# Inside
## *Smithsonian Research*



Smithsonian Institution

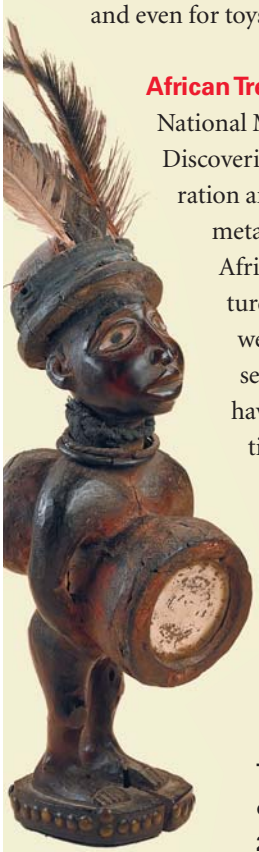

SCIENCE, HISTORY AND THE ARTS
NUMBER 8 • SPRING 2005

## SMITHSONIAN ONLINE

**Paleo Art.** Scientific illustrators have helped disseminate Smithsonian research findings in paleontology since the Institution was founded in 1846. Scientists who study dinosaurs and other prehistoric animals and plants have long relied on artists to communicate how an extinct species may have appeared in life. "Paleo Art," a new Web site that highlights some of the most interesting paleontological art in the Smithsonian's collections, offers an inside look at the techniques and media used by scientific illustrators. Paleontological illustrators at the Smithsonian's National Museum of Natural History use their skills to draw and reconstruct fossil specimens; prepare life restorations of ancient plants, animals and environments; and depict abstract concepts, such as evolution and extinction. They also prepare graphics materials, such as phylogenetic charts, maps, graphs and diagrams. Prepared for use in scholarly journals, monographs and books written for specialists, their artwork also is used widely in museum exhibitions, children's books, nature centers, textbooks, online field guides and even for toys.—**www.nmnh.si.edu/paleo/paleoart**

**This lifelike painting of *Triceratops* (detail) was done in 1905 by Charles R. Knight.**

**African Treasures.** To celebrate its 25th anniversary as a Smithsonian museum, the National Museum of African Art has assembled the exhibition "Treasures: Aesthetic Discoveries/Visual Delights." Billed as an "old-fashioned show about visual exploration and aesthetic discovery," the exhibition is an eclectic display of sculptures in metal, wood and ivory. Featuring works from East, West, central and southern Africa created between the 15th and 20th centuries, "Treasures" mainly features African masks and statuary. A few artworks on view in the exhibition were displayed in several early 20th-century exhibitions that planted the seeds of abstract modernism in the United States. Other works in the show have never been displayed in the United States before. The familiar traditional sculptures in "Treasures" allow visitors to see the aesthetic variances in African art and to view these works as form, not function. The online exhibition reflects the continuing tradition of displaying African art as art and the important role private collectors have had in shaping perceptions about African art. In addition to objects from "Treasures," color images representing many objects from the museum's collection can be viewed through a searchable database in an "Explore the Collection" section on this Web site.—**africa.si.edu/exhibits/treasures**



**This wood figure from "Treasures" was made by the Kongo people, Mayombe region, Democratic Republic of the Congo, in the late 19th to early 20th century. Collection of Saul and Marsha Stanoff (Franko Khoury photo)**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*On the cover: The Hemishield Platinum double velour vascular graft, made by Boston Scientific Co. Inc., is one of many revolutionary textiles featured in "Extreme Textiles: Designing for High Performance," a new exhibition at the Smithsonian's Cooper-Hewitt, National Design Museum through Oct. 8, 2005. This bioimplantable device was designed to replace or repair damaged arteries in the human body. Plain weave gives the graft strength to endure the high pressures found in arteries near the heart. A velour surface promotes ingrowth of human tissue. (Image courtesy of the Boston Scientific Co. Inc.)*

Smithsonian Institution

# High-tech fibers help launch a new generation of textiles for 'extreme' uses

By John Barrat
Smithsonian Office of Public Affairs

A bit of fancy needlework helped change the life of London actor Tim Baggaley after a motorcycle crash in 2001 severed his left arm and irreparably crushed his collarbone. Losing an arm was bad enough, but the missing collarbone made it hard for Baggaley to lead when pursuing his passion—ballroom dancing.

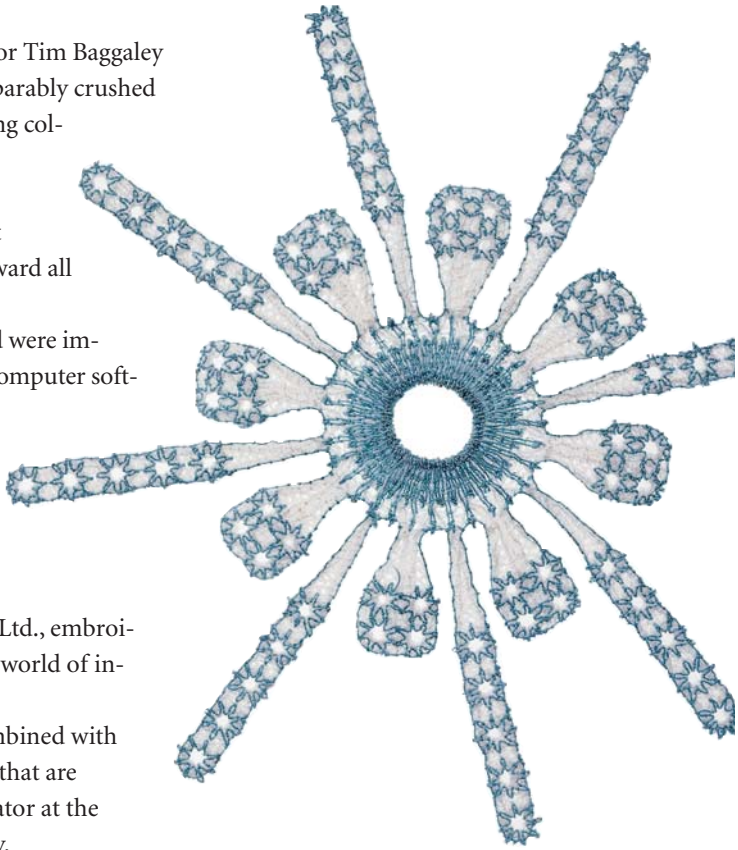
"You don't realize how hugely important shoulders are until you haven't got one," Baggaley told a British newspaper in 2003. "My shoulder fell forward all the time. It was uncomfortable and painful."

In a surgical first, embroidered ligaments made of tough polyester thread were implanted into Baggaley's chest and attached to a new titanium collarbone. Computer software developed in the textile industry for embroidery designs—such as monograms, company logos and lace frills—was used to create Baggaley's embroidered ligaments. They now anchor Baggaley's collarbone to other bones in his body, while allowing flexibility of movement. "The prosthetic clavicle has restored the structure of my shoulder essential in my dancing. I cannot imagine being without it now," Baggaley says.

Created by the British companies Ellis Developments Ltd. and Pearsalls Ltd., embroidered surgical implants are just one example of a revolution sweeping the world of industrial textiles.

"Age-old techniques of weaving, braiding, knitting and embroidery, combined with tremendous advances in science and engineering, have resulted in textiles that are more dynamic and versatile than ever before," says Matilda McQuaid, curator at the Smithsonian's Cooper-Hewitt, National Design Museum in New York City.

"Extreme Textiles: Designing for High Performance" is a new exhibition at the Cooper-Hewitt that surveys this revolution in fabrics, the fibers of which are spun from liquid crystal polymers, ceramics, carbon, high-modulus polyethylene and other modern compounds. "Extreme Textiles" takes a look at dozens of applications for these new products in such areas as architecture, sports, art, medicine, transportation, warfare, aerospace and the environment.



**This embroidered device for reconstructive shoulder surgery is made from polyester surgical thread. Eyelets allow the device to be attached to bone with screws. Its long and short arms act as artificial ligaments, holding bones together yet allowing flexibility. The implant was designed by doctors using computer software developed in the textile industry for commercial embroidery. (Image courtesy of Ellis Developments Ltd. and Pearsalls Ltd.)**

## Textile techniques

Developments in polymer technology, for example, have resulted in fibers that are stronger than steel but retain the traditional flexibility of a textile. These extraordinary new fibers, McQuaid says, are employed in many high-performance products, ranging from the strongest rope ever fabricated—the Marlow SuperLine, which features a break load of 2,000 tons—to woven shipping containers such as B.A.G. Corp.'s Super Sack. Made of woven polypropylene, the Super Sack can lift 12 tons of solid or liquid.

(*continued*)

Lightweight airbags made of tightly woven layers of Vectran were used to cushion the Mars rovers as they landed on the surface of that planet last year. Like most synthetic fibers, "Vectran liquid crystal polymer is extruded from a liquid state through a spinneret, similar to a shower head, and drawn into filament fibers," Susan Brown, a curatorial assistant at the Cooper-Hewitt explains. Capable of remaining flexible on the frigid minus-117-degree-Fahrenheit surface of Mars, the Vectran airbags weigh only 2.4 ounces a square yard, yet offer the strength of steel.

"Many innovations of the last 40 to 50 years involving the development of high-performance fibers have been contained within the small markets of aerospace and the military," McQuaid says. "It was not until the 1980s that the rest of the world became familiar with the existence and potential uses of these fibers and textiles."

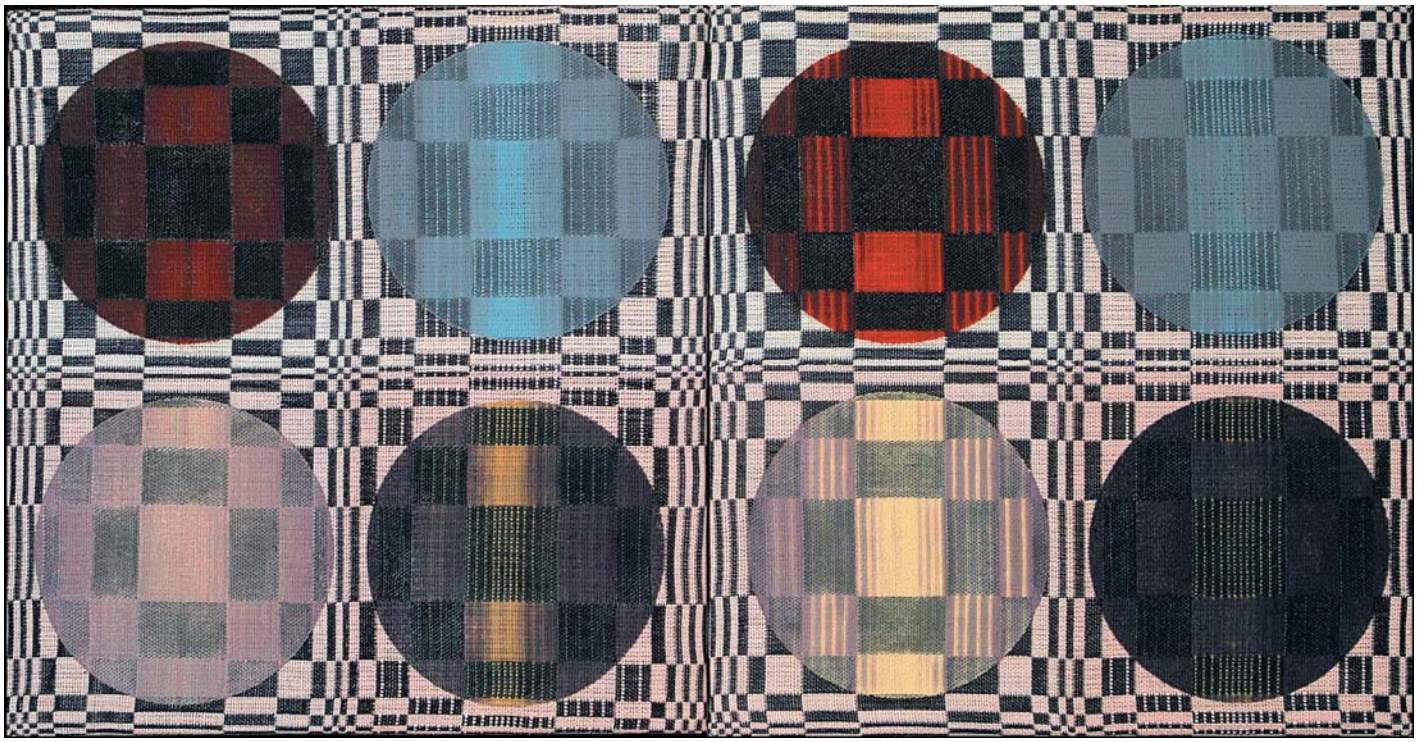
In the 1990s, innovations skyrocketed. Availability of high-performance fibers "caused engineers and designers to re-examine the structural capabilities of traditional textile techniques," says Brown. "Weaving, braiding, embroidery and knitting each represent a different and very specific fiber architecture."

For example, plain weaving, the interlacing of threads at right angles, provides fabric strength and stability. Knitting, which is a looping technique, is most commonly used for its stretch characteristics. Embroidery permits freedom of thread placement, allowing a design to move in complex directions and positions.

Depending on the application and qualities desired in a textile—flexibility, rigidity, impact resistance, lightness—different textile techniques can enhance the characteristics of high-performance fibers. Combinations of techniques and materials are also used in some products to achieve superior performance.

For example, one extreme textile creation displayed in the Cooper-Hewitt exhibition is a lightweight bladed disk from the turbopump of a rocket engine. Both braiding and weaving were used in its construction.

The disk's rigid blades are composed of densely layered, triaxially braided carbon



fibers capable of functioning at 2,700 degrees Fahrenheit. They are integrally attached to its polar-woven carbon-fiber hub.

"Polar weaving is a method of producing complex forms where very high stresses are anticipated," Brown explains. "In polar weaving, the warp runs vertically, while a second set of fibers runs radially and a third circumferentially."

## Trade shows

Putting together an exhibition of visually interesting industrial textiles was a challenge, McQuaid says. "By definition, technical textiles are never meant to be seen. Their success is measured by how they perform." A number of important textiles under consideration for "Extreme Textiles" were rejected because, aesthetically, they are uninteresting.

To explore the many high-tech areas of textile design for the exhibition, McQuaid and Brown attended a number of technical textile trade fairs, such as the Industrial Fabrics Association International held in Frankfurt, Germany. They took notes and photographs, gathered trade literature, attended presentations and made contacts.

In their New York offices, they read technology magazines and journals, contacted fiber and textile societies, visited countless Web sites, and made calls to manufacturers and salespeople to obtain information and create the chance to start a dialogue.

"We did a lot of prep work and general reading about these products before interviewing" inventors and innovators, McQuaid says. "In general, people were very patient in explaining their products in layman's terms."

One of these people was master boat builder Eric Goetz of Bristol, R.I., an innovator in the creation of high-performance racing sailboats. Goetz began building sailboats in the late 1970s with sheets of wood veneer held together with epoxy resin.

During his career on the cutting edge, Goetz has searched for the lightest, strongest and fastest hull materials, experimenting with glass, carbon and Kevlar fibers woven, knitted, stitched and layered together. Today, Goetz adapts different combinations of textile techniques and materials, exploiting their individual strengths to match the type of performance required of the boat he is creating.

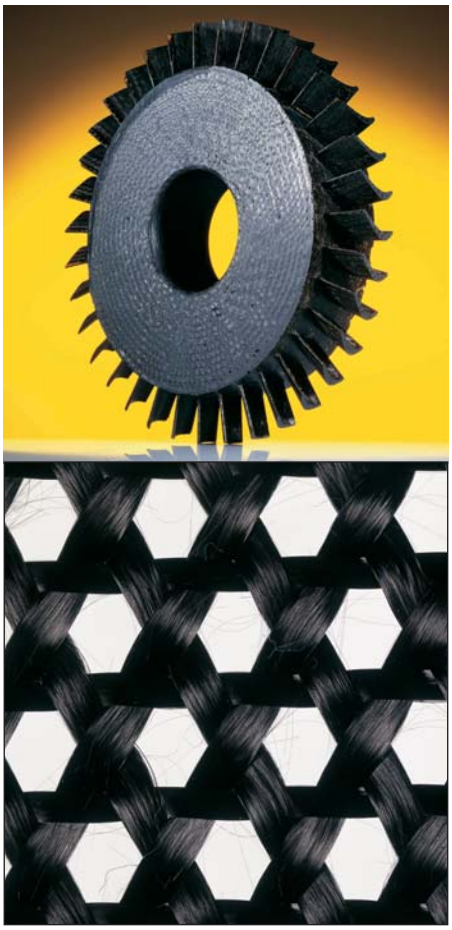
## Soft electronics

Recent innovations in the creation of soft and pliable electronic cables that transmit electricity and high-speed electronic data also hold a wealth of new possibilities in the new area known as smart textiles.

For example, researchers at the U.S. Army Natick Soldier Center Individual Protection Directorate in Natick, Mass., are working toward the creation of a battle uniform that operates like a complex electronic instrument. Woven into the fabric of this lightweight suit are sensors and communications equipment that can monitor a soldier's vital signs, transmit his battlefield location and allow communication with other soldiers in a unit. The suit will lighten a soldier's equipment load by 80 pounds.

"The new millennium has been, and will continue to be, marked by the global networking of these new technologies and the further expansion of the markets and applications of these textiles," McQuaid says. "The goal of 'Extreme Textiles' is to reveal the breadth of areas in which textiles are being used and provide inspiration for new approaches to design." ❖

*"Extreme Textiles: Designing for High Performance" will be on view at the Cooper-Hewitt, National Design Museum in New York City from April 8 through Oct. 8, 2005.*



**Above: Capable of functioning at 2,700 degrees Fahrenheit, the blades of this 6-inch-diameter rotor from a rocket engine (top image) are made of layers of triaxially braided carbon fiber (bottom image). The rotor's hub is made of polar woven carbon fiber. (Images courtesy of Williams International, Foster-Miller Inc., Fabric Development U.S.A. and the Cooper-Hewitt)**

**Opposite top: A soldier models the Future Force Warrior uniform developed by the U.S. Army Natick Soldier Center. (Image courtesy of the U.S. Army Natick Soldier Center)**

**Opposite bottom: Dynamic Double Weave, designed by Maggie Orth, is a smart-textile home furnishing. Electronic circuits, color-change inks and drive electronics allow this handwoven fabric to change color slowly over time. Also known as Electric Plaid, it is one example of how designers are exploring ways to integrate electronic yarns into various weave processes. (Image courtesy of International Fashion Machines Inc.)**

# Terahertz telescope unveils a new molecular universe

By Christine Pulliam
Smithsonian Astrophysical Observatory

Astronomer Dan Marrone has just spent the last 30 hours traveling 5,000 miles from the Smithsonian Astrophysical Observatory in Cambridge, Mass., to the Observatory's newly built Receiver Lab Telescope on Cerro Sairecabur peak in the frigid Atacama Desert in the mountains of northern Chile. Now, his truck is stuck in the snow, its wheels spinning helplessly, only a mile from his destination.

As he gets out to dig free, the wind suddenly picks up and begins piling snow under and around the vehicle, entombing it with frightening speed. Marrone hurries to his companion's truck, and they quickly drive away, returning the next day to clear the snow and reach the telescope.

Why would an astronomer subject himself to such risks? For the chance to get in on the bottom floor of an entirely new field of astronomy.

"Personally, I'm excited to be part of the first group to do terahertz astronomy from the ground," Marrone says of this realm of astrophysics. It previously has been conducted only intermittently by scientists with access to balloons or aircraft.

## Terahertz

Terahertz astronomy is the science of receiving and analyzing waves of radiation from space emitted by molecules at frequencies of more than 1 trillion hertz. Such signals have frequencies roughly 10,000 times faster than signals broadcast by an FM radio station.

The universe is filled with clouds of gas composed of different types of molecules, each of which radiates energy at a different frequency. By measuring the strength of terahertz signals coming from a cosmic cloud at the known frequency for, say, carbon monoxide, terahertz astronomers can determine the amount of carbon monoxide in the cloud. They can also measure where inside the cloud these molecules are congregating and how fast they are moving.

Terahertz astronomy holds great potential for new discoveries in interstellar chemistry and star formation.

## Location is key

But doing terahertz astronomy from the ground is like stargazing from inside a limousine with darkly tinted windows—even the brightest star is tough to see. Just a tiny amount of water vapor in the air can block incoming terahertz radiation.

When asked how it is possible to overcome this obstacle, project leader Ray Blundell of the Smithsonian Astrophysical Observatory replies with the real estate agent's mantra: "It's all about location." The search for dry, clear skies led Blundell and his team to a site 18,000 feet up in the Atacama Desert of northern Chile. "We're operating the highest telescope in the world," he says.

The Receiver Lab Telescope site is so arid that if all the water vapor in a narrow column stretching straight up from the ground to the edge of space were condensed, it would form a film only about 1/100th of an inch thick. "That's about 100 time less humidity than found over Washington, D.C., on a crisp fall day," Blundell says.

Like rolling down the tinted glass of the limo, moving to such a high and dry location opens a window onto the terahertz universe.

## Detector design

In addition to finding the right location, Blundell and his colleagues at the Receiver Lab Telescope had to build the sensitive receivers that detect terahertz radiation.

The detector, a superconducting thin film of niobium nitride cooled to 4 degrees above absolute zero, is only a few atomic layers thick. It acts like a tiny, really fast thermometer and can measure the smallest temperature change induced by the incoming radiation in less than a billionth of a second.

"The Receiver Lab Telescope is the only telescope using this type of terahertz detector," Blundell says. "It is state of the art."

Even the antenna dish, which collects cosmic radiation as it flows Earthward like falling rain, exhibits groundbreaking tech-

nology. "The antenna has the most accurate surface of any radio telescope in the world because, at these high frequencies, we need a very good surface," Marrone says. "It was made from a single piece of aluminum and cut by the largest commercially available diamond-turning lathe in the world."

## Orion Nebula

The Receiver Lab Telescope began recording data in November 2002, probing wisps of gas floating between stars and clouds of dust hidden throughout the Milky Way.

One of the telescope's first targets was the famous Orion Nebula. There, hot young stars blast the gas and stars around them with powerful winds and intense ultraviolet radiation. Peering into this seething realm, astronomers are analyzing signals from carbon monoxide molecules to map the distribution of the warm molecular gas within the nebula.

Astronomers using the Receiver Lab Telescope also can detect ionized nitrogen atoms within the gases floating between the stars of our galaxy. Data from these relatively warm gases, carbon monoxide and nitrogen, combined with radio observations from other telescopes that see cold gas a few tens of degrees above absolute zero, give astronomers a more complete picture of the complex chemistry inside these clouds.

Finally, the Receiver Lab Telescope soon will be used to map a three-atom form of the heavy hydrogen molecule that is stored in a deep freeze within dusty cosmic clouds. "We want to look inside these cold clouds because complex molecules form there," Marrone says.

By studying the molecular composition of everything from the nebulae from which new stars are born to the clouds that hold the seeds of life in the universe, Smithsonian astronomers using the terahertz-frequency Receiver Lab Telescope are gradually helping to forge a new understanding of the cosmos. ❖

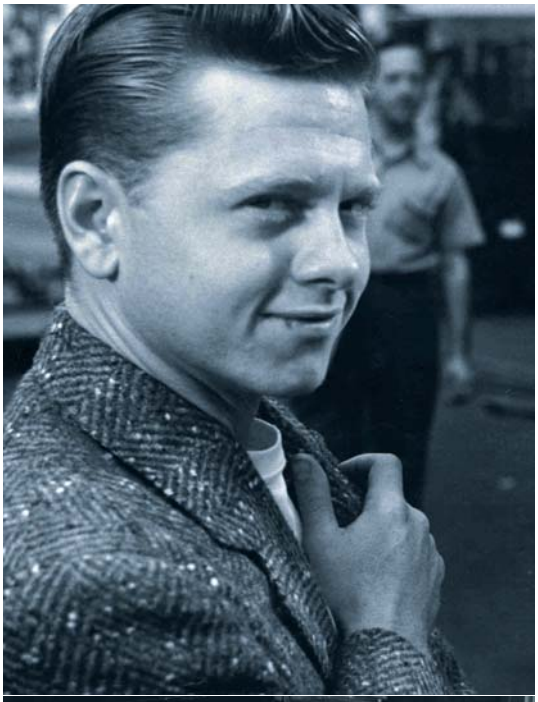
**Opposite: The ultra-sensitive antenna dish of the Receiver Lab Telescope is not much larger than a standard TV-satellite dish. It was made from a single piece of aluminum and cut by the largest commercially available diamond-turning lathe in the world. (Photo by Ray Blundell)**

**Above: This panoramic view was taken by Dan Marrone from the peak of Cerro Saircabur, above the site of the Receiver Lab Telescope at an altitude of 19,685 feet.**

**Right: In this infrared image of the Orion Nebula from the 2MASS telescope and the Receiver Lab Telescope, newborn stars appear as points of light. Purplish clouds represent dust at 1,300 degrees Fahrenheit. The white contour lines, which indicate the intensity of carbon monoxide emissions, are wider near the center of the nebula, the hottest part, and narrower toward the edges. Images such as this one are used by astronomers to determine the motion of gas in space, which cannot be done with optical telescopes.**

# George Sidney gift is a legacy of Hollywood film history

By Caroline Taylor
Special to Inside Smithsonian Research



Everyone has dreams. George Sidney (1917-2002) earned a living capturing his on film. A director and producer in Hollywood from the 1930s through the 1960s, just the titles of Sidney's movies—"Show Boat," "Annie Get Your Gun," "Kiss Me Kate," "Viva Las Vegas" and "Pal Joey," to name a few—conjure up a vivid universe of dramatic scenes, dances, songs and stars.

Gregarious and inquisitive, Sidney rubbed elbows on and off the set with many of Hollywood's greatest stars, including Judy Garland, Gene Kelly, Marilyn Monroe and Frank Sinatra. He boosted the careers of Kim Novak, Elvis Presley and Ann-Margret when they were relative newcomers. He even acted.

And wherever he went, Sidney always took along a camera and snapped pictures, thousands of them. As he observed later in his life: "I've documented my life as a director photographically."

"He was a nonstop picture taker," says Wendy Shay, an archivist at the Archives Center in the Smithsonian's National Museum of American History. "He took pictures on sets, pictures on trips, pictures at parties, pictures of visitors to his home...."

Shay never met Sidney, but she did recently visit his home in Las Vegas with museum Curator Dwight Blocker Bowers and Archivist Craig Orr to assess, organize and pack more than 70 boxes of still photographs taken by Sidney during his long Hollywood career. The photos were a gift to the Smithsonian from Sidney's widow, Corinne, and their son, Benjamin.

Sidney's photographs "document a rich section of American history—from the rise of the entertainment industry in New York City in the 1910s through the rise and decline of the Hollywood studio system," Bowers says. "They show us filmmaking not only as an art but also as an industry that happened to achieve a degree of artistic prominence."

Historical and cultural value aside, Sidney's photographs are fun and fascinating. One shows Gene Kelly running around third base on the baseball diamond at Metro Goldwyn Mayer. Another is of Sammy Davis Jr. doing a Cagney impersonation on stage. Another freezes Mickey Rooney and Judy Garland in mid-conversation on the set of "Babes on Broadway." Still another captures Ann-Margret in a wild shimmy in the whacky 1963 musical "Bye Bye Birdie."

## On time, under budget

In a lucky confluence of genes—Sidney's mother was an Irish vaudevillian and his father a movie magnate of Hungarian descent—the director possessed both the artistic vision to captivate movie-goers and the business acumen to understand the bottom line.

In fact, Bowers says, "one of George Sidney's greatest contributions to the Hollywood studio system was his ability to produce a high-quality motion picture within budget and on time."

While photos make up the bulk of the Sidney donation, it also includes scrapbooks, correspondence, home movies, posters, audio recordings, an Oscar, a Golden Globe award and 38 leather-bound working movie scripts. The scripts came complete with crossed-out sections where scenes were cut, edited and transformed; notes on camera angles; and columns of numbers in which Sidney kept track of shooting costs.

The collection also contains 20 original posters and lobby cards from Sidney films, including "The Eddy Duchin Story," "Annie Get Your Gun," "The Three Musketeers" and "Viva Las Vegas," one of Elvis Presley's most beloved and recognizable

**Clockwise from top left: Mickey Rooney and Judy Garland pause for the camera of George Sidney on the set of the 1941 musical "Babes on Broadway," a film that Sidney co-directed with Busby Berkeley. Ann-Margret shimmys in a George Sidney photo taken during a dance scene from the 1963 musical "Bye Bye Birdie." In this Sidney photo, Frank Sinatra is shown wearing George Sidney's hat in a 1957 promotional photo for "Pal Joey." Betty Hutton rehearses a scene from the 1950 musical "Annie Get Your Gun," for George Sidney (seated, center in tie), as other members of the cast look on.**

movies. There's even a swatchbook of fabrics for costumes used in "The Harvey Girls," a musical starring Judy Garland, Ray Bolger and Angela Lansbury.

The jacket and hat made famous by Frank Sinatra in the insouciant pose he struck in promotional shots for "Pal Joey" also are part of the acquisition. "Sinatra didn't like the fit of the hat and coat he'd been given," Bowers says. "So he borrowed Sidney's own hat and jacket. The rest is Hollywood history."

## Art and reality

In all, the Sidney collection illustrates the collaborative nature of making motion pictures in the factory that was Hollywood under the studio system, Bowers says.

"Sidney's materials will help illuminate the interface between art and reality, making it possible to see how sets, costumes, lighting, camera angles and so forth were employed by the factory's highly skilled workers," he says. "They created an illusion of reality so powerful that memories of Judy's songs, Gene's dancing, Kim's come-hither gaze or the sight of a showboat steaming down the Mississippi help define what it means to be an American today.

"Our next step with this remarkable collection," Bowers continues, "will be getting the photographs cataloged and archived. After that, we will begin to investigate the possibility of an exhibition and putting some of the images up on the Web.

"My greatest hope is eventually to publish a coffee-table book with authoritative biographical-critical text about George Sidney and his work." ❖

# Colorful works of self-taught African American artists are prized by collectors

Dancing with her grandmother across a pink field of white flowers, the young girl in the painting has on a dress made from small, individual packets of Equal, the no-calorie sweetener. Her grandmother's dress also is covered with Equal packets, as well as larger cardboard Equal boxes.

"I use Equal in my coffee, and it reminds me of my grandma," explains Mary Proctor, the Tallahassee, Fla., artist who created "Equal," one of 54 artworks in "On Their Own," a new exhibition at the Smithsonian's Anacostia Museum and Center for African American History and Culture in Washington, D.C.

Proctor, whose grandmother grew up in the segregated South, wrote these words on the painting:

*I said to my grandma*
*what is it you "want the most"*
*she said just to be treated "equal"*
*That will be sweet baby*

## Surge of interest

Proctor, who signs her artworks "Missionary Mary Proctor," is a rising star in the contemporary world of folk art and self-taught artists in America. She began painting in 1995, after her grandmother died in a trailer fire. A vision came to her one night, telling her to begin painting.

Since 1990, the art world has seen a surge of interest in the work of self-taught artists, and African American self-taught artists in particular, says Robert Hall, curator at the Anacostia Museum. Many black colleges and institutions, such as the Studio Museum in Harlem and the New York-based Schomburg Center for Research in Black Culture, have hosted scholarly symposia and published major books on the subject.



**Left: Artist Mary Proctor at the Anacostia Museum with "Equal," an artwork she created on a door (Photo by Harold Dorwin)**

**Above: "I Pray to Put My Shoes On," an acrylic-on-wood painting done in 1999 by Ruby C. Williams (Steven Cummings photo)**

"Unaffected by the influence of peers, popular trends or creative movements, these artists developed their own truly personal ways of making visual statements about things going on in the world," Hall says.

## Something to say

Hall, curator of "On Their Own," had been "kicking around" the idea of a folk art show at the Anacostia Museum for years. He decided to emphasize three recurring themes among self-taught African American artists: self, family and community. Selecting artists, Hall says, was simply a matter of finding those "who had something compelling to say" about these subjects.

"Each artist in the exhibition is emerging as an important and original force," Hall explains. All have shown their works at major folk art venues, such as Alabama's annual Kentuck Festival of the Arts.

## Miniature buildings to dots

Hall purposely selected a wide range of forms and materials for the show, from painted furniture and doors to wire mesh sculptures and quilts.

Self-taught artist Simon Jackson, whose work is on display in "On Their Own," uses tree shavings, tin cans, aluminum foil, old extension cord wires and tiny handmade bricks to create—in intricate detail—miniature buildings of the past. Jackson's near-to-scale reproductions are his way of preserving the farmhouses, barns and general stores that disappeared long ago from the landscape of his native Tennessee.

Sam "The Dot Man," a k a Sam McMillan, a Winston-Salem, N.C., painter who uses furniture, lamps and automobiles as canvases to tell stories about the American South, is another artist featured in "On Their Own."

In the span of a few hours, the 79-year-old applies hundreds of dots and friendly, stylized images to a surface to create vivid farm scenes like the ones he remembers from his boyhood in North Carolina.

"He does the same with his kitchen cabinets and table lamps and with his hats, shoes and neckties," Hall says. "Even his van and the radio in his house are covered with dots." Though McMillan never trained to become an artist, his work commands the attention of serious collectors of "outsider" and "vernacular art," terms used for the art of the self-taught.

## Produce signs to quilts

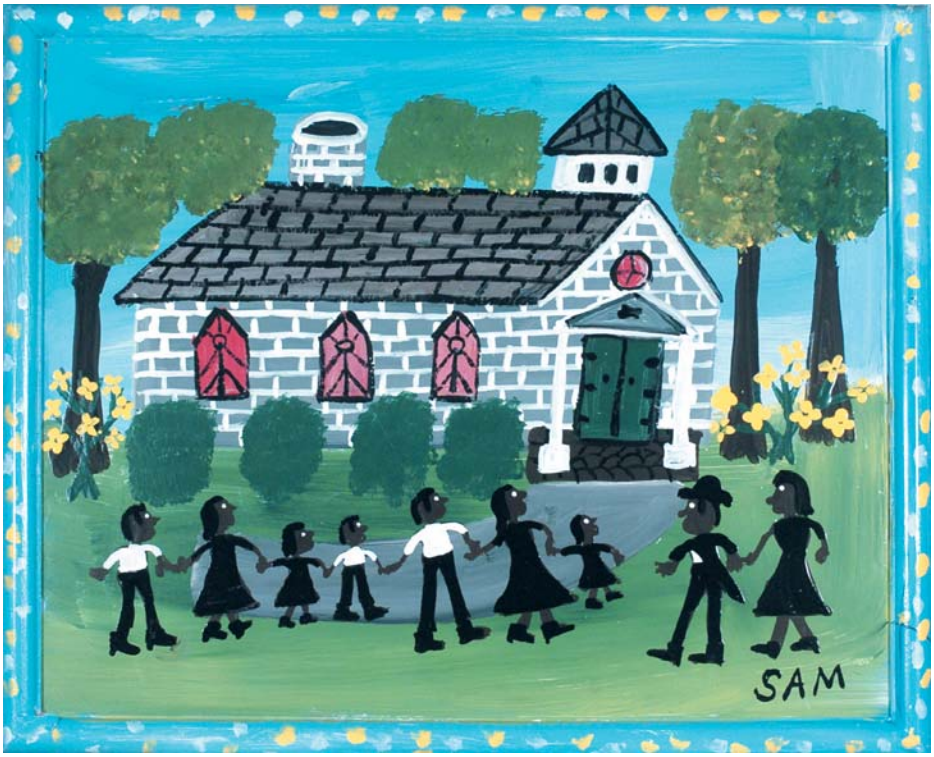
One of the most-talked-about artists in the exhibition is Ruby C. Williams, of Plant City, Fla. Williams has spent years splashing carnival-colored paint onto recycled planks and turning out images of farm animals, field hands and gleaming farm produce—all made to lure people off the highway and up to her roadside vegetable stand. Her art is in some of the most esteemed private collections in the United States.

Chris Clark, an artist whose quilts are in the exhibition, learned quilting from his grandmother 10 years ago. His colorful quilts sell for prices anywhere between $100 and $1,000. Clark doesn't mind being called a folk artist, a term he say suits him fine.

"I think of a folk artist as someone whose creativity outweighs their ability," he says. "Someone trained in fine arts is searching for perfection. I don't have time for that. I want to create work that's not intimidating, that can be enjoyed by everyone." ❖

*—Fleur Paysour and Rita Zeidner*

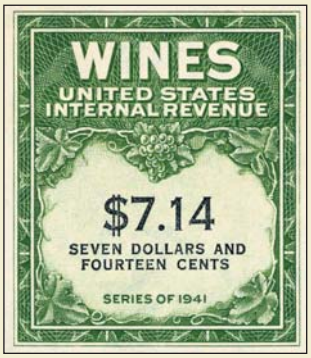
*"On Their Own" will be on view at the Smithsonian's Anacostia Museum and Center for African American History and Culture in Washington, D.C., through June 12, 2005.*




**Top: "Sunday Morning" (2004), an enamel-on-board painting by Sam "The Dot Man" McMillan (Photo by Steven Cummings) Bottom: Robert Hall, left, and artist Chris Clark at the Anacostia Museum with Clark's 2000 creation "Dream Quilt" (Photo by Harold Dorwin)**

Panamanian golden frogs at the National Zoo (Jessie Cohen photo)

**Marine science.** Roger and Victoria Sant of Washington, D.C., recently donated $10 million to the Smithsonian's National Museum of Natural History to establish the museum's first endowed chair in ocean research. The Sant Chair for Marine Science, part of an Ocean Science Initiative at the museum, will be awarded to a leading marine scientist to direct research for the initiative. The initiative is a multidisciplinary program to foster greater public understanding of the oceans. The endowment also will support the establishment of a Center for Marine Science, which will be a forum for the advancement of scientific knowledge about the oceans.




A 1941 IRS wine tax stamp

**Revenue stamps.** On Feb. 12, the Smithsonian's National Postal Museum sold at auction in New York City a large holding of duplicate revenue stamps that had been deaccessioned from its National Philatelic Collection. The Smithsonian acquired the stamps between 1954 and 1977, when the Internal Revenue Service transferred some 7.8 million obsolete revenue stamps to the Institution. Revenue stamps were first used by the Department of Internal Revenue during the Civil War to show that taxes for certain goods and services had been paid. The approximately 35,000 stamps sold to stamp collectors and dealers during the auction included 135 highly valuable revenue stamp varieties, such as wine and marijuana stamps. Sale proceeds, which totaled more than $3,309,950, will be used to create a philatelic acquisition fund at the National Postal Museum.

**Golden frogs.** Living in special tanks in the Reptile House at the Smithsonian's National Zoological Park, a group of Panamanian golden frogs on loan from the Baltimore Zoo have begun breeding. In January, the frogs laid some 200 eggs. A little more than a week later, tadpoles began to emerge. The tadpoles are expected to go through metamorphosis and become frogs between May and July.

The young adult frogs will be dark green and, at maturity, will turn bright orange or yellow with or without stripes or spots. Nearly extinct in the wild, the Panamanian golden frog is under pressure from habitat destruction, illegal poaching and decimation from the Chytrid fungus.

**Mustang donation.** Eleanor McMillan, a former Smithsonian conservator, has donated a near-mint condition 1965 Ford Mustang coupe to the transportation collection of the Smithsonian's National Museum of American History. The car, which McMillan had owned for 40 years, was assembled in October 1964 in Dearborn, Mich., during the first calendar year of Mustang production. It is the latest addition to the more than 70 automobiles in the museum's collection.

The 1965 Ford Mustang coupe donated to the Smithsonian's National Museum of American History by Eleanor McMillan (Photo by Jeff Tinsley)

**Bird strike.** A field team consisting of staff from the Division of Birds at the Smithsonian's National Museum of Natural History and the U.S. Air Force Bird Aircraft Strike Hazard team traveled to Korea last fall to collect specimens of birds that are potentially hazardous to military aircraft safety. Three hundred specimens representing 55 species of birds were collected in Korea and added to the collections in the Division of Birds. Frozen tissue samples were saved from each specimen for DNA identification and virus screening.

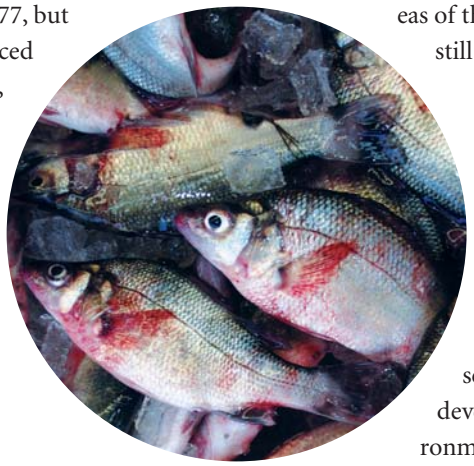
## *Researchers find high levels of PCBs in some Chesapeake Bay perch*

Fish living in Chesapeake Bay tributaries that flow through developed areas may be unsafe for human consumption because they contain unhealthy levels of cancer-causing polychlorinated biphenyls, or PCBs. This is the conclusion of a new study from the Smithsonian Environmental Research Center in Edgewater, Md.

During 2002, Smithsonian scientists measured PCB levels in white perch caught in 14 Chesapeake Bay tributaries and correlated their findings with the amount, type and distribution of developed land in each location. The highest PCB levels were found in white perch caught near areas where development was most intense and closest to shore.

"The amount of development, particularly high-density residential and commercial development, and its proximity to the water were incredibly strong predictors of contaminant levels in white perch tissue," Aquatic Ecologist Ryan King, leader of the project, says.

The manufacture of PCBs has been banned since 1977, but once they are introduced into the environment, they remain there for many years. "PCBs take a very long time to degrade, and older areas of development may still be acting as sources of these contaminants," King says.



**White perch for sale in a fish market**

A major finding of this study is that, even where there is relatively little development in a watershed, there can still be unsafe levels of PCBs in white perch, particularly when the development is close to the shore, King says. Researchers were surprised to find that perch in some of the less-intensively developed areas of the Chesapeake Bay still had high PCB levels.

The study presents a strong case for a better understanding of the impact of development on the Chesapeake Bay, King adds. "Our study points to the serious implications of development in the environment," he says. "It provides strong evidence that environmental and ecological conditions in subestuaries of the Chesapeake are tied to land use in the watershed area." *—John Barrat*

## *Ornithologist examines when and how the chimney swift acquired its name*

Unlike many birds native to the forests of North America, the small blackish chimney swift, *Chaetura pelagica*, does not perch like a songbird. Its long curved talons, short legs and barbed tail feathers allow it to cling easily to vertical surfaces. These adaptations evolved during millions of years of nesting inside hollow trees and caves.

**Illustration of an "American swallow" nesting in a chimney, drawn in 1748 by Mark Catesby**

Finding a chimney swift in a tree today, however, is a rare phenomenon, says Gary Graves, ornithologist at the Smithsonian's National Museum of Natural History. Its nest is "found almost exclusively attached to the inside of man-made structures, such as chimneys, wells, silos and porches," Graves says.

But how long after European-style homes began appearing in North America did the swift make the switch from nesting in trees to nesting in chimneys? Graves searched historic written accounts of this bird, looking for an answer.

The earliest description he found was in John Josselyn's 1672 book *New England's Rarities Discovered*. Josselyn describes the bird, which he calls a "troculus," as nesting in a "chymney."

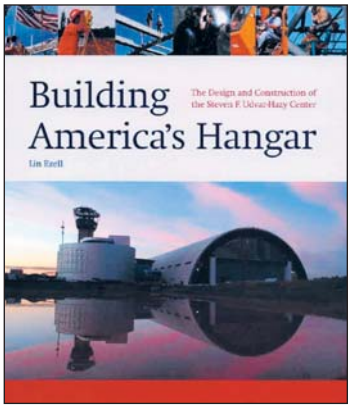
The next chimney reference appeared in 1748 in Mark Catesby's book *The Natural History of Carolina, Florida and the Bahama Islands*. Calling it an "American swallow," Catesby noted that the bird built its nest in chimneys.

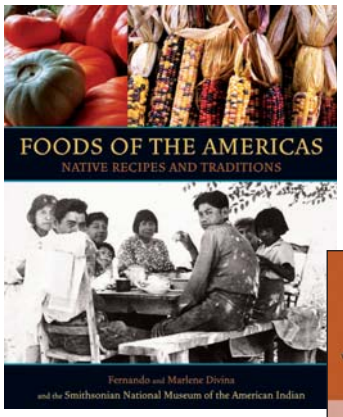
The word chimney did not become associated with the bird's name until 1761, when a Swedish naturalist named Kalm called it "Korstens Swalor," or "chimney swallow," in his book *En Reas til North America*.

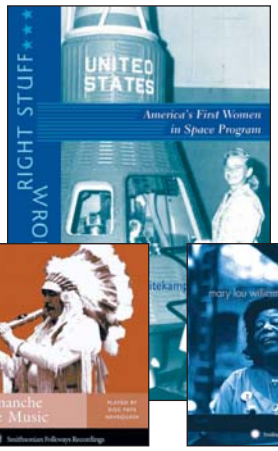
The common name "chimney swift" was introduced by naturalist Thomas Nuttall in 1840. The name became popularized in 1888 after its publication in a checklist of North American birds.

"The clearing of millions of acres of primeval forest in eastern North America by European colonists led to a profound shift in the breeding ecology of the chimney swift," Graves wrote in an article published in the journal Archives of Natural History. "It was one of the first native American birds to nest in European dwellings, a conversion that appears to have occurred rapidly in settled areas."

*—John Barrat*

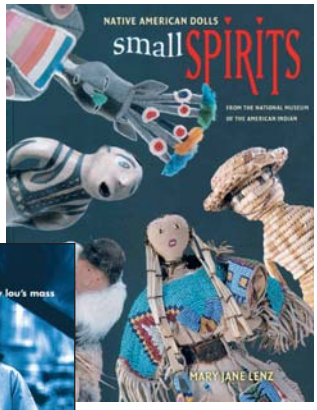







**Native American Dolls: Small Spirits From the National Museum of the American Indian,** by Mary Jane Lenz (University of Washington Press, 2004, $24.95). This richly illustrated book explores a dazzling variety of dolls—from prehistoric ceramic figures to contemporary Inuit and Pueblo creations—that embody the vibrancy of Native American life.

**Sports: Breaking Records, Breaking Barriers,** by Ellen Roney Hughes (Scala Publishers, 2004, $9.95). A look at the highlights of the sports collection at the Smithsonian's National Museum of American History.

**Building America's Hangar: The Design and Construction of the Steven F. Udvar-Hazy Center,** by Lin Ezell (Giles, 2004, $45). An engaging, illustrated, behind-the-scenes history of the building of the Smithsonian National Air and Space Museum's new Steven F. Udvar-Hazy Center in Chantilly, Va.

**Native Modernism: The Art of George Morrison and Allan Houser,** by Truman T. Lowe (University of Washington Press, 2004, $35). An in-depth look at the magnificent paintings, drawings and sculptures of two highly acclaimed Native American artists.

**The Papers of Joseph Henry, Volume 10, January 1858-December 1865: The Smithsonian Years,** edited by Marc Rothenberg (Science History Publications, 2004, $89.95). The latest volume of the Smithsonian's Joseph Henry Papers Project covers events leading up to and through the Civil War and includes Henry's opinions on race, democracy and American society.

**Right Stuff, Wrong Sex: America's First Women in Space Program (Gender Relations in the American Experience),** by Margaret A. Weitkamp (Johns Hopkins University Press, 2004, $45). A history of the achievements and frustrated hopes of a remarkable group of women who struggled to serve their country as astronauts in the early 1960s.

**Foods of the Americas: Native Recipes and Traditions,** by Fernando and Marlene Divina (Ten Speed Press, 2004, $39.95). Culinary traditions of the Native peoples of the Americas are celebrated in this colorfully illustrated cookbook.

**Mary Lou's Mass** (Smithsonian Folkways Recordings, 2005, $15). Gospel-tinged, innovative, dynamic, sometimes funky and always profoundly stirring, this album of piano music by Mary Lou Williams is music for the soul.

**El Ave de Mi Soñar: Mexican Sones Huastecos** (Smithsonian Folkways Recordings, 2005, $15). Festive, poetic songs of northeastern Mexico characterized by melodic violin, guitar and soaring vocals.

**Comanche Flute Music Played by Doc Tate Nevaquaya** (Smithsonian Folkways Recordings, 2004, $15). A reissue of this flute master's seminal 1979 Folkways LP featuring his diverse repertoire and spoken introductions.

**The Countrymen Have Arrived: Concert Favorites of Nati Cano's Mariachi Los Camperos** (Smithsonian Folkways Recordings, 2005, $15). The favorite songs of a band long considered the foremost interpreters of mariachi music in the United States.

*Books listed on Pages 14 and 15 may be ordered through online book vendors. They also may be purchased in bookstores nationwide.*

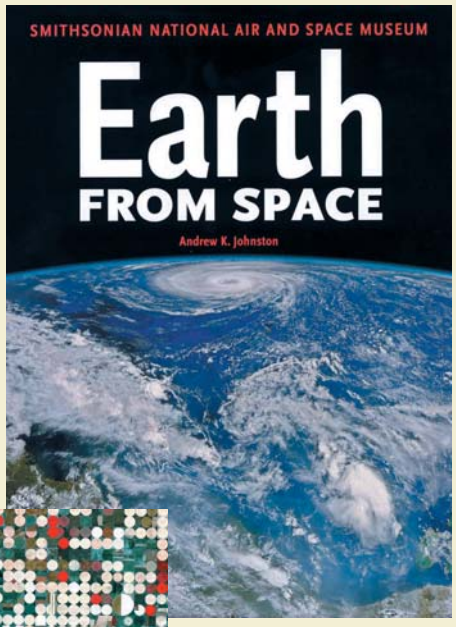
*Recordings can be ordered from Smithsonian Folkways Mail Order, Smithsonian Folkways Recordings Dept. 0607, Washington, D.C. 20073-0607. To order by phone, call (800) 410-9815 or (202) 275-1143.*

# *Earth From Space*

By Andrew K. Johnston (Firefly Books, 2004, $49.95)

In the aftermath of the devastating tsunami that struck many coastal areas of South Asia on Dec. 26, 2004, newspapers used satellite images to help readers comprehend the incomprehensible. Photographs—"before" and "after"—taken miles above the Earth by remote-sensing satellites made clear the levels of destruction to many communities. Portions of Banda Aceh, Indonesia, for example, were virtually scoured from the face of the Earth.

For nearly a decade, scientists have used satellite images to better understand the natural phenomena and varied landscapes of the Earth. Now, a new book, *Earth From Space,* provides a vivid introduction to the many new ways scientists and others are using remote-sensing data.




**Circular fields watered by center-pivot irrigation are shown near Garden City, Kan., in the infrared satellite image at left.**

Urban planners, for example, use satellite images to map cities and plan for future development. Geologists and miners use satellite images to locate petroleum and valuable mineral deposits. Images taken from space help firefighters locate forest fires and meteorologists track weather patterns and the paths of hurricanes.

Author Andrew Johnston, a geographer at the Center for Earth and Planetary Studies at the Smithsonian's National Air and Space Museum, explains in detail how scientists glean information from satellite images. This work is providing new insight into such subjects as global warming, winter weather systems, island ecology and overpopulation.

"These are some of the most sophisticated satellite pictures ever taken of Earth," Johnston explains in the book. *Earth From Space* includes spectacular sky-high images of glaciers and forests, hurricanes and volcanos, the Grand Canyon, the pyramids, airports, major cities and even war zones—all viewed at different perspectives by orbiting satellites.

One image in *Earth From Space* shows the angry white cloud mass of tropical storm Gustav, which soaked and stressed the North Carolina coast in 2002.

Military applications for satellite images are numerous. Included in the book is an April 2003 image taken by the IKONOS satellite showing the effects of U.S. air strikes on buildings in downtown Baghdad, Iraq.

Patterns of agricultural activity, when beamed back to Earth from a satellite, can appear as beautiful arrangements carefully created to please the eye. An infrared image of Garden City, Kan., taken by the Landsat 7 satellite in 2000, shows dozens of perfectly circular fields watered by center-pivot irrigation. Growing crops appear bright red. By contrast, fallow and harvested fields are yellow. It is an astonishing mosaic.

Similar infrared images of the Amazon clearly reveal areas where rain forest has been replaced with farmers' fields.

Much more than a collection of extraordinary images, *Earth From Space* includes background information explaining the tools of the trade and maps that place the photos in context. The introduction offers an overview of the past, present and future of remote sensing.

Intended for a general audience, this large-format book strikes a balance between wow-'em pictures and educational text on remote-sensing technology.

Many images in this visual journey draw the reader's attention to how Earth is being covered in concrete and steel. Human impact also is visible in side-by-side images of the Aral Sea in central Asia. The first was taken in 1998. The second in 2002. Even a layperson can interpret the contrast: The sea is disappearing.

"It is one of the most severe environmental problems caused by humans. Nobody's come up with a solution," Johnston says.

Individually, the images in *Earth From Space* capture every aspect of our dynamic planet. Collectively, they provide us with a unique and unparalleled view of the Earth.

*—Daniel Friend*

# *Rare image of the Smithsonian Castle turns up on an Internet auction site*

It was so cold inside the Smithsonian Castle on Jan. 24, 1865—the infamous day that this Washington, D.C., landmark caught fire—that water-filled fire buckets inside the building were unusable because they had frozen solid.

The central roof of the Castle caught fire after an employee stuck a stovepipe into what he believed was a chimney flue. "It was actually an air shaft that went up into the attic," explains Rick Stamm, keeper of the Castle Collection in the Smithsonian's Office of Architectural History and Historic Preservation.

The fire did extensive damage to the building and reduced most of the Smithsonian's early records—as well as a priceless collection of portraits of Native Americans by Charles Bird King and John Mix Stanley—to ashes. Within days, a temporary wood-and-tar paper roof was constructed inside the second floor area to protect a natural history exhibition on the Castle's first floor.

Stamm, an expert on the history of the Castle, has closely studied and collected hundreds of 1800s photographs of this historic building during his 30-year career at the Smithsonian. He was astounded last fall when an antique stereograph of the Castle turned up for sale on an online auction site. "It was a photo, taken soon after the fire, that I had never seen before," Stamm says. He purchased it for the Castle Collection. (Stamm's Web site, "Stereoviews of the Castle," is online at www.si.edu/oahp.)

**Taken shortly after March 7, 1865, by George D. Wakley, this image of the Smithsonian Castle recently came up for sale on an online auction site.**

Stamm dates the image to shortly after March 7, 1865. Taken by George D. Wakley, it was in a private collection of photographs in Texas. In the photo, the top 30 feet of the south tower of the Castle are missing. "The top of the south tower was pulled down after the fire because it was unstable," Stamm explains. In addition, the roof above the center of the Castle is clearly gone, as is the peaked roof of the lower tower of the Castle's two north towers. "This roof wasn't properly replaced until the 1970s," he says. Windows on the second floor are visibly burned out and a stonemason's shed at the base of the building indicates that the Castle's rebuilding already had begun.

According to Stamm, the flag flying above the Castle was drawn on the photo after it was taken. "At the time, there was no roof on the Castle's tallest tower" and no easy way to climb to its top.

*—John Barrat*

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