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The Conservation of the Jefferson Bible at the National Museum of American History

INTRODUCTION

As a student at Johns Hopkins University in 1886, Cyrus Adler discovered two cut-up copies of the New Testament in a private library in Baltimore. A catalog note glued inside the front cover of each stated that Thomas Jefferson had used these two volumes to create an original book. Nine years later, in 1895, while serving as the Smithsonian's librarian and curator of world religions, Adler located that original book with Jefferson's great-granddaughter, Carolina Randolph, and purchased it from her for $400. That year, Adler included "The Life and Morals of Jesus of Nazareth" in an exhibition the Smithsonian mounted at the 1895 Cotton States International Exhibition in Atlanta, where it was displayed under the title "Jefferson's Bible." It has been referred to as "The Jefferson Bible" ever since.

"The Life and Morals of Jesus of Nazareth" (fig. 1) is a book created by Thomas Jefferson between 1819 and 1820. For political and personal reasons, he kept it private throughout his life. It is an 86-page assemblage of cut-out New Testament passages removed from the Gospels and glued to paper. Verses are arranged in four columns across each page spread, each column showing the same verses in a different language: English and French on the right page, and Latin and Greek on the facing page. It is a chronologically arranged story of Jesus' life and teachings viewed through the eyes of the Enlightenment, without miracles, without angels and saints, and without a resurrection.

As imagined by one of the greatest thinkers of the Revolutionary Era, Jefferson's book answers the question, where there is no king sanctioned by God, what is the moral basis of the new republic? It is a statement on the separation of church from state and power from religion. It remains the single most important artifact that defines Jefferson's unique Christian faith, which he described by saying "I am of a sect by myself, as far as I know" (Jefferson 1904, 203).[1]

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Fig. 1. "The Life and Morals of Jesus of Nazareth," known familiarly as "The Jefferson Bible," before treatment

In 1902, Congressman John F. Lacy introduced a resolution in Congress to produce a facsimile of the Jefferson Bible, which the Government Printing Office printed in 1904. The 9000 copies were distributed to both the House and Senate. The House supply ran out quickly, but a facsimile was given to each newly elected senator on the day he swore the oath of office until the 1950s.

Jefferson's handwork within "The Life and Morals of Jesus of Nazareth" is comprised of 43 folios, each a single sheet of paper folded in half to produce two leaves or four pages. These 43 folios were sent to Frederick Mayo, his last bookbinder, to be bound sometime between 1819 and 1820.

Hannah French provides insight into Frederick Mayo in her 1986 book, *Bookbinding in Early America: Seven Essays on Masters and Methods.* Frederick August Mayo was born Friedrich Gotthill Meyo in Nossen, Saxony, the Dresden region southeast of Leipzig. He worked as a binder in different parts of Europe and England before a four-year impressment into the navy, where he was injured and landed by chance in the United States in 1809. He set up a stationer's shop in Staunton, Virginia, moving later to Richmond, where he

became Jefferson's bookbinder in 1818. Jefferson wrote that he liked books that were "solid, as heavy as blocks of metal" (French 1986, 153)[2] and informed Mayo that he preferred London and Paris bindings to American ones, which he called "so spongy, that after a book has been once opened, it will never shut close again" (French 1986, 209).[3]

Mayo glued 62 stubs onto Jefferson's 43 folios to compensate the spine folds for the thickness of the verses that had been glued to the front and back of each page. He then added six endleaves and sewed the book three-up on four recessed cords. He sewed on silk endbands over cord cores with a double thickness of thread so that each single pass of the needle produced a double wrap. He lined the spine in heavy paper and covered in full morocco with gold-tooled designs, producing a tight-back, tightly bound, French-style book that was in keeping with Jefferson's preferences.

PRESERVATION DECISION-MAKING

The National Museum of American History and the Smithsonian strongly support the exhibition, publication, and sharing of collections via the Web. In addition to providing physical and chemical stabilization of the artifact, the conservation of the Jefferson Bible offered opportunities to fulfill these missions: Smithsonian Books published a full-color facsimile, the Smithsonian Channel created an hour-long documentary, the Smithsonian Institution hosted a dedicated website featuring high-definition digital images, and the museum opened an exhibition of the book, which later went on a national tour. When the possibility of treatment was being discussed, however, these opportunities were carefully separated from the side-by-side comparison of benefits and risks associated with the treatment of the artifact. Treatment decisions were made based upon the artifact's needs alone.

With age, Jefferson's heavily glued paper had lost its flexibility. The binding's rigid spine linings and glued-on stubs dramatically limited the extent to which the book could be safely opened. The stiff pages hinged along the stub line and cracked (fig. 2). The museum considered exhibiting the book in 2005, but after examination determined that doing so would risk further damage. Discussions to address the conservation needs began at that time in order to make the artifact accessible again. Eventually, through both institutional and private funding, a conservation plan was implemented that included an extensive survey, risk assessment, chemical analysis, treatment, and protective enclosure. A conservation team was assembled in September 2010.

The curators recognized that Jefferson's book was actually two masterpieces—Mayo's binding and Jefferson's Bible—but of the two, Jefferson's work was more important to the museum. Since the binding was clearly damaging the Jefferson document within, Mayo's work would have to be altered in order to stabilize Jefferson's work. Because Mayo's binding would cease to be an object of study once treatment began, a massive amount of pre-treatment documentation was carried out. Conservators examined other Mayo bindings at the University of Virginia Rare Book Library, and found numerous other Mayo bindings that were constructed in the same manner: sewn three-up on four recessed cords, using double-thread endbands with the same number of tie-downs. Since these other Mayo bindings could substitute as the objects of study for future scholars of colonial bookbinding, modification of the Jefferson Bible could be considered.

Fig. 2. Restricted opening of the Jefferson Bible. Note in particular the way the leaves hinge near the stubs, causing cracks and tears.

The team's first task was to create a sewing map of the book to see whether Jefferson had used a blank book and had cut out pages to create stubs. If so, modifying the book stubs would not be considered. Conservators confirmed that the Jefferson Bible was not based on a blank book. The next tasks were to complete a survey of the artifact in order to quantify its damage, to undertake materials analysis to determine its compositional elements, and to establish a base line for monitoring its aging characteristics. Jefferson's book is a complex artifact. It contains 12 different types of paper, six different printing inks, four different iron-gall inks, and two different adhesives.

The team assembled research, produced a glossary of terminology, created material standards against which the Jefferson Bible could be measured over time, and designed a custom survey database that included 200 data points for each page. To minimize damage, the survey was performed with the book open to only 30 degrees. The conservators worked in teams of two. Pages were examined in ambient, raking, transmitted, and ultraviolet illumination. A 50x microscope was used to observe iron-gall ink characteristics.

The survey results indicated that 98% of the pages had torn, with 67% torn at the head or tail of the stub line, and 56% showing cracks along the stub. An additional 69% had losses. A significant number of the 1000-plus attachments were partially delaminated. There was a clear need for physical stabilization. The iron-gall ink was in fairly good condition. Only 8% of the ink suffered from cracks, less than 7% had losses, and there were no instances of complete burn-through. There was not a clear need for chemical stabilization of the iron-gall ink. Locations for material analysis of paper fibers, adhesives, and inks were chosen with the curator from areas that did not contain "Jeffersonian" features. For example, an unintentional ink splatter was a viable sampling location whereas a period was not.

The curator did not want surface pH readings to be taken because of the risk of water staining; cold-water-extraction and degree-of-polymerization tests were also impossible due to the required sample size. The Smithsonian's Museum Conservation Institute performed micro-XRF, revealing the presence of iron, aluminum, potassium, sulfur, and copper in all papers. Near-infrared spectroscopy of 118 locations determined that the average surface gelatin content was 3.2%. FTIR indicated that the adhesive was a combination of protein and starch. Materials testing results concluded that no solvent-modified aqueous bath could benefit all the component materials. The risks of chemical treatment outweighed the benefits, so physical stabilization and long-term storage in an anoxic environment were the treatment options chosen.

After six months of study, preparation of rebinding and page-repair models, and discussions about options, risks, and historical implications, curators and conservators together established a conservation treatment plan. Authorization to proceed was received: separate the Jefferson pages from the Mayo binding, keeping the leather binding and silk endbands intact; remove the damaging stubs and preserve them separately; mend the Jefferson pages; take high-resolution digital images of the disbound pages; create new, more flexible stubs; resew the book through the original sewing holes; re-attach the silk endbands; and recase the text back into its original cover.

TREATMENT

Even though the curator and museum wanted to change everything about how Jefferson's volume functioned, they wanted to change nothing about how it looked.

Step one was removing Jefferson's four-page, handwritten index, which was sloppily glued to the Stormont-pattern marbled flyleaf. It had previously been partially pulled off and reglued, revealing numerous delaminated areas on the surface of the marbled paper. The index had also been previously repaired in situ. With the front cover supported in an open position, a microspatula and scalpel were slowly rocked against the animal glue until it released.

The text block was tightly wrapped in polyester film and plastic wrap. The book was placed in a humidity chamber for 15 minutes to minimize leather desiccation and then faced overall with Klucel G-coated kizukishi paper, which was solvent-set with acetone applied with a goat-hair brush. A single cut was made to the marbled board paper near the hinge of each board. Ethanol and methyl cellulose were applied, and the paper was slowly lifted towards the hinge to reveal the four cords, which were cut even with the board edges with a scalpel.

Using a small, rounded-edge Jeff Peachey lifting knife, the cover was separated from the text block along the spine lining. The bulk of the heavyweight lining paper was left adhered to the inside of the spine leather to support it and prevent flexing and breakage (fig. 3). Over a 5-hour period, work proceeded simultaneously on the front and back covers, proceeding towards the middle, until the leather cover was removed intact in one piece. The leather cover was immediately wrapped around a custom surrogate text-block support and placed in a storage box.

Methyl cellulose was applied to the spine of the text block to help soften and remove the remaining adhesive. Dental tools were used to gently scrape off the remnants of Mayo's lining paper. With the spine cleaned, the silk endbands were

Fig. 3. Removing the leather binding intact

separated from the text block. Each tie-down was cut near the kettle stitch, and a new linen thread was tied to the end of the silk using a weaver's knot. When each tie-down was secured, the endbands were gently lifted off the text block and placed in protective enclosures so they could be reused later (fig. 4).

The folios were opened to the center, the sewing thread was cut, and the text block was separated into the original 43 folios. Because all the folios showed significant planar distortion, the protective enclosures designed for them were sink mats, so there would be no danger of crushing them when the enclosures were stacked for storage in the vault every night. Each folio was opened and photographed before treatment in raking and ambient illumination (fig. 5).

Fig. 4. Original endbands removed, with new linen sewing thread attached to each side of the tie-down

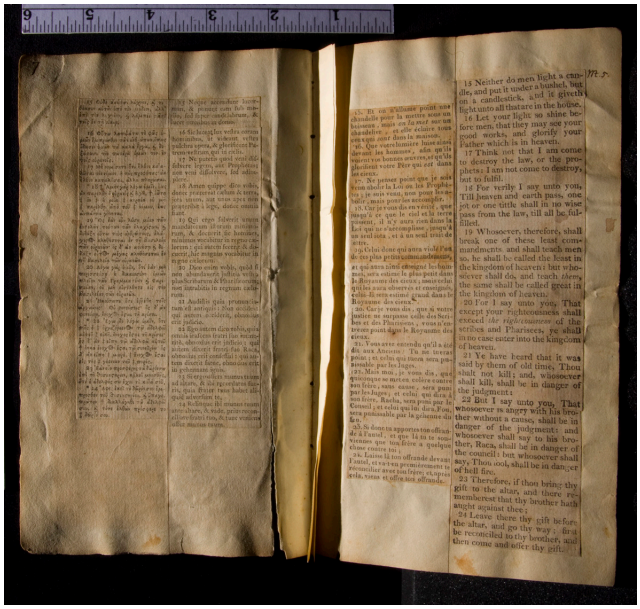

Fig. 5. Page spread of 7 verso and 8 recto in raking light during treatment. Note the adhered stub, the resulting damage, and Jefferson's dog-eared page corners.

Ethanol and methyl cellulose were applied to the glued-on stubs around each folio to soften the adhesive, and the stubs were lifted off with Teflon spatulas. The watermark "P A Mesier," which appeared on numerous stubs, was found to have been produced by a mould purchased in March 1817 for the Lydig paper mill in the Bronx, New York (Gravell and Miller 1979, plate 487, 110). After the stubs were removed, each folio was photographed again in ambient, raking, and ultraviolet light.

Copies of the photos were printed on acid-free paper. Conservators and curators examined each Jefferson page together and discussed where mends needed to be made, how the mends would be applied, and where evidence of Jefferson's hand would preclude treatment. For example, raking light photographs revealed that 60% of the pages had been dog-eared, supporting the curator's historical research indicating that Jefferson read this book nightly. The year he made the book, Jefferson wrote, "I never go to bed without an hour, or half hour's previous reading of something moral, whereon to ruminate in the intervals of sleep" (1904, 187).[4] The curators and conservators made treatment decision notes on acid-free printouts of the page photographs, and signed them as treatment authorization documents (fig. 6).

Mending kits were assembled from a variety of Japanese papers that were toned with acrylics using an airbrush. Mends were designed to stabilize pages, not to improve upon Jefferson's handwork or the appearance of this early 19th century object. Berlin tissue coated with Klucel G was solvent-set with acetone on tears near iron-gall ink. Wheat-starch paste was used for the remaining mends. Mends that extended over the edges were trimmed under the microscope, carefully following the original contour of the artifact.

Fig. 6. Senior paper conservator Janice Stagnitto Ellis consults with curator Harry Rubenstein.

Fig. 7. Resewing the text block using a sewing tray made to the exact height of the desired thickness of the text block to align and protect page edges

Digital photography using a 50-megapixel Hasselblad camera proceeded in batches as folio mending was completed. These images were carefully examined for quality control.

New stubs were made from kizukishi that was toned to match the Jefferson paper. Two new stubs were made for each folio, one for inside and one for outside the fold, thereby protecting the Jefferson folios from both the sewing thread and the spine adhesive.

A sewing tray was made to the exact height of the original text block (fig. 7). The tray provided a constant visual and tactile reminder of how much to compact the text block as the sewing progressed. The tray also provided protection for the page edges and kept them aligned as the book was sewn. The folios were sewn all-along, unsupported, with 35/3 unbleached linen thread. The sewn text block was lined with two layers of Japanese tissue and wheat-starch paste before the original silk endbands were re-sewn back into place in their original locations. The spine was lined with additional layers of Japanese paper until the book could be opened without the spine throwing upwards.

After lining, the sewn book was opened and paged through several times to observe how the pages moved and determine where additional page repairs or support were needed. The marbled pastedowns were lifted from the front and back cover boards using ethanol, methyl cellulose, and a Teflon lifter. The leather spine was supported from the inside with layers of Japanese paper, with the uppermost layer toned blue to assist future conservators. To recreate the tight-back structure, the text block was adhered to the covers using wheat-starch paste on the spine, the exposed boards, and the lining tabs, which were adhered beneath the marbled papers. About 1/8 in. of each tab was visible inside the hinges. The exposed tabs were inpainted with dots of Golden Fluid Acrylic Paints to match the Stormont marbled paper. After the treatment was complete, the Jefferson Bible maintained its original aesthetic (figs. 8–10).

Fig. 8. "The Life and Morals of Jesus of Nazareth" after treatment

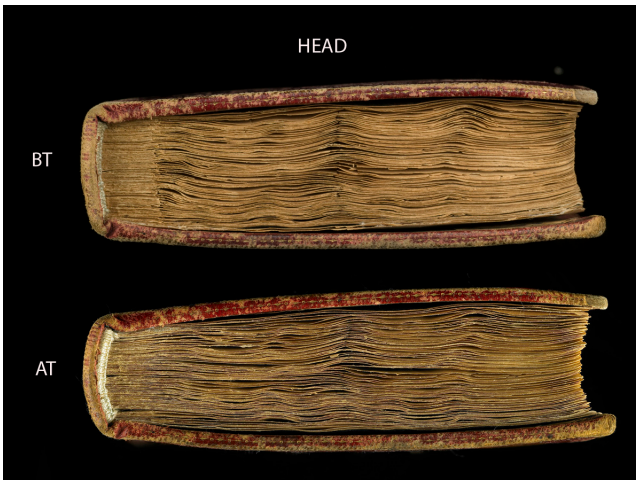

Fig. 9. The head edge of "The Life and Morals of Jesus of Nazareth" before (top) and after (bottom) treatment.

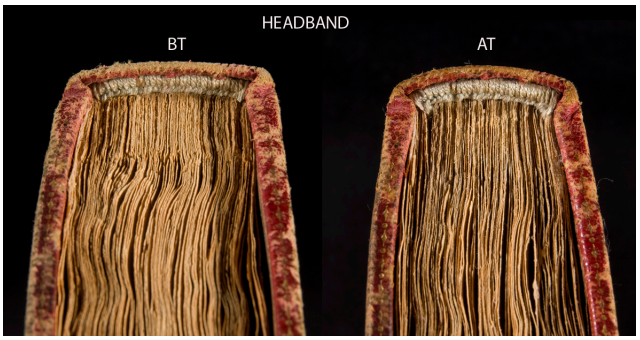

Fig. 10. Close-up of the headband of "The Life and Morals of Jesus of Nazareth" before (left) and after (right) treatment.

SOURCE BOOKS

One hundred years after Jefferson cut them apart and 25 years after Adler found them in a private collection in Baltimore, the Cohen family donated the two English New Testament source books to the Smithsonian. These books, referred to as Source Book 1 and Source Book 2, were also part of the Jefferson Bible conservation project.

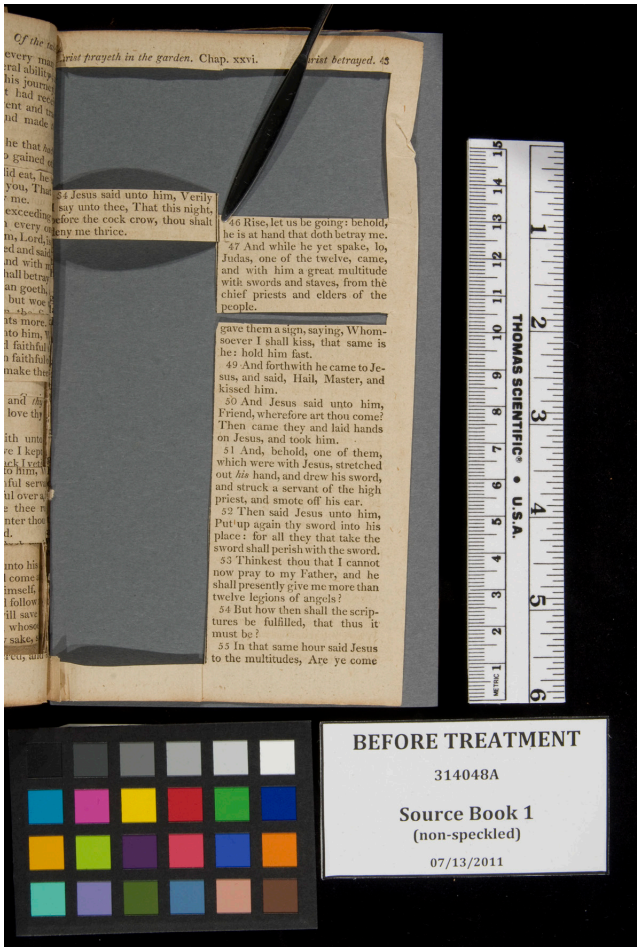

Fig. 11. Source Book 1 before treatment, with passages extracted by Jefferson

Both volumes were split through the text block, spine linings, and leather. Source Book 1 was broken twice. Source Book 2 was broken in three places. The curator suspected that these splits might have been created by Jefferson himself to aid in extracting clippings. If this was the case, or even a possibility, he did not want the breaks in the binding repaired.

Although both volumes exhibit numerous cutouts, Source Book 1 served as Jefferson's primary resource, with at least 171 individual passages extracted from the first 160 pages of the volume, which comprised the four Gospels. In Source Book 2, Jefferson removed at least 69 individual passages from the four Gospels. These passages ranged from single lines to an entire page (fig. 11). Jefferson left behind empty page borders, partial page borders, and other cut-out but unused passages, which were neatly tucked inside the extremely vulnerable books.

After several meetings with the curator, lots of brainstorming, and informal discussions with colleagues, a minimally interventional approach was deemed most suitable to stabilize the source books, and plans were made to produce digital surrogates for future scholars. As with the Jefferson Bible, the conservators and curator examined each page together and decided what to mend, what to stabilize, and what to leave alone.

In general, conservators repaired breaks in the paper that appeared to be torn from age and/or use. Areas that appeared to have been cut or sliced with a tool were not mended since these were most likely evidence of Jefferson's hand. Cuts that were vulnerable to further tearing were supported at the base while leaving the cut edges unrepaired. Of the loose fragments tucked inside the book, only those that appeared to be torn off were reattached. The remaining fragments were encapsulated in polyester film with labels for each fragment indicating its chapter and verse, its original page location in the text, and where it was found in the book. The encapsulated fragments were post-bound and were stored together with the source books. Treatment notes, including the exact locations of all mends, were written directly on the curatorial approval sheets and added to the permanent documentation. In accordance with the curator's wishes, no treatment was executed on the binding of either source book.

Even after repair, the two source books remain vulnerable to damage from handling. To preserve them, digital surrogates will be served to researchers in lieu of the original objects. Each page of the two books, from the front pastedown through the end of the Gospels, was photographed with a piece of photo-gray paper behind it. This blocked the view of the subsequent pages that showed through the cutouts, and makes the surrogates easier to read and use than the originals.

OUTREACH

The museum never missed an opportunity to showcase the project. In the eight months between the initial March 10, 2011, press release announcing the Jefferson Bible Conservation Project and the exhibit opening on November 11, 2011, the Paper Conservation Laboratory provided 47 tours during the treatment phase of the project, most lasting 45 minutes to an hour. Staff could set up the "tour table"—complete with photographs, conservation documentation, sewing models, source books, and selected Jefferson folios—in 10 minutes flat. The laboratory hosted tours for the entire museum staff, professional colleagues, donors, the museum's Board of Directors, the Secretary of the Smithsonian and his staff, the Smithsonian's Board of Regents, and members of Congress, including the Chair of the Appropriations Committee.

The project took on reality-TV status when Smithsonian Networks filmed every crucial step of the conservation treatment for a one-hour documentary called "Jefferson's Secret Bible." Whether conservators were discussing options with curators, tying threads to delicate original silk endbands, or resewing the volume, the cameras were there as witnesses (fig. 12). This process was at times inconvenient, occasionally

Fig. 12. A cameraman films as Janice Stagnitto Ellis resews the Jefferson Bible.

intrusive, definitely time consuming, and sometimes flat-out embarrassing. However, the end result is an amazing show that reaches an entirely new audience and sheds light not only on Jefferson and his little volume but on the field of conservation and the importance of preserving our cultural heritage.

The conservation treatment also provided the opportunity for Smithsonian Books to publish the first color facsimile of the object using the digital images taken during treatment. The *Jefferson Bible, Smithsonian Edition* contains a chapter discussing the conservation decision-making and treatment. The book release date coincided with the exhibition opening, and within five months the book was in its fourth printing, winning "Best in Show" in the 2012 Washington Book Publishers Book Design and Effectiveness Competition.

The Smithsonian also used the digital images to create an interactive website where visitors can view each page of the Bible and zoom in on interesting details. Between November 2011 and April 2012, the website—which contains a page showing the step-by-step conservation treatment—had more than 65,000 visitors from around the world.

The Jefferson Bible, the two source books, and a copy of the 1904 Government Printing Office facsimile were on display at the National Museum of American History for eight months (fig. 13). The exhibition gallery included three touch-screen video monitors that offered visitors the chance to view two short films provided courtesy of Smithsonian Networks, one discussing the history of the Jefferson Bible and the other featuring its conservation treatment. The third touch-screen monitor allowed visitors to interact with the high-definition digital images of the pages by zooming in on details or paging through the book. Conservation was also highlighted in one of the exhibit panels.

By April 2012, the Jefferson Bible had generated 64 online articles, including international news stories, eight printed

Fig. 13. "The Life and Morals of Jesus of Nazareth" on display at the National Museum of American History; Courtesy of Hugh Talman

articles, four magazine articles, five blog articles written by the conservation team for the museum's blog, two TV news clips, one radio segment, one podcast, and one full-length documentary.

What began as a private devotional act for Thomas Jefferson has taken on different meanings as a modern nation considers afresh how religion and politics mix. This timeless message is brought to a ready audience. Through "The Life and Morals of Jesus of Nazareth," the public learns the moral philosophy of Thomas Jefferson, the principles founding our country, and the importance of preserving our cultural heritage.

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NOTES

1. Jefferson to Ezra Stiles Ely, 25 June 1819.
2. Jefferson to William F. Gray, 8 November 1818, Jefferson Papers, Library of Congress. Quoted in French (1986).
3. Jefferson to Frederick Mayo, 30 November 1818, Jefferson Papers, Library of Congress. Quoted in French (1986).
4. Jefferson to Dr. Vine Utley, Monticello, 21 March 1819.

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