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Smithsonian
Institution

SCIENCE, HISTORY AND THE ARTS
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Key Ingredients. Ever salted a spaetzle or peppered a pierogie? Week in and week out, most of us sit down for three meals a day never giving a thought to the wealth of history and culture that shapes our dining habits and taste preferences. “Key Ingredients: America by Food” is a Smithsonian Institution Traveling Exhibition Ser-



Rosie's Diner in Rockford, Mich. The American diner is all about food, mood and attitude. (Photo by Jerry Berta)

vice Web site that explores the connections between Americans and the foods they produce, prepare, preserve and present at the table. It offers a comprehensive survey of food history in North America from coast to coast. “Key Ingredients” examines the evolution of the American kitchen and how food industries have responded to innovations that have enabled us to choose an ever-wider variety of frozen, prepared and fresh foods. This site includes the American Cookbook Project, a forum for people to share favorite recipes and recollections of great meals of the past.—www.keyingredients.org

Smithsonian Photography Initiative. From John Brown to John F. Kennedy, art to animals, mailmen to music and science to snowflakes, there's a little bit for everyone in the Smithsonian's newly launched Web site



This 1900 photograph of a mail carrier is from the collection of the Smithsonian's National Postal Museum.

featuring thousands of photographs from the collections of its 18 museums and many research centers. This online image collection documents the marvelous and the mundane, the historic and the everyday. Most of the images here have never been on public exhibition. “Enter the Frame,” one of the site's interactive features, is a search interface for browsing, sequencing and tagging Smithsonian photographs. Part online exhibit, part educational activity, it allows visitors to contribute to an ongoing public dialogue about pictures and the words used to frame and describe them on the Internet. A visual-literacy curriculum with libraries of images and audio slideshows can also be found at this site.

—www.photography.si.edu

Correction: The “Off the Shelf” column in the Summer 2006 issue of Inside Smithsonian Research included an incorrect date for President Abraham Lincoln's second inaugural ball. The correct date is March 6, 1865.

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On the cover: Hanna Szczepanowska, a conservator at the Smithsonian's National Air and Space Museum, uses a cotton swab to clean the surface of a model of Vanguard 1, launched into orbit March 17, 1958. Szczepanowska is working to understand and halt the deterioration of the complex materials used in a number of satellite models in the museum's collections. See story, Page 6. (Photo by Eric Long)



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On a remote Canadian lake, scientists track mercury's path through the food chain

By Michael Lipske

Special to Inside Smithsonian Research

Here's a recipe for understanding a widespread and stubborn environmental problem: Take one small, pristine Canadian lake and slowly add approximately one teaspoon of mercury (highly diluted and administered during a span of six years). Meanwhile, assign top researchers from the United States and Canada to study the lake's sediments, fish and surrounding landscape.

Follow these directions, and you have METAALICUS, not a famous heavy metal band but an unprecedented experiment to track the movement of mercury through an entire ecosystem and measure how much of that mercury finds its way into fish.

The scientists conducting the Mercury Experiment to Assess Atmospheric Loading in Canada and the United States, or METAALICUS, are after more than academic knowledge. What they learn could help the rest of us, especially government leaders, answer an important question: Will spending billions of dollars to cut mercury emissions, mainly from power plants that burn coal, pay off in public-health benefits by reducing the amount of mercury in fish and, consequently, in the diet of millions of Americans who eat fish?

"The big questions we're asking are, if we change the mercury load to an ecosystem, how much is that ecosystem going to respond to that change, and how fast," says Cynthia Gilmour, a microbial ecologist and senior scientist at the Smithsonian Environmental Research Center, near Annapolis, Md. Gilmour, a member of the METAALICUS team, says that evidence garnered from the experiment so far suggests that curbing mercury emissions will indeed slash mercury levels in fish.

Methylmercury

The less mercury in fish, the better. Mercury is a neurotoxin that can damage the nervous systems of young children and fetuses and can cause other health problems. Most states in the United States have issued warnings to limit consumption of certain fish, usually predatory species at the top of the food chain, because of mercury contamination.

Mercury pollution comes from a number of sources—as a byproduct of gold mining, from trash incineration, even from scrap yards that melt down old cars and the mercury light



Georgia Riedel, a physical science technician at the Smithsonian Environmental Research Center, collects sediment samples along the shore of Experimental Lake 658 in Canada. The mercury content of each sample was later analyzed and recorded in a laboratory. (Photo by Cynthia Gilmour)

switches that were once built into them. There also is a lot of old mercury out there, stored in soils and sediments from industrial emissions going back 150 years or more. With so much mercury already in the environment, some policymakers say that costly controls on new mercury may not have much effect.

Power plants burning coal are the main source of new mercury in the United States. Mercury in the coal is released into the at-

(continued)

mosphere. Carried back to ground level by rain, the mercury eventually ends up in aquatic sediments. There, bacteria transform mercury into an organic and more toxic form, methylmercury, that is readily absorbed by small animals, such as plankton and worms. As those little creatures are eaten by bigger ones, methylmercury works its way up the food chain. It also biomagnifies, or gets more concentrated, as it climbs the chain. So much so that a rockfish from the Chesapeake Bay might contain 1 million times more mercury than the water it came from.

Bioavailability

Much of Cynthia Gilmour's work has focused on the Chesapeake Bay and nearby Atlantic Ocean, where she delves into the relationship between bacteria and mercury in sediments. Since 1995, she has also studied methylmercury production in the Florida Everglades.

Overall, Gilmour is interested in what she calls the "bioavailability" of mercury to bacteria. "We know in general that sulfate-reducing bacteria are the guys that do most of this methylmercury production," says the scientist, who admits, "I'm probably one of the few people who like the smell of sulfide in mud."

But exactly which of these bacteria convert mercury to methylmercury and how they do it remains unknown. "It's kind of a black box in there," says Gilmour, who tries to pry the lid off the box—and get at the mechanism behind methylmercury production—through studies of microbial community structure at the Smithsonian Laboratories of Analytical Biology, in Suitland, Md.

Experimental lakes

Her METAALICUS work takes place in a different kind of lab, a large swath of northwestern Ontario known as the Experimental Lakes Area, where the Canadian government controls access to dozens of lakes for a variety of ecological studies. METAALICUS scientists have set up shop there because the area receives



Above top: In her laboratory at the Smithsonian Environmental Research Center in Edgewater, Md., Cynthia Gilmour and colleagues work to understand the biogeochemical controls on mercury methylation in the environment. Shown in this photo is a distillation apparatus for the measurement of sulfur, which is intimately linked to the mercury cycle. (Photo by Ken Rahaim)

Above bottom: A METAALICUS team member sprays a wetland area on Experimental

Lake 658 with water containing a highly diluted amount of mercury marked with an enriched stable isotope that is readily identifiable in the lab. (Cynthia Gilmour photo)

Opposite: Smithsonian Physical Science Technician Tyler Bell collects stream water samples from the Experimental Lake 658 watershed to be tested for mercury sprayed over the area by plane. (Photo by Cynthia Gilmour)

less mercury pollution than much of North America. It's an ideal place to learn what happens when mercury is added to a lake under controlled conditions.

"We've been dosing the lake since 2001," Gilmour says. Mercury added to the 22-acre lake, known only as Lake 658 and located 18 miles down a dirt road from the TransCanada Highway, is dribbled out the back of a small boat several times each summer. Once every spring, mercury is also applied to the surrounding wetland and forest with hoses and an agricultural spray plane.

By the time the mercury goes into the lake and surrounding area, it doesn't look anything like the silvery globules you might have seen in a broken thermometer. "It just looks like water," Gilmour says. Highly diluted in light acid, the total amount of pure mercury added to the ecosystem each year is equal to about one-sixth of a teaspoon.

Yet that minuscule addition has transformed Lake 658, increasing its mercury load four to five times. It's as if METAALICUS scientists had picked the lake up and plopped it down on the East Coast. "The amount of mercury we've added to the lake is pretty close to the amount that we get here in Maryland from mercury wet deposition [rain]," Gilmour says.

Stable isotopes

The key to METAALICUS is that the mercury the project uses has been separated into different stable isotopes—mercury with different atomic signatures. The scientists add one mercury isotope to the lake, another to the wetlands and a third to the nearby upland or forest.

"The point of using stable isotopes is so we can separate the mercury that we're adding to the system from the mercury that was already there," Gilmour explains. And by using three different isotopes, the scientists can track how the added mercury cycles through different parts of the ecosystem.

In June and September this year, staff

"The amount of mercury we've added to the lake is pretty close to the amount that we get here in Maryland."

from Gilmour's lab at SERC were in a Boston Whaler on Lake 658, sampling bottom sediments from around 20 locations. They used an Eckman dredge, a small metal scoop that, lowered to the bottom with a rope, grabs a chunk of lake mud.

Back at the Smithsonian Environmental Research Center, the mud was analyzed with an instrument known as an Inductively Coupled Plasma Mass Spectrometer, which lets Gilmour determine how much of the mercury in the lake sediments consists of the isotopes applied over the last six years.

Gilmour's co-investigators on the project have measured mercury isotope loads in surrounding wetland sediments, in upland soils, and in fish and other organisms. "We're following how fast the mercury moves into all these compartments and how fast it gets transformed into methylmercury," she says.

Good news

Fast indeed is the answer when it comes to mercury in the fish. Methylmercury levels in Lake 658's fish increased by about 40 percent in the first five years of the project. All of that increase was traced (through isotope analysis) directly to the mercury that was added to the lake itself—"new" mercury that was quickly processed into methylmercury by bacteria at the bottom of the lake.

Those results won't whet your appetite for Northwoods fish, but Gilmour calls the findings "good news."

"One of the major findings from this study is that the mercury that comes down on the system this year is fairly readily converted into methylmercury and taken up by the fish," she says. "But

the mercury that's been there a long time [mercury that found its way into Lake 658 long before METAALICUS got under way] is not."

Gilmour's investigations into how bacteria methylate mercury have led her to believe that the older mercury is, the more tightly it becomes bound up in soil and sediment particles and the less accessible it is to bacteria. "The bugs can't get at it," she says.

So if the bugs can't get at the old mercury that has built up in soils and sediments since the start of the Industrial Revolution, but they do get at new mercury that rains down from coal-fired power plants, then METAALICUS scientists have come up with valuable information for environmental policymakers.

"If we can cut deposition," Gilmour believes, "we can make a big dent in how much mercury is found in fish."

And that really is good news for all those fond of the Captain's Platter at their local seafood restaurant. ♦



Conservator works to halt the slow deterioration of Earth-bound satellites

By Donald Smith

Special to Inside Smithsonian Research

It soared 500 miles above the Earth's surface nearly half a century ago, a silvery globe about the size of a large beach ball. Supposedly measuring cosmic rays from the sun in the interests of science, its true mission was to keep an eye on the Soviet Union's air defense capabilities during the depths of the Cold War. One of America's top military secrets at the time, the Galactic Radiation and Background satellite, launched in 1960, was the world's first successful spy in space.

Little-known to the public even today, GRAB—like all U.S. satellites at the dawn of the Space Age—had a twin. Identical in all respects, these twins were manufactured as engineering models used for reference on Earth. Whereas GRAB never returned to Earth, GRAB's double never left the ground.

Today, with the approach of the 50th anniversary of the launch of the Soviet satellite Sputnik in 1957, many doubles of early satellites are either in storage or, like GRAB's, on display in the Smithsonian's

National Air and Space Museum in Washington, D.C.

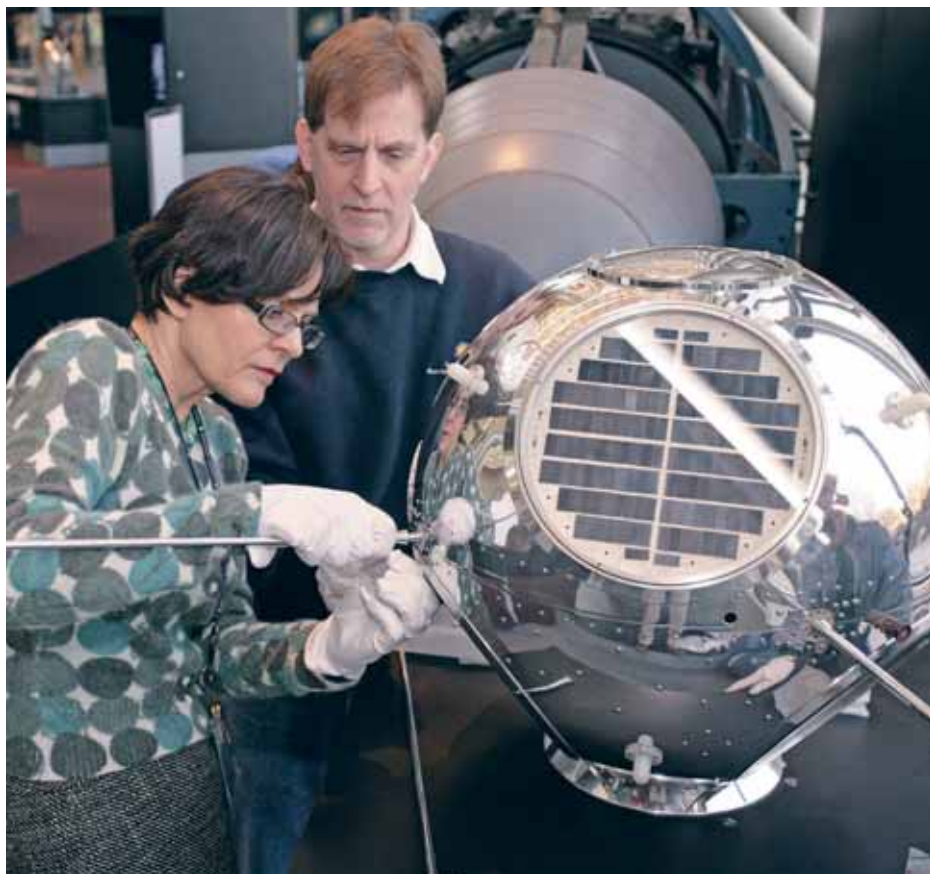
The years on Earth have not been kind to these relics of the early Space Age. For instance, GRAB's instrumentation was powered by six circular panels of solar cells set at intervals around the satellite. Each array contains 156 black cells arranged in rows like miniature dominos embedded in white cement. The surface of the solar cells has a metallic quality that appears to be corrosion. The ceramic adhesive holding them is cracking and turning to powder.

"Once this stuff falls apart, it's gone forever," says Air and Space Museum Curator James David, who was alarmed by GRAB's condition after he recently prepared it for display. He turned for help to Air and Space Museum Conservator Hanna Szczepanowska, a scientist involved in researching the materials used to make objects that are now museum artifacts.

Little information

Designed to perform in space, the materials used in the construction of these satellites were "expected to endure extreme fluctuations of temperature and exposure to intense light, vibration, radiation and atomic oxygen," Szczepanowska explains. On Earth, atmospheric moisture, oxygen and other forces are attacking the satellites. One offender, Szczepanowska says, may even be "corrosive off-gassing from some of the satellites' storage materials."

There is virtually no published information detailing the materials used to construct the GRAB satellite because of its



reconnaissance mission, Szczepanowska says. In addition, as far as she can determine, no conservator has ever tackled satellite conservation in a systematic way. Little literature exists on the subject.

To address the problem, Szczepanowska began a collaborative research project. Her first objective is to conduct an analysis of the materials used to make the GRAB satellite. Knowing the exact materials will enable her to decipher the individual chemical processes responsible for their deterioration, she explains.

A second step will be to outline a conservation process to arrest further damage. Szczepanowska, in collaboration with a curator in the museum's Space History Department, David DeVorkin, has expanded her efforts to include other satellites at the Smithsonian, including Vanguard I and Explorer VII.

Szczepanowska has secured the assistance of three important allies for the project: the U.S. Naval Research Labora-

Left: While installing the Air and Space Museum's model of the GRAB satellite on the floor of the museum's Space Race Gallery, Hanna Szczepanowska and Museum Specialist Carl Bobrow attach one of the satellite's four main antennas. (Eric Long photo)

Above: Some of the many satellites in the Air and Space Museum collection hang from the ceiling of the museum's Steven F. Udvar-Hazy Center in Chantilly, Va. The tail of the space shuttle Enterprise can be seen at lower right. (Dane Penland photo)



tory, which built the GRAB satellite, and Paul Biermann and Edward Ott of Johns Hopkins University Applied Physics Laboratory, where many early satellites were designed.

Spectroscopy

Microscopic samples of materials from the satellites will be analyzed using mass spectroscopy and Fourier transform infrared spectroscopy. Other techniques will determine their molecular composition from the signatures of the light waves the material samples reflect. Examination with a binocular stereomicroscope, used in conjunction with a digital camera, will yield 3-D images of the physical characteristics of surface deterioration. This will enable Szczepanowska to diagnose the types and extent of damage.

Other laboratory techniques will yield further information about chemical composition inside the satellite's materials. This is an important distinction. If

changes are detected on the outer surface only, deterioration can probably be attributed to environmental forces. Internal degradation most likely would indicate the process of aging.

Szczepanowska has applied for a grant to support a one-year analysis of 27 satellites in the Air and Space Museum's collections, which would result in a report setting forth guidelines for assessing the condition of space artifacts and recommending techniques for conserving them. She also plans to conduct a comparative analysis of the materials used to make early satellites and materials used today.

"These objects are an important part of our history," Szczepanowska says, "and their conservation is a fascinating new field. The knowledge I gain in this project will be shared with other museums around the world that are caring for objects designed for space." ♦

Scurlock photographs reveal hidden side of nation's capital

By John Barrat
Smithsonian Office of Public Affairs

Each year, some 15 million tourists pass through Washington, D.C., a city packed with monuments and museums, a city where history is made nearly every day. Yet one aspect of Washington, D.C., generally overlooked by visitors is that it is, and always has been, a city of families and neighborhoods—a place where people live and work and that they simply call home.

A new project from the Archives Center of the Smithsonian's National Museum of American History, Kenneth E. Behring Center has unveiled an intimate and little-known side of Washington, D.C.'s history, one that has long been hidden behind the city's public role as the nation's capital.

"Portraits of a City: The Scurlock Photographic Studio's Legacy to Washington, D.C." is an online collection of more than 2,000 photographs of Washingtonians taken during the 1900s by Addison Scurlock and his sons. Scurlock, an African American photographer, made a living shooting portraits, weddings, high-school graduations, family reunions, sporting events and other events in the life of Washington's African American community.

The United States was segregated during much of the time that the Scurlocks were in business. It was an era when the white majority of Washington, D.C., usually preferred to ignore the daily life of the African American community. For the most part, black Washingtonians lived in a separate world, a "Secret City," in the words of Washington, D.C., historian Constance McLaughlin Green.

Yet for decades, Scurlock and his sons, Robert and George, documented this world on film. From 1911 to 1994, the Scurlock Photographic Studio was a fixture in Washington, D.C.'s Shaw neighborhood. Although esteemed and sought out by the city's thriving black community, the Scurlock Studio was little-known to the outside world.

"The Scurlock collection is a real vision into the very vibrant community of Washington, D.C., in the 1900s," American History Museum Curator Fath Ruffins says. Addison Scurlock is considered by many to be one of America's most talented, yet unrecognized, photographers. His photographs are a valuable re-

source for understanding the history of Washington, D.C., and of the nation.

A grant from the Save America's Treasures program is helping the Archives Center make digital scans from the Scurlock negatives, create catalog records for each image and post them on the Internet at the address americanhistory.si.edu/archives/scurlock/. As the work proceeds, the staff will add thousands more of the Scurlocks' penetrating images to the "Portraits of a City" Web site. Images and catalog information also are available online through the searchable online resource, the Smithsonian Institution Research Information System.

"Portraits of a City" is the most visible aspect of a much larger project begun by the Archives Center in 1994, when the Scurlock collection of more than 230,000 images—30,000 photographic prints and 200,000 negatives—was acquired by the Smithsonian.



*“The Scurlock collection
is a real vision into the
very vibrant community
of Washington, D.C.,
of the 1900s.”*

This important transfer also included ledgers, appointment books, business and personal correspondence, and other records and ephemera, as well as cameras and photographic equipment.

The negatives arrived from Scurlock Studio in a variety of envelopes and other containers with information about their contents inscribed on the outside, such as the name and address of the sitter, date taken and amount charged by the studio. The negatives range from glass plates to 35-millimeter strips and 10-by-20-inch panoramas.

“Archival processing of the negatives has been slower and more complicated than we anticipated,” Senior Archivist John Fleckner explains. “Many are deteriorating, so we had to move the bulk of them into off-site storage. Because negatives are harder to view, they also are more difficult to describe and organize.”

The vast majority of the Scurlock photographs are portraits of



individuals, family groups and organizations, as the primary business of the studio was portrait photography, explains Archivist David Haberstich, who wrote a detailed finding aid, or collection guide, for the Scurlock collection to assist researchers working in the Archives Center.

“Portrait files normally have minimal research value,” Haberstich continues. “This one is different because it documents primarily one special group—middle-class African Americans in the nation’s capital during a 90-year period that included enormous social change.” The collection includes images of politicians, entertainers, scientists, writers, intellectuals and academics, including George Washington Carver, Marian Anderson, Duke Ellington, Paul Laurence Dunbar, Martin Luther King Jr., Sidney Poitier, Sammy Davis Jr. and Booker T. Washington. Photographs of the funeral of President John F. Kennedy and street scenes taken during the 1968 riots also are in the collection.

For decades, the Scurlocks were the official photographers for Howard University, a historically black private university in Washington, D.C., Ruffins says. “Every famous black person or person interested in African Americans who came to Washington, D.C., visited Howard. Because the Scurlocks caught them on film, their photographs offer an unusual record of the intersection of Washington, D.C.’s local history with national and international history.”

“There is very little out there depicting the everyday life of Washingtonians, white or black,” Fleckner adds. “Once online, the Scurlock collection will help put more people, particularly more African American people, into the visual history of Washington, D.C.” ♦



From 1911 to 1994, the Scurlock Photographic Studio was a fixture in Washington, D.C.’s Shaw neighborhood. Esteemed and sought out by the city’s thriving black community, the Scurlock Studio was little-known to the outside world. Several images from the Scurlock Collection are shown here. Left: “Mrs. Brame [and children’s party]” (detail), taken in 1940 by Addison Scurlock. Above left: “Dining car waiters” (detail), taken in February 1949 by Addison Scurlock. Above right: Julia Brooks’ wedding (detail), taken in December 1947.

Exhibition follows the knife, fork and spoon through 500 years of design

To avoid sticky fingers while eating a popular sugar-coated treat called “suckets,” medieval and Renaissance banquet guests began using a novel implement: the fork. And to measure a man’s social status, one needed look no further than the knife with which he carved his meat. “Status was once conveyed by the lavish use of materials—coral, enameled metal or carved ivory—in knife handles,” explains Sarah Coffin, curator of 17th- and 18th-century decorative arts at the Smithsonian’s Cooper-Hewitt, National Design Museum in New York City.

Just as these early forks and knives were once in vogue, the utensils on your dining room table constitute the newest chapter in the fascinating history of culinary design. Much of that story is revealed in “Feeding Desire: Design and the Tools of the Table, 1500-2006,” a Cooper-Hewitt exhibition that takes a look at how dining utensils have changed in the last 500 years—from the materials used to make them to how they are shaped for specific uses and the elaborate motifs, such as flowers and leaves, that decorate their surfaces.

“The tools of the table are constantly evolving, yet they still have the power to transform the basic ritual of eating into a social celebration,” Coffin explains. “Sitting down at a table set with china you love and flatware that pleases you is marvelous. It enhances even a simple meal.”

Traveling cutlery

Five hundred years ago, neither hosts nor inns provided guests with eating utensils. “Members of the upper class never trav-



eled without their own set of cutlery,” Coffin says. From the Renaissance to the 18th century, sheaths, folding handles and finely decorated cases of leather, wood and ivory were integral to the design of flatware. A set of Northern Italian flatware with mother-of-pearl handles that fits neatly into its leather traveling case is on view in the exhibition. It was undoubtedly a status symbol for a family around 1600. This section of the exhibition then jumps forward to examine traveling flatware of the 20th century, namely utensils used in the dining rooms of trains, planes and ocean liners.

In the 17th century, specialized spoon sizes and shapes began appearing with the arrival in Europe of beverages such as tea and coffee. As table manners became more rigid, oval spoon bowls were introduced to help avoid slurping.

Yet these culinary changes were “subtle compared with those that started in the mid-19th century, particularly in the United States, when specialized pieces of flatware in numerous patterns and styles exploded on the scene,” Coffin says. “New technologies and materials, combined with broader wealth and a fervor for invention, shaped the design of flatware for generations.”

For example, during the Gilded Age (1878-1889), elaborate settings of flatware became popular. One flatware pattern offered 146 different pieces for each place setting. “No one set the table with all of the tools at the same time, but can you imagine keeping track of 146 pieces times eight or 12 settings?” Coffin asks. In the 1920s, then-Secretary of Commerce Herbert Hoover introduced legislation limiting flatware patterns to just 55 pieces.

In the late 19th century a broader variety of foods became available, leading to the appearance of uniquely shaped forks designed for specific foods, such as sardines, olives, scallops and cherries.

Ergonomics, children’s flatware, 20th-century modern design and the use of natural forms, such as leaves and animals, to decorate flatware are other elements covered in the exhibition.

Detective work

Coffin, along with Contemporary Design Curator Ellen Lupton and Darra Goldstein, a food historian and founding editor of *Gastronomica* magazine, were the curators of “Feeding Desire,” which premiered at the Cooper-Hewitt in the summer and will travel in 2007. In preparation for the exhibition, Coffin researched and cataloged



Opposite: The elaborate handles on this silver fork and spoon, made in Nuremberg, Germany, circa 1600-1630, were carved from red coral.

Above: These flatware pieces and cake server were manufactured in Germany and the United States by four different cutlery companies, circa 1938-1941. They are made of bakelite and stainless steel.

Right: This early 17th-century traveling flatware set with case from Northern Italy is made of steel, mother-of-pearl, gilded leather and cotton. (Photos by Matt Flynn)



some 2,000 eating and serving utensils used mostly in Europe and the United States.

"I was looking for works of great craftsmanship and execution," Coffin says, along with pieces that give insight into social customs, including how people entertained and what they ate.

Although many of the objects in the exhibition came from the Cooper-Hewitt's collection, Coffin still had to play the role of detective to date and identify some of the pieces. On a few of the older implements, the hallmarks—tiny punches or stamped-in marks identifying a silver-smith—had worn away. Coffin turned to other sources, such as wills and purchase orders, to determine their provenance.

"Once I determined where part of an

object, such as the handle, was made or who made it," she explains, "that gave me clues to the geography of the maker of a utensil's blade, bowl or tines."

Coffin also compared unidentified pieces in the collection with objects featured in historic paintings and etchings. "Dutch still-life paintings, for instance, often feature very specific knives and flatware," she points out. "This is certainly a clue to what kind of knife was being used in Holland at that time." A silver "St. Thomas" or "St. Matthew" apostle spoon from Exeter, England, from about 1661, is featured in the exhibition. Silver was a preferred material for spoons because the metal does not chemically interact with or

change the taste of the food it touches.

"Feeding Desire," Coffin expects, will leave visitors hungry—not for food, but for the long-held tradition of eating as a gracious social occasion.

"Sharing food can be an expression of love and power, duty and honor, knowledge and taste," Coffin says. "Dining is one of the most cherished social traditions. Done properly, it is one of the most civilized aspects of living." ♦

—Rita Zeidner and Christine Miller Ford

Tiger report. Smithsonian National Zoological Park scientists John Seidensticker, Peter Leimgruber and Melissa Songer were among the authors of “Setting Priorities for the Conservation and Recovery of Wild Tigers,” a recently released study of tiger habitats compiled by the World Wildlife Fund, the Wildlife Conservation Society, the Save the Tiger Fund and the National Zoo. The shocking conclusion of the report reveals that tigers reside in 40 percent less habitat than they occupied a decade ago. In Asia, the big cats now occupy only 7 percent of their historic range. Scientists estimate that about 5,000 or fewer tigers remain in the wild, down from as many as 100,000 in 1900.



A new report indicates tigers reside in 40 percent less habitat than they did a decade ago. (Photo by Jessie Cohen)

Tiffany gift. The Tiffany & Co. Foundation has given \$1.1 million to the National Gem Collection of the Smithsonian’s National Museum of Natural History to create an acquisition fund that will allow curators to buy rare gemstones for the museum’s collection. Gemstones purchased with the fund will be known as the Tiffany & Co. Foundation Collection. The gift also will make pos-

sible the creation of an exhibition case to display these and other gemstones in the National Gem Collection Gallery.

Andromeda’s stars. A new infrared image of the Andromeda galaxy taken by the Spitzer Space Telescope has enabled astronomers at the Harvard-Smithsonian Center for Astrophysics to more accurately estimate the galaxy’s population of stars. Using Andromeda’s infrared brightness as a guide, Astronomer Pauline Barmby and colleagues deduced that the galaxy shines with the same energy as about 4 billion of our suns. Based on these measurements, the researchers estimate that Andromeda contains roughly 1 trillion stars. Our Milky Way galaxy is estimated to contain about 400 billion stars.

New director. John W. Smith has been named director of the Smithsonian’s Archives of American Art. Since 2000, Smith has served as assistant director for collections, exhibitions and research at the Andy Warhol Museum in Pittsburgh, where he oversaw the permanent collection, organized exhibitions, raised money for the museum’s exhibitions and collections programs, and lectured and published books on various aspects of the museum’s collection. Smith succeeds Richard J. Wattenmaker.

Boeing donation. The Smithsonian’s National Air and Space Museum received a donation of \$15 million from the Boeing Co. in continued support of the museum’s education and preservation efforts. The gift will help fund programming, care of artifacts and future construction at the museum’s Steven F. Udvar-Hazy Center in Chantilly, Va. In recognition of the donation, the central structure at the Udvar-Hazy Center will be called the Boeing Aviation Hangar.



The newly discovered HAT-P-1 has baffled astronomers. It has a radius greater than Jupiter’s yet contains only half Jupiter’s mass. (Artist’s rendering by David Aguilar)

Planet discovery. Smithsonian astronomers have discovered a puzzling new planet that is larger yet much lighter than Jupiter. Located some 450 light-years away in the constellation Lacerta, its diameter is about one-third greater than Jupiter’s, yet it has a density roughly the equivalent of cork. The new planet, known as HAT-P-1, “may represent an entirely new class of planets,” says Gaspar Bakos, an astronomer at the Harvard-Smithsonian Center for Astrophysics. Gaspar designed the network of small automated telescopes that discovered HAT-P-1. This odd new planet “suggests something could be missing in our theories of how planets form,” says Smithsonian Astronomer Robert Noyes.

Birds of South Asia represents final work of ornithologist S. Dillon Ripley

Requiring 15 years to complete and weighing more than 5 pounds, the recently published *Birds of South Asia: The Ripley Guide* represents the final work of S. Dillon Ripley (1913–2001), the distinguished ornithologist who served as the eighth Secretary of the Smithsonian, from 1964 to 1984.

After Ripley became too ill to proceed with his project, the two-volume guide to 1,441 species was carried forward by Pamela Rasmussen, Ripley's former scientific assistant at the Smithsonian, and bird illustrator John Anderton.

What sets *Birds of South Asia* apart from other field guides is the depth of original research that went into its production. Rasmussen, now an assistant professor of zoology and assistant curator at Michigan State University, conducted painstaking research on bird distributions, plumage, vocalizations

and geographic locations for the guide.

She immersed herself in thousands of South Asian bird specimens at the Smithsonian and in other museums around the world. "I was unhappy with just quoting measurements of birds that had been listed in other sources," she says. "So I ended up redoing measurements for all the birds in the region."

In creating the guide's range and habitat maps, Rasmussen used data from actual museum specimens, rather than from less reliable field reports of bird sightings.

Rasmussen also tracked down thousands of recordings of bird songs. She digitized them and converted them into graphic sound prints that permit visual comparisons. Anderton and the guide's 11 other scientific

illustrators also relied on museum specimens for the bird drawings that fill the guide's 180 color plates.

In the course of her research, Rasmussen discovered that dozens, and possibly thousands, of South Asian bird specimens donated to the British Museum by a prominent early 20th-century collector were fraudulent. Many were intentionally mislabeled. Rasmussen and others conducted sophisticated forensic studies to prove the deceit.

"Although Mr. Ripley was not able to participate," Rasmussen says, "we always felt we had to do our best to make *Birds of South Asia* reach his high standards."

—Michael Lipske



A pair of pittas from *Birds of South Asia: The Ripley Guide*

Smithsonian scientists create hybrid butterfly species in laboratory

Scientists at the Smithsonian Tropical Research Institute in Panama recently created a hybrid butterfly species, *Heliconius heurippa*, by crossing the species *Heliconius cydno* and *Heliconius melpomene* in a laboratory.

"We re-created the evolutionary steps that may have given rise to *H. heurippa*, a hybrid butterfly species," says Jesús Mavárez, a molecular evolution fellow at the Tropical Research Institute.

H. heurippa exists in the wild and is considered unusual because it is a fully sexual hybrid, capable of reproducing. It is only attracted to others of its kind and will not mate with either of its parent species. The experiment by Mavárez and co-researcher Mauricio Linares of the University of the Andes, Colombia, suggests that fully sexual hybrid species of animals may be more common than previously thought.

Butterflies in the genus *Heliconius* exhibit a tremendous diversity of brightly colored red, orange, yellow and white markings on black wings. Color patterns serve as mating cues for these butterflies, which are extremely choosy about finding mates with their own, species-specific, wing pattern.

Linares had long suspected that *H. heurippa*, boasting red and yellow wing stripes, could be a hybrid species resulting from a

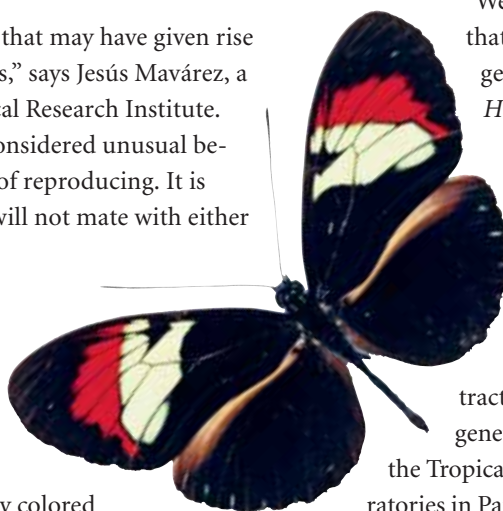
cross between *H. cydno* and *H. melpomene*. To test his theory, Linares designed and performed a series of crosses between *H. cydno* and *H. melpomene*.

"We found that a wing pattern almost identical to that of the hybrid can be obtained in just three generations of lab crosses between *H. cydno* and *H. melpomene*," he explains.

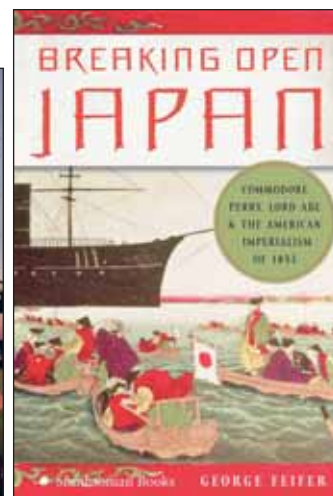
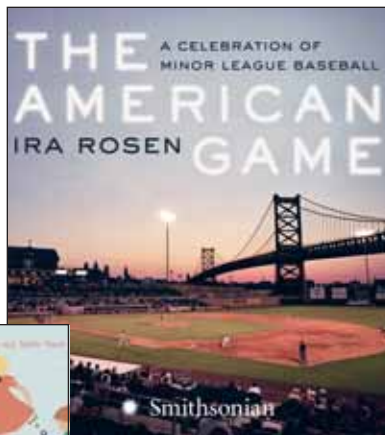
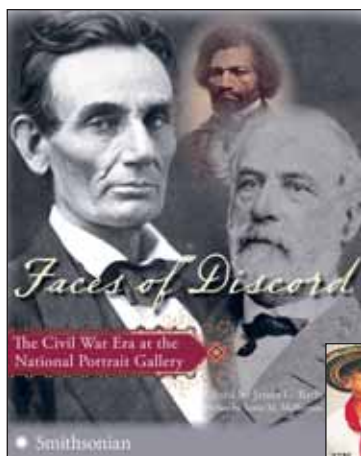
H. heurippa males choose females with red and yellow stripes. They don't choose females of either of their parent species because these species have only a yellow or a red stripe. "If you cover the red or the yellow stripe of a bicolored hybrid female, hybrid males no longer find her the least bit attractive," says Mavárez, who documented the genetic relationships between the three species at the Tropical Research Institute's molecular biology laboratories in Panama.

The "weird" wing pattern of *H. heurippa* individuals makes them undesirable as mates for members of their parents' species but attractive to each other. Such a preference is nearly all that is required for a new species to arise.

—Beth King



H. heurippa, a hybrid butterfly (Photo by Marcos Guerra)



Faces of Discord: The Civil War Era at the National Portrait Gallery, edited by James G. Barber (Collins, 2006, \$34.95). Portraits and stories illuminate the lives of the men and women of the Civil War era in this stunning visual record featuring portraits—such as Abraham Lincoln, Ulysses S. Grant, Robert E. Lee and Stonewall Jackson—from the Smithsonian's National Portrait Gallery.

The Epidemic: A History of AIDS, by Jonathan Engle (Collins, 2006, \$28.95). This sweeping look at AIDS from many angles and across the world recounts the short but tumultuous history of this modern scourge.

The American Game: A Celebration of Minor League Baseball, by Ira Rosen (Collins, 2006, \$29.95). Photographer Ira Rosen turns his lens on the increasingly popular minor leagues to capture the excitement of small-town baseball. Interviews with notable major and minor league players are featured.

Letters on the Wall: A Collection of Letters Left at the Vietnam War Memorial, by Michael Sofarelli (Collins,

2006, \$24.95). A powerful and moving look at some of the thousands of letters and mementos left at one of America's most visited national memorials.

Space 50, by Piers Bizony (Collins, 2006, \$40). This stunning visual tour of rarely seen images from the National Air and Space Museum shows why humans have gone into space and what we are learning there.

Breaking Open Japan: Commodore Perry, Lord Abe and the American Imperialism of 1853, by George Feifer (Collins, 2006, \$33.50). A fascinating blow-by-blow account of America's first confrontation with Japan and the two powerful men at the center of the drama.

Dark Cosmos: In Search of our Universe's Missing Mass and Energy, Dan Hooper (Collins, 2006, \$32.50). A crash course in particle physics questioning what the universe is made of.

Alberta: Wild Roses, Northern Lights (Smithsonian Folkways Recordings, 2006, \$15). Some of the best contemporary music of Wild Rose Country—from Alberta,

Canada's majestic Rocky Mountains to its prairies, foothills, badlands, forests, lakes and cities—is featured on this 19-track CD.

You are my Little Bird (Smithsonian Folkways Recordings, 2006, \$15). With her pure and soothing voice, singer Liz Mitchell puts a hip, new spin on the Folkways tradition of children's music.

Un Fuego de Sangre Pura (A Fire of Pure Blood) (Smithsonian Folkways Recordings, 2006, \$15). The roots of the "cumbia"—a Colombian folk dance and folk music—thrive in this recording by Los Gaiteros de San Jacinto, a group from Colombia's violence-torn Caribbean hinterlands.

Books listed on Pages 14 and 15 can be ordered through online book vendors or purchased in bookstores nationwide.

Recordings can be ordered from Smithsonian Folkways Mail Order, Smithsonian Folkways Recordings Dept. 0607, Washington, D.C. 20073-0607. To order by phone, call (800) 410-9815 or (202) 275-1143.

Hope Diamond: The Legendary History of a Cursed Gem

By Richard Kurin (Collins 2006, \$24.95)

In 1653 while in India, French traveler Jean-Baptiste Tavernier purchased a huge, rough-cut blue diamond that he later sold to the King of France.

Some 250 years after his purchase, a legend was fabricated claiming Tavernier had stolen the stone from the eye of a Hindu idol, and soon afterward, he was torn apart and eaten by a pack of wild dogs. Tavernier had been cursed by the diamond, the legend contends, and misfortune would fall upon the head of anyone who dared own it.

Today, the infamous Hope diamond is regarded as one of the most important treasures in the Smithsonian's collections. Some 6 million visitors to the Smithsonian's National Museum of Natural History admire it each year. But when this priceless gem was acquired by the Smithsonian in 1958, many Americans urged the Institution not to accept it for fear the United States would suffer from its curse.

In his new book, *Hope Diamond: The Legendary History of a Cursed Gem*, Cultural Anthropologist Richard Kurin, director of the Smithsonian's Center for Folklife and Cultural Heritage, transports readers from the 17th-century diamond mines of India to 20th-century jewelry stores and museums. The author follows the rich history of the Hope diamond, which is steeped in revolution, revenge, sexual impropriety and violence.

With elaborate detail gleaned from a decade of research, Kurin reveals the fascinating story of how this 45.52-carat,

walnut-sized treasure—valued today at \$200 million—became the world's most infamous gemstone.

"What adds tens if not hundreds of millions of dollars to the gem's worth? Simply, its story," Kurin writes.

The Hope once was stolen from the French Crown during a revolutionary upheaval. Much later, it was pawned to secure a \$100,000 cash ransom during the



The Hope diamond (Dane Penland photo)

kidnapping of Charles A. Lindbergh Jr. in 1932. The jewel has been worn by royalty and traveled the world. It even made the big screen in the days of silent film in a 15-part series "Hope Diamond Mystery."

As part of his research, Kurin traveled to Paris, where jeweler Pierre Cartier had told the legend of the diamond's curse to the rich Americans Evalyn Walsh McLean and her husband, Edward—whose family owned the Washington Post newspaper—at the Hotel Bristol in September 1910. Cartier's story was an elaborate sales pitch, Kurin writes, designed to pique the couple's interest in the gem. It worked. The McLeans bought the jewel for \$180,000 (a sum equal to approximately \$3.9 million in today's dollars).

With the help of an eager media, the

curse legend grew. It gained popular currency in 1919 when the McLeans' 9-year-old son, Vinson, was struck and killed by an automobile. Deaths, misfortunes, accidents and many other troubles of the Hope's long line of owners have been attributed to the curse.

Yet, Kurin writes, "there is no indication that Tavernier stole the...diamond or any other diamond from the eye of a Hindu idol as Cartier suggested to the McLeans." Tavernier, in fact, was a merchant who was much respected by Indian and Persian

rulers. Tavernier's own travelogues, however, and the mysterious culture where the Hope originated tend to bolster the diamond's intrigue.

Indian classical texts and gem merchants in Tavernier's time attributed certain meanings and powers to a gem's color and shape. Sanskrit text on the medicinal qualities of gems says "blue diamonds are to be avoided."

Kurin also details how this legendary object eventually found a home at the Smithsonian. His 311-page book is filled with photographs and illustrations, many depicting famous and glamorous figures associated with the gem: Marie Antoinette; three French kings; Caroline of Brunswick, who became the wife of George IV; a showgirl named May Yohe, who married Henry Francis Hope, the Sixth Duke of Newcastle, who inherited the diamond from his uncle Henry Philip Hope; Evalyn Walsh McLean; and former First Lady Jackie Kennedy.

Today, at the Smithsonian, inside a high-tech transparent vault, this fabulous gemstone still casts its spell. As Evalyn McLean recalls—in her autobiography—of a weekend that Pierre Cartier left the diamond in her care: "For hours that jewel stared at me....At some time during that night, I began to want the thing."

—Daniel Friend

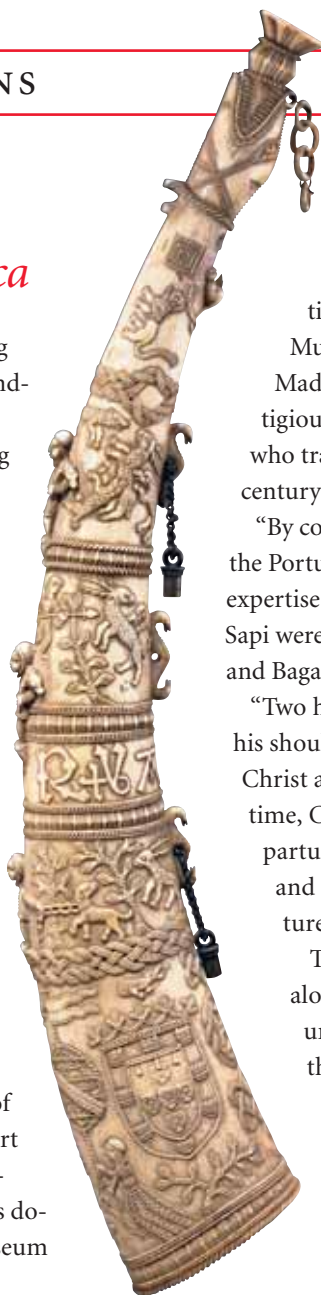
Hunt scenes adorn ancient carved-ivory horn from Africa

Tethered by a heavy chain, a fierce hunting dog strains to pull free and chase a stag it sees standing nearby in the forest. Horn-blowing huntsmen follow the hunt. The dogs corner the stag, allowing one of the hunters to kill it with a spear.

This Renaissance-era hunting scene, carved in elaborate relief on a 15th-century hunting horn of African ivory, once served as a prestigious gift to royalty in Renaissance Europe.

Inscriptions and heraldic designs on the horn—which include coats of arms for both Portugal and Spain—have led experts to believe the horn was given by Portuguese King Emmanuel I to Ferdinand V of Spain as a symbol of solidarity. It may have marked the 1494 Treaty of Tordesillas between the two countries, or it may have celebrated one of two royal marriages of King Emmanuel I to daughters of King Ferdinand—either Isabella in 1497 or, after her death, Maria in 1500.

Made in what is now Sierra Leone, West Africa, by a master ivory carver, this horn is one of 525 pieces in the Walt Disney-Tishman African Art Collection—one of the finest collections of traditional African art in the world. The collection was donated last year to the Smithsonian's National Museum



of African Art by the Walt Disney World Co.

“This horn, one of a number of Afro-Portuguese ivories, speaks to an early history of trade and interaction along the West African coast,” explains Christine Mullen Kreamer, a curator at the African Art Museum.

Made for export, these objects were commissioned as prestigious gifts by Portuguese explorers and commercial agents who traded along the West African coast from the late 15th century to the end of the 16th century.

“By commissioning such an important and complex piece, the Portuguese were acknowledging the artistry and technical expertise of the people they called the Sapi,” Kreamer adds. The Sapi were the ancestors of present-day Bullom, Kissi, Temne and Baga peoples in what is now Sierra Leone and Guinea.

“Two high-relief figures, each with an animal draped across his shoulders, suggest the Good Shepherd, a reference to Christ and to the fact that Portugal and Spain were, at that time, Catholic countries,” Kreamer says. “However, in a departure from Christian imagery, each figure carries a spear, and the animal is not a lamb but an unidentifiable creature that appears to have been killed in the hunt.”

This unusual object is one of only three hunting horns, along with two powder flasks, that are attributed to an unknown West African artist known to art historians as the Master of the Arms of Castile and Aragon.

—John Barrat

This Sapi-Portuguese style horn, crafted in the late 15th century by the Bullom or Temne peoples of Sierra Leone, is made from ivory and measures just over 25 inches in length. (Photo by Franko Khoury)

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