History Through a Prism

PHOTOGRAPHING GREENE AND GREENE

INQUIRING MINDS IN THE CONSERVATORY
ISAAC NEWTON SPENT YEARS WORKING out his theory of universal gravitation and the three laws of motion. He published his findings in the *Principia*, helping to settle any lingering doubts that the Earth revolved around the Sun rather than the other way around. The great astronomer and physicist was also pulled by the Sun in a different way. By experimenting with a prism, he was the first to figure out how to refract a beam of sunlight into separate colors and then recombine the spectrum into white light.

This fall, The Huntington opened its new Dibner Hall of the History of Science, where visitors can see a model of Newton’s prism experiment as well as his personal copy of the *Principia*. In an interview with Huntington Frontiers (page 6), curator Daniel Lewis talks about one of his favorite scientific topics—the history of color theory. Like astronomers debating the movement of the heavens, Newton and other scientists over the centuries have adapted and revised color wheels in an effort to understand how light looked at different wavelengths.

Today, that early prism experiment seems like child’s play. Middle-school students can experience firsthand Newton’s long reach when they pick up a refractometer in one of the activities of a fun program called “CSI: Conservatory Science Investigation” (page 18). After dropping a sample of nectar on the plate of the small instrument, a student can hold it up to the sunlight to view a scale that indicates how much light bends, which depends on the amount of sugar in any given solution. By the end of the exercise, the students realize another one of Newton’s legacies—a passion for rigorous experimentation.

The late photographer William Current used a camera lens as an intermediary between himself and the beams of light that fell into his line of vision. Long fascinated with the architecture of Greene and Greene, he captured the geometric details in the patterns of wood interiors and recorded the play of natural light as it reflected off the polished surfaces. His photo of the Gamble House staircase resembles a view through a kaleidoscope, albeit in his preferred medium of black-and-white film. In a third article, Greene and Greene archivist Ann Scheid (page 11) explains that Current set out to illuminate the work of Greene and Greene and ended up mirroring their artistic achievement. Like Newton before him, Current revealed the hidden nuances that can be found between the extremes of black and white.

**Matt Stevens**


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A Critical Presidential Election loomed, perhaps the most portentous in U.S. history. Out of a crowded field of potential candidates, including powerful senators, imperious governors, and party leaders brimming with experience, an unlikely standard-bearer emerged: a virtually untested Illinois lawyer with a reputation for eloquence. The eventual nominee seemed to come out of nowhere with a dazzling speech before a national audience, and as the race progressed he revealed deep wells of electoral acumen and, at times, the sharp political elbows more associated with a Chicago ward boss than a denizen of the sleepy capital of Springfield.

If this description of Abraham Lincoln’s emergence on the national political stage sounds instead like Barack Obama’s, it’s not only because the two candidates shared a common background or political philosophy. In 1860, as in 2008, the nation stood at a fateful crossroads, and American voters faced a historic choice. So at the conclusion of this year’s lengthy and expensive presidential race, it is tempting
to reflect on that election almost 150 years ago—the most important the nation has faced and one that, unlikely as it may have seemed, brought to the fore the best man for that historical moment.

Seasoned political observers surveying the field of White House hopefuls as the 1860 contest began could have been forgiven for missing the electoral appeal of the Springfield lawyer and one-term congressman who had not won an election since 1846. One 1859 biographical survey of potential candidates failed even to include Abraham Lincoln among its 21 likely prospects. Yet Lincoln and his associates were to run a near-perfect campaign. First he began positioning himself in speeches and letters as a more “moderate” Republican than leading candidates like New York Sen. William Seward and Ohio Gov. Salmon P. Chase. Then he went directly into Seward’s backyard and delivered a phenomenal speech at New York City’s Cooper Union, attracting the attention of national political observers of all stripes. Next, Lincoln’s allies carefully positioned their man as a “viable alternative” for the Republican presidential nomination should first-tier candidates falter.

After Lincoln upset a field of better-known Republican presidential hopefuls to capture the nomination on the third ballot, his campaign team astutely focused financially and politically on the so-called doubtful states that John C. Frémont—the GOP’s first presidential nominee—had failed to carry in 1856. Party activists and money poured in (at least in 1860 terms!) to Pennsylvania, Indiana, and Illinois, enough to turn critical “battle-ground” Democratic precincts Republican. On the national level, the Lincoln campaign skillfully exploited Northern voters’ growing anti-slavery feeling and unbridgeable divisions in the Democratic Party and the electorate. The result was the nation’s first “sectional” president, so called because Lincoln won less than 40 percent of the national vote but earned a wallop 180 of 303 electoral votes from the populous Northern states. That was enough for an easy victory in the electoral college and the never-before achieved feat of reaching the White House without the help of a single Southern elector.

The presidential election of 1860 was unique in American history. It took place in the midst of the nation’s severest crisis; there were four major candidates, each of whom received at least a dozen electoral votes; not a single candidate won the popular vote in both a Northern

The eventual nominee seemed to come out of nowhere with a dazzling speech before a national audience.

One difference between 19th-century campaigning and today’s races is the role of the candidate: Lincoln never actively campaigned for himself, instead allowing allies and surrogates to do the job. He gave his one and only campaign speech at a rally in front of his own house in Springfield, Ill. (opposite). The photo and campaign materials reproduced here are part of The Huntington’s substantial holdings on Lincoln.
and a Southern state; and the winner in the electoral college failed to garner a majority of the popular vote. It remains the only election that led directly to states seceding from the Union (seven before Lincoln even took the oath of office) and to their residents taking up arms against the United States. The tally also marked the first election of a candidate with purely sectional appeal, an outcome made possible by the leading issue in the campaign (and, arguably, each campaign dating back to 1846): whether slavery should be allowed to expand into new territories.

The failure of successive political generations to resolve the issue of slavery in the territories, from Missouri to California to Kansas, has led some historians—chiefly during the middle of the last century—to label the era’s leaders as “blanderers.” My research in The Huntington’s collections points to a conclusion far closer to the opposing “irrepressible conflict” school of thought. To solve the difficult problem of slavery and its expansion required leaders to make difficult decisions about how the United States would live up to the words in Jefferson’s Declaration about human equality, and whether the enslavement of 4 million men, women, and children conflicted with the nation’s ideals. By the time of the long run-up to the election of 1860, these questions were truly beyond compromise. A growing faction of “fire eaters” in the South actively sought disunion, and a surprisingly large number of Northerners refused to condemn the violent actions of the abolitionist warrior John Brown. As Lincoln famously foretold it in 1858, “Either the opponents of slavery will arrest the further spread of it…or its advocates will push it forward, till it shall become alike lawful in all the states.” The balloting and violent aftermath of the election of 1860 suggest that Lincoln was right, and his political idol Henry Clay (the prime mover of so many failed “compromises” over slavery) was wrong. The nation could not endure half slave and half free. And in 1860, American voters went to the polls faced with the most important decision in the history of the republic.

Jonathan Earle, associate professor of history at the University of Kansas, is writing a book on the election of 1860 for Oxford University Press’s series Pivotal Moments in U.S. History. He spent the 1999–2000 academic year at The Huntington as an NEH Fellow and 2006–07 as the Billington Chair in U.S. History at Occidental College and The Huntington.

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TEN SCORE YEARS AGO

This coming February marks the 200th anniversary of Lincoln’s birth. The Huntington will commemorate the occasion with an exhibition and conference on the 16th president.

“The Last Full Measure of Devotion: Collecting Abraham Lincoln” will show highlights from The Huntington’s significant Lincoln holdings, which rank with the collections of the Library of Congress and the Abraham Lincoln Presidential Library of Illinois as the most important in the nation. The exhibition will pay tribute to those whose interest in Lincoln made them indispensable in preserving his legacy, tracing the history of collecting and interpreting Lincolniana from 1865 to Henry E. Huntington’s times. The exhibition runs from Feb. 7 to April 27, 2009, in the West Hall of the Library.

Also in the spring, The Huntington will host the conference “A Lincoln for Our Time,” bringing together a distinguished group of scholars to explore the 16th president, his times, and his historical impact. Their presentations will highlight the degree to which Lincoln remains a rich and timely subject for historical investigation. The participants will address, among other topics, Lincoln’s reaction to the Mexican-American War, his relationship with Mary Todd Lincoln, his image in the illustrated press, his role as commander-in-chief, and his handling of war-related internal dissent. The conference takes place April 3–4, 2009, in Friends’ Hall.
Leading Lady

A RECENT FILM BRINGS TO MIND AN 18TH-CENTURY PORTRAIT

by Kimberly Chrisman-Campbell

ONE OF THE STARS of The Huntington’s art collections has gone Hollywood. In this fall’s film *The Duchess*, Keira Knightley starred as Georgiana Spencer, an ancestor of the late Princess Diana, whose arranged marriage to the powerful Duke of Devonshire proved to be just as controversial as Diana’s to the Prince of Wales. Based on Amanda Foreman’s 1999 biography, the film covers two decades in Georgiana’s life, beginning in 1774 with her marriage at age 16.

A rare full-length portrait of Georgiana graces the walls of The Huntington’s Thornton Portrait Gallery. Georgiana’s mother, Countess Spencer, likely commissioned the portrait in 1775 as a reminder of her recently married daughter. Originally, it hung in the countess’s bedroom at Althorp, the Spencer family seat in Northampton (and the childhood home of Princess Diana).

The artist, Sir Joshua Reynolds (1723–1792), already had painted Georgiana once, when she was a toddler. Now she was a celebrity, one of the richest and highest-ranking ladies in the kingdom. In addition, she was an author and a noted political hostess who counted among her friends Prime Minister Charles James Fox, the playwright Richard Brinsley Sheridan, the Prince of Wales, and Marie Antoinette. Reynolds depicted her outdoors, descending a staircase, and captured her famous exuberance and charm.

Reynolds also portrays Georgiana’s flair for fashion, particularly the tall pink and white ostrich feathers she wears in her hair. Previously associated with actresses, this French style gained respectability in England thanks to the young duchess. Though Georgiana’s gown is a fanciful blend of Turkish and classical influences, her exotic headdress would not be out of place in a genteel English drawing room—or the French court, for that matter. In March 1775, she appeared at Hampton Court wearing two 16-inch plumes. The following month, Lord Stormont, then British ambassador to Paris, presented Georgiana with an ostrich feather four feet long, which she wore proudly despite increasing attacks from moralists and satirists.

The film shows why Georgiana was hailed as London’s “Empress of Fashion.” In one scene, her feathers catch on fire in a crowded ballroom, creating a minor emergency.

The London *Morning Post* reported on the ostrich feather: “Many other females of distinction have been made to molt, and rather than be laughed at any longer, left themselves featherless; while her Grace, with all the dignity of a young Duchess is determined to keep the field, for her feathers increase in enormity in proportion to the public intimations she receives of the absurdity.”

*Kimberly Chrisman-Campbell was the Andrew W. Mellon Foundation Curatorial Fellow in French Art at The Huntington from 2003 to 2007. She is currently the Maggie Pexton Murray Research Scholar at the Los Angeles County Museum of Art.*
In Living Color

A Conversation with the Dibner Senior Curator of the History of Science & Technology

by Traude Gomez-Rhine

As the Dibner Hall of the History of Science neared its opening in November, Huntington Frontiers asked curator Daniel Lewis to talk about one of his favorite topics, the history of color theory.
Q: The notion of the history of science doesn’t immediately bring to mind the history of color.
A: In fact, the history of science includes a huge number of books on color, as scientists from centuries past worked to understand how color is formed. Think about Isaac Newton’s published experiment, where he used a prism to break white light into a rainbow of colors and then combine them again into white light. Scientists were fascinated by color and were constantly working to understand it. As it turns out, when we received the Burndy Library in 2006—our biggest single acquisition in more than 80 years, and one of the country’s great history of science and technology rare book collections—we got the third largest collection of Newton materials in the world. We also received a specific collection of books and manuscripts on color, including dozens of color dictionaries, such as the two created by the American ornithologist Robert Ridgway (1850–1929).

“How do birds and color fit together?”

Ridgway was with the Smithsonian Institution from the age of 24 until his death. In 1912 he printed 5,000 copies of his book Color Standards and Nomenclature, one of the most influential works on color ever published. This was prompted by his problems with color descriptions in bird portraits. So he developed descriptions of 1,150 colors as well as the technology for making and printing them all; his wife cut all the color swatches by hand and pasted them into the books. In providing a textual description he used very colorful language—deep turtle green, clear fluoride green, malachite green, shamrock green, light Danube green, deep dull green. The books are historic artifacts in and of themselves. But it’s important to note that the book is still very much in use. Everyone from stamp collectors to naturalists to chemists refers to “Ridgway colors” to identify specific shades.

What exactly is a color dictionary?

Color dictionaries helped to quantify a very slippery notion—how to assign a unique label to a color. Say you’re a naturalist in Kalamazoo and you want to write to a naturalist in Germany about a bird that’s light blue. Saying it’s light blue will only get you so far. Distinctions between the colors were critical. They might indicate the bird was a different species or a subspecies; this was important for what it said about evolution and how species changed over time and from region to region. A color that one dictionary might call light blue–green was noticeably different from a color called Ethel green, for instance. These dictionaries

Huntington books related to color and color theory sampled here include J. Norman Lockyer’s Studies in Spectrum Analysis (1878), which illustrates light spectra from stars (detailed in the title treatment of this article); Isaac Newton’s Opticks (1717, 2nd ed.), which includes the three line drawings on these pages and that on page 8; and Charles Darwin and John Gould’s The Zoology of the Voyage of H.M.S. Beagle (1839–43), which features a color illustration of saffron-cowled blackbirds.
Alberti (1404–1472) and Leonardo da Vinci (1452–1519). These writers and thinkers really wanted to connect the extremes of black and white. What was it, really, that lay between them? Battista, a contemporary of da Vinci’s, was the first to try to work out the “essential” colors required to form other colors. Mixing colored pigments to create new colors of paint or dye was certainly well known by then—perhaps from the prehistoric era. Battista thought four chromatic colors made up all others—yellow, green, blue, and red. Da Vinci took Battista’s arrangement and extended it to seven colors. This “seven color” idea wasn’t
gave naturalists and others a visual language with which to identify with much greater precision what something actually looked like. This was in the days before you could e-mail color images to someone. There are dozens of color dictionaries and no comprehensive bibliography of them.

**Was Ridgway part of a long line of people exploring this “slippery notion”?**

Well, to understand color dictionaries you need a bit of background on the history of color theory. It’s necessary to distinguish between works on color theory—which deal with the ways that colors are formed, interact, and are perceived—and color dictionaries, which are a practical application for that theory. It’s somewhat analogous to the distinction in the text realm between linguistics and dictionaries. The dictionaries put theory into action.

**And the theory has been around for a while?**

Color theory has been around for centuries. Since the early 15th century people have been writing about color theory principles, including Italian polymath Leon Battista
new; it was first described by Robert Grosseteste, the first chancellor of Oxford University in the 13th century. People continued to refine descriptions of what colors really were, in their essence, up into the early 20th century.

**What role does color play in other branches of science?**

Think of color and astronomy—the color of a star as we view it from Earth in the night sky can reveal much about its composition. Although nonvisible spectra of light teach us a great deal about the composition of the universe, so do the visible spectra. Stars have what’s called a “spectral class,” which determines what their colors are. If a star is a particular shade of orange, then we know it’s cooler or warmer, or farther away or closer, because of that shade.

In medicine, physicians make diagnoses based on the color of blood or other bodily fluids. If your bile is black or yellow, that’s very telling about your physical state. There are also many areas of color research of great interest to behavioral scientists because of what they teach us about humans’ physiological and psychological responses. For instance, it’s been shown that a black-and-white image might sustain a viewer’s interest for less than two-thirds of a second, while a colored image might hold that same person’s attention for two seconds or more. Quantifying just why this is has involved more than a few research scientists. Chemists also were very interested in colors and produced works such as *Chemical Reports and Memoirs*, by Thomas Graham, in 1810. The list is nearly endless.

**You mentioned Isaac Newton. How did he help us to understand how light produced color?**

We can’t talk about color without mentioning Newton and his *Opticks*, published in 1704. And I should also note that The Huntington has his personal copy, which is on display in the new exhibition. People certainly understood for many centuries that you could split white light into colors. They could see it in the form of the rainbow. But for some reason they couldn’t readily reproduce one. Something that now seems so simple and obvious isn’t obvious until somebody does it. Newton was an experimentalist, and he split colors with a prism and then recomposed them back into white light.

Newton also created a color wheel, which allowed people to see colors in relation to each other in circular form rather than in a straight line. One color would bleed into the next in a continuous circular path. These color wheels were important because they could show the relationships and proximity of one color to another in the spectrum. Others built on Newton’s color wheel work, including Johann Wolfgang von Goethe, Claude Boutet, J. A. H. Hatt, and others working on color between the 17th century and the first quarter of the 20th century.

**What about items from the collection that might not seem to fit the category of science?**

Milton Bradley, the great game guy, was a big color expert and had an impact on the way we think about play and color. He wrote a really important early book called *Elementary Color*, first published in 1895. In his work, he helped kids understand just what color was and how it worked. But it also engrossed him in its technical aspects. Ridgway’s color dictionary started as a Smithsonian project before he took it on as his own project, and the Smithsonian’s top officer
“Check out these colors,” Daniel Lewis exclaimed when he took visitors for a preview of “Beautiful Science: Ideas that Changed the World.” The permanent exhibition opened in November in the new Dibner Hall of the History of Science, where the walls of galleries devoted to the subjects of astronomy, natural history, and medicine are painted in bold, vibrant hues. A fourth gallery, on light, is painted white. Lewis seemed to be evoking the memory of Robert Ridgway—author of Color Standards and Nomenclature (1912)—when he described the choices he made: “Astronomy is ‘Midnight Dream,’ and we used a color called ‘Pomegranate’ for the medicine section.”

Lewis and exhibition designer Karina White knew a key challenge in presenting their exhibition was to showcase densely worded books in a way that would make them come alive. “We knew we had our work cut out for us,” said Lewis. “When you put a book on display, you’re only able to show a two-page opening.” Their solution features attractive cases set against the colorful walls, which are enlivened with numerous graphics and reproductions of illustrations from books in the collection.

Dibner Hall is named for the late Bern Dibner, whose collection of more than 67,000 books and manuscripts—the Burndy Library—came to The Huntington in 2006. An additional gift of an endowment helped establish the permanent exhibition, which draws from the Burndy Library as well as the rich holdings of scientific works that have long been part of The Huntington’s collections.

Shortly after receiving the Burndy Library from the Dibner family, The Huntington welcomed yet another generous gift. Lithography collector Jay T. Last had amassed more than 125,000 printed artifacts from the 19th and 20th centuries, including advertising posters, citrus labels, sheet music, trade cards, and historical views. He gave the entire collection—including 2,500 books—to The Huntington in 2007.

Next fall, visitors can view items from the Jay T. Last collection in a new exhibition that will include works by Milton Bradley. Years before he wrote Elementary Color (1895), Bradley was a well-established lithographer, producing posters, board games, and product labels with this form of printing, which transformed visual culture in the 19th century. The exhibition is titled “The Color Explosion: 19th-Century American Lithography from the Jay T. Last Collection.” It opens in the MaryLou and George Boone Gallery on Oct. 17, 2009.

corresponded with Bradley about a number of the technical details required to do a proper color dictionary. In any case, color was a central part of Bradley’s life, and I’m sure he was part of the reason why toys aren’t typically made in muted tones.

Scholars can come here to study Milton Bradley’s works—we have all four of his key color books, and I’m hoping to acquire relevant manuscript collections related to him as well in the coming years. All these aspects of color history are ripe for researchers eager to understand what these people have done, how they thought about their work, and why it was important.

_Tsao Gomez-Rhine is a freelance writer based in Pasadena._

Milton Bradley’s advertising poster for the Springfield Bicycle Club (1886).
Ted Bosley had a hunch. In the summer of 2005, the director of the Gamble House got a call from someone who had purchased an Arts and Crafts lantern on eBay. The buyer wanted Bosley to determine if it might be the work of Charles and Henry Greene, the architectural team that had designed the Gamble House and many others in the Pasadena area. Not only did Bosley suspect a connection, he thought the find might be one of three lanterns stolen from the Gamble House terrace back in 1971.
He set about looking for a historical photograph that would confirm his suspicions.

Bosley first looked in the Greene and Greene Archives, which are housed at The Huntington but run independently by the University of Southern California School of Architecture. Like the Gamble House (also operated under the auspices of USC), the archives help preserve the rich legacy of the architects. When nothing turned up, Bosley remembered that William R. Current (1923–1986) had taken a series of photographs of the Gamble House in the mid-1950s: highly detailed shots that capture light and pattern in wood, brick, and stone. Bosley may have had in mind Current’s image of a porch lantern in which the roughened oxidized surface of the metal and the marbled quality of the glass stand out with such clarity that comparison with a tangible object would be effortless.

**In his photos of the Gamble House, Current brought an eye for tight composition and extraordinary detail.**

He contacted Karen Sinsheimer, who once had been married to the late photographer and retained Current’s archive of more than 1,600 photos. His excitement soon turned to disappointment when Sinsheimer found a lantern photo that wasn’t a match. Bosley relied on other research to authenticate the eBay purchase and was thrilled when
the buyer decided to return the lantern to its original home. Sinsheimer then resolved to make a generous gift of her own. Her search through the long-forgotten photographs led her to see the value of donating the Current collection to the Greene and Greene Archives. Now Current’s valuable legacy can be viewed by researchers seeking not only to document Greene and Greene but also to explore the artistic accomplishments of this photographer.

When the Gamble House opened as a museum in 1966, the Greenes’ architecture was still largely unknown and unappreciated. Many of the other commissions by the firm were still undiscovered, others had been demolished, and some were threatened with demolition. All that remains of the Arthur A. Libby House (1905), for example, are the staircase (on view in The Huntington’s Greene and Greene Gallery), the porch lantern (on display through Jan. 26, 2009, in The Huntington’s exhibition “A ‘New and Native’ Beauty: The Art and Craft of Greene & Greene”), and a small group of photographs by Current.

In his photos of the Gamble House, Current brought an eye for tight composition and extraordinary detail, willfully shrinking the field of view to exploit the camera’s ability to capture the smallest nuances of form and surface texture. The images can be read as abstract art, fully in tune with the dominant movement in the arts of the time. Not coincidentally, Current’s approach also was in keeping with the Greenes’ celebration of the handiwork of the individual craftsman.

Current revealed his own aesthetic in the instructions he passed on to a younger photographer in the 1950s. According to an anecdote related by Graham Howe, a longtime friend of Current’s, the young Lewis Baltz had

asked Current how to make art photographs. Taking Baltz out behind his camera shop in Laguna Beach, Current instructed him to photograph a simple board fence with a single vine tendril climbing up it. “Keep the subject neutral,” he recommended, “then make sure the photograph is well-composed, and finally that it is superbly printed.” Years later, Baltz, by then an internationally known photographer and founder of the New Topographic movement, pointed to those early, formally elegant photographs of the fence as the inception of his own work.

A Pasadena native, Current studied photography at Art Center in Los Angeles, then moved to Laguna Beach in the late 1940s, where he came under the influence of
Paul Outerbridge, recognized as one of America’s most influential 20th-century photographers. After Outerbridge’s death in 1958, Current moved north to the Monterey Peninsula, where he helped found the Friends of Photography center in Carmel, along with Ansel Adams, Wynn Bullock, Brett Weston, and Morley Baer. This nonprofit gallery promoted photography as an art form. In Carmel, he met his future wife, Karen, when she visited the center on a field trip with her photography class from the University of California, Berkeley. Following their marriage in 1969, the Currents moved to Pasadena, where William began a five-year-long project—once again photographing the work of Greene and Greene.

Times had changed since the 1950s, when Current’s access to interiors had been limited to the Gamble House, graciously granted by the Gamble family. Other photographers and authors had since become interested in the Greenes’ work, creating a rivalry that sometimes caused conflicts and confused owners of the houses, who were not always willing to open their homes again and again. At the same time, everyone was aware of the race to document the buildings and furniture before they were lost to demolition or dispersal. Current found himself photographing the famous Eddy House, an Arts and Crafts monument by architect Frederick Roehrig, before its demolition in 1972, an event that shook the local architectural preservation community. Despite the difficulties, Current persevered and managed to produce a series of significant photographs of the Gamble, Blacker, Pratt, Thorsen, Ford, and Robinson houses. He carefully selected his shots, avoiding areas that had been altered in the years since the Greenes completed their commissions. Although pursuing common themes—doors, stairways, light fixtures, wood joinery, and art glass—Current sought out views unique to each house. His shot up the basement stairway of the Blacker House (see page 12), for example, illuminates a space that is usually ignored by visitors, with light reflecting off the polished wood steps and paneled side walls, revealing the rich grain and glossy texture of the wood and highlighting the windows at the head of the stairs. (Current reportedly polished the wood a bit before taking the photo.) He used the same technique in his iconic photograph of the Gamble House staircase (page 11), capturing in one masterful image the profile of the railing, the joinery details, and the grain and texture of the wood, as well as the front door with its art glass, and even the sculpture of a crane that hangs in the

Current used careful lighting, creative composition, and depth of field to entrance the viewer while revealing the subjects in new ways.
CRAFTING AN ART

William R. Current first achieved national recognition as a photographer in 1963, when his radical landscape photographs were featured prominently in a show at the Museum of Modern Art in New York. His picture of California eucalyptus trees, hung at the entrance to the gallery, became the dominant image of the exhibition. Bolton Colburn, director of the Laguna Art Museum, describes Current’s “elegant landscapes, which disintegrate and modulate light,” as having a significant influence on the history of American photography, particularly the New Topographic movement of the 1970s, led by Current’s protégé, Lewis Baltz. The MOMA show, “The Photographer and the American Landscape,” traveled to museums across the United States and also to Canada. In 1965, Current had the honor, along with only two other living photographers on the West Coast, Ansel Adams and Imogen Cunningham, of participating in the White House Festival of the Arts.

Awarded the John Simon Guggenheim Fellowship in Photography in 1964, Current moved to Santa Fe, N.M., where he produced a monumental series on Native American architecture, published as Pueblo Architecture of the Southwest in 1971, the same year that he received a National Endowment for the Arts Individual Artist Award. Meanwhile, he and his wife, Karen, began their next project in 1969, photographing the work of Greene and Greene. Their efforts culminated in the exhibition “Greene & Greene: Architects in the Residential Style,” which opened in 1974 at the Amon Carter Museum in Fort Worth, Texas, and included a companion catalog of the same title. Over the next year the exhibition traveled to half a dozen museums, including the San Francisco Museum of Art, the Chicago Art Institute, the Walker Art Center in Minneapolis, and Baxter Art Gallery in Pasadena. The Currents’ last project, Photography and the Old West (1978), consisted of photographic reproductions of vintage prints; it traveled as an exhibition to nine museums in the West and in book form became a key reference work for students of Western photography.

His dramatic compositions and selection of details often overlooked by the casual observer bring to light new and previously unappreciated aspects of the architects’ work.

stairwell. Whether in interior close-ups or more expansive views, Current used careful lighting, creative composition, and depth of field to entrance the viewer while revealing the subjects in new ways.

Conceiving the idea of a book and exhibition that would fully introduce the Greene brothers’ work, the Currents traveled to Columbia University’s Avery Architectural and Fine Arts Library in New York, where most of the Greenes’ drawings had been deposited by Jean Murray Bangs, one of the first to write about Greene and Greene architecture. They photographed hundreds of the drawings, which had to be unrolled one by one on the musty basement floor of the library, weighted, and then photographed from above. “I laid the drawings on the floor for each exposure,” Karen recalls. “It was the week of 600 knee bends.” At a time when architectural drawings were considered to be of practical value only, Current recognized that the drawings were an integral part of the Greenes’ artistic achievement and were essential to telling the story of their work.

Such was Current’s legacy when Bosley sought to authenticate that mysterious lantern and found more than he bargained for. Sinheimer’s donation arrived at the Greene and Greene Archives in November 2005. The gift not only enhances the archives’ stature as one of the three research centers on Greene and Greene (with those at Berkeley and Columbia University), but also addresses significant gaps in our understanding of their work. The timing has been fortuitous as well: both the photographs and the prints of the drawings have provided essential research material and illustrations for exhibitions and publications associated with the celebration of the Gamble House centennial this year. Architect Kelly Sutherlin-McLeod, for example, consulted drawings and photographs
of the Bandini, Camp, and Hollister houses to inform the reconstruction of a portion of the Greene’s Arturo Bandini House design, which is part of The Huntington’s exhibition “A ‘New and Native’ Beauty.”

However, the intrinsic artistic value of Current’s photographs makes them a highlight of a collection that also includes images by such major architectural photographers as Ezra Stoller and Maynard L. Parker. His dramatic compositions and selection of details often overlooked by the casual observer bring to light new and previously unappreciated aspects of the architects’ work. A photograph of the upstairs hall in the Gamble House reveals a peaked ceiling over the door to the bathroom, a surprisingly elegant touch in an otherwise dark, utilitarian corner. Current’s understanding of light and its play on architectural forms and materials like wood, stone, and glass is exemplified in a 1950s photo of the Gamble House’s front door (above), in which irregular patterns of natural light and shadow reveal the texture and curves of the wood and the patterns and sheen of the art glass so clearly that the photograph almost appears three-dimensional. This sensitivity to light surely would have been appreciated by Charles and Henry Greene, for it was central to all of their designs. Current saw the inherent art in the Greenses’ architecture and created his own works of art to record it.

Ann Scheid is the archivist of the Greene and Greene Archives.

SEEING WILLIAM CURRENT

More than 40 photographs by Current, as well as photos of the Greenses’ work by Minor White, Maynard L. Parker, Johan Hagemeyer, Frances Benjamin Johnston, Frederick Martin, and Julius Shulman, may be seen in the exhibition “Seeing Greene & Greene: Architecture in Photographs,” on view at the Pasadena Museum of California Art through Jan. 4, 2009. It was curated by Karen Sinsheimer, who donated the Current collection to the Greene and Greene Archives. She is the curator of photography at the Santa Barbara Museum of Art.
A few years ago, a rural farmer thought he had gotten away with murder. In a story that recalls the best episodes of TV’s “CSI,” the physical evidence finally caught up with him. Was it a bloody glove? Fingerprints? Gun residue? Not quite. The murderer had staged the crime as a hanging. Investigators eventually thought to compare pollen found on the rope with samples from the suspect’s vegetable crops. A jury found the defendant guilty, thanks in part to the expert testimony of a scientist well versed in the growing field of forensic botany.

In another case, Beatrice Beadle has found herself under the microscope. The butterfly expert is a suspect in the disappearance of Daisy Flowerdew’s prized potted plant. If the names sound too good to be true, that’s because they are protagonists in a plot concocted by Huntington botanical educators who have taken one page from the crime shows and another from the real-life forensics that inspire them.

“CSI: Conservatory Science Investigation” invites middle-school students from throughout Southern California to crack a case that has stumped a fictional team of investigators. On Wednesday mornings throughout the school year, 30 to 40 students gather in The Huntington’s Botanical Center for a briefing from staff educators Mike Kerkman, Martha Kirouac, and Rachel Vourlas, who have a little fun by staying in character as frustrated detectives. The trio explains they have narrowed their search.

“We have four suspects, but we need your help analyzing the evidence,” says Vourlas as she hands out kits containing bagged and tagged items from the scene of the crime: nectar from the prized potted plant and pollen, soil, and seeds found on the suspects or their property.

The students are split into teams of four or five, each charged with investigating one of the unusual suspects: the aforementioned Beatrice Beadle; hummingbird enthusiast Scarlet Flitterwell; Jacques Soufflé,
a chef specializing in organic ingredients; and Skip Shutterman, a renowned wildlife photographer who is showing his work in an exhibition titled "Bee Specific."

Beadle, for example, was one of 50 guests at Mrs. Flowerdew’s party on the night the plant in question went missing. Beadle has her own impressive garden, complete with plants that attract butterflies. Did she give in to temptation and steal the precious plant to add to her collection?

The neophyte crime solvers get to work, amused by the faux realism of the exercise but nonetheless humbled by the responsibility. They want to get it right. In four stations scattered across The Huntington’s Rose Hills Foundation Conservatory for Botanical Science and Brody Teaching Lab, they set about testing the soil, pollen, and nectar samples from their evidence kits. Huntington volunteers are on hand at each station to provide guidance.

“The kids are drawn into the project because the format is familiar from TV,” says Daniel Morse, a science teacher from Bloomington Middle School in Colton. He brought a group of seventh and eighth graders in April. “But at the core of the ‘game’ is
the most effective type of inquiry-based learning.” The Huntington educators agree.

In inquiry-based learning, students are encouraged to formulate questions before setting out to find the answers. The teacher acts as a facilitator rather than simply as a source of information.

Morse has been bringing students to The Huntington for years, long before its “CSI” program kicked off in the spring of 2007. He cites one memorable field trip to the Desert Garden as a nice illustration of inquiry-based learning. As the students gathered around a group of aloe vera plants, they began shouting out a riot of questions: Why are they shaped like that? Why do their leaves look like gutters? Why do they have waxy leaves? Rather than answer the kids directly, Morse asked a docent if one of the students could spray a plant with a water bottle. With a few squirts, the kids saw how the water beaded up on the waxy surface and slid down to the center of the plant. They then discussed how a waxy surface could also help keep moisture from evaporating too quickly in a dry climate.

Morse knows that some students might “get it” simply by listening to a lecture about drought-resistant plants. Others absorb a lesson through their reading assignments. But he feels more students are reached by reinforcing both lecture and reading with active observation. It’s that last component of inquiry-based learning that brings him to The Huntington every year with a new group of students.

“Sure, I could do a lab simulation with wax paper,” says Morse. “Or

Above: Before sifting through evidence left at the crime scene, eighth grader Harry Flynt takes a close look through a microscope at different types of seeds, analyzing how their shapes dictate their mode of dispersal. Behind him, classmates Kevin Herrera and Elliot Wandel make notes of their findings. Photo by Lisa Blackburn. Right: The “CSI” workbooks added a level of verisimilitude with photos of the “crime scene” and from the suspects’ homes. The workbooks won the Gold Media Award from the Garden Writers of America this fall.
better yet, I could go to Home Depot and buy a number of cactus plants and bring them to my classroom.” But he says his annual trips to The Huntington add an element of fun while reinforcing his lesson plan.

In “CSI,” the students combine their enthusiasm for observation in the field with the discipline needed in a laboratory. A variety of scientific instruments adds a level of gadgetry that helps make for a memorable experience. While the typical classroom might have a set of microscopes, it’s unlikely it would come equipped with a refractometer, a tool that measures the sugar content of nectar samples. After all, suspect Beatrice Beadle said she wouldn’t even be interested in the plant in question because it didn’t attract butterflies. The students quickly read how butterflies, hummingbirds, and bees seek out plants with different sugar levels. They then test a nectar sample—and the merits of Beadle’s alibi. Intrigued by their findings, they move on to the other stations.

While using high-tech instruments impresses the kids, just as impressive is the team approach they employ. The students want to help each other. Although each team hopes to find the guilty party, they do not treat the 90-minute exercise as a competition. After all, the average adolescent is well-versed in networking. Part of the inquiry process is to get information from other people, albeit with a healthy dose of skepticism.

“That’s one of the whole points of science,” Morse says. “You put your research out there and let your colleagues rip it apart to see if it stands.” But “CSI” participants tend to be supportive. They might debate each other, but they eventually arrive at a consensus.

In inquiry-based learning, students are encouraged to formulate questions before setting out to find the answers.

Morse speaks glowingly about a former student who wants to go into forensic science, but he is equally proud of the kids who admit that science isn’t their thing. Jeramie Diaz, for example, is an eighth grader whose passion is for music, not molecules. Nonetheless, he immersed himself in the “CSI” exercise, drawn in by the realism of the format.

Fellow student Lorie-Ann Arce, on the other hand, sees herself going to medical school someday and enjoyed setting aside her books to do some
hands-on learning, particularly the seed dispersal testing conducted using samples that are transported via the wind or on the backs and feet of furry animals.

For Morse, the “CSI” program transcends his science curriculum. “If there is one thing that I want my students to walk away with,” he explains, “it’s the ability to support whatever they say with some sort of evidence.” If his students end up in a political or business realm, for example, Morse wants them to support their decisions with facts.

“CSI” is analogous to what goes on in our court system, he says, riffing on the true-crime format of the program. “You have to prove a particular case or problem—did this person commit this crime?”

A jury would use inquiry to piece the evidence together, determining which facts are relevant while disregarding others.

“I want them to be good jurors,” he says. The Huntington volunteers and botanical educators have also prepared them to be stellar expert witnesses.

Matt Stevens is editor of Huntington Frontiers.
Like the students from Bloomington Middle School, scientist Sarah Feakins knows a thing or two about the waxy surfaces of succulent plants. The assistant professor of earth sciences from the University of Southern California has been conducting her own inquiry-based project in The Huntington’s Desert Garden Conservatory.

We often hear weather reports describing the hottest or wettest day “on record.” Unfortunately, such data have not existed all that long. Can we say with any certainty, for example, that the dust bowl of the 1930s was the driest spell in its region’s history? Feakins has been applying her training in geology and chemistry to answer some very big questions about climate. A few years ago she was studying how the environmental differences between forest and grassland vegetation in Africa can help tell stories about human evolution. She now is trying to show how waxy succulent leaves can teach us about patterns of climate change. Feakins believes her research ultimately will reveal patterns of drought going back centuries, if not millennia, allowing scientists to anticipate the dry cycles ahead.

Those leaf waxes are actually made of lipids, resilient little compounds that can be found in sediment millions of years after the plant dies and decomposes. Feakins is most interested in the hydrogen isotopes found in the lipids.

Feakins grew up in England and was educated at Oxford and Columbia University. She conducted some of her research in the Desert Garden Conservatory while on a postdoctoral fellowship at Caltech. She speaks in a clipped accent, enhancing her conversation with a strong dose of elements from the periodic table.

“Think of a glass of water,” Feakins explains, “or H\textsubscript{2}O.” For those who don’t remember their basic chemistry, each hydrogen molecule has a mass of one, whereas oxygen has a mass of 16. A water molecule’s mass, therefore, adds up to 18. However, nature includes the occasional hydrogen isotope—deuterium—that is just a bit heavier than normal, creating a water molecule that actually has a mass of 19. When water evaporates, it is the lighter hydrogen molecule that escapes into vapor.

For Feakins, the glass is never half empty; it is half vaporized. Better yet, it is half full but “enriched” with heavier deuterium molecules. By weighing water samples to determine their ratio of hydrogen to deuterium, Feakins can detect patterns of evaporation. As for those waxy lipids found in any handful of soil, Feakins can calculate the ratio of hydrogen isotopes in them to determine changes in precipitation and aridity in the past.

The science gets far more complicated. The tricky part for Feakins is in trying to learn how different plants process—or photosynthesize—their water source into the lipids that form on their surfaces. She is profiling as many species as possible in order to document what she calls the fractionation of each plant—the ratio of hydrogen isotopes in leaf wax to those found in the irrigation source. The plants in the Desert Garden Conservatory provide a control group because they have a known water source and undergo the same fluctuations in temperature and humidity. Her research will help her better assess what she finds in sediment samples elsewhere in Southern California. If her findings hold water, she will publish her research in a geochemical journal next spring.
In Print

A SAMPLING OF BOOKS BASED ON RESEARCH IN THE COLLECTIONS

A COMPANION TO CALIFORNIA HISTORY
William Deverell and David Igler, eds.
Blackwell Publishing, 2008

This volume, produced in association with the Huntington-USC Institute on California and the West, presents 30 original essays that range widely across perspectives, including political, social, economic, and environmental history. Deverell, director of the institute, and co-editor Igler show that the study of California influences historical scholarship well beyond the state’s borders. Topics include the struggles of a pluralistic society, immigration, political reform, religion, and globalization.

THE WEB OF EMPIRE: ENGLISH COSMOPOLITANS IN AN AGE OF EXPANSION, 1560–1660
Alison Games
Oxford University Press, 2008

In their first forays outside of Western Europe, the English learned to rely on accommodation and innovation rather than force. They transported this style of imperialism wherever they went, always adapting to local opportunities and constraints. Drawing on the fascinating life stories of cosmopolitans who traveled, traded, preached, governed, and colonized all around the world, Games explores the century in which England’s global stature was transformed.

PATH OF EMPIRE: PANAMA AND THE CALIFORNIA GOLD RUSH
Aims McGuinness
Cornell University Press, 2008

Tens of thousands of U.S. citizens migrated westward to California by way of Panama during the California Gold Rush. In Path of Empire, McGuinness describes the intertwined histories of the Gold Rush, the course of U.S. empire, and anti-imperialist politics in Latin America. In his transnational history, McGuinness reveals how U.S. imperial projects in Panama were integral to developments in California and the larger process of U.S. continental expansion.

POSTSCRIPT

Last year, T. June Li wrote about the naming of The Huntington’s new Chinese garden in the Spring/Summer 2007 issue of Huntington Frontiers. The name Liu Fang Yuan or Garden of Flowing Fragrance, arose from thoughtful discussion among Li—who is curator of the Chinese garden—and members of her advisory committee: Richard Strassberg, Wango H. C. Weng, and Yang Ye. In Another World Lies Beyond: Creating Liu Fang Yuan, the Huntington’s Chinese Garden (Huntington Library Press, 2009), Li has gathered essays by Ye and Strassberg along with several other contributors who discuss the challenges of constructing the garden in Southern California as well as the cultural traditions and aesthetics of Chinese garden design, especially the ways in which the plants and structures engage the imagination of visitors. Weng’s dedication speech for the new garden also appeared in this magazine (Spring/Summer 2008), where he compared the literary allusions of garden names to evocative dreams. In his foreword to the new book, he writes that the new garden is a dream come true.

In 2004, Lori Anne Ferrell and Steven Tabor co-curated the Huntington exhibition “The Bible and the People.” Ferrell’s continued interest in the subject has resulted in the publication of a new book of the same title. The Bible and the People (Yale University Press, 2008) charts the extraordinary voyage of the Bible from early manuscripts and Gutenberg volumes to versions commissioned by kings and queens, not to mention the array of offerings shown by door-to-door salesmen in the 19th century. An excerpt from her book appeared in the Fall/Winter 2006 issue of Huntington Frontiers, where she wrote about the Kitto Bible, which contains 30,000 engravings and drawings in 60 large volumes. That extra-illustrated version is but one example of the ways the Bible has been endlessly retailed to meet the changing needs of religion, politics, and the reading public while retaining its special status as a sacred text.

ON THE WEB Link to the entire contents of back issues of the magazine at http://www.huntington.org.
Thomas Andrews was born in Boulder, Colo., and teaches history at the University of Colorado, Denver. While he might live a mile high, he delves into the underground history of southern Colorado, which once was occupied by countless miles of active coal mines. His new book describes the Ludlow massacre of 1914 as less a flashpoint of labor strife than the culmination of generations of competing forces that drove workers, consumers, and industrialists.

On April 20, 1914, 19 people (including six strikers and 11 children) were killed in Ludlow by the Colorado National Guard, the bloodiest day of a 14-month coal miners’ strike. But Andrews shows that the unrest started years earlier. Back in 1884, 59 workers died in an explosion at the Jokerville mine in Crested Butte. “Like the gunfighters of Western lore,” Andrews writes, “most died with their boots on.” While alluding to the romance of the Wild West, Andrews describes the reality of its industrialization, challenging his readers’ notions of Western history, not to mention labor and environmental history. For him, Denver is not a mere boomtown on the frontier but a complicated urban metropolis built by fossil fuel as much as by bricks and mortar.

Andrews is among the many scholars who have received fellowships at The Huntington while working on their first books. He writes compellingly about immigrant workers who “found the foul taste of blood and coal and last night’s drink in their mouths in these unfamiliar places, where the coal barons and their henchmen ruled just the way other overseers had governed the lands left behind: signori in business suits, hacendados in bowlers, massas piously extolling the virtues of free labor.” Historians often talk about agency; for Andrews, workers were agents of their own actions as much as they responded to the forces around them.

In Colorado, consumers, too, played a role in the decades leading up to the Ludlow massacre. Before our modern-day carbon footprint there was the 19th-century coal footprint: coal was used to bake the bread, “mill the flour...refine the sugar beets that sweetened the bread...power the elevators that sorted and stored wheat kernels before milling...and power the locomotives that hauled golden streams of grain.” From this perspective, Killing for Coal is ultimately a history of energy.
On the Cover

Isaac Newton was the first to use a circle to show the relationships among the colors in a spectrum of white light. Other scientists revised and adapted the color wheel, all the while debating the number of primary and secondary colors. Inside this issue, Daniel Lewis explains his fascination with color and color theory—from Newton’s early experiments with a prism to ornithologists’ attempts to develop standardized terms describing the variations in color among countless species of birds. Lewis, the Dibner Senior Curator of the History of Science & Technology, just opened a new permanent exhibition at The Huntington. “Beautiful Science: Ideas that Changed the World” includes works of astronomy, natural history, medicine, and light.