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Updates

on

Smithsonian

**RESEARCH**

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### **Smithsonian Civil War: Inside the National Collection/Smithsonian Consortia**

The new book *Smithsonian Civil War: Inside the National Collection* brings together the research of 49 Smithsonian authors and objects from 13 Smithsonian museums, advancing the Smithsonian’s research on its Civil War collections and sharing these collections with the public in a manner never before possible. The collaboration began with a committee—chaired by Michelle Delaney, director of the Consortium for Understanding the American Experience—that was created to commemorate the Civil War Sesquicentennial with funding from two Consortia seed grants. This was the first comprehensive survey of Smithsonian Civil War items. Connections were made that could not have been possible without the collaborative scholarship. No one knew, for example, that the National Portrait Gallery held the Lincoln portrait that inspired Cooper Hewitt’s model for the Lincoln penny. The National Museum of American History discovered the thrilling story behind Confederate Colonel John Singleton Mosby’s unblemished cloak that they thought was unworn—but in fact had been seized by Union soldiers who missed capturing Mosby by minutes. The book is just one outcome from this collaboration. Smithsonian Channel created the three-part *Civil War 360*, and *Smithsonian* magazine launched smithsoniancivilwar.com with its interactive Gettysburg map, now a thriving gateway to all things Civil War at the Smithsonian.

### **Low-Cost Carbon Slashes Risk from Mercury Hot Spots/Smithsonian Environmental Research Center**

Mercury-contaminated “Superfund sites” contain some of the highest levels of mercury pollution in the U.S., a legacy of the many industrial uses of liquid mercury. But, short of digging up contaminated sediments and burying them in landfills (an expensive and ecologically risky process), few technologies exist to decrease the risk of exposure. This fall, researchers from the Smithsonian Environmental Research Center (SERC) and the University of Maryland, Baltimore County (UMBC), found a low-cost, nonhazardous solution: using charcoal to trap mercury in the soil. In a study published in October 2013, Cynthia Gilmour (SERC), Upal Ghosh (UMBC), and their colleagues tested activated carbon, a form of charcoal processed to increase its ability to bind chemicals. In laboratory test, the team added the carbon to mercury-contaminated sediments from four locations: a river, a freshwater lake, and two brackish creeks. In addition to mercury, they also tested how well the carbon bound methylmercury, the dangerous neurotoxin that can poison tuna and other seafood. They also used sediment-dwelling worms to detect how much methylmercury worked its way up the food web. Adding activated carbon at only 5 percent of the mass of surface sediments reduced the worms’ methylmercury uptake by up to 90 percent. The research group is now testing its effectiveness in the field at several Superfund sites across the country. Called “in-situ remediation,” the use of sorbents like activated carbon has been proven to reduce the uptake of several other toxic pollutants. However, this is the first time activated carbon had been tested for mercury-contaminated soils. If successful in the field, treating soils with activated carbon could reduce the risk of exposure and subsequent contamination of food webs.

## **Science Magazine Cover/National Museum of Natural History**

National Museum of Natural History's (NMNH) Mineral Sciences curator Liz Cottrell was the lead author on a study that showed that volcanic rocks from the seafloor preserve a record of the deep Earth oxygen cycle, going back billions of years, and that this cycle may be linked to the deep carbon cycle. To make the discovery, Cottrell and team member Katherine Kelley from the University of Rhode Island used powerful X-rays to analyze a proxy for oxygen in volcanic glasses from NMNH's Rock and Ore Collection. An image of one of the volcanic glasses from the study was featured on the cover of June 14, 2013, issue of *Science* magazine. This is the story of Earth's deep oxygen cycle. Cottrell and Kelley measured the X-ray absorption spectrum of iron in lava from sea floor volcanoes as a way to assess the activity of oxygen in the deep Earth. They found that oxygen activity varies from place to place and depends on the history of the rocks that melted to make the lava—sometimes recording plate tectonic events billions of years in the past. Moreover, their data suggest that the deep oxygen cycle may depend on the deep carbon cycle: the two inextricably linked in a dance that has built the on which habitable planet we live.

## **First Detailed Ultraviolet Images of the Sun's Corona/Smithsonian Astrophysical Observatory**

The Center for Astrophysics—built solar telescope on NASA's IRIS (Interface Region Imaging Spectrograph) mission to study the Sun's hot corona has revealed a dynamic and highly structured chromosphere with thin, elongated structures. Launched in June 2013, IRIS uses ultraviolet light to capture for the first time highly detailed and time varying activities (~150 miles; every 10 seconds) on the Sun. The image shows the Sun in the light of ionized silicon (temperature of about 116,000 degrees Fahrenheit). The bright dots are short-lived, intense patches of silicon emission; their role in heating the solar atmosphere is still not known. [Image on cover taken with the CfA-built telescope on NASA's IRIS spacecraft showing the region around two sunspots. Photo credit: NASA/IRIS]

*Not pictured:*

## **Religion in America/National Museum of American History**

Smithsonian scholars have studied and researched religion for many years. Their efforts spring from interests in anthropology, science, the arts, and varying cultures. The National Museum of American History (NMAH) held a two-day symposium in December 2013 to better understand religion in America. Nine experts from universities around America presented talks on Islam, Christianity, Hinduism, Buddhism, Yoruba, Judaism, Native American traditions, and Secularism, and answered questions from the audience about how these very different religions have merged and transformed the United States. The symposium was introduced by Secretary Clough and moderated by NMAH Goldman Sachs Fellow Stephen Prothero, a professor at Boston University and author of numerous books, most recently *The American Bible: How Our Words Unite, Divide, and Define a Nation*. The symposium was supported by the Smithsonian's Consortium for Understanding the American Experience, NMAH Board member Ambassador Philip Lader, and Reverend Linda LaSourd Lader, the NMAH's Director's Fund, and NMAH's Division of Home and Community Life.