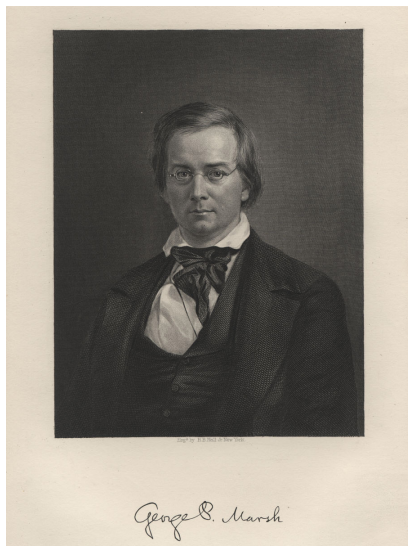


RESEARCH HIGHLIGHTS

Inspiring Generations Through Knowledge and Discovery

The work of Smithsonian scientists, curators, and historians is essential to the Institution's ability to meet the four grand challenges of the Smithsonian strategic plan: understanding and sustaining a biodiverse planet, unlocking the mysteries of the universe, valuing world cultures, and understanding the American experience. The following pages highlight recent achievements in research and celebrate the recognition of research efforts and initiatives under way at the Smithsonian.



Rediscovering the Smithsonian's First Collection

The Smithsonian's first collection was a group of European engravings purchased by Regent George Perkins Marsh in 1849. Researchers, including Marsh's biographer, have long believed that these engravings were destroyed in the devastating 1865 fire in the Castle building. However, National Museum of American History (NMAH) Graphic Arts Curator Helena Wright has located and identified some 500 of the prints within the museum's holdings. They include priceless engravings and etchings by Durer, Rembrandt, and other old master artists. With assistance from the Smithsonian Institution Libraries staff, she also has identified many of Marsh's art books in the holdings of the Smithsonian Libraries. When complete, Wright's research on the Smithsonian's first collection will be the basis of a comprehensive book that will be published within the next several years. The book will be supplemented by a database and website that will document the objects of the Smithsonian's first collection.

*Top: Mid-19th century portrait of Smithsonian Regent George Perkins Marsh, engraved for his widow's memoir, *Life and Letters of George Perkins Marsh*, published in 1888*



*Bottom: *Adoration of the Magi*, 1594 engraving by Hendrik Goltzius (Dutch, 1558–1617)*

The Chigusa Jar

In 2009, the Freer Gallery of Art purchased a Chinese jar widely revered as an icon of Japanese tea culture. The jar, made in the 13th or 14th century, was shipped to Japan while brand new, perhaps as a container for a commercial product. It was one of hundreds, possibly thousands, of similar jars that reached Japan. Once there, however, its fate took a turn after it was selected for use in storing dried tea leaves. The drinking of powdered green tea was a social activity enjoyed in the highest echelons of Japanese society, and the imported Chinese tea bowls and other utensils were a focus of intense scrutiny. Rising to prominence in these circles, the tea-leaf storage jar received a name derived from classical court poetry: “Chigusa” (Thousand Grasses).

That name, along with tea diaries kept by other merchants who recorded their detailed appraisals of the jar, enabled researchers to trace the jar’s 16th-century ownership by a series of prominent merchants who participated in tea drinking, collecting, and connoisseurship. Original documents passed down with the jar show that it then became the property of a leading family of tea masters in Kyoto at the beginning of the 17th century, after which it entered the collection of an Osaka merchant in the late 19th century. Also of note are objects that accompanied the jar’s accession by the Freer: three storage boxes, a cover tailored from antique Chinese

silk, a silk macramé bag, and braided cords used for the jar’s display at tea events. This rich array of well-documented accessories is exceedingly rare, even among the famous tea jars held in Japanese collections.

“Chigusa” and its complex of related objects and documents are the focus of an ongoing international research collaboration that will eventually result in a webinar; exhibitions at the Sackler Gallery of Art (scheduled for early 2014) and the Princeton University Art Museum; symposia and workshops; and a major publication that will present everything that has been learned about this remarkable jar. This collaboration got under way with a January 2011 workshop that was held at the Freer and supported by the Toshiba International Foundation. Japanese specialists Takeuchi Jun’ichi and Oka Yoshiko; American scholar Andrew Watsky of Princeton University; and Freer and Sackler Galleries curators Louise Cort and Jim Ulak convened to emulate the 16th-century diarists in scrutinizing “Chigusa” and its components. An international webinar was held later in 2011 that brought together scholars and Japanese ceramic enthusiasts from all over the world to examine aspects of the jar and its historic and artistic context. In April 2012, Cort and Watsky held a workshop on “Chigusa” and all of its accoutrements for a group of about 45 scholars of Japanese art at a study

day held in conjunction with the Artist in Edo symposium, cosponsored by the Freer and Sackler Galleries and the Center for the Advanced Study of the Visual Arts (CASVA) at the National Gallery of Art. The scholars were completely fascinated by the object and the research that is unfolding around it, a testimony to the value of the collaborative research project designed around this important object.



“The Chigusa Jar,” c. 13th–14th century Chinese commercial container adapted for Japanese tea drinking, collecting, and connoisseurship

Colombia Research Collaboration

Over a seven-year period from 2003 to 2010, Center for Folklife and Cultural Heritage (CFCH) curatorial staff collaborated with the Colombian Ministry of Culture, the nonprofit Fundación Erigaie research institute in Bogotá, and individual cultural experts to research, document, explore, and present regional Colombian folklife traditions. The collaboration resulted in the 2011 Smithsonian Folklife Festival “living” exhibition *Colombia: The Nature of Culture*, which convened 100 cultural practitioners for 10 days on the National Mall, and award-winning recordings of traditional Colombian music.

Smithsonian Folkways Recordings blazed the way in 2003 by researching and recording traditional Colombian music in some of the same regions later featured in the Folklife Festival. The initial years of research produced five recordings of music from the eastern Orinoco river plains, the Afro-descendants of the Pacific littoral, and two traditions of the northern Caribbean coast. The recordings earned one GRAMMY nomination, one Latin GRAMMY award, and other music industry honors.

Building on this work, Folklife Festival curator Dr. Olivia Cadaval spearheaded the effort to work with the Fundación Erigaie, supported by the Ministry of Culture, to carry out the research and fieldwork for a major Folklife Festival program. The Folklife Festival project team included researchers, curators, artists, translators, photographers, videographers, educators, engineers, and educators from the United States and Colombia. From 2008 to 2011, they worked together to conceptualize, research, and produce the Festival exhibition. Using Smithsonian research methodology, Colombian researchers recommended traditions that would best illustrate the relationship between culture and environment, knowledgeable practitioners skilled in their art or trade, and contexts for presentation that could evoke home settings. *Colombia: The Nature of Culture* featured more than 100 cultural practitioners presenting live performances, demonstrations, workshops, and discussion sessions representing six ecosystems and three cities. The program attracted an audience of one million visitors.



Basketmaker from Filandia in central Colombia, pictured at a crafts fair

The project and the collaboration with the Ministry of Culture and Colombian cultural experts endure. Research enriched the Ministry of Culture’s database on intangible cultural heritage. The Smithsonian research methodology and approach has been implemented to do new fieldwork research in some of the other Colombian ecosystems. Artesanias de Colombia has tapped the research base to do portfolios for the craft artists that came to the Festival to help promote their art. Elements of the program were restaged in Bogotá and Medellín, and some of the giant bamboo structures made for the Festival were featured in the recent Summit of the Americas in Cartagena. An online version of the Festival program is currently in production, and Smithsonian Folkways Recordings is planning future recordings of music from other Colombian regions.



Research on the Inka Road: Chawaytiri Self-ethnography Project

A collaboration between the National Museum of the American Indian (NMAI) and the Quechua indigenous (ayllu) community of Chawaytiri, in the Peruvian Andes, has generated substantial ethnographic research material for the museum's Inka Road exhibition project. Elder families of Chawaytiri, a "people of the llama," asked Jose Barreiro, NMAI Director for Offices for Latin America, to film a traditional llama caravan. The effort will contribute to the elders' documentation of the ceremonial and economic practices of the Andean way of life, including the rituals of "ayni" and "mink'a," ancient concepts of reciprocity among individuals, families, and communities that are based on in situ cosmological significance, time-tested agricultural practices, and social sustainability.

The families documented the cycle of ceremonies required when preparing for a llama caravan in the presence of specific mountain "apus" (deities) and the revered Pachamama (Mother Earth). Walking their llamas on the old Inka Road, the Antisuyu route to the jungle region, one of the four provinces of the ancient Tawantinsuyu, the people of Chawaytiri recorded a living memory of an ancient and core tradition. This work of "living indigenous culture" documentation and enhancement has resulted in a full-length documentary, "Caravan of Memory," scheduled to premiere this fall.

The initiative in Chawaytiri forms part of a broader integrative context of "living community" work by the National Museum of the American Indian in Peru. Chawaytiri is

one of 12 Quechua agricultural communities that feed into the Pisac Indigenous Community Museum, a project instigated by Dr. Ramiro Matos in 2004 and inaugurated with the communities by the NMAI and the Inter-American Foundation in September, 2009. The community museum, first of its kind in Peru, is a model in the hemispheric indigenous community museum movement. A philosophy of economic empowerment through cultural awareness, research and education, and self-interpretation and self-representation is at the core of this community museum movement initiative.

Elder families of the Quechua indigenous community of Chawaytiri take part in a traditional llama caravan

Conservation Research Highlights

At the Hirshhorn Museum and Sculpture Garden (HMSG), recent conservation research has resulted in significant insights to several artists' methods and materials, as well as supported the development of conservation treatments for important works in the museum's collection. Highlights of HMSG conservation research projects follow.

HMSG Sculpture Conservator Gwynne Ryan, in collaboration with the veterinary team at the National Zoo and the Capitol Police bomb squad unit, took x-radiographs of *Warrior's Leg*, a fragile wax and plaster cast by artist Paul Thek, and *Venus of the Rags*, a life-sized plaster cast by Michelangelo Pistoletto. The resulting images greatly enhanced existing understanding of the artists' working methods and revealed hidden areas of vulnerability in the construction of the artworks. In the case of *Warrior's Leg*, a weak connection between the foot and the base was identified. The images of *Venus of the Rags* identified the configuration and placement of an embedded internal armature, as well as inherent structural weaknesses. With this information, conservators identified alternative treatment options, revised housing and storage recommendations, updated handling guidelines, and placed both sculptures on the museum's restricted lending list.

As part of the Getty Conservation Institute's Modern Paintings Project, HMSG Chief Conservator and Director of Collection

Management Susan Lake is collaborating in a number of case studies that are being conducted on the materials used by several important 20th-century painters. The first study, a systematic examination of Willem de Kooning's paintings from the 1940s through the 1960s, applied a range of instrumental analytical techniques (GCMS, SEM-EDS, FTIR, and PLM) to identify the artist's pigments, binders, and supports, the results of which were published in Dr. Lake's book *Willem de Kooning: The Artist's Materials*. Selected essays on de Kooning's methods and materials were also published in the Museum of Modern Art exhibition catalogue, *de Kooning: a Retrospective*. Similar studies of the painting materials of Clyfford Still and Morris Louis are ongoing.

Partnering with the Smithsonian 3D Charter Collection, Sculpture Conservator Gwynne Ryan is attempting to devise a safe conservation treatment for *Lunar Landscape*, an extraordinarily rare relief sculpture by Japanese-American artist Isamu Noguchi. For his "Lunar" series, Noguchi created fantastic moon-like topographical sculptures made of cast magnesium cement that are often internally illuminated and crisscrossed by string and bobbing corks that hover like satellites.

The Hirshhorn is no longer able to show *Lunar Landscape* due to a series of structural cracks

in the brittle cement material. Using 3D scanning technology, a cradle will be constructed that will allow conservators to safely invert the sculpture, access its reverse side, and stabilize the cracks and repair faulty wiring. If the treatment is successful, the sculpture will be placed back on view in its permanent gallery of Surrealist art, as well as be included as a key work in an upcoming exhibition of Surrealist sculptures coorganized by the Hirshhorn and the Musée national d'art moderne (Centre Pompidou).



Radiograph of Michelangelo Pistoletto's plaster figure Venus of the Rags, 1967

Smithsonian Institution Libraries and the National Postal Museum Contribute to Philatelic Research Online Library Catalog Collaboration

On February 15, 1888, American Philatelic Society President John Tiffany wrote to Edward Denny Bacon, Secretary of the Royal Philatelic Society London (RPSL), regarding a joint indexing project. He said: "I consider the project as utterly impossible of any practical execution." One hundred and twenty-four years later, the "impractical" project has become a reality.

The Smithsonian Institution Libraries (SIL) and the National Postal Museum have agreed to share library data with the Royal Philatelic Society London and the American Philatelic Research Library. This partnership is the beginning of a "one-stop" global philatelic research online library catalog, www.globalphilatelibrary.org. The site was developed as a centralized information portal through which philatelists around the world can access philatelic research from partner libraries in real time, using any computer.

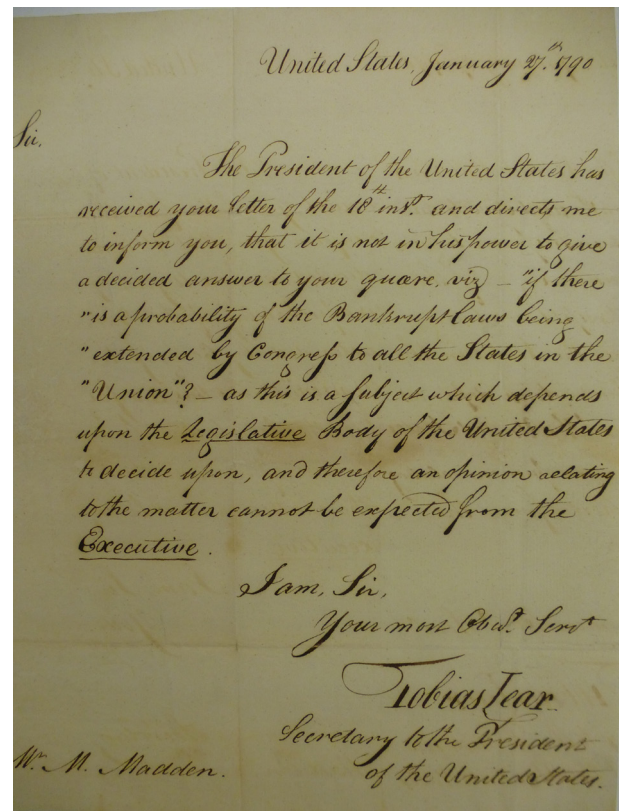
The Smithsonian was the first to partner with the RPSL, and other international libraries have since joined. Official contributing membership has grown to 12 individual societies in the United Kingdom, United States, Canada, Norway, and Germany.

SIL has expanded access to its inventory by sharing some non-traditional library metadata from their "hidden collection" of small journals. Work continues between SIL and the American Philatelic Research Library to combine traditional library holdings data with various philatelic society libraries. As this global project continues, additional international libraries will be added and the website upgraded with improved search capabilities.

Early Alexandria History Rediscovered

While conducting research for the upcoming American Enterprise exhibition, National Museum of American History (NMAH) curator Nancy Davis and Goldman Sachs Fellow Kathleen Franz uncovered important 18th- and early 19th-century business records of William Ramsay, a merchant and founder of Alexandria, Virginia. Although the records have long been in the NMAH Archives, they had never been closely examined. Ramsay kept detailed accounts of his 1753–1756 mercantile activity in a 900-page account ledger that provides an unparalleled view of the economic life in a colonial city. Within the documents, Davis and Franz located the sheepskin incorporation papers of Alexandria, letters from George Washington's secretary Tobias Lear on issues of bankruptcy in the new Republic, and correspondence with Patrick Henry and other prominent citizens.

Tobias Lear, Secretary to President George Washington, addressed this letter on the issue of bankruptcy laws to William Ramsay's son-in-law, Michael Madden



Smithsonian Research Reaches Millions

The widespread reach of Smithsonian science is remarkable. The following pages celebrate the recognition of research efforts and initiatives through top-tier publishing in the world's leading outlets for scientific news, commentary and research.

The first Secretary, Joseph Henry, forged the Smithsonian as the country's foremost research institute and facilitator of global scientific dialogue. That tradition continues today.

Smithsonian science examines many of the world's most complex, dire and time-sensitive problems such as climate change, biodiversity and Zoonotic diseases. In dozens of disciplines, the Smithsonian drives scholarship, expands partnership and "increases and diffuses" knowledge.

Progress in science demands the sharing of results within the scientific community as early as possible. Scientists distribute their results so that others may build on previous work to move knowledge forward.

Most established academic disciplines have their own journals and other outlets for publication of that knowledge. Along with the variation in review and publication procedures, the kinds of publications that are accepted as contributions to research differ greatly among fields and subfields.

Top among the interdisciplinary journals are *Science*, *Nature*

and *PNAS* (the Proceedings of the National Academy of Sciences). These leading weekly journals publish original scientific research and research reviews, science-related news, opinions on science policy and other matters of interest to scientists and others who are concerned with the wide implications of science and technology. Unlike most scientific journals, which focus on a specific field, *Science*, *Nature* and *PNAS* cover the full range of scientific disciplines.

A published work in these top-tier journals carries highly competitive peer-reviewed credibility and visibility reaching millions online and in print.

Journals are measured by statistical metrics of their influence, calculated by the average number the citations given to those papers in a journal. *Science*, *Nature* and *PNAS* are the most frequently cited and have by far and away the most overall influence on science.

Sharing Smithsonian science with the world helps to achieve our strategic goals of Understanding and Sustaining a Biodiverse Planet and

Unlocking the Mysteries of the Universe. Placement within the scientific community's most prestigious journals creates a multiplier effect to advance this mission. Many of the publications are also covered by the mainstream media.

Nearly every Smithsonian scientific discipline has been published within these top-tier journals with an impressive number of publications over the last 10 years:

- » *Nature*: 105 publications
- » *PNAS*: 163 publications
- » *Science*: 228 publications

From Paleozoic Ecology to the extraterrestrial origin of a natural quasicrystal, nearly all Smithsonian research units have earned this world-wide attention, many with cover stories in 2012 alone.

The next pages provide a glimpse of Smithsonian science shared through the most prestigious, competitive journals of the world.



Smithsonian Science Earns Top Billing

Dr. Nicholas Pyenson is the Curator of Fossil Marine Mammals at the Smithsonian’s National Museum of Natural History and studies the paleobiology of marine mammals, and, more broadly, of other marine tetrapods.

Dr. Pyenson and his colleagues discovered a sensory organ in rorqual whales’ chins that help them consume millions of fish through a complex, rapid filtration of vast amounts of water.

The research on the newly discovered organ earned the cover of the May 24 issue of *Nature*.

Earlier this year, the Smithsonian Astrophysical Observatory research earned top billing on the cover of *Nature*. The February 9 cover story research highlighted physicists use of the planet-hunting space observatory Kepler to discover extrasolar planets in orbit around the Sun-like star Kepler-20.



A Small Collective

Some people are surprised to learn that beyond museums, the Smithsonian is also a leading science institution with more than 500 scientists working in astrophysics, biodiversity, climate change, and more.

The relatively small collective of 500 scientists yields an impressive output. From July 2011 to June 2012, *Science*, *Nature* and *PNAS* included publications from the following Smithsonian units:

- » MCI: 1
- » NASM: 4
- » NMNH: 27
- » NZP: 1
- » SAO: 9
- » SERC: 2
- » STRI: 17

Nature:
Volume 485, Number 7399 and
Volume 482 Number 7384.

A 10-Year Look at Coverage in Three Premiere Scientific Journals

JOURNAL	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012*
Nature	9	14	14	10	10	10	13	4	15	6
PNAS	9	7	12	15	17	27	29	20	20	7
Science	19	2	19	29	31	36	17	17	27	10

* 2012 publications to date (through early June 2012).

Most Competitive, Frequently Cited Journals

Science: Founded in 1880 by the inventor Thomas Edison, *Science* publishes the very best in scientific research, news and opinion and has the largest paid circulation of any peer-reviewed science journal. International in scope, 35 to 40 percent of contributing authors based outside the US. Its high standards of peer review and editorial quality translate into stiff competition. The journal accepts less than 7 percent of all papers submitted. *Science* is published by the American Association for the Advancement of Science, the world's largest general science society which serves more than 10 million individuals.

Nature: Founded in 1869, *Nature* is edited and published in the United Kingdom by Nature Publishing Group (NPG), a subsidiary of Macmillan Publishers. *Nature* is independent of any scientific society or institution. Editors employ a rigorous selection criteria to select only 8 percent of the 200 papers submitted each week. Focusing on the needs of scientists, NPG publishes journals, online databases and services across the life, physical, chemical and applied sciences and clinical medicine. Nature.com provides over 6 million visitors per month with access to NPG publications and services.

PNAS: Established in 1914, *PNAS*, the official journal of the US National Academy of Sciences, is an authoritative source of high-impact, original research that broadly spans the biological, physical, and social sciences. The journal is published daily online in *PNAS* Early Edition and weekly in print. The National Academy of Sciences is an honorific society comprising nearly 2,200 members and more than 400 foreign associates. New members are elected annually in recognition of their distinguished research achievements. *PNAS* has a 19 percent acceptance rate, but all papers must be transmitted by an Academy member.

Smithsonian Science in the Mainstream Media

The Office of Public Affairs works daily to promote Smithsonian science and to garner coverage in mainstream media as well as on blogs and social media. Recent science coverage highlights in the traditional media include:

Two features in the *New York Times*:

- » *Smithsonian scientists discover why the Hope Diamond is blue*
- » *A secret behind the whale's mighty gulp*

Two features on *MSNBC*:

- » *Smithsonian research into invasive Burmese pythons eating bird eggs in the Everglades*
- » *Research of multiple ancient species of seacows once cohabitating in three separate areas of the world*

In addition to proactively pitching stories to reporters, and promoting Smithsonian science on the web, the office also hosts quarterly Smithsonian Science Media Briefings where journalists go behind-the-scenes to learn about different projects at the Smithsonian. The goal is for media representatives to see places at the Smithsonian they normally would not get to see and to meet researchers they typically would not get to meet — thus broadening their understanding of science at the Smithsonian.

In late March, the briefing was held in the Department of Mammals at the National Museum of Natural History focusing on that collection and how it serves a resource to Smithsonian scientists and others. A media briefing held on June 21, at the Freer | Sackler Galleries (F|S), showcased Smithsonian science in unexpected places. In addition to touring the conservation and restoration labs at F|S, media also met two staff scientists and learned about their work.