

# Transmutations

No. 7 | Summer 2010

**transmutations** \tran(t)s-myü-'tā-shenz  
n. Acts of change or alteration to appearance  
or nature, especially to a higher form.



Today's students will tackle tomorrow's challenges. CHF is helping prepare a new generation of scientists and engineers for this vital task.

CHF



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No. 7 | Summer 2010

**Transmutations** is a newsletter published three times per year for supporters of CHF.

## Comments or questions about this issue?

### Please contact

Margo Bresnen, Editor  
mbresnen@chemheritage.org

## For information on supporting CHF, please contact

Rick Sherman, Director of Advancement  
rsherman@chemheritage.org

## Chemical Heritage Foundation

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315 Chestnut Street  
Philadelphia, PA 19106-2702  
Phone: 215.925.2222  
Fax: 215.925.1954  
chemheritage.org

## HOURS

### The Museum at CHF

Monday–Friday, 10:00 a.m.–4:00 p.m.  
First Fridays, 10:00 a.m.–8:00 p.m.

### The Donald F. and Mildred Topp Othmer Library of Chemical History

Monday–Friday, 10:00 a.m.–4:00 p.m.  
(by appointment; schedule at  
reference@chemheritage.org)

## Go to chemheritage.org for

- *Chemical Heritage*, CHF's magazine
- *Distillations*, our award-winning podcast
- Blogs, including Ship of Fellows, The Center, and Periodic Tabloid
- Classroom Resources
- Event Registration
- *And much more*

## Also check out CHF on

YouTube, Facebook, Flickr, LinkedIn, MySpace, and Twitter

**DESIGN:** Willie•Fetchko Graphic Design

**COVER PHOTO:** Conrad Erb



*I joined CHF* nearly seven years ago, just in time to witness the launch of the 25th Anniversary Initiative. The initiative was CHF's first major fundraising campaign and, having spent the previous 20 years in industry, it was my first campaign as well. We set—and later reached—ambitious goals, including raising \$75 million, building on our unparalleled collections, and creating a unique, unforgettable museum at our headquarters.

We also decided to expand CHF's programming to reach across the United States and around the world. One new program, History Live, has been particularly successful. An extension of CHF's Oral History Program, History Live presents first-person accounts of legendary careers before a live audience. The inaugural interview with P. Roy Vagelos, former CEO of Merck and Co., at CHF was followed by a conversation between Stephen Turner, cofounder of Pacific Biosciences, and CHF's David Brock at the Gordon and Betty Moore Foundation in Palo Alto, California.

In the next 12 months CHF will host several more History Live events around the country, including discussions with Nobel laureates Robert Curl, Jr., and Sir Harold Kroto at the T. T. Chao Symposium in Houston, with Joseph DeSimone in North Carolina's Research Triangle Park region, with George Whitesides and John Deutch in New York City, and with Harry Gray and *New York Times* columnist and three-time winner of the Pulitzer Prize Thomas Friedman here in Philadelphia.

On the international front CHF has broadened its outreach in the form of affiliations. Our newest affiliate organizations are the Royal Society of Chemistry, the Fondation de la Maison de la Chimie, and the Japanese Analytical Instruments Manufacturing Association. These connections will help us accomplish important goals overseas.

Now we eagerly await the Paris launch of the International Year of Chemistry (IYC) in January 2011, where CHF's president and CEO, Thomas R. Tritton, will give an address. I hope you'll stay tuned for CHF's additional IYC observances and other activities made possible, of course, in no small part through your generous support. Thank you.

Rick Sherman  
Director of Advancement



[LEFT] Kati Miner, at left, and Kathy Tusler, visitor services assistants in the Museum at CHF, talk to a group from Little Flower Catholic High School for Girls during “Chemistry’s Past and Your Future.”



[ABOVE] Heritage Day awardees George Whitesides, C. Berdon Lawrence, and Robert Grubbs join moderator Kerry Grens and Philadelphia-area high-school students for CHF’s first Student-Laureate Forum. [LEFT] A student tries out his handmade kaleidoscope at the *Marvels and Ciphers* opening celebration.

## LOOKING AHEAD

# CHF’s Educational Initiatives

**W**hy is it crucial that CHF tell the story of chemistry? This question has many answers, but one stands out as urgent: the cultivation of a new generation of scientists and engineers. Today’s students will tackle tomorrow’s challenges, and CHF is helping prepare them for this vital task.

Several recent events at CHF have demonstrated just how engaging chemistry can be. During the opening celebration of CHF’s latest exhibit, *Marvels and Ciphers: A Look Inside the Flask*, children—and quite a few adults—explored the science behind kaleidoscopes, learning how to make their own and see the world through a new lens.

The informal learning continued

with the conference “Chemistry’s Past and Your Future.” Volunteers from Bristol-Myers Squibb, Continuum Health Partners, The Dow Chemical Company, DuPont, GlaxoSmithKline, *Science* magazine, and the Philadelphia district of the U.S. Food and Drug Administration presented 21st-century career options in chemistry to 54 local high-school students.

In May CHF added a new feature to its signature Heritage Day celebration: the Student-Laureate Forum, a moderated discussion between Heritage Day awardees and students, teachers, and principals from high schools in the Greater Philadelphia region. The inaugural event, which encouraged high-achieving students to channel their

talents toward the sciences, was moderated by Kerry Grens, senior health and science reporter at local NPR/PBS affiliate WHY? and former staff writer for *The Scientist*.

Throughout the year CHF offers valuable resources for chemistry classrooms. Visit [chemheritage.org](http://chemheritage.org) for free online teaching tools and other educational materials, including information about It’s Elemental!, a national video competition for students that CHF will launch this fall in celebration of the International Year of Chemistry.

*Scientific literacy has never been more important. If you are interested in supporting CHF’s educational initiatives, please contact Denise Creedon at 215.873.8266 or [dcreedon@chemheritage.org](mailto:dcreedon@chemheritage.org).*

# From Beer to Biotech



CONRAD ENB

John Ceccatti.

Fermentation is a core technological foundation of modern biotechnology. The process, which today allows for the mass production of medicines, materials, and foods, was first researched by 19th-century brewers.

John Ceccatti, a John C. Haas Fellow at CHF, is at work on a manuscript about the development of fermentation science within the brewing industry. The specific focus of his project is the 1880s discovery of “pure yeast culture” at Carlsberg, the Danish beer company. By the turn of the 20th century the brewing technique was widely adopted by scientists, leading to the rise of industrial microbiology and, eventually, biotechnology.

Ceccatti is a former associate director of programs in the natural sciences at the University of Pennsylvania, where he currently teaches courses in the history of science. He earned an M.S. in molecular and evolutionary genetics and a Ph.D. in the history and philosophy of science from the University of Chicago.

CHF created the Haas Fellowship to enhance public understanding of the history of the chemical industries. “The Haas Fellowship is a valuable opportunity to return to my dissertation research and interact with other fellows in residence at CHF,” says Ceccatti. “I also benefit from having direct access to the collections of CHF’s Othmer Library in the course of my research and writing.”

Ceccatti also helped CHF participate in Philly Beer Week. During June’s First Friday event he exposed the science behind the froth in a talk entitled “Vital Ingredients,” while Dock Street Brewing Company generously provided fitting samples. Visit [chemheritage.org](http://chemheritage.org) to learn more about CHF’s fellowship program.

*If you are interested in supporting CHF’s fellows, please contact Richard Ulrych at 215.873.8286 or [rulrych@chemheritage.org](mailto:rulrych@chemheritage.org).*

## Oral History Spotlight

# Family Business

Richard Bolte, Sr., founded his own logistics firm in 1966. He spent the rest of his career turning BDP International into one of the world’s largest privately owned global-logistics companies specializing in the shipment of chemicals. His oldest son, Richard Bolte, Jr., continues this work as BDP’s president and CEO. For a memoir published shortly after his father’s death in 2006, the younger Bolte recalled his first involvement with the company at the tender age of 15:

“My father needed a messenger for the business. He took one look at me, with the potential I had to lounge around the house all summer, and said, ‘Come on, I’m taking you to work.’ I was paid \$50 a week. I considered that a huge amount of money, because my allowance had only been \$4 a week. The first time I went to the office with Dad, he quickly introduced me to Joe Messick and told Joe to pick me up every morning. Dad tended to work late and would therefore come in later. He wanted to make sure that I had the discipline of starting on time, at 8:30 a.m.

That first summer I moved documents around Philadelphia, taking things down to customs, picking up from ship lines, visiting consulates. In order to handle an export, say, to Colombia, you had physically to go to the Colombian Consulate ... There was an occasional bus, called the Loop, which connected to midtown. You could take it for a quarter. I preferred to keep the quarter and walked; that way I had a dollar for lunch: a tuna sandwich, potato chips, and a Coke.

Being involved in the business was very stimulating, particularly being responsible for moving things around the world. Back when we just had phones and typewriters, the action was on the phone. You could leave work with a sense of accomplishment because you’d been on the phone all day long, making deals. Being a freight jockey was probably the most fun I had in terms of business, just moving things around.

You soon knew whether you were good, bad, or indifferent at your job, because the shipments either ended up where they were supposed to or they



Richard Bolte, Jr., at far right, stands next to his father at the latter’s 1974 wedding. Photo courtesy of Richard Bolte, Jr.

didn’t. That was very different from being a manager or leader, where the results from your decisions can take years to come through. BDP was also a highly entrepreneurial company: as long as you were making money and keeping the customers happy, you could go in any direction.”

*To support CHF’s oral history program, please contact Rick Sherman at 215.873.8254 or [rsherman@chemheritage.org](mailto:rsherman@chemheritage.org).*



[LEFT] J. Clarence "Terry" Davies, former EPA assistant administrator for policy, testifies in 2009 at a U.S. House of Representatives hearing to reexamine TSCA. Photo courtesy of Alex Parlino, Project on Emerging Nanotechnologies. [BELOW] A front-page headline from the 30 October 1977 Sarasota Herald-Tribune.

## New Law Requires Testing Of Chemical Product Safety

WASHINGTON (AP) — President Ford signed a law Tuesday requiring the testing of chemical products for public safety before they are allowed for sale.

The Toxic Substances Control Act, long sought by environmentalists, authorizes the Environmental Protection Agency to block or limit the marketing of new chemical products judged to be harmful and to ban or limit the continued marketing of such substances.

The law specifically bans "PCB" (polychlorinated biphenyls) from entering widespread use without precautions to prevent damage to health or the environment.

The Ford administration has opposed the Toxic Substances bill, but when a compromise version was worked out last month by Senate and House conferees, supporters of the House and Senate reached a conference agreement on October 27.

By signing the bill, Ford called it strong and said it would deal with "the most serious environmental problem not regulated, curtailed or banned by the chemicals it are the new law.

Slowly urged by environmentalists and White House advisers, a toxic substances control bill was prepared five years ago by Sen. President Richard M. Nixon.

Victories were passed in the House and Senate and reached a conference agreement on October 27.

More recently, the EPA reported on the analysis of 10 samples of mineral milk. All but two of the samples contained PCBs in amounts from a level deemed acceptable in later food by the Food and Drug Administration in 1966.

When Quarles criticized it in 1976, the chemical already was linked by scientific studies to such ailments as laboratory-induced thyroid and reproductive disorders.

At that time, an EPA official

We asked Jody Roberts, manager of the EHPP, to describe why the TSCA Oral History project is an important part of the program's mission.

"The TSCA Oral History project stands as an example of what we in the EHPP broadly aim to accomplish. It brings the weight of history to bear on the present in a deep and meaningful way. Such a project helps us make the argument that history not only matters, but that understanding it is necessary. And it highlights our institutional strengths—oral history and original scholarship—in the process. The TSCA project also provides the opportunity to engage with new audiences. We'll disseminate our findings as a written report later this year, and we'll present our work directly to the stakeholders in this process. It's been an extremely fulfilling project."

# A Chemical World: CHF's Environmental History and Policy Program

CHF's Environmental History and Policy Program (EHPP) was established in 2007 to advance scholarship on topics at the crossroads of chemistry, health, and the environment. Through original research, public engagement, and collection and archival activities, the EHPP contributes historical perspective and critical insight to local and national environmental issues.

For instance, the EHPP's Toxic Substances Control Act (TSCA) Oral History project sheds light on recent efforts to reform the 1970s-era chemical regulation through in-depth interviews with authors of the original law and with former senior Environmental Protection Agency (EPA) officials. Another EHPP project, Nano@EPA, explores the EPA's attempts to balance research on materials' applications with the potential environmental implications of these new technologies.

Over the last three years the EHPP has forged several rewarding partnerships with other institutions. It joins the

University of Pennsylvania School of Medicine in helping Greater Philadelphia communities bring an understanding of environmental history to the development of contemporary health policy. With the American Association for the Advancement of Science, the EHPP staff cohosts a monthly history seminar in Washington, D.C., which allows scholars to connect with government officials, scientists, and members of the general public. And for its C3 project, which connects volunteer chemists with neighborhoods in need of their expertise, the EHPP collaborates with organizations such as the Clean Air Council, Drexel University, and the Public Interest Law Center.

The EHPP is poised for further growth, both in expanding its areas of expertise and its outreach efforts. For more information about the EHPP, log on to [chemheritage.org/policy](http://chemheritage.org/policy). To support the EHPP's projects, please contact Denise Creedon at 215.873.8266 or [dcreedon@chemheritage.org](mailto:dcreedon@chemheritage.org).

# donor profile Warren Schlinger

This is a love story—and a love story in many marvelous dimensions. Like any student completing his master's thesis in 1946, Warren Schlinger needed a typist. Who better than Katharine, "Katie," the beautiful young woman who was secretary to the California Institute of Technology's two chemical-engineering professors? As courteous then as he is today, Schlinger took his helper out to dinner, paving the way to their marriage.

Schlinger, a Los Angeles native, also fell in love with chemistry—and with Caltech—at an early age. By 1939, as a 16-year-old, he had already graduated from a starter Gilbert chemistry set to his own impressive home lab (now permanently housed at CHF) and was attending evening lectures at Caltech given by Robert Milliken and other luminaries. The pathway was set, leading from undergraduate to graduate study, to a position with the fledgling chemical-engineering faculty, to a lifelong love affair with Caltech—culminating in the 2010 dedication of its state-of-the-art Warren and Katharine Schlinger Laboratory for Chemistry and Chemical Engineering. Schlinger, it should be noted, is the only individual who has known every president of Caltech since its creation, a reality underlining vividly the rapid rise of California, and Caltech, chemistry to global prominence.



Warren and Katie Schlinger at their California home in 2003.

An optimistic, affable believer in the ability of science to better the human condition, Schlinger was early convinced of the promise and power of industrial research. Hence his 35-year career with Texaco at their Montebello research station, where he pioneered many crucial innovations in coal gasification—a subject of continuing and central significance in our energy-constrained world. From a passion for innovation to sponsoring and then endowing CHF's Warren G. Schlinger Symposium was an easy step. Now in its seventh year, the Schlinger Symposium brings together senior executives, re-

search managers, and young industry scientists to take inspiration from the rich heritage of chemical innovation while exploring the emerging promise of chemistry in an ever-widening range of industrial applications.

The Schlinger Symposium and the Caltech lab are but two of the Schlingers' many generous acts. A philanthropist is one who exerts himself for the well-being of humanity, or for the love of humanity. We thank and salute the Schlingers, true philanthropists, as the romance goes on....

*Arnold Thackray, Chancellor*

## T R A N S M U T E   Y O U R   I N T E R E S T

### transmutations

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n. Acts of change or alteration to appearance or nature, especially to a higher form.

CHF can transmute your interest—and generosity—into action. We turn your charitable contributions into dynamic conferences, panel discussions, and lectures; the means to acquire and preserve world-class collections; fellowships and travel grants that encourage academic research; ambitious programs of outreach, education, and interpretation; and much more.

Help us continue to convert ideas into events and initiatives that tell the story of chemistry. Support CHF with a tax-deductible gift today! You may use the enclosed envelope, donate online at [chemheritage.org](http://chemheritage.org), or contact Rick Sherman at 215.873.8254 or [rsherman@chemheritage.org](mailto:rsherman@chemheritage.org).

Thank you.

JOIN US

2010 T. T. Chao Symposium on Innovation

Join CHF for the second annual Chao Symposium, including a special **History Live** conversation with four members of the research team that discovered buckminsterfullerene. This year's symposium is part of a three-day event, produced by the Richard E. Smalley Institute for Nanoscale Science and Technology, to celebrate the 25th anniversary of the buckyball discovery.

**Monday, 11 October**  
Rice University, Houston

Admission is free, but registration is required.  
For more information visit [chemheritage.org/Chao](http://chemheritage.org/Chao).



International Year of  
**CHEMISTRY**  
2011

The International Year of Chemistry (IYC) is a prime opportunity to tell the story of chemistry to a broad audience. CHF's "Thank A Chemist" project aims to make household names of chemists whose work has made modern amenities possible. Which names would you include? Please send suggestions, or stories of the people behind familiar products, to [thankachemist@chemheritage.org](mailto:thankachemist@chemheritage.org). And thank you!

Dynamic Engagement

recent events



[1] Richard Holmes signs copies of *The Age of Wonder* before delivering CHF's first **Civic Science Lecture**, "Romantic Science."

[2] CHF supporter Stephen Madva, National Museum of American Jewish History president and CEO Michael Rosenzweig, and CHF Gordon Cain Fellow Roger Horowitz enjoy a reception before Horowitz's **Fellow in Focus** presentation, "The Chemistry of Kosher."

[3] At CHF's annual **Heritage Day**, Robert Grubbs, at left, receives the American Institute of Chemists Gold Medal from Jerry Jasinski. [4] Othmer Gold Medalist George Whitesides, at left, catches up with CHF's Denise Creedon and his former adviser Jack Roberts, who serves on CHF's board of overseers. [5] C. Berdon Lawrence, at left, chats with Arnold Thackray, CHF's founding president, shortly before receiving the Richard J. Bolte, Sr., Award for Supporting Industries. [6] Peter McCausland, at left, accepts The Chemists' Club's Winthrop-Sears Medal from Eric Borgstedt.

[7] Stephen Turner, at left, cofounder of Pacific Biosciences, mingles with David Schwartz, at center, cofounder of Bio-Rad Laboratories, and CHF's David Brock during a **History Live** event at the Gordon and Betty Moore Foundation.

[8] Laurie Landeau, a member of CHF's board of directors and chair of its development committee, explores an interactive feature of *Marvels and Ciphers* along with a museum visitor.

The Civic Science Lecture was made possible by the generous support of Merck and Co., Inc., and Stephen Starr Events.

Fellow in Focus was presented in partnership with the National Museum of American Jewish History. Special thanks to Betty the Caterer for its in-kind contribution.

Heritage Day was sponsored by Alpha Chi Sigma Fraternity; the American Chemical Council; the American Chemical Society; the American Institute of Chemical Engineers; the American Institute of Chemists; BNY Mellon Wealth Management; The Bryn Mawr Trust Company; The Chemists' Club; Mill Creek Capital Advisers; Montgomery, McCracken, Walker & Rhoads; Morgan, Lewis & Bockius, LLP; the Omni Hotel at Independence Park; the Royal Society of Chemistry-U.S. Section; SnyderCreative, Inc.; the Société de Chimie Industrielle (American Section); and the Society of Chemical Manufacturers and Affiliates.

CHF gratefully acknowledges the Laurie Landeau Foundation and Schroder Investment Management North America for their generous financial support of *Marvels and Ciphers*.



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*We tell the story of chemistry.*



The Chemical Heritage Foundation (CHF) fosters an understanding of chemistry's impact on society. An independent nonprofit organization, we strive to

- Inspire a passion for chemistry;
- Highlight chemistry's role in meeting current social challenges; and
- Preserve the story of chemistry across centuries.

CHF maintains major collections of instruments, fine art, photographs, papers, and books. We host conferences and lectures, support research, offer fellowships, and produce educational materials. Our museum and public programs explore subjects ranging from alchemy to nanotechnology.

Detail of "Science" trade card, early 20th century, Churchman's Cigarettes, Imperial Tobacco Company. Gift of William Helfand, CHF Collections.

## Events

**First Friday at CHF**  
3 September

**Joseph Priestley Society Meeting**  
*Speaker: Magid Abou-Gharbia,*  
*Temple University*  
16 September

**Innovation Day 2010**  
22–23 September

**Book Launch: Makers of the  
Microchip: A Documentary History  
of Fairchild Semiconductor**  
*Computer History Museum*  
*Mountain View, California*  
29 September

**First Friday at CHF**  
1 October

**The Secret Cinema at CHF**  
6 October

**T. T. Chao Symposium on Innovation**  
*Rice University, Houston*  
11 October

**Joseph Priestley Society Meeting**  
*Speaker: John J. Baldwin,*  
*Vitae Pharmaceuticals*  
14 October

**Fall Governance Meetings**  
**Franklin-Lavoisier Prize Presentation**  
14–15 October

## Exhibits

**Marvels and Ciphers: A Look  
Inside the Flask**  
Closes 10 December

**Making Modernity**  
Ongoing

**Transmutations: Alchemy in Art**  
Ongoing

**The Whole of Nature and the  
Mirror of Art: Images of Alchemy**  
Ongoing

Visit [chemheritage.org](http://chemheritage.org)  
for further information and  
registration details.

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