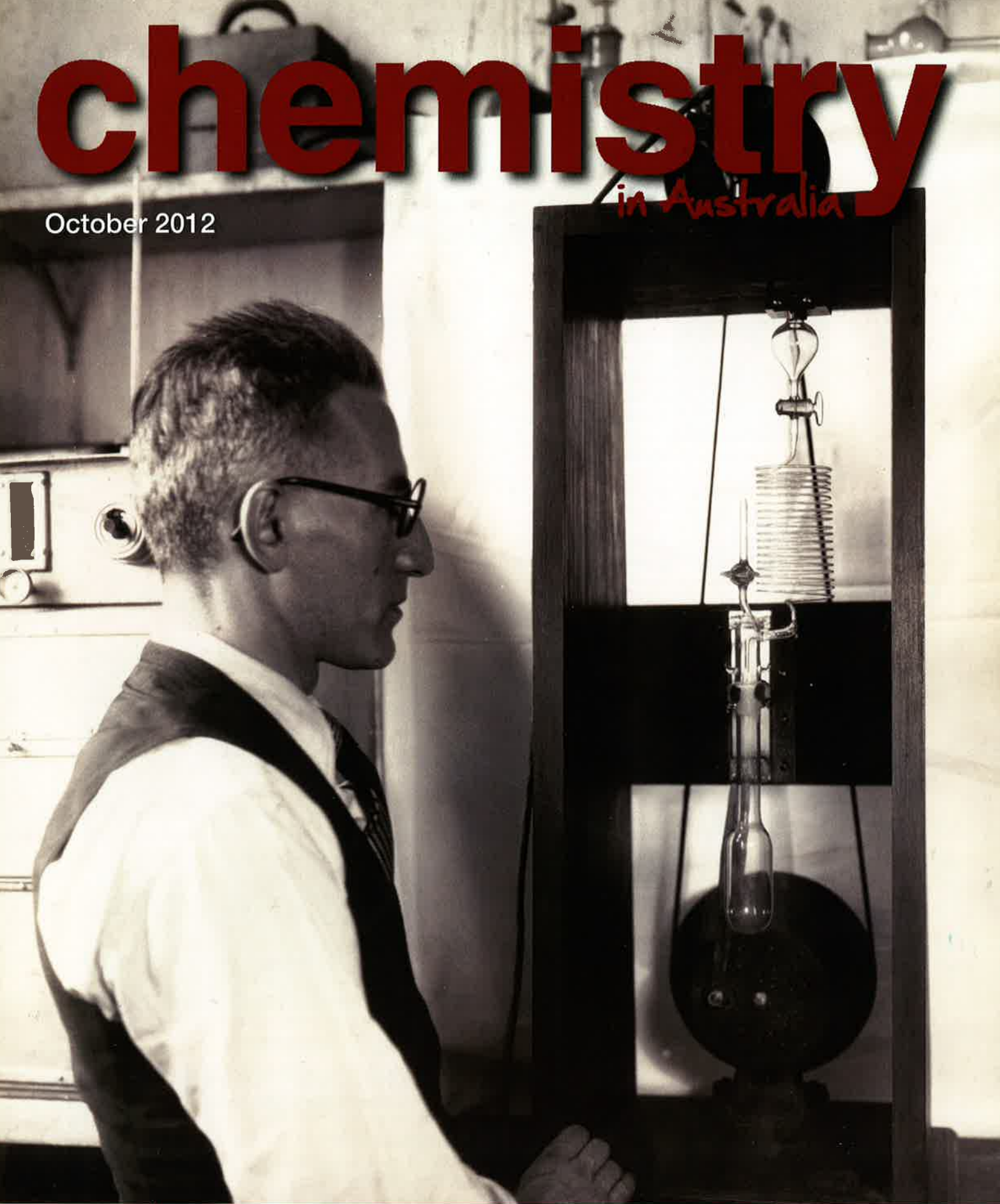


# chemistry

in Australia

October 2012



## October 2012

### 24 Have we reached the limits to growth?

A 40-year-old model and forecasts of the global economic and environmental system – that many had relegated to the ‘dustbin of history’– appears to be standing the test of time surprisingly well. The insight and messages of *The limits to growth* stand as a warning of potential global collapse – perhaps more imminent than generally recognised.

### 29 RACI: should we roll the ‘R’?

Once upon a time, the RACI was simply the ACI. Today, 30 years after the first of two royal charters, and with one set aside, the Royal Australian Chemical Institute retains its royal prefix. How has this come to pass, and should the ‘R’ stay or go?

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### Chemical heritage in the US

In the three decades since its inception, the Chemical Heritage Foundation in the US has become an important centre for the history of chemistry. Collections, fellowships, research and outreach are just some of the activities it hosts.

Thermostatted agitating device, Fixed Nitrogen Research Laboratory, US Department of Agriculture, 1930. Courtesy of the Chemical Heritage Foundation Collections ([www.chemheritage.org](http://www.chemheritage.org))

# 18



# Chemical heritage in the US

**T**his year, 2012, the Chemical Heritage Foundation (CHF) celebrated 30 years of telling the story of chemistry: what Founding President Arnold Thackray describes as 'the great cumulative story of mankind.'

In the late 1970s, the first stirrings that eventually led to CHF began with the coincident anniversaries of the United States (bicentennial 1976) and of the Washington-based American Chemical Society (ACS) (centennial 1976.). An extra impetus, said a smiling Arnold Thackray, Chancellor and founder of what became CHF, was chemists' 'envy of the physicists and their Center for the History of Physics.'

By 1981, the ACS was inviting expressions of interest from universities and other entities who might want to host a centre for the history of chemistry. With private funding from philanthropist John Haas and corporate funding from Dow and DuPont, in January 1982, ACS and the University of Pennsylvania created the Center for the History of Chemistry (CHOC) – initially in vacant basement rooms on Penn's campus.

CHF began as a hybrid organisation, and it remains so. From the beginning, CHF has been supported by both academics and industry. Thackray continued to serve as Joseph Priestley Professor of the

History and Philosophy of Science at Penn while the fledgling organisation grew. During CHF's first decade, Thackray ran the organisation part-time with administrative help from Marthenia Perrin.

In 1984, the American Institute of Chemical Engineers joined ACS as a CHF founding organisation. In 1986, when CHF was just four years old, the organisation came to the attention of Arnold O. Beckman, the instrument innovator involved in many of the greatest innovations in the 20th century.

## Beckman broadens CHF mission

Beckman broadened and strengthened the mission and vision of CHF, bringing the number of affiliates from two in 1984 to 27 in 2000. He saw chemistry as including all aspects of the molecular sciences – biochemistry, petrochemistry, pharmaceuticals and his own field of automatic instrumentation. Beckman gave \$2 million to CHF that led to the Arnold and Mabel Beckman Center for the History of Chemistry in 1987. The Beckman Center is celebrating its silver anniversary this year (see p. 32).

Beckman's gift meant much more than the money itself. Like the gift from John Haas, Beckman's backing gave the new organisation the benefit of his name. According to Thackray,

Beckman's gift led Donald Othmer to become involved in CHF. In 1995, Othmer left more than \$100 million to CHF, leading to the creation of the Othmer Library and putting CHF on a very sound financial footing.

## Othmer secures CHF future

Another immediate consequence of the Othmer bequest was a change of address from borrowed rooms on the Penn campus, to the historic First National Bank building opposite Independence Mall. The building needed major renovation. By 2000 it was ready for visitors.

Between 1997 and 2001, CHF established an award program that has become a series 'Lifetime Achievement Awards' in chemistry. The highest award given by CHF is the Othmer Gold Medal, first given in 1997. The Othmer honours multifaceted achievement. Recipients must have made outstanding contributions in several of the following: innovation, entrepreneurship, research, education, public understanding, legislation and philanthropy.

## Heritage Day and new directions

In addition to the Othmer and other awards on its first Heritage Day, marking its 20th anniversary, CHF made two announcements that would strongly affect its future. Roy

**In the three decades since its inception, the Chemical Heritage Foundation in the US has become an important centre for the history of chemistry. Collections, fellowships, research and outreach are just some of the activities it hosts.**

Eddleman, chief executive officer and founder of Spectrum Laboratories, contributed his collection of alchemical art to join the Chester G. Fisher collection. The combined artworks represents one of the largest collection of alchemical art in the world.

At the same event Perkin-Elmer announced they were donating their considerable collection of instruments from their museum in Bodensee, Germany. The collection put CHF among the world leaders in mid-20th century automatic instruments. CHF's museum, which would open six years later, includes many of these historic instruments.

This year the tenth annual Heritage Day was notable as the first time more awards went to women than men. This year's Othmer Gold Medal went to Marye Anne Fox, chancellor of the University of California, San Diego.

Tasmanian-born Nobel laureate Elizabeth H. Blackburn, Morris Herzstein Professor of Biology and Physiology in the Department of Biochemistry and Biophysics at the University of California, San Francisco, received the 2012 AIC Gold Medal. Blackburn was also the first Australian to take home a Heritage Day award.

## Awards on the road

The Othmer Gold Medal became the signature award of the new Heritage

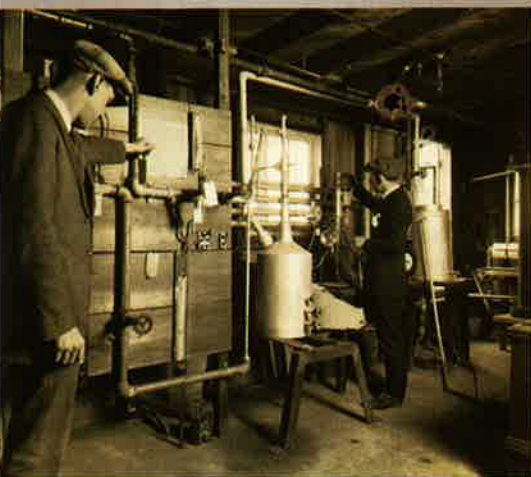
Day, but the Othmer bequest allowed CHF to add an awards programs with affiliate organisations that quickly grew in stature. In 1997, CHF and the Founders Club presented the first annual Petrochemical Heritage Award to Gordon Cain – the entrepreneur known for making plant workers very rich when his businesses flourished.

Two years later, in 1999, CHF presented the first Biotechnology Heritage Award at the annual meeting of the Biotechnology Industry Organisation.

In 2002, CHF began awarding the Pittcon Heritage Award to leaders and innovators in instrumentation from around the world. Men and women from the US, Europe and Asia have received this award in the last decade. CHF also keeps an extensive Pittcon Hall of Fame that includes William Hewlett, David Packard, Beckman and many other instrument pioneers. In 2008, CHF added the Neville Prize. The award is in memory of Roy Neville (see below) and honours achievement in biography and bibliography.

## The Neville Collection

In 2004, CHF jumped to the top ranks in rare books in the history of chemistry with the acquisition of the Roy G. Neville Historical Chemical Library, the last major collection of historic books in chemistry and early science still in private hands. Neville



Scenes from the Fixed Nitrogen Research Laboratory, US Department of Agriculture, 1926. Courtesy of the Chemical Heritage Foundation Collections ([www.chemheritage.org](http://www.chemheritage.org))

BY NEIL GUSSMAN



## About the Chemical Heritage Foundation

With a museum, library, centre for scholars, archives, the world's largest collection of alchemical paintings, public programming, a year-round award program that includes Lifetime Achievement awards in several chemistry disciplines, and outreach that includes an award-winning podcast, a magazine, extensive online image collections, oral histories and many web-based education resources, CHF is at the centre of the study of the history of chemistry. It includes:

- 6000 rare scientific volumes dating from 1478 onwards
- comic and captivating depictions of alchemy and alchemists in 300 paintings and drawings from the 16th to the 19th centuries
- analytical tools and artefacts that shaped the 20th century, including test samples of nylon stockings from the 1930s, early batteries, instruments and labware. Holding a special place among tens of thousands of artefacts is CHF's collection of chemistry sets – the largest in the world and the subject of an episode of the show 'Wired Science'
- more than 20 000 photographs that illustrate the lives and work of individuals and groups as well as chemical processes and products
- the personal papers of innovators such as Daniel Fox and Carl Marvel and of Nobel laureates Paul Flory, Paul Lauterbur, Alan MacDiarmid and Richard Smalley
- organisational records, including the Dow Historical Collection and the Rohm and Haas Archives.



CHF front entrance at 315 Chestnut Street.

© Dutch Huff photography 2011

began collecting at the end of the Second World War and had amassed a world-class collection in his home in Monterey, California.

Having the Neville Collection at CHF led to a brief flurry of public attention in the US and around the world, and in 2006 CHF held the first International Conference on Alchemy and the History of Early Science. The conference opened with a concert of 16th-century music. More than 150 scholars from around the world attended.

### A museum takes shape

With world-class collections in instruments, rare books and alchemy art – not to mention chemistry sets –

CHF began to focus on a museum to display its treasures to the public. The \$20 million project was completed in October 2008. In 2007, while the long-planned museum was beginning to take shape on the first floor, founding president of CHF Arnold Thackray, decided to retire as chief executive. CHF's second president, Thomas R. Tritton, began his tenure in January 2008.

In February 2011, CHF played host to the official opening of IYC 2011 in America. Nearly 300 guests celebrated the achievements of chemistry and discussed a future that was beginning to look very good. After the downturn of late 2008, the business of chemistry was looking much better,

and the CEOs of Dow and DuPont were upbeat in the panel discussion that served as the keynote for the opening event.

CHF also hosted the closing event of IYC 2011 in America at the Metropolitan Club in New York City in November.

### First for fellowships

In the academic year 2011–12, CHF became first in the nation in a category no one expected. In that year and in the current academic year, CHF will be the leading grantor of fellowships in the History of Science in the US. The scholars program that began with the establishment of the Beckman Center at CHF in 1987 had grown to become

the national leader. Beckman yet again was the catalyst for something greater.

In 2012, CHF began its first expansion since building the museum in 2008. A new archives building will be built on the CHF property and connect with the current structure. Outreach continued in new directions with a Women in Chemistry video project. CHF hosted an evening seminar looking at innovations in materials in February that became a feature article in *Discover* magazine and a series of videos on the [www.discover.com](http://www.discover.com) website.

### Reaching the world

Although the history of chemistry concerns every corner of the world,

CHF is located in Philadelphia. For those who can't easily visit the City of Brotherly Love (no major city on the planet being farther away from Philadelphia than Perth), CHF has many ways of connecting with connoisseurs of chemistry. CHF's website, with links to all things CHF online, includes our Facebook page and Flickr page – each with hundreds of images. The Chemistry in History portion of CHF's website provides teachers and students with biographies of chemistry's leading lights, information on chemistry milestones arranged by theme, and classroom activities.

*Chemical Heritage* magazine features the chemists and chemical innovations that have shaped modern life. *Chemical Heritage* has told the stories of the beginnings of anaesthesia, one of the most important chemical innovations in history; and Felix Hoffmann's inventions of aspirin and heroin in the same month, August 1907. Book reviews highlight the latest publications in the history of chemistry and related sciences, while articles by educators and policymakers offer perspectives on contemporary issues.

'Distillations', CHF's science podcast, brings listeners extracts from the past, present and future of chemistry. For five years in more than 140 biweekly episodes 'Distillations' entertains and informs an audience of more than 10 000 with green chemistry, explosive chemistry, the chemistry of love and the chemistry of leeches. Episodes are available for download at [chemheritage.org/distillations](http://chemheritage.org/distillations) and through iTunes.

Neil Gussman <[NeilG@chemheritage.org](mailto:NeilG@chemheritage.org)> is Strategic Communications and Media Relations Manager at the Chemical Heritage Foundation.



Photo by Conrad Erb

Heritage Day 2012 awardees Elizabeth H. Blackburn (left) and Marye Anne Fox visit CHF's rare book room.