



T H E S T A R ★ S P A N G L E D B A N N E R

State-of-the-Flag Report ★ 2 0 0 1



THE
STAR-SPANGLED BANNER
PRESERVATION PROJECT
AT THE
NATIONAL MUSEUM OF AMERICAN HISTORY,
BEHRING CENTER

is made possible by major support from
POLO RALPH LAUREN

Generous support is provided by
THE PEW CHARITABLE TRUSTS
UNITED STATES CONGRESS
THE JOHN S. AND JAMES L. KNIGHT FOUNDATION

Special thanks to
FORMER FIRST LADY HILLARY RODHAM CLINTON
AND THE WHITE HOUSE MILLENNIUM COUNCIL

and
SAVE AMERICA'S TREASURES AT
THE NATIONAL TRUST FOR HISTORIC PRESERVATION

for their leadership

Front cover: Detail of the Star-Spangled Banner
without Fowler stitches, revealing its true,
vibrant colors. Photo by Ira Block and
Jeff Tinsley. © National Geographic and
Smithsonian Institution.

A Message from
THE SECRETARY



FOR MORE THAN
155 YEARS, the
Smithsonian Institution

has been the guardian of America's cultural heritage. The Smithsonian preserves the objects that represent our collective history and offers all Americans numerous venues across the country where they can explore the seminal experiences that continue to shape our nation.

Perhaps no other object tells as compelling a story about the beginnings of our country as the Star-Spangled Banner. This famous flag flew over Fort McHenry in Baltimore during the British bombardment of 1814 and inspired Francis Scott Key to pen his patriotic poem that became the national anthem in 1931.

When Eben Appleton, grandson of the commander of Fort McHenry and caretaker of the flag, was looking for an appropriate place to preserve the Star-Spangled Banner for all time, he turned to the Smithsonian. He wanted it to stay on public view at the Smithsonian forever. True to our promise, we have kept the Star-Spangled Banner on almost continuous view since then.

As you know, the timeworn, almost 188-year-old textile is now undergoing a groundbreaking conservation treatment at the National Museum of American History, Behring Center—in full view of the public. Preserving such a large and aged object as the Star-Spangled Banner is quite a challenge. We are using many tools, from needle and thread to NASA near-infrared spectral

imaging. We have removed the banner's linen backing, originally attached in 1914 during the first Smithsonian preservation effort, and all its nearly two million stitches. Absent its backing, the flag's fragile state is readily apparent; a gust of wind could virtually sweep it away. We will never let that happen. We also discovered previously unseen patches on the original flag and more vibrant colors in the fabric. We're sharing all these discoveries with the public, so a visitor can return several times and each time see a different view of the flag.

This report details our progress in the preservation effort. We explain what we have discovered about the Star-Spangled Banner, and how that knowledge informs our decisions on how to best care for it. The conservation team now estimates that, because of the strides they're making in techniques and research, the life span of this national treasure might be expanded as much as 500 years.

We are on schedule and very optimistic about the future of the Star-Spangled Banner. We're keeping our promise to Eben Appleton and the nation. We hope you find the project as enthralling as we do, and if you haven't already visited, we invite you to come to the Museum to see for yourself.

Thank you very much for your continued support.

A handwritten signature in blue ink, which appears to read "Lawrence M. Small". The signature is fluid and cursive, written in a professional style.

Lawrence M. Small, Secretary

A Message from
THE DIRECTOR



THE NATIONAL
MUSEUM OF
AMERICAN
HISTORY, BEHRING
CENTER is entrusted by
the Smithsonian Institution

and the American people with the stewardship of one of this country's most beloved national treasures, the Star-Spangled Banner. In 1996, the Museum embarked upon the Star-Spangled Banner Preservation Project, a major conservation effort to preserve for the next millennium one of the most potent symbols of our national identity.

Why is it important to preserve the flag? Objects such as the Star-Spangled Banner tell stories about our nation—what more magnificent story can be told than that of our flag emerging out of the smoke and darkness of Fort McHenry on that cold dawn in September of 1814?

This is the first time that a museum has undertaken a project to preserve such a large, fragile, and significant object. We didn't want to do it behind closed doors, out of sight of the public. That is why the Star-Spangled Banner can be viewed today in the Museum's state-of-the-art conservation laboratory, the focal point of an exhibition that has been seen by more than four million people since May of 1999.

Once the flag's conservation is complete, I am proud to announce that it will become part of a new

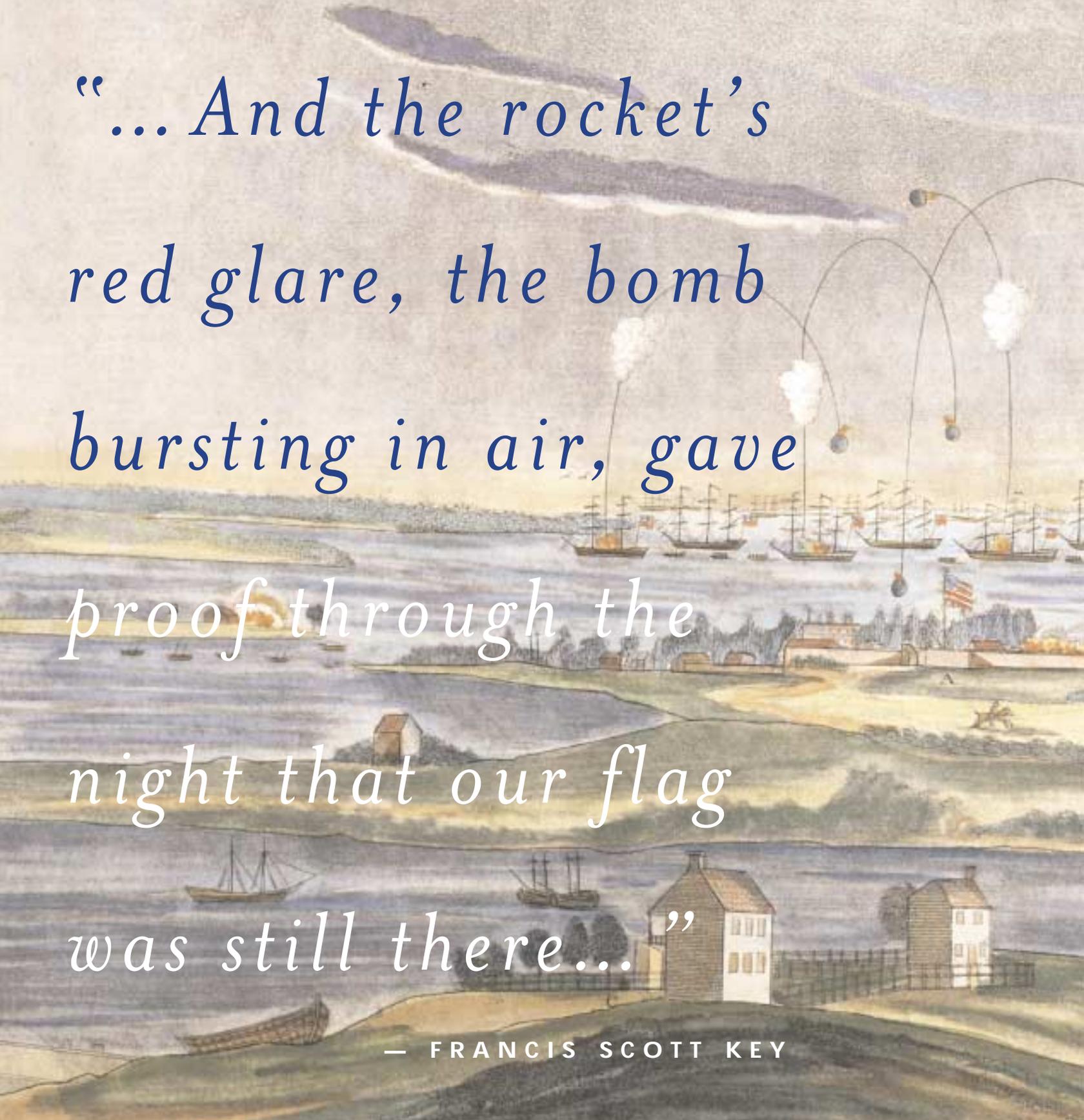
permanent exhibition, *For Which It Stands*. The Star-Spangled Banner Preservation Project fulfills one of the paramount goals of the Smithsonian: to preserve the objects that are crucial to our understanding of history and our place in it.

On behalf of the Museum, I wish to express our gratitude to those who made this preservation work possible. I would like to thank The Pew Charitable Trusts for its catalytic role in committing the initial support for the project. This significant leadership stimulated funding from the United States Congress. The Trusts' partnership with First Lady Hillary Rodham Clinton and the White House Millennium Council led to the project's major support from Polo Ralph Lauren. Mr. Lauren's generosity extended beyond the Museum as it included funding for a national advertising campaign in association with Save America's Treasures at the National Trust for Historic Preservation. It is public-private partnerships such as this one that allow us to fulfill the Museum's mission and the American people's expectations.

To quote Francis Scott Key, "The Star-Spangled Banner, long may it wave." May it inspire our children and our children's children, as it has inspired us and so many who have gone before, in the new millennium and beyond.

A handwritten signature in blue ink that reads "Spencer R. Crew". The signature is written in a cursive, flowing style.

Spencer R. Crew, Director



*“... And the rocket’s
red glare, the bomb
bursting in air, gave
proof through the
night that our flag
was still there...”*

— FRANCIS SCOTT KEY

THE STATE OF THE FLAG

INTRODUCTION



First known photo of the Star-Spangled Banner, Boston Navy Yard, 1873. American Antiquarian Society, Worcester, Mass.

DID YOU KNOW...?

Throughout history, flags have generally been regarded as utilitarian objects—only occasionally repaired and usually discarded when they are too worn to use.

*“This is about the preservation of our history—
one of the most important pieces of our history.”*

—Visitor to the National Museum of American History,
Behring Center, 1999

FROM ITS HUMBLE BEGINNING IN 1813 as an ordinary garrison flag to its transformation into a national symbol of our American identity, the Star-Spangled Banner has served to remind all people of this country’s fascinating past and our enduring ideals of citizenship, patriotism, and national identity.

The Museum’s Star-Spangled Banner Preservation Project is unprecedented in the history of the Smithsonian Institution.

It has combined the expertise of some of the world’s foremost textile conservators with the best scientific conservation research and technology in a monumental effort not only to rescue an aging artifact, but also to preserve it for the millions of Americans, now and in the future, to whom it rightfully belongs.

Mary Pickersgill. Pickersgill Retirement Community, Towson, Md.

CONDITION OF THE FLAG

"This Flag is part of our history...it is incredible that it has been preserved this long considering what it's been through."

—Visitor to the National Museum of American History,
Behring Center, 1999

NATURAL AGING AND DAMAGE

from exposure and handling of the Star-Spangled Banner, already well under way when it arrived at the Smithsonian Institution in 1907, has literally

threatened the existence of the nearly 200-year-old artifact. By the end of the 20th century, it had become clear that the Museum needed to take immediate action to halt the deterioration.

In 1996, the Museum convened a technical advisory symposium, inviting 50 of the world's foremost conservators, historians, curators, engineers, and organic scientists to evaluate the flag's condition and recommend a course of action for its conservation and future preservation.

Some of these experts have continued to advise the



★ **THE FLAG TODAY** measures 30-by-34 feet. With its linen backing, it weighed about 150 pounds; without its backing, the flag weighs about 50 pounds. Although people are continually amazed by the flag's monumental size, its original size of 30 by 42 feet was typical of 19th-century garrison flags. Flown from 90-foot-tall poles, these giant flags were meant to be seen from great distances.

★ **PIECES OF THE FLAG** were removed from the fly edge and the interior—and reportedly given to important personages, a common practice at the time, known as “souveniring”—before it came to the Smithsonian in 1907.

★ **MARY PICKERSGILL** started sewing the Star-Spangled Banner in her home in Baltimore. When it outgrew the confines of her home, she borrowed the nearby malt house of a local brewery in which to complete the flag.

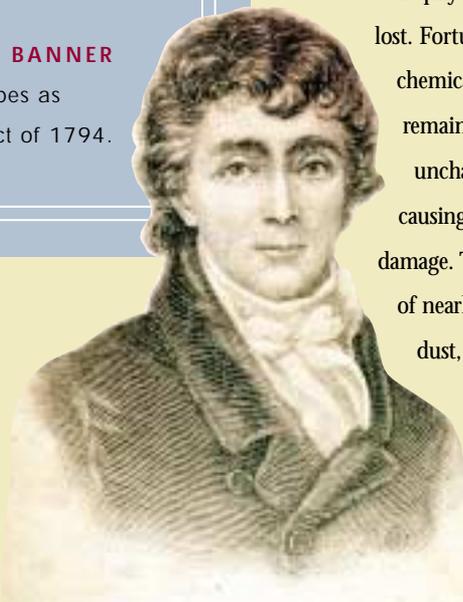


★ **WEATHER IS AN ENEMY** of all flags.

When the Star-Spangled Banner flew at Fort McHenry, it suffered from exposure to the elements. A preservation treatment by Amelia Fowler in 1914 dramatically altered the worn and stretched flag to give it a rectangular flat look — which made for a more pleasing appearance in her day. The flag's halyard (rope) also was removed from its hoist. The old halyard will be displayed in the new Star-Spangled Banner exhibition.

★ **THE STAR-SPANGLED BANNER**

has 15 stars and 15 stripes as mandated by the Flag Act of 1794.



Museum. In December 1998, the flag was carefully removed from the wall where it had hung for 35 years and transported to a specially designed state-of-the-art conservation laboratory at the Museum. It lies there today, visible to the public, the focal point for an exhibition about its illustrious history and the conservation process.

The flag's condition has been exhaustively documented at each stage of the preservation project. Research indicated that over its lifetime 80 percent of the wool's physical strength has been lost. Fortunately the wool's chemical structure has remained mostly unchanged, with light causing the most severe damage. The cumulative effects of nearly 200 years of light, dust, and a host of environmental

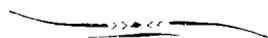
factors and physical stresses have all taken an inevitable toll on the fragile textile. As illustrated in the first known photographs of the Star-Spangled Banner, taken in 1873, damage to the flag was clearly visible decades before it came into the care of the Smithsonian.

As caretaker of this precious artifact, the Smithsonian kept a watchful eye on the Star-Spangled Banner and cleaned and treated it several times. The most extensive treatment occurred in 1914 when renowned flag restorer Amelia Fowler attached a protective linen backing to the flag.

Over time, Fowler's backing became weak and soiled and actually obscured the flag's true condition. Overall physical deterioration of the flag is extensive. Large new holes, clearly visible in the delicate

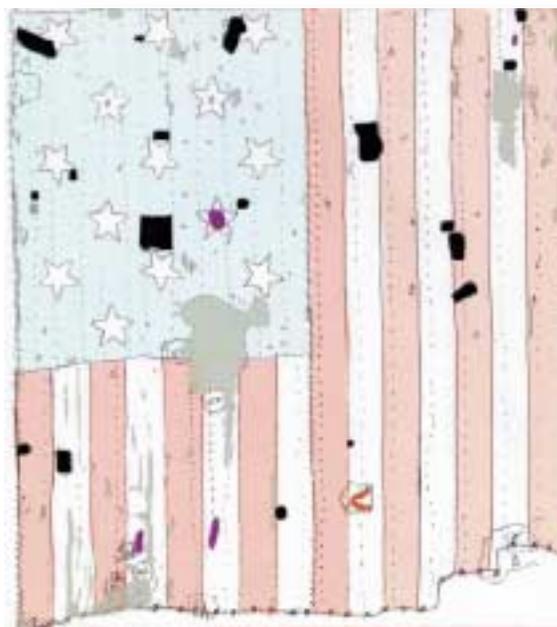
Francis Scott Key. Walters Art Gallery, Baltimore, Md.

fabric, have opened up. Severe breakage of the textile fibers was caused by abrasion, a virtually imperceptible, but constant, movement of the flag against the old linen backing. Before coming to the Smithsonian, significant portions of the flag, about 8 feet or 240 square feet, were worn away and lost to a common practice called "souveniring," in which pieces of the flag were removed and given away as mementos.



DID YOU KNOW...?

The Star-Spangled Banner was first displayed in the Smithsonian's Arts and Industries Building. In 1964, it was placed in the new National Museum of History and Technology, renamed the National Museum of American History in 1980.



Sketch of losses and damaged areas



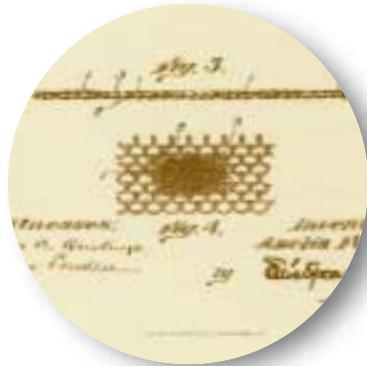
Magnification of dirt vacuumed from flag



Magnification of wool fibers from the Star-Spangled Banner

CONSERVATION

WHAT IS TEXTILE CONSERVATION?



Detail of the patent issued to Amelia Fowler on October 7, 1913. U.S. Patent and Trademark Office, Washington, D.C.

DID YOU KNOW...?

The flag's colors are actually much more vibrant and bright. The true colors had long been obscured by Fowler's 1914 "dyed-to-match" stitches, which faded with time.

TEXTILE CONSERVATION IS A SCIENCE carried out by highly skilled and trained practitioners called conservators. In a museum setting, for example, conservators examine, document, and treat fragile artifacts, such as the Star-Spangled Banner, to stabilize them and to halt or reduce further damage, with the goal of preserving them for future generations.

Detailed documentation is critical to the conservation process. The flag's conservators realize they are not the first,

nor will they be the last, to treat the flag. They must carefully record everything that the object has endured, including treatment, testing, and environmental conditions.

Scientific research will continue to make possible advancements in conservation treatment methods and technology, so it is important for textile conservators to devise treatments that respect the historical authenticity of the object but also ensuring that the treatment can be reversed when better technology or



Conservators used small scissors to cut the Fowler stitches in two places. The thread then was removed without straining the fabric.

techniques become available. Unfortunately, Fowler's 1914 treatment of the Star-Spangled Banner—the best available at that time—was neither well documented nor easily reversible. This has challenged conservators as they proceed to treat and preserve the flag today.



IF YOU WANT TO LEARN MORE...

The Star-Spangled Banner Project has inspired an array of ongoing public programs geared toward all ages, including lectures and symposia, family days, and living history performances.

A host of educational materials makes it possible for the Museum to extend the

Star-Spangled Banner Project from the National Mall in Washington, D.C., into homes and schoolrooms across the country, enriching the learning experience of millions of adults and children.



Amelia Fowler and seamstresses, 1914



Conservators clipping stitches

PRESENTATION

DISPLAYING THE FLAG IN THE FUTURE



★ **SCIENTIFIC TESTS** indicate that the Star-Spangled Banner could survive for at least 500 years, and perhaps even 1,000, if the Smithsonian can significantly reduce the mechanical agents—including abrasion from debris, air movement and handling—that stress the flag.

★ **A RED “V”** on one of the white stripes has prompted long-standing interest. It very likely represents the beginning of the letter “A” for Armistead, the name of Fort McHenry’s commander.



THE FLAG’S ENVIRONMENT is the most important factor in determining its future preservation and display. A secure, climate-controlled setting, low light levels, and the elimination of any contact with soils and pollution will be required in the flag’s future display to ensure its survival.

The Star-Spangled Banner is no longer an intact piece of fabric and cannot support its own weight. Conservation science has already determined that vertical display of textiles is the single most stressful

exhibition method. In the past, vertical display placed enormous stress on the flag.

The Museum is carefully considering the least stressful means of support for the flag’s future display, one that will

significantly minimize, if not entirely eliminate, the effects of gravity on the fragile flag.

The project’s Technical

Advisory Committee and invited architects are advising the Museum on possible solutions. Any future display must strike a suitable balance between what is best for the flag, and what provides an enriching visitor experience.



NEW INSIGHTS

DISCOVERING THE FLAG'S SECRETS

SINCE 1998, many features of the Star-Spangled Banner have been revealed for the first time. The Museum is continually discovering more of the flag's secrets. Here are just a few:

- Old repairs of the flag have been identified; 27 areas have been patched over the years.
- Distinctive staining patterns resembling cursive handwriting have been discovered on the fabric; are these the signatures referred to in historical documents? Scientific analysis now under way may provide an answer.

- Perhaps the most important discovery has been the Museum's new understanding of the deteriorated condition of the Star-Spangled Banner. Conservators are creating a special "map" of the flag that indicates the areas of greatest weakness.



IF YOU WANT TO LEARN MORE...

Click onto the Museum's award-winning [Star-Spangled Banner website](http://americanhistory.si.edu/ssb) to find out more about the history of the banner and for brief updates on the conservation process.



Detail of star with inscription



Threadbare area, illustrating losses

IF YOU WANT TO LEARN MORE...

Millions of television viewers learned about the flag's illustrious history and the Smithsonian's role in preserving it in a dramatic 50-minute documentary produced by The History Channel in collaboration with the National Museum of American History—a highlight of the Channel's 1998 "Save our History" campaign. The History Channel and the Museum also published and have distributed more than 120,000 copies of *The Star-Spangled Banner Project K-8 Teacher's Manual*.

NEXT STEPS

"What will happen to the Star-Spangled Banner in the next hundred years? Will this be a lifetime conservation?"

— Visitor to the National Museum of American History, Behring Center, 1999



Visitors viewing the Star-Spangled Banner

IN 2000, conservation of the flag continued as the conservation team carefully removed each of Fowler's 1.7 million stitches from the old linen backing. This task and the removal of the entire linen backing, to be completed by February 2001, will reveal a side of the flag

that has not been seen by the public since 1873.

Much remains to be done over the next two years, including the

completion of the conservation treatment, making a final decision on how to display the flag in the future, and creating a new permanent exhibition that will feature the Star-Spangled Banner.

The Star-Spangled Banner will become part of a new

exhibition, titled *For Which It Stands* (taken from the Pledge of Alligence). This exhibition will include a rich array of artifacts and compelling personal narratives to explore the universal themes represented by the American flag and its important place in our history and in our daily lives.

The time has long since passed for the Star-Spangled Banner to fly triumphantly in

the wind as it did in the first years after its creation.

However, if properly supported and subjected to no further environmental or physical stresses, even the extensive damage that was suffered by our flag over the past 187 years need not prevent its being displayed.



★ **THE RED AND WHITE STRIPES**

and the blue union of the Star-Spangled Banner are made of English woolen bunting, dyed blue with indigo and red with cochineal and madder. The stars are cotton and are sewn into the union by reverse appliqué method.

★ **EACH STAR** is about two feet across and each stripe is approximately 23 inches wide.

★ **IN 1914**, it took Fowler and her team of ten needlewomen just eight weeks to apply the 1.7 million stitches needed to attach a linen backing to the flag. It took the equivalent of seven human years of labor to remove those stitches.

In 1999 John Hillman, an astrophysicist for NASA, mapped the surface of the flag using near-infrared spectral imaging

REVIEW

THE SSB PRESERVATION PROJECT

November 1996—March 2001

Detail of damage to one of the stars



A patch before and after the removal of the Fowler stitches

IF YOU WANT TO LEARN MORE...

Star-Spangled Banner history

buffs will want to read

Smithsonian historian

Lonn Taylor's book,

The Star-Spangled Banner:

The Flag that Inspired

the National Anthem

(Harry N. Abrams, Inc., 2000),

a fascinating tale that recounts

the author's original research

into the flag's history.

THE STAR-SPANGLED BANNER is a tangible reminder of our

American identity. It is a dynamic and fluid symbol, one that has assumed new meanings during critical periods in American history.

Since the advent of the Star-Spangled Banner Preservation Project in 1996, the Museum has begun an important new dialogue with the American public focused on this most precious national icon. The Museum has partnered with organizations in the public and private sectors to create innovative television programming, educational activities, and publications about the flag that have stirred the popular

imagination and enriched the lives of millions, especially those who will never travel to Washington, D.C.

We believe that the Star-Spangled Banner Preservation Project has generated new admiration and pride in the objects of our national heritage, encouraging us to appreciate anew our fascinating past and our hopes for the future. As caretaker of the Star-Spangled Banner, the Smithsonian Institution and its National Museum of American History, Behring Center have accepted the responsibility to provide for the preservation of the flag and its accessibility to the American people for many generations to come.



GLOSSARY OF FLAG TERMS

BUNTING

This is the lightweight woolen fabric used to make flags.

CANTON

This part of the flag's field is distinguished by color or design. On the Star-Spangled Banner, it is where the stars are situated. The canton is also called the "union."

FIELD

This is the basic area of a flag, also called the "ground."

FLY EDGE or **FLY**

This is the edge of a flag that flies loose in the wind.

GARRISON FLAG

This is a national flag flown at military installations.

HALYARD

This is the formal name for the rope that was pulled through the hoist, holding a flag to its pole.

HOIST or **HOIST EDGE**

This is the side of a flag that is attached to the pole.

"You can neither honor the past, nor imagine the future, nor achieve it without the kind of citizenship embodied by all of our memories of the flag. So, as you see this flag, and leave this place, promise yourself that when your great-grandchildren are here, they'll not only be able to see the Star-Spangled Banner, it will mean just as much to them then as it does to you today."

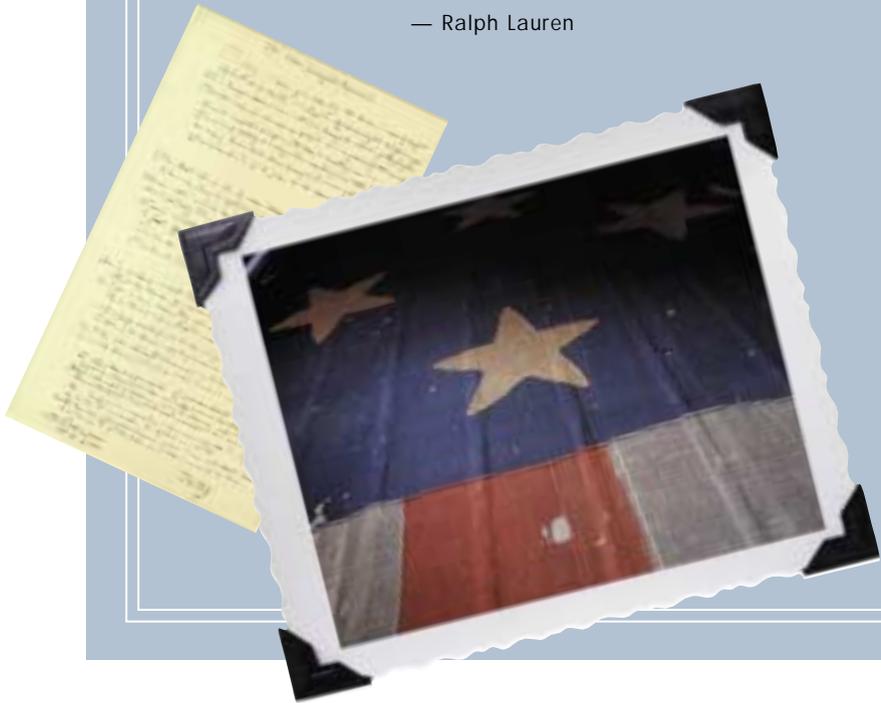
— PRESIDENT BILL CLINTON,
NATIONAL MUSEUM OF AMERICAN HISTORY, BEHRING CENTER, 1998



POLO RALPH LAUREN

We at Polo Ralph Lauren are honored to join Save America's Treasures and the National Museum of American History, Behring Center in the preservation of this great American treasure. Its preservation and conservation is imperative so that those who succeed us will understand our nation's heritage and the ideals on which this country was founded.

— Ralph Lauren



THE PEW CHARITABLE TRUSTS

We all know first-hand the goosebumps we experience when we get an up-close look at the Star-Spangled Banner. We suddenly feel our heritage more deeply and understand our responsibility as citizens more clearly. The founders of The Pew Charitable Trusts, believing strongly in the blessings of living in a strong and healthy democracy, understood this responsibility. Our initiative to help preserve the Star-Spangled Banner reflects the Trusts' continuing pride in America's past as well as our faith in its future. It's part of our own "pledge of allegiance" to our republic and its people.

This marvelous preservation effort is not merely a look back. It's also a look forward, helping to give Americans of each new generation a sense of belonging, inspiring them as civic stewards, a fundamental obligation of being part of this great nation.

— Rebecca W. Rimel
President and Chief Executive Officer
The Pew Charitable Trusts

A FLAG OF MANY HUES

The variations of color you see in these pictures illustrate the different phases of the ongoing conservation treatment.



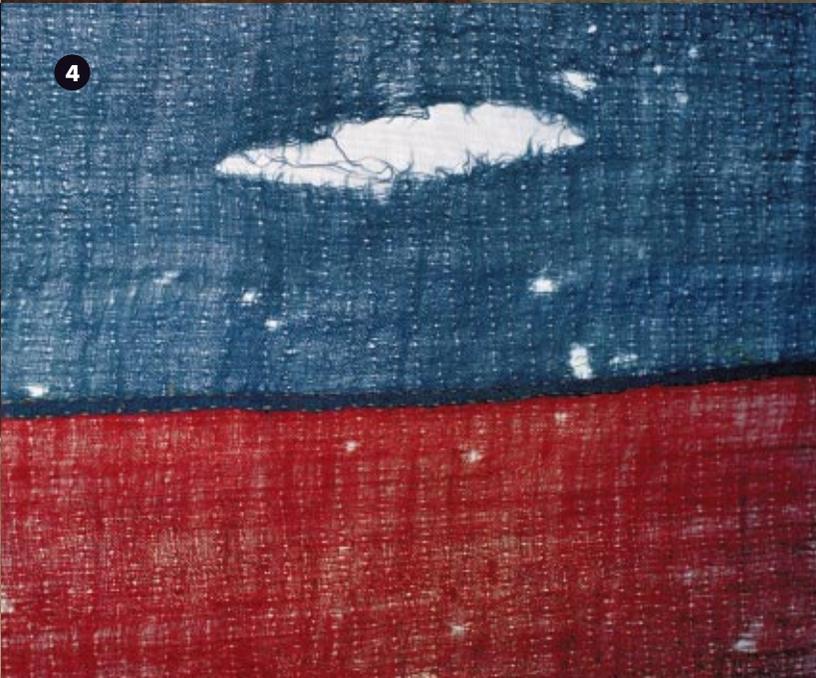
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1 The Star-Spangled Banner was covered with almost 2 million faded stitches which were obscuring its red, white and blue color. The stitches, added in 1914 by Amelia Fowler to hold a supportive linen backing to the bunting, were originally dyed to match the colors of the flag. Over the years, these stitches faded to a dirty beige, giving the colors a washed out appearance.

2 The thin fabric and open weave of the flag allowed the color of the linen backing to show through and made the flag look more faded than it really was.

3 Beginning in May 1999, the conservators carefully clipped and removed the Fowler stitches, immediately revealing the flag's vibrant reds and blues.

4 The flag's vivid colors, protected from light for more than 100 years, were discovered when the banner was turned over and the museum's conservation team removed the linen backing. For the first time, the public can see a side of the Star-Spangled Banner that has been covered since 1873 when the first backing was attached.

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