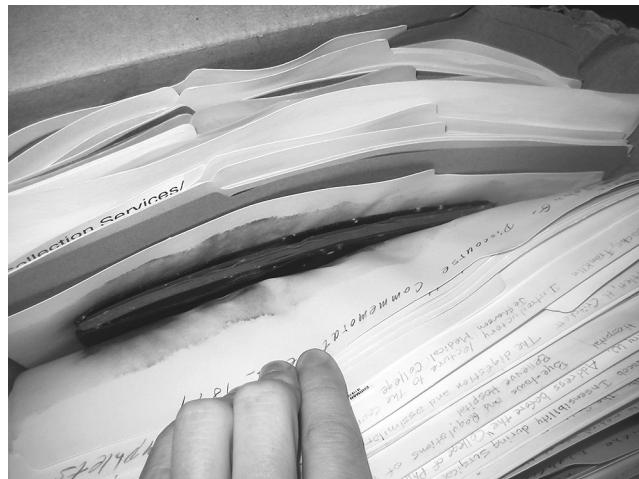


Fig. 3. Detail of water-damaged pamphlets in wet carton.



Fig. 4. Pamphlets laid out to dry in a Medical Center conference room.

materials were either unaffected and being packed up for safe storage, or they were still submerged and inaccessible in the Lower Level. However, two record cartons containing approximately 200 rare medical pamphlets were found on the Ground Floor underneath a desk in a cataloger's office where they had been temporarily stored (fig. 2). These materials belong to the Lillian and Clarence de la Chapelle Medical Archives of the NYU Health Sciences Libraries, which includes works by prominent physicians and founding members of the NYU School of Medicine. These two boxes had been completely submerged, and the conservators turned their attention to these materials (fig. 3).

Although the cartons and folders had begun to dry partially, mold growth was evident on a small number of the pamphlets. The conservators began triage recovery work in a conference room located in another part of the Medical Center complex, where large windows provided both light and ventilation. Conservators removed and discarded the wet folders the pamphlets were stored in, retaining just the top edges of folders with bibliographic information and barcodes, and placed the pamphlets on tables lined with plastic sheeting (fig. 4). They worked until nightfall, when the lack of electricity made it necessary for all personnel to leave the building.

The conservators returned the next day to continue the work, but it was clear that the pamphlets would need to be frozen to prevent mold. With the ongoing power outages city-wide there was no immediate prospect of finding a working freezer or freezer truck, and any such equipment that could be spared was being put to use supporting the damaged medical facilities. However, NYU's Bobst Library, some 30 blocks downtown from Ehrman, was one of the few buildings in lower Manhattan that hadn't lost power during the storm due to its connection to NYU's cogeneration power plant, and the preservation department in Bobst had a freezer that could accommodate the pamphlets. The conservators wrapped the pamphlets in sheets of absorbent polyester/cellulose non-woven cloth from Ehrman's disaster response kit and packed them into totes to be transported via taxi to Bobst Library. At the conservation lab in Bobst, conservators unwrapped the pamphlets and removed the saturated absorbent sheets, then divided the pamphlets into small groups separated by waxed paper, and put them into polyethylene zip-top bags which they then placed in the freezer.

#### SALVAGE TREATMENT

Over the next two years, the conservators carried out the recovery and treatment of the pamphlets by working on one or two frozen groups each week. NYU's three full-time conservators—McCann, Di Gennaro, and the author—conducted the treatments in alternating turns, with undergraduate and graduate student employees sometimes assisting with the treatments.

The conservators established a treatment protocol for thawing each batch of frozen pamphlets. First, a pamphlet would be placed whole into a plain water bath and allowed to thaw, then transferred to another tub and disbound while in the bath using either scissors to cut thread or microspatulas to release staples or other fasteners (fig. 5). Conservators used brushes to help separate pages and to dislodge dirt deposited by the floodwaters and adhesive residues from pamphlet binders or previous repairs. As individual folios or leaves were removed from the bath they were placed in a stack of absorbent non-woven sheets, and when each pamphlet was stacked it was transferred to a drying rack and allowed to air dry (some dried pamphlets required pressing but most did not). Conservators or student assistants then collated and reassembled the dry pamphlets and evaluated them for further treatment, always being careful to keep the original barcoded folder fragments with their corresponding pamphlets.

In the early days of the project, most pamphlets treated received extensive surface cleaning, mending, guarding, and rebinding into original covers or new paper covers, but progress was considerably slower than had been initially



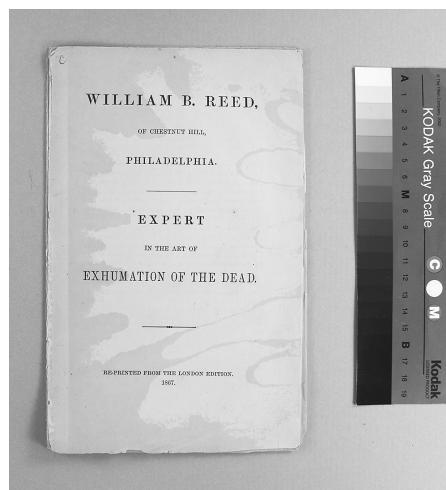
Fig. 5. The author working on thawed pamphlets in a water bath.

estimated. It became clear to the conservators that the pamphlet workflow was too unwieldy to effectively integrate into the conservation lab's everyday program. In order to advance the pace of the project, conservators greatly scaled back the level of treatment performed on individual pamphlets. Considering how dirty the floodwater was, thorough surface cleaning was deemed necessary for all of the pamphlets. However, conservators were increasingly selective about employing advanced interventions; they did only very simple resewing (where the volume could support it) and/or minimal guarding/mending (when absolutely necessary to facilitate handling). In time, the conservators simplified the treatments even further; they stopped doing nearly any guarding or resewing altogether, and most pamphlets received only minimal mending for stabilization.

At around the time that the conservators were making these changes they were informed by Sushan Chin, Archivist at Ehrman Library, of plans to digitize some or all of the pamphlets in this collection. This development provided a further justification for the reduced treatment protocol, as leaving the pamphlets disbound would facilitate the digitization process. Ehrman Library also provided some funding to cover a part-time contract assistant conservator to work on the pamphlets, and this staffing addition did relieve some of the stress that the project placed on NYU's regular conservation program. Work on the project continued at a steady pace through August 2014, when the last group of frozen pamphlets was thawed, and in December 2014, the treated pamphlets were returned to Ehrman Library. Because Ehrman is still operating out of a temporary space more than two and one-half years after Hurricane Sandy, the pamphlets are currently being stored at NYU Libraries' remote storage facility.

The majority of the pamphlets emerged from the treatment in surprisingly good condition. Most pamphlets are stable following treatment but have cosmetic damage such as extensive staining from the starched cloth spines, hinges, and covers of old pamphlet binders, or from the colored paper covers of the pamphlets themselves (fig. 6). In some cases the water exposure exacerbated existing damage from fasteners, resulting in rust staining and losses or weakening of paper (fig. 7). As expected following a flood event some items did have mold, but this number was relatively small: 10 items—approximately 5% of total volumes—received additional mold remediation after thawing, which included surface cleaning and a light spray of alcohol solution (fig. 8)<sup>3</sup>. In the offsite facility where the pamphlets are stored, carefully monitored environmental conditions should inhibit reactivation of the mold; in addition, notes on mold remediation are included in the treatment documentation so that archivists and conservators can monitor vulnerable items.<sup>4</sup>

For this project, conservators treated 223 items total, including the 205 pamphlets from the wet cartons and 18 rare books that were retrieved from the top of a desk in the same office where the pamphlets were found. (The books were not directly affected by the floodwater but were in need of surface cleaning and protective enclosures.) Most of the titles treated (164 items) are 19th century imprints; of the rest, 34 are 20th century imprints and 26 date from the 18th, 17th, or 16th centuries. Conservators spent a combined total of 534.5 treatment hours on the project (including 155 hours for the contract conservator) with an average treatment time per item of approximately two and one-quarter hours.



LEFT TO RIGHT

Fig. 6. A pamphlet with staining caused by the floodwater.

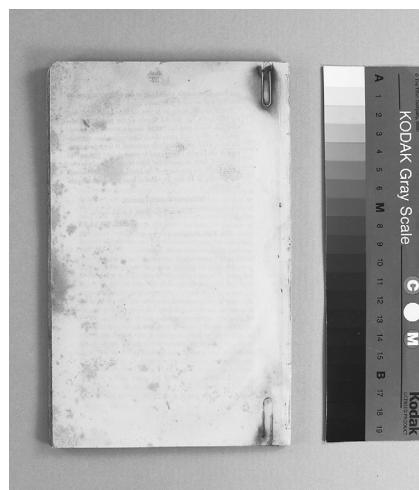


Fig. 7. Rust staining and damage from paperclips.

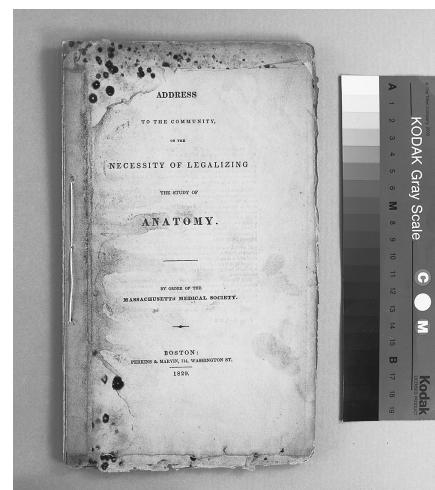


Fig. 8. An exceptional example of mold growth on a flood-damaged pamphlet.

## SUCCESSES AND LESSONS LEARNED

In looking back on how this project unfolded, the conservators can point to a number of successes along the way that can be attributed either to good planning or just fortunate circumstances. One critical factor was engaged leadership from Ehrman Library administration. The recovery effort was aided by good collection control at Ehrman, where a relatively recently updated disaster plan and an even more recent inventory with identified collection priorities were extremely helpful in the immediate salvage and recovery. Ehrman Library staff and administrators also acted quickly in securing a contract with Belfor and were very responsive to recommendations by Belfor and conservators. In addition, there was an effective division of labor for the cleanup effort. Belfor had the bulk of the collection recovery well in hand so that Ehrman Library staff were able to focus on restoring their core services, and two conservators were perfectly adequate to handle the rare materials that needed attention; any more people would have been redundant and inefficient. Concerning the removal of the pamphlets from Ehrman to Bobst, all parties—Ehrman staff, conservators, and Belfor—agreed that these materials needed immediate attention and supported their transfer to a facility that could house them; the move was the best decision under the circumstances.

Although the plans to digitize the pamphlets came after the salvage treatment project was already underway, this was a silver-lining development. Ehrman archivists seized this opportunity and in doing so, just at the time when conservators were coming to grips with managing the pamphlet workflow, allowed conservators to cut back the level of treatment and relieved some of the strain caused by this project. Individual pamphlets can always be evaluated for additional treatment in the future if archivists determine that there is a need for it. The necessary removal from the pamphlets of many non-contemporary, acidic, restrictive or otherwise harmful pamphlet binders can also be seen as a positive result of this event. Despite having been subjected to the stress of being immersed in floodwater, frozen, and immersed once again in the thawing process, many of the pamphlets are more stable and accessible now than they were before the flood.

However, the significant investment of resources that the pamphlet salvage project demanded greatly impacted conservation lab operations, ultimately affecting the core conservation program even after streamlining of the pamphlet treatment procedure. This led conservators to reconsider how they might approach a similar situation in the future. Before taking on the treatment, conservators should have more carefully weighed the impact of handling a salvage project in-house versus employing a vendor or hiring a contract conservator from the outset. Conducting trials of varying treatment levels on a sampling of pamphlets, for instance,

may have given conservators a better sense of how many treatment hours the project would require.

Once the conservators had committed to treating the pamphlets, it would also have been beneficial to explore additional funding sources to reduce the financial impact of the project. Ehrman Library had a small readily accessible fund from which they were able to cover the contract conservator's salary and the cost of some supplies, but securing additional funding would have been complicated because Ehrman's institutional systems were severely disrupted by the storm<sup>5</sup>. In addition, it might have been helpful to engage curators from the collections normally served by the conservation lab in a discussion about the potential for a reduction in conservation services resulting from the salvage project. By clearly communicating this possibility the conservators could have alleviated some of the pressure they felt to continue to deliver at normal capacity while the pamphlet project was ongoing.

With the benefit of hindsight, the conservators recognize that the highly charged emotional climate in their surroundings following Hurricane Sandy played a powerful role in affecting their decision-making and may be the most important factor that prevented their considering the salvage treatment undertaking as critically as they might have. Sandy was an extremely devastating storm and the conservators, like many others in the region who were not personally affected by the storm but were witness to the destruction it caused, had a very strong feeling of wanting to help in whatever way they could. While taking physical custody of the pamphlets was certainly the right thing to do, this should have been only a temporary solution. The conservators realize in retrospect that once the pamphlets were in their possession it was very difficult to let go of their sense of custodial responsibility toward the materials.

Although the conservators acted with the best of intentions, the obligation they felt to take care of the pamphlets prevented them from clearly seeing that sending the pamphlets to a vendor for treatment would have been the better solution for this project. Participation in disaster response and recovery efforts is an important service that the conservation lab provides to the NYU community, but the scale of the treatment portion of this project was beyond what could be comfortably accommodated in a busy, multifunctional academic library conservation lab with a small staff. A disaster recovery firm or regional conservation center, on the other hand, would be adequately equipped and have well-established procedures in place for large-scale salvage treatments.

## CONCLUSION

It has now been nearly three years since Hurricane Sandy. The Ehrman Medical Library remains closed to the public while its administrative offices operate out of a temporary space; the renovated library is expected to reopen in late 2015. For

all of the challenges that they encountered along the way, the conservators at NYU consider the outcome of the project to be a success. They continue to apply the lessons they learned in practical ways both small and significant, from investing in a larger freezer and finding new ways to incorporate the versatile polyester/cellulose non-woven material—which had been so useful during the pamphlet recovery—into more treatments, to improving the conservation lab's documentation procedures and revising NYU Libraries' disaster response and recovery plan.

#### ACKNOWLEDGEMENTS

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#### NOTES

1. "Effects of Hurricane Sandy In New York," Wikipedia, accessed May 11, 2015, [https://en.wikipedia.org/wiki/Effects\\_of\\_Hurricane\\_Sandy\\_in\\_New\\_York](https://en.wikipedia.org/wiki/Effects_of_Hurricane_Sandy_in_New_York).
2. J. David Goodman and Colin Moynihan, "Patients Evacuated From City Medical Center After Power Failure," New York Times, October 30, 2012, [http://www.nytimes.com/2012/10/30/nyregion/patients-evacuated-from-nyu-langone-after-power-failure.html?\\_r=0](http://www.nytimes.com/2012/10/30/nyregion/patients-evacuated-from-nyu-langone-after-power-failure.html?_r=0).
3. Conservators always wore nitrile gloves during thawing procedures and used a dedicated fume hood for mold remediation that is located in a dirty room separate from the lab. Any additional mold cleaning was done in that room with appropriate PPE (fitted half-face respirators, gloves) and a HEPA-filter vacuum. Pamphlets with mold were treated with a 70% alcohol solution modeled after Conservator of Textiles and Historic Objects Elise Yvonne Rousseau's presentation at the 42nd annual meeting of AIC in 2014, "New Approaches in Comprehensive Mold Remediation & Recovery." The solution is comprised of 12 parts isopropanol, 8 parts Ethanol, 2 parts Hydrogen peroxide, and 5 parts distilled deionized water. In a fume hood, objects were sprayed with the solution, allowed to air dry, cleaned with low-suction HEPA vacuum, brushed with the alcohol solution, blotted, and cleaned again with HEPA vacuum.
4. Conditions at NYU's remote storage facility are kept at 50°F and 35%RH [+ -5%].
5. Sushan Chin, email message to author, February 26, 2015.

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