President’s Message

As the fall programming season approaches, we find ourselves beginning at the end. Or, are we at the end of the beginning? Let me explain.

The Library’s current exhibition, *Crayon and Stone: Science Embraces the Lithograph, 1800 – 1899*, opened last spring and will draw to a close in mid-September. This exhibition, which examines the relationship of lithography and scientific illustration, began the Library’s year-long look at the intersection of art and science. During this time, we have considered the ability of scientific illustration to tell stories, and the use of nuclear techniques to analyze art. We will close this exhibition with a talk by Dr. William Lacovara of Drexel University who will discuss his work using laser scans and 3D printing technology to create scale models of fossil bones, yet another expression of scientific illustration and a vivid example of the ways that science and art inform each other.

Bidding farewell to *Crayon and Stone*, and in anticipation of the October arrival of *Wheels, Pyramids, and Spinning Tops: The Scientific Approach to Color*, we find ourselves not at the end at all but midway through our examination of the art/science juxtaposition. This exhibition, and the lecture series that will accompany it, promise to alter the way we perceive and understand color. We will learn in fascinating detail what significance the concept of “color” has for an ophthalmologist, a psychologist, and a cyborg!

I hope you will be as intrigued as I am at the prospect of discovering new ways to interpret familiar concepts. Please join us as our “year of science and art” continues.

An Interview with Neil Harbisson

Neil Harbisson is an artist, composer, and cyborg activist who was born with complete color blindness. At the age of 20, he had an electronic eye (an “eyeborg”) installed in his head that allows him to ‘listen’ to colors. In 2010, he co-founded the Cyborg Foundation, an international organization that promotes the use of cybernetics to extend the human senses.

Harbisson will speak at the Linda Hall Library on November 7 at 7:00 p.m. as part of a lecture series that complements the exhibition, *Wheels, Pyramids, and Spinning Tops: The Scientific Approach to Color*. In an interview made possible by Harbisson’s Cyborg Foundation, Neil explains how his eyeborg works and what life as a cyborg is like.

How long have you been wearing the eyeborg?

*Neil Harbisson:* In 2003, when I moved to Devon to study music composition at Dartington College of Arts, I heard a lecture by Adam Montandon, a cybernetics expert. He helped to create my first “eyeborg,” which lets me hear light waves. The very first thing I looked at with it, outside the classroom, was a red notice board. It made the note F, the lowest sound on the spectrum. Red was my favorite color for years. Now it’s eggplant because it sounds unusually high pitched.

How does it detect color?

*NH:* Color is basically hue, saturation, and light. Right now, I can see light in shades of gray, but I can’t see its saturation or hue. The eyeborg detects the light’s hue, and converts it into a sound frequency that I can hear as a note. It also translates the saturation of the color into volume. So if it’s a vivid red I will hear it more loudly.

How is the eyeborg attached to your head?

*NH:* In the beginning, I had cables coming out of my head, snaking down into a big backpack with a laptop. It made people a bit uncomfortable. But now the eyeborg translates color into sound using a chip at the back of my skull. It makes noise by pressing against my head and I hear color through bone conduction. This way, it doesn’t interfere with regular hearing because it comes through different channels.
How long did it take you to learn how to recognize colors?

NH: About five weeks, but it was five weeks of 24/7. After five weeks my headaches went away and it became automatic. Now it feels normal, it's just like an extra sense.

What powers it?

NH: I still have to recharge myself at a power socket, but I'm working on ways to use my blood circulation instead. I recently had it osteointegrated—which means that part of the device was put inside my bone in a hospital in Barcelona and now the sound resonates much better. It took a year to convince them that it was ethical to have the eyeborg implanted.

When did you feel like it had become an extension of your body?

NH: When I started to hear colors in my dreams is when I noticed that my brain and the software had united and given me a new sense. My brain was creating electronic sounds in my dreams, not the device. That was the point when I started to feel no difference between the software and my brain: the cybernetic device had become an extension of my brain—an extension of my senses.

It's that connection that makes a cyborg a cyborg.

Can you go beyond the normal range of the 360 or so visible hues?

NH: I perceive near infrared—I perceive color that is invisible to the human eye. And also near ultraviolet. The thing about perceiving UV is that it's good to detect it because it damages the skin and I can know about it beforehand. This allows me to perceive pictures that no one else sees.

I also do portraits live by pointing at the different hues on the different parts of the face, so I can create the chord of a face. Prince Charles sounds surprisingly similar to Nicole Kidman.

Neil Harbisson

You came up with a new term to describe yourself, sonochromatism. What is that?

NH: Achromatopsia can no longer define my visual condition because achromatopsics cannot perceive nor distinguish colors. Also, synesthesia does not define my condition accurately because the relation between color and sound varies depending on each person, whereas sonochromatopsia is an extra sense that relates color to sound objectively and equally to everyone.

You're an artist and a musician. How have you integrated the eyeborg into your profession?

NH: Thanks to the eyeborg, I've made a career by combining music and art. I do concerts where I plug myself into a set of speakers and play the colors of the audience back to them. The good thing is that if it sounds bad, it's their fault! I also do portraits live by pointing at the different hues on the different parts of the face, so I can create the chord of a face. Prince Charles sounds surprisingly similar to Nicole Kidman. This is how I found out that there are no black or white skins. We all are different shades of orange.

In 2010 you started the Cyborg Foundation. What is its mission?

NH: Our mission is to help humans become cyborgs, to promote the use of cybernetics as part of the human body and to defend cyborg rights. We do not sell cybernetic extensions, we believe that cybernetic extensions should be treated as body parts, not as devices, and therefore should never be sold. Instead we encourage people to create their own sensory extensions.
**Fall Programs**

**Thursday, September 12, 2013 at 7:00 p.m.**  
*Next-Gen Paleontology: 3D Printed Dinosaurs*  
Dr. Kenneth Lacovara, Associate Professor, Department of Biodiversity, Earth & Environmental Science  
Drexel University

According to Dr. Kenneth Lacovara, “technology in paleontology hasn’t changed in about 150 years. We use shovels and pickaxes and burlap and plaster. It hasn’t changed—until right now.” Dr. Lacovara will share his pioneering work using laser scans and 3D printing technology to create and test scale models of fossil bones for educational use, museum display, and for testing hypotheses about how dinosaurs moved and behaved.

**Thursday, October 10, 2013 at 6:00 p.m.**  
Exhibition Opening  
*Wheels, Pyramids, and Spinning Tops: The Scientific Approach to Color*  
Curator: Nancy V. Green, Head, Digital Projects Unit  
Linda Hall Library

What is your favorite color? This seemingly straightforward question is anything but simple. If a follower of Aristotle answered the question, they would choose one of five colors, or light and dark. A proponent of Isaac Newton might select one of the seven colors of the rainbow. A contemporary web developer might choose from a palette of 256 colors, and a fashion designer could select one of the 1,925 colors in a Pantone palette.

Philosophers, scientists, manufacturers, and artists have struggled with the attempt to understand, categorize, capture, and standardize colors from ancient times to the present day. In fact, color is devoid of meaning without human perception.

The exhibition explores color from several vantage points. “Published theories on color systems will be represented by an amazing array of intricate diagrams and dazzling representations of color,” explains exhibition curator Nancy V. Green. “Visitors will see Richard Waller’s hand-colored, linear exploration of Isaac Newton’s theory, Michel Chevreul’s color wheels, Wolfgang von Goethe’s experiential color studies, and Albert Munsell’s color tree concept that demonstrated the attributes hue, chroma, and value.”

The exhibition also will explore specific aspects of the experience of color firsthand. “Concepts of color vision and color blindness will be presented through the optical works of James Clerk Maxwell, Thomas Young, and Hermann Helmholtz, as well as Wilhelm Von Bezold’s color experiments,” notes Green. “By spinning tops, experiencing color illusions, experimenting with different states of color vision, and exploring the interaction of colors, visitors will leave the exhibition with new insights on the line between the sensation and the science of color.”

*Wheels, Pyramids, and Spinning Tops* opens Thursday, October 10 at 6:00 p.m., followed by a lecture at 7:00 p.m. by Dr. Jay Neitz. Exhibition galleries are open Monday through Friday from 9:00 a.m. to 5:00 p.m., and the second Saturdays of each month from 10:00 a.m. to 2:00 p.m. Admission and parking are free.

**Thursday, October 10, 2013 at 7:00 p.m.**  
*Reweaving the Rainbow*  
Dr. Jay Neitz, Bishop Professor of Ophthalmology and Color Vision Researcher  
University of Washington

Jay Neitz’s goal in life is to cure colorblindness. Working alongside his wife, Maureen, he seeks to understand how the human visual system operates by studying the entire process of seeing, from genes to behavior. He will explore how and why we see color, the evolution of color vision, and experiments using gene therapy with primates as a potential treatment for human vision disorders.
Thursday, November 7, 2013 at 7:00 p.m.
*Listening to Colors: Life with Extra Senses*
Neil Harbisson, Artist, Cyborg, and Colorologist

Neil Harbisson is an artist best known for his ability to hear and perceive colors outside the range of human vision. Neil was born with achromatopsia, a condition that only allows him to see the world in black and white. At the age of 20, he had an electronic eye (“eyeborg”) installed in his head that allows him to ‘listen’ to colors. Neil will talk about his personal relationship with cybernetics and how technology changed his perception of life.

Wednesday, November 13, 2013, at 7:00 p.m.
*The World Until Yesterday*
Jared Diamond, Professor of Geography, UCLA and Pulitzer Prize-winning author of *Guns, Germs, and Steel.*

In his latest book, Pulitzer Prize-winning author Jared Diamond compares the modern industrialized culture so familiar to us with the traditional societies that blanketed the world until relatively recently, revealing some of the things that we moderns have lost along the way as we came to embrace state government, industrialization, globalization, and technological innovation.


Thursday, November 21, 2013 at 7:00 p.m.
*Aesthetic Preference for Colors*
Dr. Stephen Palmer, Professor of Psychology and Cognitive Science, University of California, Berkeley

Color preference is an important aspect of human behavior, but little is known about why people like the colors they do. Dr. Palmer’s aesthetics lab seeks to provide an answer. He will present an interdisciplinary approach to aesthetic experience in vision using human color preferences as the focus, discussing which colors people prefer, why they prefer them, and how such preferences vary across gender, cultures, and social subcultures.

Lectures are free and open to the public; however, seating is limited and e-tickets are required. The e-ticket registration form is available at www.lindahall.org/events. If you have questions, please email events@lindahall.org or call 816.926.8772 to leave a message.

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President’s Circle Launches

The Linda Hall Library is pleased to announce the formation of a new donor recognition society, the President’s Circle. Co-chaired by Nick and Mary Ann Powell, the President’s Circle helps promote the understanding of and support for the Library’s role as an international destination for research in science, technology, and engineering, as well as support for the Library’s arboretum. Through their involvement, members of the President’s Circle help strengthen and extend the Library’s mission.

President’s Circle members raise the Library’s visibility among the general public; provide leadership support for special funding opportunities; motivate other key individuals and leaders to support the Linda Hall Library, aid in the identification, engagement, and recruitment of new President’s Circle members; and act as a sounding board for the Library’s President and Board of Trustees on its strategic planning and direction.

The Linda Hall Library
President’s Circle

The President’s Circle meets once a year for a members-only dinner and lecture. This year’s dinner will take place on October 22 and will feature a talk by Professor James Fleming of Colby College on his latest book, *Fixing the Sky: the Checkered History of Weather and Climate Control.*

Membership in the President’s Circle confers numerous additional benefits including but not limited to: invitations to pre-lecture cocktails with guest speakers, reserved seating at all Library events, a monthly e-newsletter, the biannual Hedgehog newsletter, a biannual Calendar of Events, and a directory of President’s Circle members. President’s Circle members will be able to take advantage of additional special opportunities including briefings from the Library’s resident research fellows and behind-the-scenes Library tours.

Membership in the President’s Circle is available to donors of $1,000 or more annually. For more information, please call 816.926.8781.
Library Welcomes Latest Group of Residential Fellows

Dustin Abnet, PhD
Indiana University

Dustin began a two-month fellowship in May. His project, "Taming Our Machines": Robots and the American Soul in the Industrial Age, traces how the late 18th century to the 1960s Americans attempted to reconcile their concerns for the liberty of the individual with the growth of industrial capitalism and the development of modern science and technology.

Monica Brannon, PhD Candidate
The New School for Social Research

Also in May, Monica began a two-month fellowship researching her project, Governing Technological Landscapes: A Historical Comparison between Rural Electrification Co-operatives and Rural Broadband Internet Access. It is an historical-comparative sociological study of U.S. rural electrification and the building of high-speed broadband internet infrastructure.

Eric Friesel, PhD Candidate
Indiana State University
and the University of Central Missouri

Eric arrived in April to begin a three-month fellowship. His project, Assessing the Value of Exogenous Modular System Design and Manufacture in Uncertain Rapidly Changing Technology Industry, evaluates modular system design and its impact on product development and return on investment. His research at the Library focuses on the history of modular system design.

Catherine Kendig, PhD
Western Missouri State University

Catherine began a two-month fellowship in June. Her project, Homology, Redux: Revisiting Richard Owen's Analogy/Homology Distinction, investigates the longstanding pre-Darwinian debates within comparative biology, and analyzes the recent impact of evolutionary developmental synthesis on the current meaning and use of these concepts. (Developmental synthesis is an approach that incorporates ecology, developmental plasticity, along with genetics to explain evolutionary change.)

One Year of CRL Partnership

The Linda Hall Library (LHL) and the Center for Research Libraries (CRL), a consortium of 270 academic libraries, have recently completed the first year of their Global Resources Partnership in Science, Technology, and Engineering. The partnership builds upon the rich holdings of print serials in science, technology, and engineering (STE) assembled by the two institutions during the past six decades, including the current and back issues of over 50,000 serial titles in multiple languages.

As part of the partnership agreement, CRL reimburses LHL for the cost of document delivery from its collections to CRL member libraries and their patrons. From July 1, 2012 through June 30, 2013, LHL received 13,248 requests from CRL member libraries, and was able to fill 11,037 of these requests. Each request was filled in an average of 11 hours.

The STE collections held by LHL and CRL have been analyzed for their subject and language areas of excellence. The collections are exceptionally strong in Chemistry, Physics, and Engineering, and in the Eastern European languages. LHL and CRL will continue to develop their collections with an emphasis on print serials in these subject areas and languages.

The combined assemblage of STE serials formed by the partnership is the largest created to date. LHL will soon load its holdings records into the Print Archives Preservation Registry (PAPR), a national database that allows other libraries to compare their STE holdings with the serial titles that LHL has committed to retain permanently.

LHL and CRL are pleased with the success of the first year of the Global Resources Partnership, and look forward to working together to strengthen science, technology, and engineering research for years to come.

Connect with Linda Hall Library online with Vimeo, Tumblr, Flickr, Facebook, and Twitter.
Summer Reading List

*The Case for Books: Past, Present, and Future* by Robert Darnton

“Darnton explores the alignment of electronic communication with the power that Johannes Gutenberg unleashed when he assembled the technologies used to print with moveable type, to locate any common ground that might exist between old books and e-books. In doing so, Darton finds commonality among webmasters, computer engineers, financiers, lawyers, publishers, librarians, and ordinary readers.”

Lisa Browar

*The Path Between the Seas: The Creation of the Panama Canal: 1870-1914* by David McCullough

“Pulitzer Prize-winning author and historian David McCullough tells the story of the financing and building of the Panama Canal. This epic saga has something for every reader: French, American, and Central American history; international intrigue, political and financial scandal, civil engineering, and medicine.”

Michelle Lahey

*Cooked: A Natural History of Transformation* by Michael Pollan

“Michael Pollan’s newest book relates the ways in which fire, water, earth, and air applied to raw food stuff result in nutritional, social, physical, and cultural advantages to humans. Food transformations invoke the processes of chemistry, physics, biology—all the great ingredients of a fine summer read by the campfire.”

Mary Moeller

*The Monk in the Garden: The Lost and Found Genius of Gregor Mendel, the Father of Genetics* by Robin Marantz Henig

“Little is known of Gregor Mendel and his work breeding pea plants for hereditary traits. His work was rediscovered and promoted in the early 1900s, and he is now known as the Father of Genetics. Mendel’s scientific papers and notes were burned in a fire yet in a manner akin to scientific research, Henig pieces together what is known of his life’s work to create an engaging read.”

Keri Cascio

*Fireflies, Honey and Silk* by Dr. Gilbert Waldbauer and James Nardi

“Looking for entomological trivia? Take a look inside this fascinating book. It’s an entertaining foray into the many uses humans have made of various insects, from dyes and candles to exotic foods and strange forms of medicine.”

Jerri Campbell

*The Signal and the Noise: Why So Many Predictions Fail — But Some Don’t* by Nate Silver

“Statistician and blogger, Nate Silver made a name for himself by correctly predicting the electoral outcome of every state in the 2012 U.S. presidential election. Silver’s latest book is written for a popular audience who wants to better understand the use of statistics and decisions based on statistical predictions. The book uses examples that matter to us: forecasting storms and earthquakes; evaluating the skill of baseball players; predicting the performance of financial products and poker hands.”

Christine Taft

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**Upward Bound**

Over 70 Upward Bound high school students from Ft. Smith, Arkansas, visited the Linda Hall Library in July. Sponsored by the US Department of Education, Upward Bound provides fundamental support and college preparation to low-income high school students and/or high school students from families in which neither parent holds a bachelor’s degree.

The Upward Bound math and science students toured the History of Science Center, the current exhibition, *Crayon and Stone*, and the William N. Deramus III Cosmology Theater. “The students were interested and very much engaged,” said LHL bibliographer Michelle Lahey. “They asked great questions and were thrilled to learn about our collections.”

Free tours are available Monday through Friday at 10:00 a.m. and 2:00 p.m. Adult and school groups that would like an in-depth tour of the History of Science Center or bibliographic instruction should contact Eric Ward at 816.926.8753 to schedule a time.
Panama Canal

On August 15, 1914, the Panama Canal opened for business after decades of construction by French and American engineers. Inspired by the centennial, the story of the events leading up to the grand opening of the canal will be retold in the Linda Hall Library’s exhibition, The Land Divided, The World United: Building the Panama Canal, opening April 8, 2014.

Visitors to the exhibition will explore the dynamic period of canal building in the early 20th century through the eyes of Office Engineer A.B. Nichols who lived and worked in the Canal Zone from 1899 until the Panama Canal opened in 1914. The exhibition will include artifacts from the Library’s Nichols Collection, a scale model of the Canal Zone, a model of a working canal lock, and rare books from the Library’s History of Science collection. Visitors will also learn about the vital role played by the technologies used in canal building, especially the importance of railroads to the entire enterprise.

The exhibition will be accompanied by a free public lecture series and an interactive educational website. Alberto Alemán Zubieta, CEO of the Panama Canal Authority from 1996 to 2012, will deliver the exhibition opening lecture. David McCullough, Pulitzer Prize-winning author and historian, will headline the fall lecture series with a talk based on his book, The Path Between the Seas: The Creation of the Panama Canal: 1870-1914, on October 2, 2014, at Unity Temple on the Plaza.