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**NEW**  
**Research**  
**INITIATIVES**

## Slave Cabin finds a Home at the Smithsonian/National Museum of African American History and Culture

The National Museum of African American History and Culture (NMAAHC) recently acquired a slave cabin built during the first half of the 19th century on the Point of Pines Plantation on Edisto Island, S.C. The Edisto Island Historic Preservation Society donated it to the museum. In mid-May, the one-story, rectangular, weatherboard-clad cabin was dismantled piece by piece at its original location, removed, and transferred to a Virginia storage facility where the reconstruction process will take place. Smithsonian historians, contract archaeologists, and construction specialists were on site during the deconstruction to conduct additional research on the structure and those who lived there. The cabin, one of more than 25 identical structures built in a single row on the plantation, was occupied as recently as the late 1980s. Among the Point of Pines residents interviewed during the NMAAHC research was 80-year-old J.B. Meggett whose aunt and uncle lived in the cabin during the 1940s. Meggett visited the cabin often, and lived in an identical cabin on the same row. Also interviewed were descendants of the plantation owners. The acquisition and dismantling of the cabin were covered by major media outlets including the *New York Times*. The cabin, which will be on view in the *Slavery and Freedom* exhibition when the museum opens in 2015, also is the subject of documentaries being produced by PBS and the BBC. “The Point of Pines slave cabin will help us share the living history of a place and the resilience of the people, who, in the darkest days of slavery, built the cabin, cleared the land, worked in the fields, and raised their families there,” said NMAAHC Curator Nancy Bercau. “The cabin will be one of the jewels of the museum, positioned at its center to tell the story of slavery and freedom within its walls.”

## Predicting Environmental Change in a Biodiverse Tropical Ecosystem/ Smithsonian Tropical Research Institute

The *Proceedings of the National Academy of Sciences* recently published important results from research conducted by Smithsonian Tropical Research Institute (STRI) scientists. The findings will significantly advance our ability to forecast the effects of global change on the planet’s most biodiverse terrestrial ecosystem, predicting the distribution of tropical trees based on an individual species’ ability to resist drought and grow with lesser or greater availability of phosphorous—an essential soil nutrient. Richard Condit and colleagues from STRI took advantage of the unique geography of Panama to create models to predict the outcomes of environmental variation on species persistence. Panama’s significant environmental variation, which includes marked differences in rainfall and in soil properties, made it possible for the research team to isolate the effects of drought and individual soil nutrients on the regional distributions of 550 tree species in 72 identical plots across central Panama—an experiment never done before at this scale. [The 72 forest plots are an extension of more than three decades of study of the 50-hectare forest dynamic plot on Panama’s Barro Colorado Island, the original model for the Smithsonian Institution Global Earth Observatory (SIGEO) plots now studied in 47 sites around the world.] Condit and his coworkers knew that drought tolerance would predict the occurrences of many species but they were completely surprised by the critical role soil phosphorous plays in explaining species distributions. Soil phosphorus strongly influences the distribution of more than half the species

in the study. A non-renewable resource mined in a few locations, phosphorus is a component of the inexpensive fertilizers that sparked the green revolution. However, recent forecasts suggest that the world's phosphate reserves could begin to run out in the next few decades. If current predictions are true, phosphorus depletion may pose a more significant risk to society than increasing CO<sub>2</sub> in the atmosphere or changes in water availability. Tropical tree species that thrive in low phosphorus soils suggest part of the solution. The strong link between phosphorus availability and species distributions opens up the possibility of identifying the genetic basis for adaptation to low phosphorus soils, the first step in breeding plants that are less dependent on phosphorus-containing fertilizers.

## **Smithsonian Launches 100-Year Experiment Turning Farmland into Forest/ Smithsonian Environmental Research Center**

This spring, Smithsonian ecologists began transforming 60 acres of a former cornfield at the Smithsonian Environmental Research Center (SERC) into an experimental forest. With the help of more than 100 volunteers, John Parker and his lab planted 18,000 seedlings in a massive field study designed to last a century. The forest's name—BiodiversiTree—comes from the key questions Parker wants to answer: Is a diverse forest a better forest? Are trees more likely to survive surrounded by other species? Will it shelter more animals? And will it do more for people, filtering out pollutants and absorbing carbon? There's reason to think it will. But to test that premise, the team needed to design the forest carefully. They divided the farmland into 35-by-35-meter plots that each hold 255 trees selected from 16 species. Some contain only oak, or beech, or elm; others contain mixtures of four or 12 species. By the time BiodiversiTree is finished, a mosaic of 120 forest plots will cover the landscape. But that is only the first half of the project. Another 70 acres of forest remains untouched nearby that Parker and his successors will observe to consider the question: What legacy does three decades of farming leave in its wake? The project is one of just a handful in the world like it, and the largest in North America. In addition to SERC's BiodiversiTree project, the Smithsonian has two experimental forests in Panama. Comparing the two will allow ecologists to find out if diversity matters as much in the temperate zone as it does in the tropics, where researchers have roughly 400 tree species to work with. They will also be able to sell forest mitigation credits and forest interior dwelling species (FIDS) credits for animals.

## **Magnetic Imaging of Living Cells/Smithsonian Astrophysical Observatory**

Magnetic field measurement techniques (like MRI) have long enabled scientists to probe the internal structure of biological and material samples, but high-resolution studies of the internal structure of cells typically require optical or electron microscopes. Harvard-Smithsonian Center for Astrophysics scientists have invented a method for sub-cellular resolution studies of living biological specimens that contain natural magnetic nanoparticles. By shining a laser beam onto the prepared specimens and measuring the resulting emitted light with an optical microscope, they can record images of the internal magnetic field pattern. This technique could be used to shed new light on the properties and life cycles of magnetic bacteria, and point the way toward more sophisticated probes of a wide range of other biologically interesting systems. The method is a serendipitous spinoff from the group's laser technology research on behalf of astronomical research that includes ultra-precise measurements to advance exoplanet detections and stable references for interferometric radio astronomy.

## **Archival Holdings are a Priceless Resource/Archives of American Art, Freer and Sackler Galleries, Smithsonian American Art Museum**

The Smithsonian is rich in archival holdings. The manuscripts, photographs, letters, and audio and film recordings in our collections are a priceless resource for scholars and students, providing a foundation for articles, books, exhibitions, lectures, seminars, and classes. In the past decade, the digitization of many of our archival documents has enabled the Smithsonian to make our resources available online, greatly expanding the scope of the Smithsonian's "diffusion of knowledge." In 2013, the archival holdings of the Archives of American Art, the Freer and Sackler Galleries, and the Smithsonian American Art Museum made significant contributions to scholarship. The Archives of American Art (AAA) played a central role in the celebration of the centennial of the 1913 International Exposition of Modern Art, better known as the Armory Show. The Archives holds most of the records that document this seminal show, offering an indispensable resource for students of the beginnings of modern art in America. To highlight the centennial, the Archives issued a special issue of its *Journal* that featured important new discoveries about the Armory Show; it also hosted exhibitions, educational programming, media outreach, and events. In addition, AAA launched an online exhibition—a timeline comprised of archival documents that chronicle the staging of the Armory Show and the public's reaction to it—that has been linked to many other websites and adapted for use in numerous college courses. At the Freer and Sackler Galleries (FSG), the galleries' archives hold the largest public collection outside of Iran of the photographs of Antoin Sevruguin (1840–1933). A significant and frequently consulted resource, the Sevruguin archive has been the focus of a multifaceted research project over the past two years. Key goals of the project were to create digital images of the entire collection so that the images could be viewed online, and to update research on the images themselves. The corrected and updated catalogue information and high-resolution scans are now searchable in SIRIS, the Smithsonian Institution Research Information System. In January 2014, FSG also will launch a new website—Iran in Photographs—that will be an immense repository of documentation of the history of Iran. At the Smithsonian American Art Museum (SAAM), the Nam June Paik Archive officially opened for research in January 2013. Research inquiries have been received from scholars across the globe and the United States, and researchers also have visited the archive in person. All have been impressed with the wealth of materials in the archive. A German scholar noted that everyone at SAAM is “. . . so committed to turn the archive into a hub of innovative research and dialogue on Paik that there is no doubt that its international importance and reception will rapidly grow.”