

Alfred Bader

Articles

[Articles about Alfred Bader]

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Above, clockwise from upper left: Dean Bob Greenstreet (center), a London native, leads the fun on a tour of Greenwich. Conductor Geoffrey Simon is congratulated by Donna Helmich (left) and Irusha Downey. Some 250 people attended a reception at Winfield House, residence of the U.S. ambassador. On the bus to the Barbican Centre. Below: Alfred Bader and Chancellor Zimpher with UWM students Amy Pokrass (left) and Katie Jagielski, who studied at Herstmonceux Castle (background) last fall.

Home-Grown Green

Despite national acclaim, exhibit designer Ed Green chose a career in Milwaukee. The result is on permanent display at the Milwaukee Public Museum.

by Emma L. Hunt



EVENTS ON THE WEB: For the latest listings of events on campus, visit us on the Web at: www/uwm.edu/events/

**GRAND VIENNESE BALL
Saturday, March 4**

Get out your petticoats and powdered wigs. The annual "have a ball" event to support School of the Arts scholarships features the music of UWM student groups as well as cocktails, dinner, dancing, and a silent auction. Mark your calendars for Saturday, March 4, 7 p.m.-12 a.m. at the Crystal Ballroom, Hilton Milwaukee City Center, 509 W. Wisconsin Ave. Tickets: 414/229-5714.



**THEATER HIGHLIGHTS
Professional Theatre
Training Program**

For ticket information, phone 414/229-4308.

Feb. 10-27: "Midnight and Moll Flanders." Playwright Marie Kohler freely adapts the "confession" of Moll Flanders, one of Daniel Defoe's greatest characters. Opening night reception Friday, Feb. 11, 6:30 p.m.

April 6-29: Samuel Beckett's "Endgame"

April 13-29: Noel Coward's "Blithe Spirit"

**Playwright's
Studio Theatre**

For ticket information, phone 414/476-8984.

Feb. 28: Audience favorites from the Playwright's Studio Theatre's Festival of Ten-Minute Plays, read by the playwrights, 7 p.m., Union Art Gallery.

UWM CO-HOSTS NATURALIST JANE GOODALL

MICHAEL NEUGEBAUER



Famed ape researcher and naturalist Jane Goodall will visit Milwaukee and give a lecture on April 13 as part of the UWM Distinguished Lecture Series.

Goodall is widely acknowledged to be one of the most important naturalists of the 20th century. She began her pioneering study of wild chimpanzees at

Gombe National Park in Tanzania in 1960. Today, she combines the continuing research in Africa with worldwide lectures to raise awareness of wildlife conservation. Her most recent book is *Reason for Hope*. Her lecture will include a book-signing afterward, sponsored by the UWM Bookstore.

Goodall's appearance is co-sponsored by UWM Union Programming and Union Sociocultural Programming, the Office of the Chancellor, the Zoological Society of Milwaukee County, UWM Center for Twentieth Century Studies, and the Jane Goodall Institute.

Time: 7 p.m.

Place: UWM Union

Cost: Advance tickets are \$12.50 (\$13 at the door if still available).

For tickets: Advance tickets are available at the UWM Bookstore or by calling 414/229-4201.

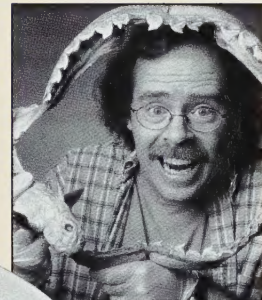
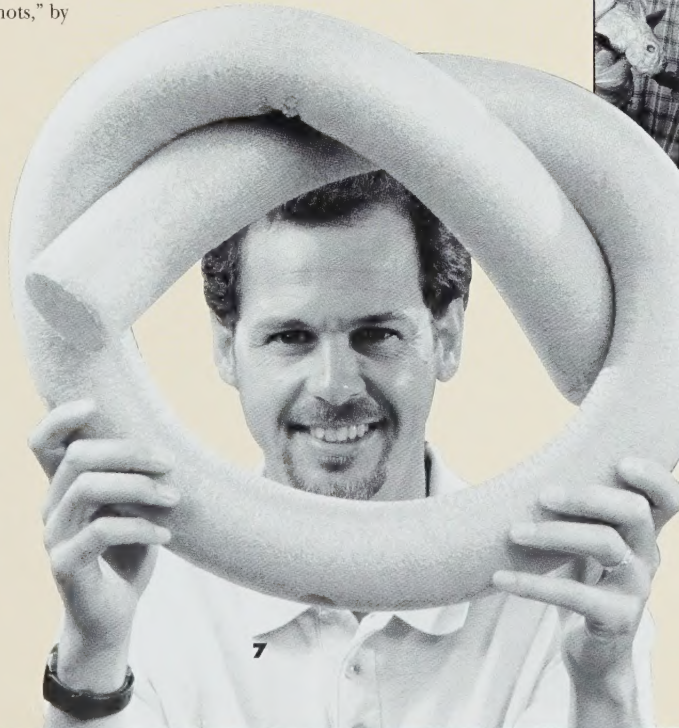
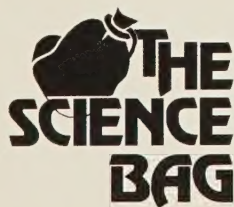
THE SCIENCE BAG

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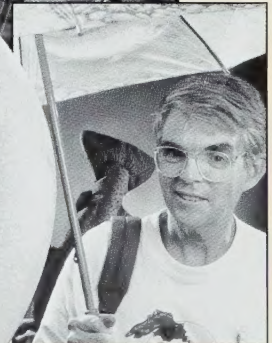
Fridays in February at 8 p.m. (and Sunday, Feb. 13, at 2 p.m.): "A Tangled World: The Mysteries of Knots," by Craig Guilbault, Mathematics Department.

Fridays in March at 8 p.m. (and Sunday, March 12, at 2 p.m.): "Hydro-Logic: Water in Your World," by Art Brooks, Biology Department.

Fridays in April at 8 p.m. (and Sunday, April 16, at 2 p.m.): "Denizens of the Devonian: Dr. Frankenfish's Secret Porpoise," by Tim Ehlinger, Biology Department.



DOB GENEROZY (165, 89)



HERE AND LEFT: ALAN MAGAYNEKOSHAK (72)

Clockwise from top: Tim Ehlinger, Art Brooks, Craig Guilbault

Taking Lond

More than 100 members of Milwaukee's arts, education, and business communities joined Chancellor Nancy L. Zimpher on a cultural mission to London in late November.

The John Downey Festival, a showcase of music composed by UWM Distinguished Professor of Music John Downey, featured major concerts at the Barbican Centre and St. John's, Smith Square. The Barbican concert featured Geoffrey Simon, who began his career in the UWM

Music Department, conducting the renowned London Philharmonia Orchestra. Soloists included Robert Thompson, professor of bassoon at UWM and member of the Woodwind Arts Quintet, who also served as the festival's artistic director. Downey conducted the St. John's performance, which featured soprano Erie Mills, pianist James Tocco, the

Veronika String Quartet, and several UWM students and faculty members, including pianist Jeffrey Peterson.



Other highlights of the trip included a series of master classes and recitals at Trinity College; a reception at the residence of Philip Lader, U.S. ambassador to the Court of St. James, hosted by Zimpher and cultural attaché T. J. Dowling; a cruise down the Thames to Greenwich; and a tour of Herstmonceux Castle led by Milwaukeeans Alfred and Isabel Bader. Bader, a chemical industry pioneer and philanthropist, donated the castle to Queens University in 1993 for use as an international study center.

The Downey Festival was the first of what is planned to be an annual cultural mission led by Zimpher. The trips are designed to reflect the cultural, commercial, and intellectual resources of Milwaukee and Wisconsin to friends, colleagues, and business partners overseas.



John and Irusha Downey

Ein Bild im Gepäck, das nächste Objekt im Auge und die Liebe zur Malerei im Herzen

Wenn Chemie und Kunst zusammenkommen, kann das eine spannende Mischung ergeben: Der Sammler und Händler Alfred Bader ist stets auf der Suche nach Besonderem

Wenn in den großen Auktionen Bilder Alter Meister in New York, London und Amsterdam holländische oder italienische Maler angeboten werden, sieht man häufig einen älteren Herrn von kleiner Statur im Saal, bescheiden, fast etwas nachlässig gekleidet. Neben ihm sitzt oft seine Frau Isabel, auch sie auf den ersten Blick unscheinbar. Man könnte sie für Zuschauer halten, denen es Freude macht, den Kampf um ein Bild zu erleben. Doch der Eindruck täuscht. Alfred Bader verfolgt nicht nur sehr aufmerksam die Auktion, sondern eifert von beiden heftig mit. Er ist die Nummer zwei. Als in der großen Auktion Alter Meister im vergangenen Januar bei Christie's in New York das Porträt



Kennerblick: Alfred Bader

Foto Archiv

eines stolzen Bürgers in schwarzer Tracht mit weißem Mühlenstein-Kragen von Frans Hals ausboten wurde, erhielt Alfred Bader bei 900 000 Dollar den Zuschlag. Er hätte auch mehr geboten, denn er wollte dieses Bild haben, weil er von seiner Qualität überzeugt war. Ihn störte nicht, dass das Porträt schon länger auf dem Markt war und in einem schlechten Rahmen unglücklich präsentiert wurde.

Ein halbes Jahr später hatte Bader keinen Erfolg, als er gemeinsam mit dem New Yorker Altmeister-Händler Otto Naumann

auf der Rothschild-Versteigerung in London ein weiteres Bild von Frans Hals, das Porträt des reichen Haarlemer Kaufmanns Tieleman Roosterman, kaufen wollte. Der Londoner Händler Clovis Whitfield, mit dem Bader ebenfalls häufig zusammenarbeitet, kaufte es im Auftrag des Kunstmuseums in Cleveland für 7,5 Millionen Pfund. So viel Geld wollte Bader nicht ausgeben – zumal er das in New York erworbene Porträt von Hals für besser hält. Er kauft mit dem Auge und der Erfahrung eines mehr als vierzig Jahre langen Sammlerlebens.

Die Versteigerung der großen Sammlung des Wiener Zweiges der Rothschild-Familie hatte für Alfred Bader besondere Bedeutung. Auch er stammt aus Wien, wo er nach dem Ersten Weltkrieg als Sohn eines ungewöhnlichen Ehepaars geboren wurde. Seine Mutter, die ungarische Gräfin Elisabeth Serenyi, heiratete gegen den Willen ihrer Familie den jüdischen Österreicher Alfred Bader. Die Ehe der Eltern war nicht glücklich. Nach dem frühen Tod seines Vaters wurde der kleine Alfred von dessen Schwester adoptiert; sie wurde für ihn zur Mutter. In seiner Biographie (1995, Weidenfeld and Nicolson, London) erzählt Bader voll Humor und Nostalgie von seiner Jugend in Wien, wo ihn seine Adoptivmutter und eine Gouvernante maßlos verwöhnten und so zu einer Rundlichkeit verhalfen, die bis heute blieb. Das behütete Leben fand ein bitteres Ende, als die britische Regierung in einer Rettungsaktion nach der Kristallnacht Ende 1938 jüdische Kinder aus Österreich nach Deutschland aufnahm. Alfreds Adoptivmutter blieb in Wien zurück und kam 1942 im Konzentrationslager um. Zu Kriegsbeginn gelangte Bader als „feindlicher Ausländer“ in ein englisches Lager, wurde dann nach Kanada verschickt und durfte dort schließlich 1941 an der Queen's University das Studium der Chemie beginnen. Mit seiner Alma Mater ist er noch heute eng verbunden. Er machte ihr großzügige Stiftungen von Gemälden, hält dort Vorträge über Kunstgeschichte und schenkte ihr sogar ein Schloss in England, in dem die Universität ein internationales Studienzentrum eingerichtet hat. Nach dem Examen trum ergründete Alfred Bader ein Promotions-Stipendium in Harvard.

In Milwaukee fand Bader seinen ersten Arbeitsplatz. Hier gründete er jene Firma für Chemikalien, die ihn reich machen soll-

te. In der amerikanischen Provinzstadt lebt er bis heute als Sammler, Mäzen und Kunsthändler mit einer kleinen Galerie – wobei er selbst schreibt, dass das Verkaufen von Gemälden aus einer Galerie in Milwaukee ein ziemlich hoffnungsloses Unterfangen ist. Als er 1992 aus dem Vorstand seiner inzwischen ein anderes Unternehmen verkaufte Firma ausschied, hatte er nicht nur die Zeit, sondern auch die Mittel, um sich ganz seiner Leidenschaft, der Kunst und dem Handel, zu widmen. Hatte er sich vorher auf weniger bekannte und weniger teure Werke beschränkt, begann er nun zusammen mit Otto Naumann und Clovis Whitfield Bilder von hoher Qualität und Wert zu kaufen. Das erste solche Werk war ein Porträt des zu seiner Zeit berühmten Pfarrers der holländischen Remonstranten, Johannes Uytenbogaert, von Rembrandt. Alfred Bader erwarb es 1992 bei Sotheby's in London zusammen mit Otto Naumann für 3,8 Millionen Pfund. Heute hängt es im Rijksmuseum in Amsterdam, das das Gemälde von Bader und Naumann kaufte.

Baders besondere Liebe und Interesse als Sammler und Händler gilt niederländischen Malern des 17. Jahrhunderts. Sie bilden das Schwergewicht seiner privaten Sammlung und seiner Galerie. In Otto Naumann, dem New Yorker Kunsthändler, hat er einen Partner, der ebenfalls Experte auf diesem Gebiet ist, während sein Partner in London, Clovis Whitfield, mehr auf italienische Meister spezialisiert ist. Bader fand früh Kontakt zu den internationalen Autoritäten für niederländische Malerei. So besuchte er bei seinen regelmäßigen Reisen nach Europa immer wieder München. Hier traf er sich mit Walther Berni, einem der großen Kenner niederländischer Malerei, dessen Gutachten lange Zeit von Sammlern und Auktionshäusern gleichermaßen geschätzt wurde. Zu seinen Freunden zählte auch Ulrich Middeldorf, der bis zu seinem Tod 1983 das Deutsche Kunsthistorische Institut in Florenz leitete. Im Gepäck hat Bader immer Fotos von Bildern, die er gerade gekauft hat, manchmal auch die Werke selbst, um über Zuschreibungen zu diskutieren, Erfahrungen auszutauschen – und nicht zuletzt um zu erfahren, wo gerade interessante Bilder zu finden sind. Ein Schwerpunkt seiner Arbeit ist das Umfeld von Rembrandt, sein Freund Jan Lieven und seine Schütler, unter ihnen Willem

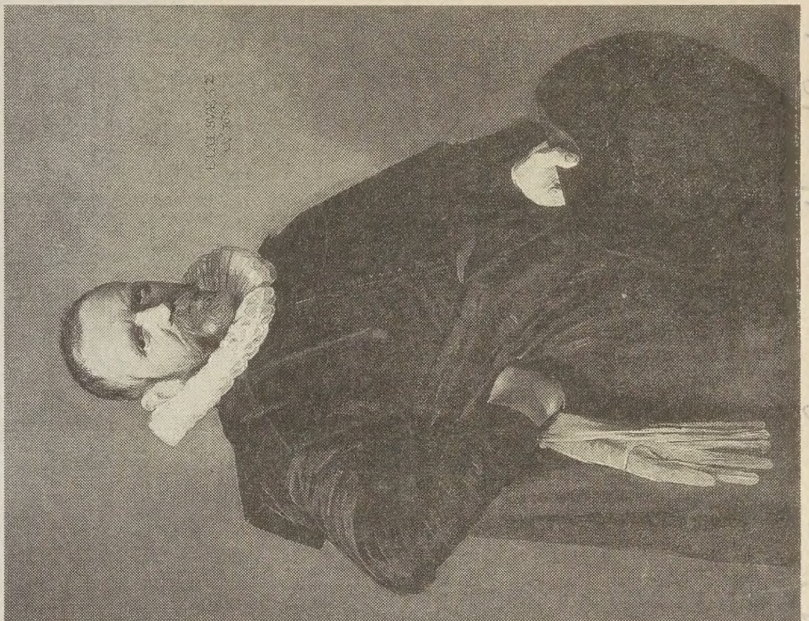
Drost und Abraham van Dyck. Doch ist Bader nicht nur Sammler und Händler, er will auch seine Erfahrungen weitergeben, Interesse wecken, zum Sammeln anleiten. So hält er Vorträge in Museen und gibt Vorlesungen an der Queen's University.

Dem agilen kleinen Herrn sieht man kaum an, dass er inzwischen 75 Jahre alt geworden ist. Er nutzt jede Gelegenheit, ein gepflegtes Wiener Deutsch zu sprechen, immer voller Selbstironie. Und immer noch geht er auf Entdeckungstouren, sucht und findet Bilder, besucht seine wissenschaftlichen Freunde. Mit geschultem Röntgenblick lässt er sich auch von verschmutzten Oberflächen, Übermalungen oder zweifelhaften Zuschreibungen nicht abschrecken. Seit Jahren arbeitet er mit den Restauratoren Charles Munch und Jane Furchgott in Wisconsin zusammen. Als Bader das Uyttenbogaert-Porträt von Rembrandt kaufte,

ließ er Munch nach London kommen, um dessen Urteil zu hören. In seiner Autobiographie berichtet er voller Stolz über manch gelungenen Kauf und die damit verbundenen Aufregungen.

Wer Bader in seiner kleinen Galerie im Astor Hotel in Milwaukee treffen will, tut gut daran, rechtzeitig einen Termin zu vereinbaren. Er ist stolz auf seine Galerie und betont, dass man dort auch schon beschiedenerer Kunstwerke für wenig Geld finden kann. Doch ist dies nicht der Ort, an dem er seine wichtigen Bilder an Museen und Sammler verkauft. Seine große Liebe zur niederländischen Malerei hindert ihn nicht daran, auch zeitgenössische amerikanische Maler des Realismus zu fördern. Er zählt zu den Amerikanern der ersten Generation, die ihrem Land für die Gasfreundschaft und die Chance zum Erfolg dankbar sind – und sich mit großzügigen Stiftungen revanchieren wollen. JULIANE STEPHAN

Foto Otto Naumann Ltd.

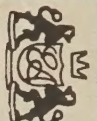


Dieser stolze Bürger war 52 Jahre alt, als er Frans Hals im Jahr 1639 Modell stand: Das verrät die Inschrift „AETAT SUAE 52/ANO 1639“ auf dem Porträt, das am 29. Januar 1999 im Rahmen der Altmeister-Auktion bei Christie's in New York als Los Nummer 14 zum Auktionslot kam. Das Bildnis des Edelmanns in schwarzer Garderobe mit weißem Spitzenkragen, der in der einen Hand einen Hut und in der anderen ein Paar Handschuhe hält, ersteigerte Alfred Bader für 900 000 Dollar.

Samstag, 15. Januar 2008, Nr. 12/Seite 53

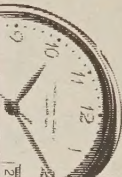
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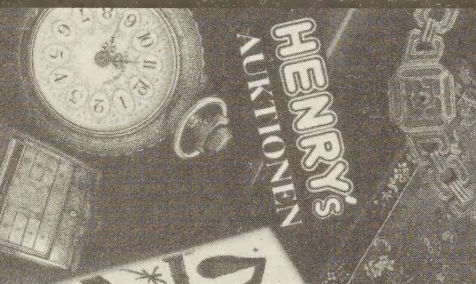
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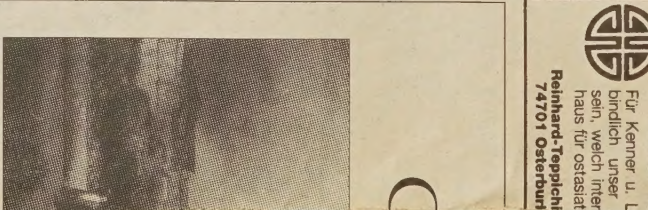
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IN THEIR OWN WORDS

Scholarship students are grateful for a chance

By Jessica L. Lanke ('98) and Allyson M. Olivier ('86)

'Your generosity has enabled me to attend the University of Wisconsin-Milwaukee."

Written by a UWM scholarship recipient, these words express a simple truth in simple terms – the tremendous importance and value of scholarship support.

Scholarship recipients come from diverse backgrounds, are active in the community, participate in volunteer activities, have varying degrees of financial need, and are academically superior students. They come from the greater Milwaukee area, Wisconsin and beyond – and many are first-generation collegians.

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Those who establish and contribute to scholarship funds are forward-thinking individuals who make an invaluable investment in the community. The partnership between scholar and donor is one of mutual reward.

Here are some comments from scholarship recipients that illustrate this partnership:

• "Without your donation I would not have made it this far in my college career. My parents came to the United States during the Vietnam War seeking political asylum. Both stressed the importance of an education because they knew firsthand the hardships I would face without one. I

always knew I would go to college – I just didn't know how I would finance it. The scholarship I received has alleviated my family of a great financial burden. And I am proud to say that I am now a senior with a 3.9 GPA and will be the first in my family to graduate from college."

• "Your scholarship has provided me much on both a financial and personal level. It has provided me with a planned goal to achieve."

• "After graduating from high school I knew that college life would provide many challenges. I wanted to attend a school that would bring out the best in me. My focus was on finding a college that was close to home, was culturally diverse, and would provide students with an excellent education. I found that UW-Milwaukee met all these criteria. And since I plan on pursuing my career in Milwaukee, a degree from UWM will be very helpful to my success in the future."

• "...Working at a high-paying job is probably everyone's dream. However, before we become too wrapped up in what we have and what we have accomplished, it is important to remember back when we were in college – and someone gave us a chance. I will try to give others the same chance I was given, whether it is by way of mentoring, tutoring or scholarships. It's always important to help those in need."

As you can see, your gift doesn't end when you sign a check. It continues to influence the many lives that are touched by your generosity.

Learn more

To learn more about how you can contribute to or establish a scholarship fund, please contact Allyson Olivier, director of UWM Foundation scholarships, at 414-906-4679.



Scholarship supporter Helen Ambuel (right) and recipient Louise Wang.

Scholarship supporters Alfred and Isabel Bader (left) and recipients Thomas Foster and Mario Nimock.



NEW FACES

The UWM Alumni Association and Office of Development have added four new faces to their ranks. We'd like to introduce...

Vice Chancellor for Development and Executive Director of the UWM Foundation: Lucia Petrie

Lucia Petrie has been named the university's new vice chancellor for development and executive director of the UWM Foundation. A well-known fund-raiser in Greater Milwaukee, she oversaw the Milwaukee Art Museum's \$100 million capital campaign that provided support for the stunning Santiago Calatrava-designed Quadracci Pavilion. The campaign required extensive work to secure gifts for the museum from individuals and foundations, and grants from corporate and government sources.

A graduate of the University of Michigan, Petrie is a longtime member of the Association of Fundraising Professionals, and has maintained Certified Fund Raising Executive (CFRE) status with the organization since 1988. The association's Greater Milwaukee Chapter recognized her work in 1991 with its Scott Cutlip Award for Fundraising Excellence. She is a frequent fund-raising lecturer and seminar leader.

Petrie has served the community of Shorewood on its school board (1973-76), village board (1984-90) and various village committees and task forces.

Directors of Major Gifts and Planned Giving: Stephanie S. Ackerman and Eric D. Anderson

Stephanie S. Ackerman and Eric D. Anderson have joined the university as directors of major gifts and planned giving.

Ackerman came to UWM from the Milwaukee Art Museum, where she directed and implemented broad-based fund-raising efforts to support operations, programs and collection growth as well as capital and endowment needs. Her accomplishments include managing a \$100 million capital campaign. A UWM alum, she received her B.S. degree in early childhood education in 1970. She

also holds an M.A. degree in special education, learning disabilities, from Cardinal Stritch University.

Anderson came to UWM from the Medical College of Wisconsin. As assistant vice president for development, he supervised a staff of 24 in a comprehensive fund-raising program that raised more than \$17 million in fiscal years 2001 and 2002. He holds a B.A. degree from UW-Madison and has done graduate work at Roosevelt University and the University of Chicago.

Marketing Manager: Jason Lusk

Jason Lusk is the new marketing manager for the UWM Alumni Association.

A Milwaukee native, Lusk is a graduate of Georgetown University in Washington, D.C. Most recently, he was director of

program development and marketing for The Washington Campus in Washington, D.C., a consortium of U.S. business schools formed to educate business executives and MBA students on the public policy process. Lusk also has worked at Georgetown University, assisting the university with its executive-education marketing efforts and working with alumni to generate new revenue streams.



Back row: Stephanie S. Ackerman and Eric D. Anderson.
Front row: Jason Lusk and Lucia Petrie.

A NEW TITLE FOR PEPPY O'NEILL

Peppy O'Neill has been promoted to Alumni Relations Program Manager.

O'Neill is a familiar face around campus and in the community, having previously served the UWMAA as special events coordinator.

As program manager, she is responsible for all programs and events designed to increase the participation and involvement of graduates in the UWM Alumni Association and the university. Among the activities under O'Neill's purview are the annual alumni awards reception, Alumni College and other Homecoming-related events, corporate club programs, national alumni outreach, and alumni connections programs locally and around the state, including events with the Milwaukee Brewers and the Milwaukee Bucks.

O'Neill has a degree in journalism from UW-Madison.



Peppy O'Neill

Toronto News

New theatre at U of T honours true love

Named for Isabel Bader, it was built with a \$6-million donation by her husband

BY REBECCA CALDWELL

If Alfred and Isabel Bader's love story sounds like a play, they've got just the venue for it. On March 3, the curtain will rise in Toronto at the new Isabel Bader Theatre.

"It's sort of a fairy tale. How many people are able to offer their true love something so generous?" asks Roseann Runte, president of Victoria University at the University of Toronto, which owns and operates the new hall at 93 Charles St. W.

Five years ago, chemist-turned-philanthropist Alfred Bader called Dr. Runte and offered to buy London's Old Vic theatre and donate it to the school. He wanted to honour his wife's passion for theatre by making a show-stopping gift to the school that Isabel had attended 50 years earlier.

Isabel and Alfred met while travelling by ship to England in 1949, with Isabel intent on finding a teaching post and Alfred searching

for relatives lost during the Second World War. They fell in love, and he proposed after a nine-day courtship. Isabel considered marrying Alfred, but ultimately refused. He eventually married someone else and had two children.

But years later Alfred tracked Isabel down in England where she worked as a drama teacher. He renewed his plea for her hand and they finally married in 1982.

Since then, they've been devoted to each other and their other obsessions: art collection and philanthropy. The Baders made news when Alfred donated Herstonceux Castle in Britain to Queen's University in Kingston, where he received chemistry degrees in the 1940s.

But when Mr. Bader offered the Old Vic to Dr. Runte, she had to say 'no thanks.'

"I said, 'Oh my goodness, no one has ever offered us anything so wonderful, but I can't take it. If the professional people who had the theatre couldn't make a go of it,



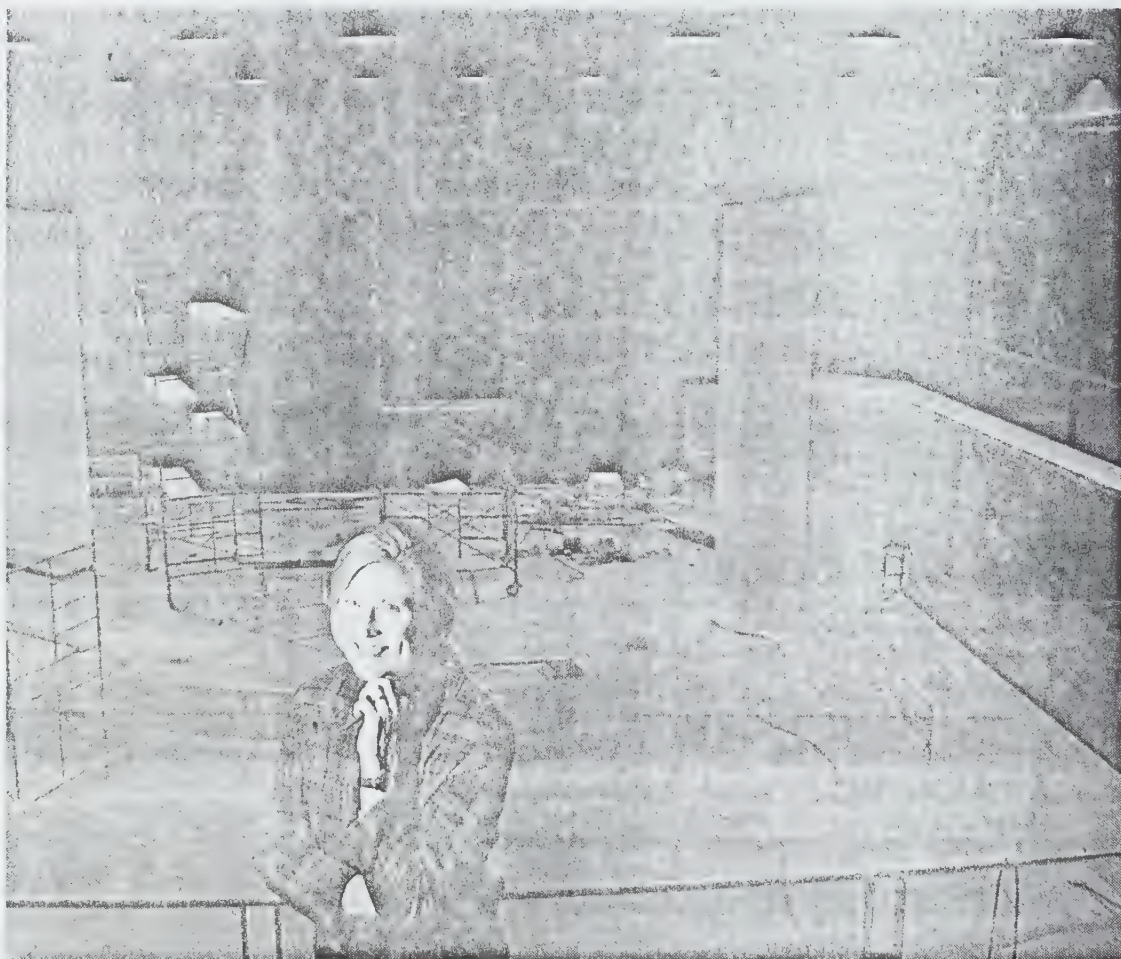
Roseann Runte, president of Victoria

how could the university? It would have been wonderful for the students to go to England and study theatre. But there is such a need on campus, wouldn't you like to do something here?"

If the university didn't want the Old Vic, Mr. Bader was determined they'd have a New Vic, so he donated \$6-million to the school on the condition that they build a theatre. Four years later, with an additional \$2.5-million supplied by other donors and the university, downtown Toronto will welcome its first brand-new theatre since the Princess of Wales opened in 1993.

Beyond studying architectural diagrams with the Baders, Dr.

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JOHN HRYNIUK/THE GLOBE AND MAIL

University, felt there was a need for a theatre at the school: "It's sort of a fairy tale," she says.

Runte maintained a close relationship with the couple. Last year, she edited a book of their love letters, *A Canadian in Love*, and she and Victoria graduate Stephen Hobé have teamed up to write *For Isabel*, a song commemorating the two that will be performed at the sold-out opening ceremonies. Norman Jewison and Don Harron will be among the guests, who will watch a variety show written for the evening called *The Chemistry of Love*.

With six theatres already operating at the downtown campus, and dozens more in Toronto, some may argue another venue was unnecessary. Victoria doesn't offer any theatre classes and doesn't intend to,

and Dr. Runte says she doesn't want to compete with the University of Toronto's acclaimed drama program. But with two student-theatre troupes at Victoria, plus the Bob, "the longest-running student revue in North America," and the university's literary and dramatic traditions (Mr. Jewison, Northrop Frye, Margaret Atwood and Donald Sutherland are among its alumni), Dr. Runte felt there was a need for a theatre at the school.

The theatre's schedule is already filling up. After the opening, they've got a reading of John Reeves's adaptation of *Abelard and Eloise*, and student performances of *Othello* and *Mr. Valentine*. There are book-

ings toward the end of the year — watch for the Toronto International Film Festival to screen films there this fall.

"I think this will become one of the cultural centres of Toronto," Dr. Runte said. "When people see its beauty and capacity, it will inspire creativity, and that's exciting."

The 500-seat auditorium is both cavernous and intimate, with facilities for dance, theatre, music and film productions.

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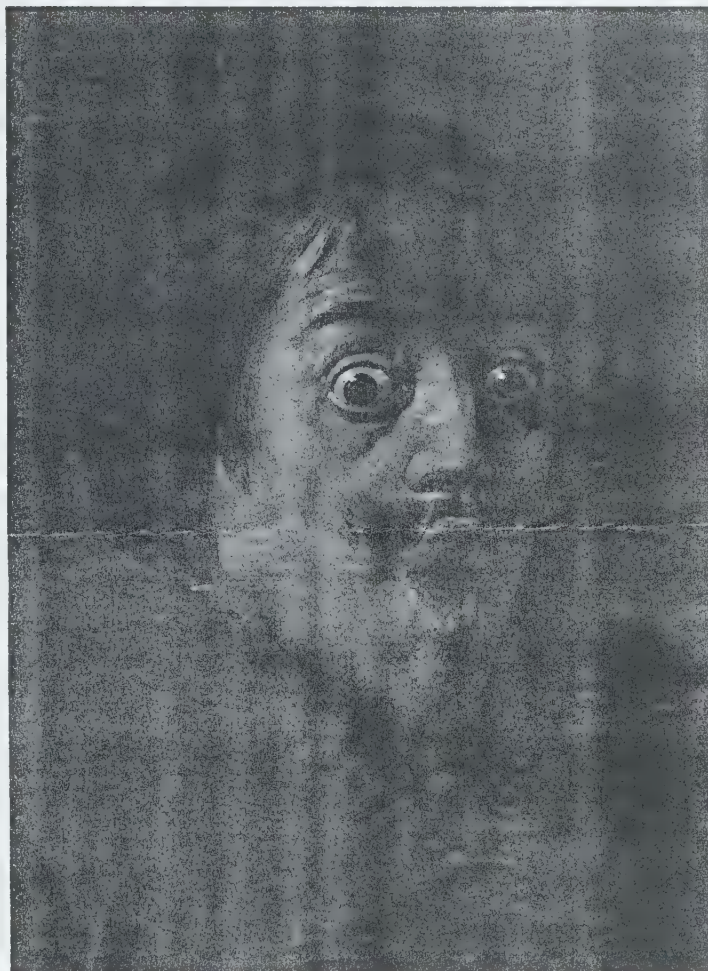
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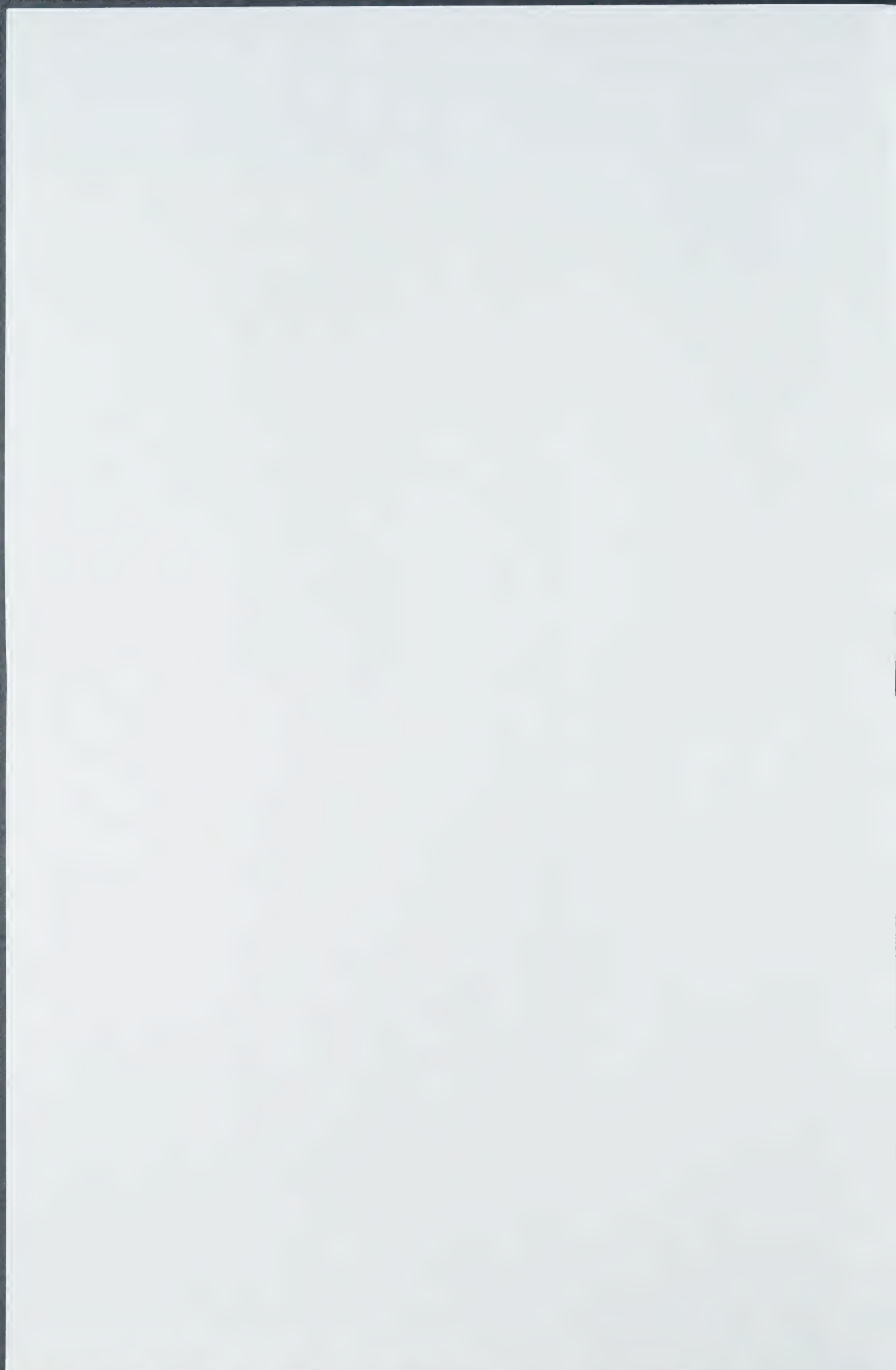
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www.alfredbader.com



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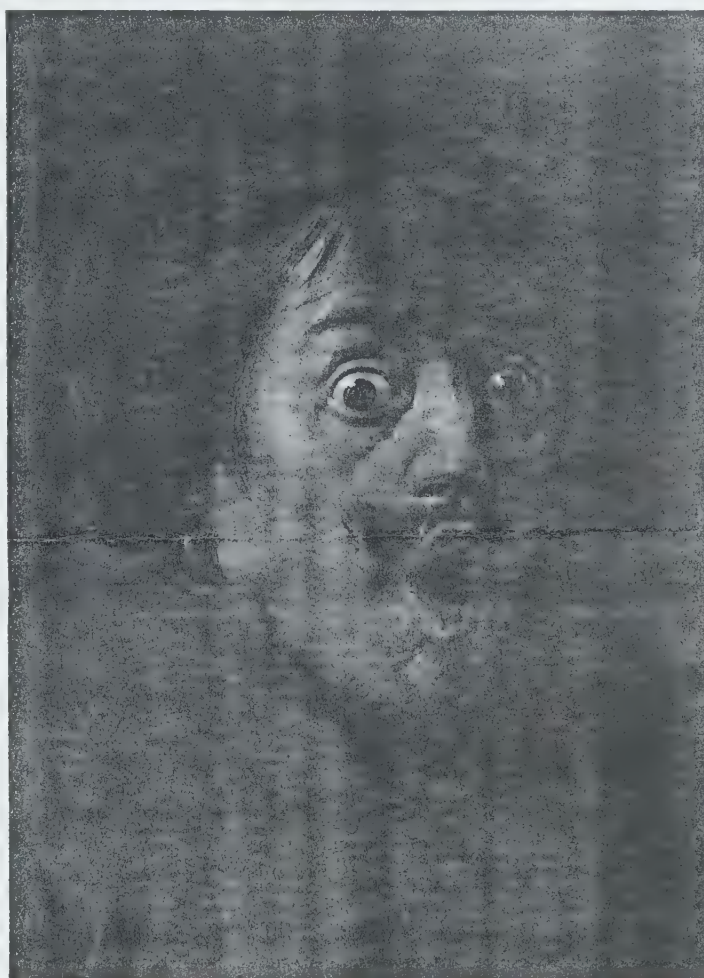
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I. Introduction

This August, Aldrich Chemical Company turns fifty. What a remarkable fifty-year period this has been! While it is today a "household" name among chemical scientists and practitioners worldwide, it is hard to imagine that Aldrich is only a half century old. On the following pages, I will take a brief look back at the past fifty years. While the story of Aldrich has been told and retold in one form or another many times,^{1,2,3} it is my sincere hope that the fresh approach I am using will prove to be of most interest to our *Aldrichimica Acta* readers. This approach traces the development of Aldrich through the key chemical products and business ventures that played a crucial role in the uninterrupted success that the company has enjoyed over the past fifty years. Since the success of any great enterprise is dependent immensely on the contributions of a legion of dedicated individuals who believe in its mission, the roles that key people played in the development of Aldrich will also be highlighted.⁴

2. What's in a Name?

2.1. Alfred R. Bader

Alfred Robert Bader, a young Austrian immigrant and a chemistry graduate student at Harvard University, first entertained the idea of starting a company to sell research chemicals in 1949—on the suggestion of Warren Stockwood, the storeroom supervisor at Harvard's Department of Chemistry⁵—after being disappointed with the service he received from the leading supplier of research chemicals at the time. Acting on the premise that chemists needed a wider array of research chemicals and better service, he and Jack Nathan Eisendrath, a Milwaukee attorney, founded Aldrich Chemical Company, Inc. on August 17, 1951. Jack became the company's first president.⁶ In a curious twist of fate, the company was named following a coin toss,



not after either of the founders, but after Eisendrath's fiancée, Bettie Mae Aldrich.⁷ Had Bader won the coin toss, the company would have been named Daniels Chemical Company, after Helen Ann Daniels, Bader's fiancée and future wife.⁸

2.2. Aldrich Chemical Company, Inc.

In 1951, the company operated first from Eisendrath's office on 161 W. Wisconsin Avenue and, later that year, from a rented garage located on N. Farwell Avenue in Milwaukee's East Side. It had three part-time employees: Alfred, Jack, and Lorraine Worby (née Neau). Lorraine first worked for Aldrich part-time, 4–5 hours on Wednesday nights, then became the first full-time Aldrich employee in August of 1954.⁸ From 1951 to 1954, Alfred sowed the seeds of what later became very important collaborations and acquisitions through visits to small chemical producers in Continental Europe and the United Kingdom. Noteworthy are two visits in 1952 to Fluka AG Chemische Fabrik in St. Gallen, Switzerland, and Heidenheimer Chemisches Laboratorium (HCL) in Heidenheim, Germany. These two companies as well as many others served as

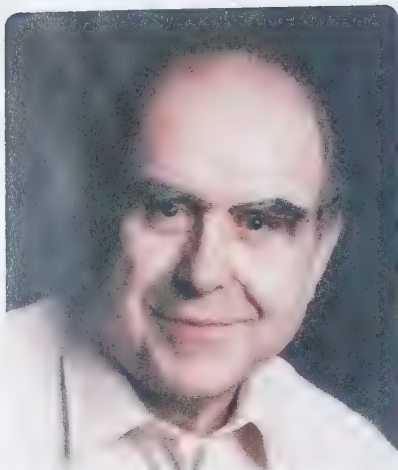


Photo courtesy of A. R. Bader

Alfred R. Bader, cofounder of Aldrich (mid-1980s).

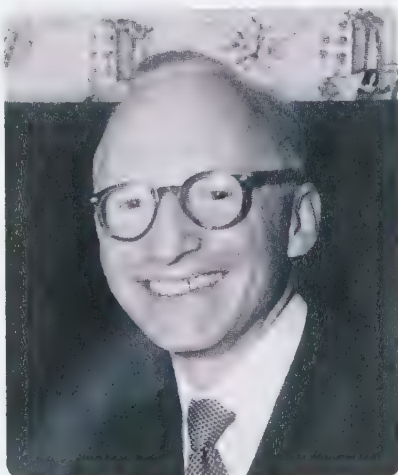


Photo courtesy of Bettie Aldrich Eisendrath

Jack N. Eisendrath, cofounder and first president of Aldrich (1951).

important suppliers to Aldrich in this period and for years thereafter. **Table 1** summarizes the fledgling company's vital statistics for this period.

2.3. MNNG and Other Products

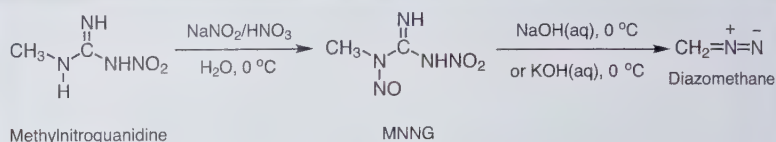
Aldrich offered 1-methyl-3-nitro-1-nitrosoguanidine (MNNG) as its first product. MNNG is a convenient, small-scale precursor to diazomethane, a widely used methylating reagent (**Scheme 1**).^{9,10} Perhaps foretelling of the vital role that suppliers would subsequently play in helping Aldrich grow and prosper, Aldrich did not at the time produce MNNG but sourced it from two companies, one in Milwaukee and the other in Canada.

Some of the other interesting products offered in the early fifties include 3-hydroxypyridine (**1**), which later became one of the

Table 1. Aldrich's Vital Statistics for the First Four Years

Year	Sales	Products Offered	Catalog Number	Catalog Pages	Employees ^a
1951	\$1,705	1	1	1	Alfred, Jack, Lorraine
1952	\$5,400	12	2	1	Alfred, Jack, Lorraine
1953	\$15,000	>100	3 & 4 ^b	4	Alfred, Jack, Lorraine
1954	\$45,000	>1,200	5	32	Alfred, Jack, Lorraine, Anthony

^a All part-time employees except for Anthony D. Kontowicz. In August 1954, Alfred and Lorraine became full-time employees; Lorraine was the first non-owner employee. ^b Two catalogs were produced for 1953, one came out in October 1952 (No. 3) and the other in May 1953 (No. 4). Each consisted of 4 pages and listed over 100 products. Sources: references 1 and 8 and company catalogs.



Scheme 1. Preparation of MNNG and Generation of Diazomethane.

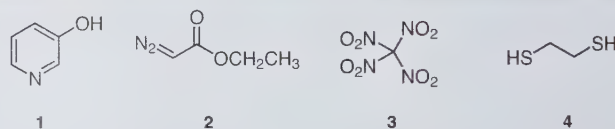


Figure 1. Some of the Interesting Products Offered in the Early Fifties.

company's best-selling products; ethyl diazoacetate (**2**); tetranitromethane (**3**); and ethanedithiol (**4**) (**Figure 1**). The addition of new products was guided by the beliefs that production should be combined with resale and that the company should not offer products that were also sold by its main competitor, Eastman Kodak's Fine Chemicals Division, which dominated the fine chemicals market at that time. In addition, Aldrich recognized very early on the vital role of suppliers in its growth and worked diligently to establish mutually beneficial relationships with them. Suppliers continue to be important to the growth of the company to the present day.

3. Critical Years: 1954 and 1955

3.1. A Crucial Decision

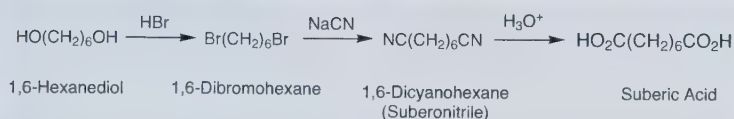
First, Alfred Bader elected not to relocate to the Pittsburgh area, where The Pittsburgh Plate Glass Co. (PPG), his employer at the time, was relocating the research laboratories of its Milwaukee paint division. Alfred had been working for PPG-Milwaukee since January 1950. Instead, he left PPG in August 1954 to dedicate his time and energy fully to the fledgling company, which he had cofounded only three years earlier. He also became convinced that products should not

only be sourced but also sold overseas, e.g., in Western Europe, in spite of the potential stiff competition from well-established fine chemicals companies. This conviction would later have important consequences for the future of Aldrich.

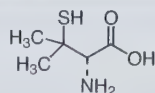
Second, William Kesselman, a Milwaukee businessman, bought one-third of Aldrich for \$25,000, but bowed out seven months later, with the company owing him \$12,000.¹¹ In August 1954, after Kesselman bought into the company, Aldrich moved out of the N. Farwell Avenue garage into a 1,000-sq ft, rented laboratory at 3747 N. Booth Street, one block south of Capitol Drive, still in Milwaukee.

Third, Aldrich hired a second full-time employee, Anthony D. Kontowicz, a former laboratory technician at PPG. Anthony was thus the first full-time laboratory technician hired; however, he worked at Aldrich for only a short period of time (ca. 1 year).^{8a,12,13}

1955 was no less critical for Aldrich. The Eisendraths sold their 50% stake in the company for \$15,000.^{14,15,16} Alfred and Helen Bader became the sole and equal owners of the company,¹⁷ and Alfred became the second president of Aldrich in May 1955.¹⁸ In August 1955, Alfred met Marvin E. Klitsner, a Milwaukee attorney, at a religious retreat.



Scheme 2. Large-Scale Preparation of Suberic Acid.



D-Penicillamine (5)

Later on, Marvin was instrumental in guiding the growth of Aldrich, both as legal counsel and director of Aldrich and of Sigma-Aldrich. As Alfred put it, Marvin "was the moving spirit in the growth of Aldrich".¹⁹ Marvin also played a key role in the negotiations leading up to the merger of Aldrich Chemical Company, Inc. and Sigma International, Ltd. in 1975; but more on that later! Beginning in January 1955, Helen Bader, Alfred's wife since July 1952, began working full-time for Aldrich.^{20,21} On September 01, 1955, George Skeff, also a former PPG laboratory technician, was hired as a full-time laboratory technician, following the departure of Anthony D. Kontowicz. George retired from Aldrich on April 14, 1989, after close to 34 years of employment!

3.2. Suberic Acid and D-Penicillamine

More importantly, Aldrich delivered its first bulk order, 500 lb of suberic acid, to Du Pont toward the end of 1955 (Scheme 2).^{3a}

Furthermore, one of the important products that Aldrich began to offer that same year was D-penicillamine or 3-mercapto-D-valine (5), an antirheumatic α -amino acid and, at the time, a promising orphan drug, which chelates and removes the copper accumulated in the liver of patients suffering from the rare disorder known as Wilson's Disease.²²

4. The Remainder of the 1950s

4.1. Rapid Growth

The remainder of the 1950s was characterized by rapid growth in sales and the number of products offered. This growth in sales led to the expansion of the physical facilities and the hiring of additional staff. In February 1956, Beverly Horick, the fourth non-owner employee, was hired on a part-time basis.²³ The next employee hired was Stella Ward. By 1958, Aldrich had about a dozen employees. In the same year, Aldrich purchased and moved to a three-story, 27,000-sq ft building at 2369 N. 29th Street in Milwaukee's inner city. Two years later (1960), a larger, 70,000-sq ft building was purchased nearby at 2371 N. 30th Street. The 29th Street building housed the R&D and Production departments, while the 30th Street

building had administrative offices and the QC, Packaging, and Warehousing departments.²⁴ The 29th and 30th Street buildings remained Aldrich's headquarters until 1969, when they were condemned by the Milwaukee County Expressway and Transportation Commission in preparation for building the east-west Park Freeway (which was never built). In 1969, Aldrich relocated to 940 W. St. Paul Avenue into an eight-story building that previously belonged to General Electric Company.²⁵

The 7th edition of the Aldrich catalog (December 1955) and its supplements featured over 1,600 products.²⁶ Some of the products offered in the late fifties became success stories. Among the most interesting ones are dicyclohexylcarbodiimide (DCC, 6), a useful reagent in peptide coupling reactions; *p*-tolylsulfonylethylmethyl nitrosamide (Diazald[®], 7), a diazomethane precursor that is safer than MNNG; and *p*-phenylazomaleinanil (8), a reagent employed for the characterization of conjugated dienes (Figure 2). Other interesting products from this period include lithium borohydride (LiBH₄), sodium tetraphenyl boron (NaBPh₄), diketene (C₄H₆O₂), and triallylamine (C₆H₉N).

The births of several important company entities, as well as other significant developments, also took place in the late fifties.

4.2. The Rare Chemical Library

The Rare Chemical Library (RCL) grew out of the collecting and salvaging of valuable research samples of retiring or deceased academic researchers and from other sources. While the RCL was initially part of a separate company, the Alfred Bader Chemical Corporation, it was sold to Aldrich Chemical Co. on December 20, 1965, just prior to a public offering of 100,000 Aldrich shares.²⁷ Over the years, large-scale contributions of samples to the library came from, among others, the personal collection of Joe Karabinos (who founded Carbolabs,



Photo courtesy of the Helen Bader Foundation

Helen A. Bader (née Daniels), 1982.



Photo courtesy of Bettie Aldrich Eisendrath

Bettie Aldrich Eisendrath (née Aldrich), 1951.



Photo courtesy of A.R. Bader

Left to right: Lorraine, George, Stella, and Beverly—1st, 3rd, 5th, and 4th Aldrich employee, respectively (1978).

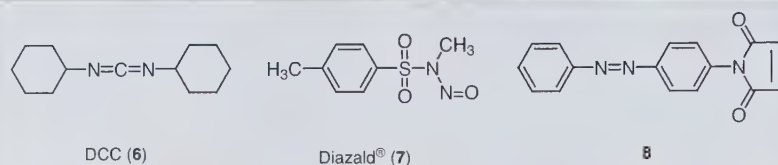
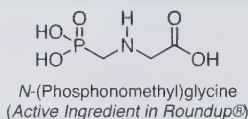


Figure 2. Best-Selling Products from the Period 1955–1959.



Sigma-Aldrich facility in Gillingham, Dorset, United Kingdom.



Sigma-Aldrich facility in Steinheim am Albuch, Germany.

Inc.) and from the laboratories of such chemical luminaries as Henry Gilman, George Wittig, Robert Woodward, and Louis and Mary Fieser. The RCL currently boasts over 90,000 listings of hard-to-find chemicals. Over the years, the RCL has been invaluable to researchers in the chemical sciences and has led to the discovery and commercialization, by others, of some very valuable chemical commodities, e.g., Roundup® (Monsanto Co.), based on lead compounds obtained from the RCL.

4.3. Aldrich Chemical Co Ltd

In 1959, Aldrich's British subsidiary formally began as Ralph N. Emanuel, Ltd., and was equally owned by the Emanuel and Bader families. It had less than \$1,000 in sales in its first year,²⁸ but sales grew briskly leading to a rapid expansion of the physical facilities and the number of employees. Between 1969 and 1973, Aldrich began gradually acquiring Ralph N. Emanuel, Ltd., and turning it into a wholly owned subsidiary. It was then renamed Aldrich Chemical Co. Ltd. Ralph Emanuel became an Aldrich and, afterwards, a Sigma-Aldrich director. Business growth led to the company moving to the current site in Gillingham, Dorset, U.K., where a distribution center and a new cGMP manufacturing facility are presently located. In 1986, Sigma-Aldrich purchased Bristol Organics, a small manufacturer and long-time Aldrich supplier of fluoroaromatics, and shortly thereafter integrated its operations with those of the larger British subsidiary. Three years after the acquisition of Fluka Chemie by Sigma-Aldrich Corp., the operation of Fluka's subsidiary in Glossop, Derbyshire, was transferred to the Gillingham facility in September 1992. The British subsidiary has a special significance to the corporation, not only because it has become Britain's largest supplier of research chemicals, but also because it has been a source of a number of individuals in corporate leadership positions. Moreover, success of the British subsidiary encouraged the company to open other branches in Continental Europe, where strong competition from well-established fine chemicals companies had been a concern.

4.4. Aldrich Chemie KG

The story of Aldrich's subsidiary in Germany is somewhat different. It starts out with Heidenheimer Chemisches Laboratorium (HCL) in Heidenheim, Germany, acting as Aldrich's best supplier for most of the 50s. HCL was then operated by Dr. Ernst Reif, a chemist, and Gerhard Keppler, a businessman. Following, an industrial accident at HCL and a legal setback for the company, Aldrich became involved in the restructuring and refinancing of its operations. It was renamed

EGA-Chemie KG²⁹ and moved to Steinheim am Albuch—with Aldrich owning about 80% of it. Later (1971),³⁰ Aldrich bought the remaining 20% of EGA and renamed it Aldrich-Chemie GmbH & Co. KG. Like its British counterpart, the German subsidiary has been a tremendous success story, and has grown steadily in capabilities, personnel, and facilities. It now manufactures a range of products [e.g., 2,4-dimethylbenzaldehyde (9), 6-hydroxydihydrotheaspirane (10), and 6-acetoxydihydrotheaspirane (11)—all three are important flavoring raw materials for the food industry (Figure 3)] and serves a corporate warehousing function for all markets in Continental Europe from warehouses in three German towns: Schnelldorf, Steinheim, and Seelze. In 1975, it started producing a full German language edition of the Aldrich catalog concurrently with the English language editions. Two decades later, the activities of all Sigma-Aldrich brands in Germany were combined in one legal entity, Sigma-Aldrich Chemie GmbH, in order to streamline their operations. Perhaps one name stands out more than any other and is credited for most of the early success of Aldrich Chemie—that of Dr. Alfred Griesinger. Dr. Griesinger joined the company in March 1963, owned an interest in EGA-Chemie (1965–1970), and served in various important capacities. He later became a director of Aldrich-Chemie KG, and remained with the company until his untimely death in August 1997.³¹

4.5. Custom Synthesis

The late fifties and early sixties also witnessed the growing importance of custom synthesis and bulk sales. In these early days, custom synthesis was formally one of the business activities of the separate corporation, Alfred Bader Chemical Corp., which was sold to Aldrich on December 20, 1965.²⁷ Over the years, custom synthesis became an important function within the Aldrich Production department, and, together with bulk sales, evolved into Sigma-Aldrich Fine Chemicals (SAFC), currently one of four strategic business units within Sigma-Aldrich Corporation. SAFC concentrates on worldwide large-scale manufacturing and sales. Past and present custom synthesis customers are some of the best-known chemical and pharmaceutical companies in the world. Perhaps some of the more interesting custom synthesis projects that Aldrich worked on in the sixties involved the preparation of *tert*-butoxycarbonyl azide (12), BSA (13), and acryloyl chloride (14).³² Some of the hard-to-find products offered in bulk (100–1,000 lb) in the late fifties included several dimethylphenols (15),

trimethylphenols (**16**), 2-methylresorcinol (**17**), and dihydroxybenzoic acids (**18**) (Figure 4). Along with the R&D group, the custom synthesis team routinely carries out significant process improvement and scale-up projects as well as the manufacture of newly introduced products.

5. The 1960s: A Decade of Transformation

Firstly, Aldrich went from being a privately owned company to being a publicly traded one. Secondly, the growth in sales began to occur, not only as a result of the addition of new products, but also as a result of joint ventures and acquisitions. Finally, important developments took place within the company, such as the birth of this magazine (1967) and the transformation of the Aldrich catalog from a simple list of products and prices into a "handbook", as a consequence of the inclusion of useful factual information about the compounds being offered.

5.1. Early to Mid-1960s

1962 was, in many respects, a watershed year for the young company. Annual sales reached the \$1 million mark for the first time, and the Aldrich catalog grew to 303 pages, as the number of products offered swelled to 10,000. Aldrich became Janssen Pharmaceutica's sales agent in the US, and started ALFA Inorganics, a joint venture with Metal Hydrides, Inc. Dr. John Biel joined the company as Director of Research, replacing Edmund (Pete) J. Eisenbraun, Harvey B. Hopps was hired as an R&D group leader, and Bernard (Bernie) E. Edelstein joined as a chemist. Bernie went on to become one of the company's directors, its secretary, and then its first Executive Vice President (1974). In 1962, William Buth was Aldrich's General Manager; he later became the first Aldrich Vice President. In the same year (1962), J. T. Baker Chemical Co. attempted to buy Aldrich for \$1.5 million, but was rebuffed.³³

In the mid-sixties, the prior practice of listing only products that were not offered by Eastman Kodak's Fine Chemicals division was abandoned in favor of listing products based on their usefulness and marketability. An interesting offering from this period is 9-amino-1,2,3,4-tetrahydroacridine hydrochloride hydrate (Tacrine hydrochloride; **19**), which was first introduced as an Aldrich product in 1963, and is now sold by Warner-Lambert, a division of Pfizer Inc., under the trade name COGNEX[®] for the treatment of mild to moderate dementia of the Alzheimer's type.^{34,35}

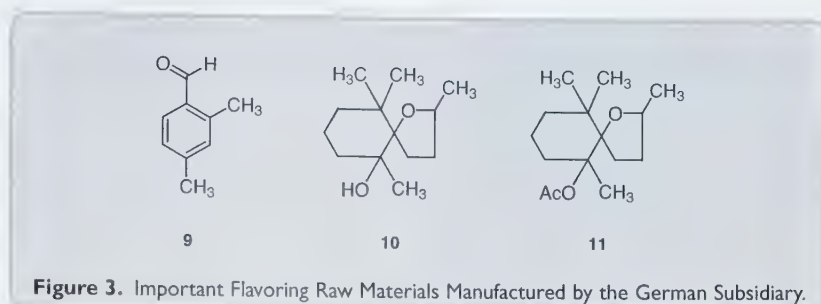


Figure 3. Important Flavoring Raw Materials Manufactured by the German Subsidiary.

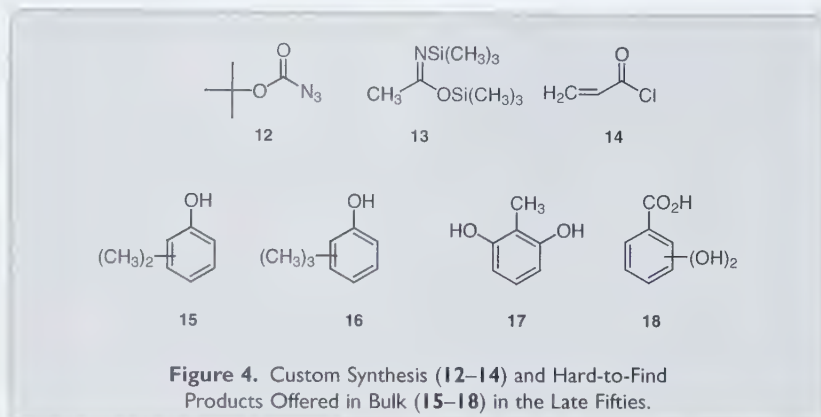


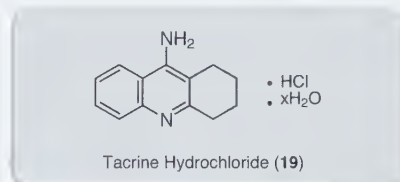
Figure 4. Custom Synthesis (**12–14**) and Hard-to-Find Products Offered in Bulk (**15–18**) in the Late Fifties.

5.2. Business, Art, and Chemistry

In 1965 and then in 1966, the Bader family sold some of their shares in the company first to a select group of chemists and friends and then to the public at large. By 1965, sales had almost doubled to about \$1.8 million, from \$1 million in 1962, and the number of employees had grown to over 100, of which 15 were chemists (7 with a Ph.D.).³¹ The Aldrich Catalog/Handbook took on its now familiar name and look, as the 1967/1968 edition was the first to have a painting, *The Quill Cutter* by Paulus de Lesire, on its cover. Contrary to popular belief, the idea for placing a painting on the cover of the catalog came, not from Bader—the art lover and collector—but from Bernie Edelstein, an Aldrich employee.³⁶

Following the public offerings, sales and the share price rose steadily as Aldrich grew by expanding into new lines of business and entering into (exclusive) distributorship agreements with a number of commodity chemical producers and other companies. Aldrich also acquired stakes in a number of U.S. based, small chemical producers, such as Hexagon and Kaplop Laboratories, but later divested itself of these stocks after the companies ran into business difficulties.

The *Aldrichimica Acta* evolved from the *Kardindex Sheets* that Aldrich used to mail to its best customers to keep them informed of its newest product offerings.³⁷ A preview issue was printed in the fall of 1967, and then



publication on a regular basis started in 1968. Richard K. Vitek, Aldrich's Director of Marketing at the time, became its first editor—albeit for a very short period of time. A classical alchemical Dutch painting by

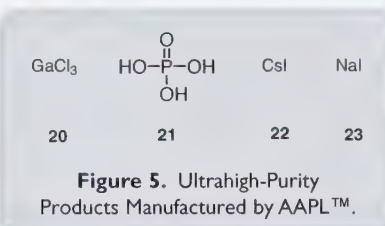
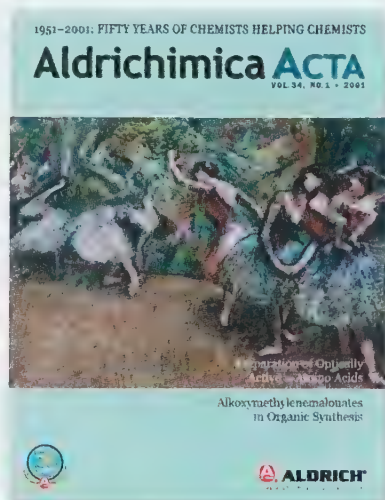


Figure 5. Ultrahigh-Purity Products Manufactured by AAPL™.



Aldrich's manufacturing site near Sheboygan, Wisconsin.

Thomas Wyck (17th century) from the Alfred Bader art collection was reproduced on the cover of the first issue of 1968. Of this very same issue, 10,000 copies were printed, whereas, today, over 130,000 copies of each issue are distributed worldwide free of charge. Alfred Bader, who coined the name *Aldrichimica Acta*, came up with the idea of placing a painting on its cover,¹⁷ following the precedent-setting reproduction of a painting on the cover of the 1967/1968 edition of the Aldrich Catalog/Handbook (vide supra).

5.3. Joint Ventures

5.3.1. ALFA Inorganics, Inc.

This 50/50 joint venture with Metal Hydrides, Inc. (later became Ventron, Inc. and then a part of Thiokol Corp.) began in 1962 and ended in 1967. It was created to market inorganics, organometallics, and others such as organoboron and organo-arsenic reagents.³⁸ Even though the joint venture lasted only five years, it helped Aldrich learn a great deal about inorganics and set the stage for Aldrich to expand into this market sector in the 1970s.

5.3.2. Aldrich-Europe

In the late fifties and early sixties, Janssen Pharmaceutica (JP) of Beerse, Belgium, had become one of Aldrich's better suppliers. It was no surprise then that, in 1962, Aldrich became JP's sales agent in the United States. Thus started the good relationship between the two companies. It led in May of 1970 to the creation of Aldrich-Europe, a wholly owned division of JP, charged with distributing Aldrich products in Continental Europe. The joint venture lasted until June 1982. Its dissolution opened the way for Sigma-Aldrich to start subsidiaries and sales offices in many countries in Continental Europe. Today, these number 18.

5.3.3. Riedel-deHaën® Laboratory Chemicals

Fast-forwarding to the present, Sigma-Aldrich first formed a joint venture, Riedel-deHaën® Laborchemikalien GmbH & Co. KG, with Allied Signal in 1997 to market and sell mainly analytical reagents and solvents carrying the Riedel-deHaën® brand name. Three years later, the joint venture became a wholly owned subsidiary of Sigma-Aldrich Corporation and is currently offering close to 4,000 products belonging to three general types: Karl Fischer reagents for water determination, standards for environmental analysis, and high-purity solvents.

5.3.4. Aldrich-APL, L.L.C. (AAPL™)

Also in the present, Aldrich has a majority stake in a joint venture with APL Engineered Materials to produce select inorganics of extremely high purity and low moisture content (ultradry) intended for the high-tech market. This collaboration began in September 1995 and presently operates from a manufacturing facility in Urbana, Illinois. Dr. John Long, who had been hired by Aldrich in the 1970s to head the inorganics production laboratories in Milwaukee, was initially charged with managing the Urbana facility. Some of the more popular,

ultrahigh-purity products that are presently manufactured by AAPL™ include anhydrous gallium(III) chloride (20), phosphoric acid (21), anhydrous cesium iodide (22), and anhydrous sodium iodide (23) (Figure 5).

6. Great Opportunities and Profound Changes (1970s)

6.1. Aldrich-Boranes, Inc.

The greatest opportunity came when Professor H. C. Brown of Purdue University convinced Aldrich to further develop and commercialize the hydroboration technology and organoborane chemistry that he had developed and patented. This led, in May 1972, to the establishment of Aldrich-Boranes, Inc., a wholly owned Aldrich subsidiary, created to manufacture, among others, hydroboration reagents and products. Aldrich-Boranes, Inc. began operation in September 1972, with Dr. Harvey B. Hopps as its manager, Professor Brown as one of its directors, and a small development group of chemists headed by Clinton F. Lane, an enthusiastic young Ph.D., who had trained with Professor Brown at Purdue. Some of the first compounds manufactured by Aldrich-Boranes were borane-THF (24), 9-BBN (25), borane-methyl sulfide (26), and compounds 27-30 (Figure 6).³⁹ A multitude of others followed in rapid succession. The early development of this chemistry has been described in several reviews by Lane.⁴⁰ In the early 80s, Aldrich-Boranes, Inc. was integrated into Aldrich.

In the first five years, Aldrich-Boranes, Inc. operated from the production laboratories on West St. Paul Avenue in Milwaukee's city center. Following the purchase, in December 1977, of a laboratory building and a property in the town of Wilson, Sheboygan County, Wisconsin, its operations were moved to this site in March 1978.⁴¹ This became the nucleus of Sigma-Aldrich's current 513-acre manufacturing site at 5485 County Road V. The range of products manufactured at the site has long expanded to include pharmaceutical intermediates, air-sensitive reagents, various organometallics, cGMP products, high-purity solvents, and many other compound types.

6.2. Stable Isotopes

Also in 1972, Aldrich acquired Diaprep, an Atlanta based manufacturer of deuterated solvents, and with it two experienced chemists—Tom Wickersham and Bob Askins. Tom remained with Aldrich until his retirement in 1999; he spent most of his career in the Stains & Dyes division, which he helped grow into an important part of the business (vide infra). With the acquisition of Diaprep, Aldrich started the production of

deuterated solvents; this production has expanded rapidly and considerably to the point that Aldrich is presently perhaps the world's largest producer of deuterated solvents. Moreover, through special agreements with companies such as Isotec Inc., Aldrich has also been able to significantly expand its offerings of products labeled with other stable isotopes, such as ^7Li , ^9Li , ^{10}B , ^{11}B , ^{13}C , ^{14}C , ^{15}N , and ^{18}O . In February 2001, Sigma-Aldrich purchased Isotec, Inc., thus becoming the leader in the stable isotopes market.

6.3. Sigma-Aldrich Corporation

The other profound event occurred three years later, in August 1975, when Aldrich Chemical Co. merged with Sigma International, Ltd. of St. Louis, Missouri, to form Sigma-Aldrich Corporation. At the time, both companies were publicly owned, with Aldrich the leading supplier of organic research chemicals and Sigma the leading supplier of research biochemicals. Having dodged several takeover attempts, Aldrich had, in 1967, approached Sigma—then a privately owned company—with an offer to merge, but was rebuffed. By 1975, however, changing trends in chemical research and the synergy to be realized from their complementary business practices and product offerings convinced the two companies to finally merge.

Dan Broida, Sigma's president at the time of the merger, became chairman of the board, while Alfred Bader, Aldrich's president, became president of Sigma-Aldrich Corp. At the time, the new company did not have a CEO. As anticipated, the merged companies drew on each other's strengths—Sigma's emphasis on quality and service and Aldrich's emphasis on introducing new products and maintaining good relationships with suppliers.

A little over a year prior to the merger (April 23, 1974), four Aldrich departmental managers—Robert Gorzek, Irwin (Ike) Klundt, Charles (Chuck) Pouchert, and Edward Segrin—were promoted to vice presidents. On the same date, Vice President Bernard Edelstein was promoted to Executive Vice President.⁴² The first and second Aldrich vice presidents, William Buth and John Biel, had left the company in 1973 and 1968, respectively.⁴¹ Also in 1974, David R. Harvey (see Section 7.1) became Aldrich's Vice President of European Operations.⁴⁴

6.4. Floyd Green's Stains and Dyes

In 1973, Dr. Floyd J. Green, a widely respected authority on biological stains and dyes, founded Aristo Custom Chemicals, Inc. in Cincinnati, Ohio, to manufacture

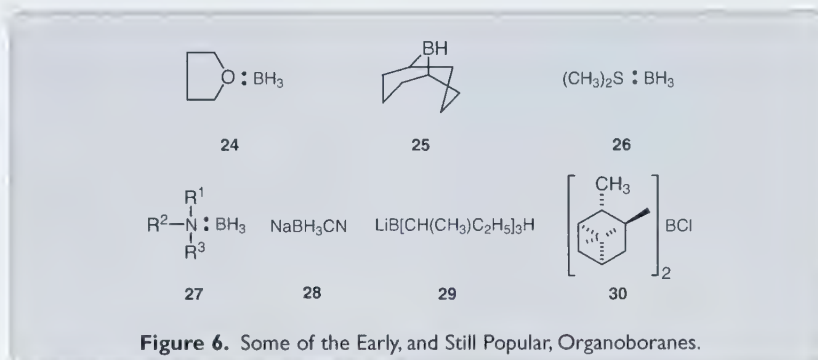


Figure 6. Some of the Early, and Still Popular, Organoboranes.

biological stains. He sold Aristo to Sigma-Aldrich in 1977 and moved to Milwaukee to become an Aldrich vice president in charge of the company's newly created Stains and Dyes division. This division currently boasts ca. 1,300 products, and offers an attractive handbook on stains, dyes, and indicators that was originally prepared by Dr. Green.⁴⁵ Two of the early dyes sold by the division were pararosaniline chloride and acetate. Presently, the Stains and Dyes division operates from a 110,000-sq ft facility, at 230 S. Emmer Lane in Milwaukee, that was purchased in the early seventies.

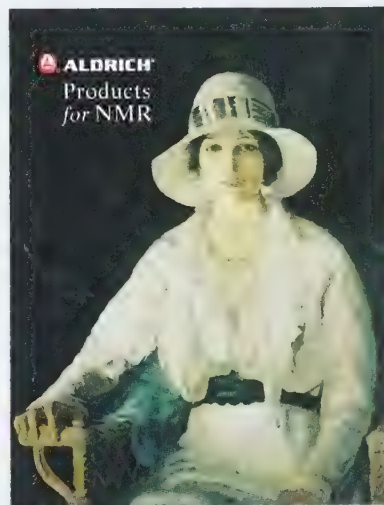
6.5. Nonchemical Products

6.5.1. Laboratory Equipment (Techware)

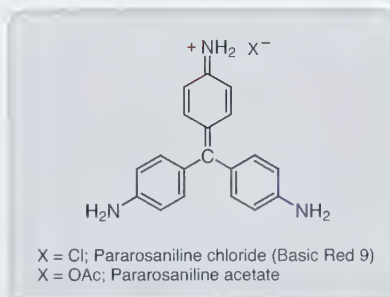
Charles J. Pouchert, a long-time Aldrich employee and Manager of its Quality Control department in the early 70s, promoted the idea that Aldrich should sell books that are useful to chemists. Not surprisingly, the first nonchemical item that Aldrich offered (cat. no. Z10,000-5)⁴⁶ was the first edition (1970) of *The Aldrich Library of Infrared Spectra*, that Pouchert edited. The idea of offering a laboratory equipment item was advanced by Dr. Harvey B. Hopps, at the time Aldrich's Manager of Technical Services. This first laboratory equipment item was a Diazald[®] kit (cat. no. Z10,025-2) and was listed for sale for the first time in the very early 70s.²⁴ Thus started the Techware division of Aldrich—with much input and encouragement from Edward J. Segrin, Aldrich's Sales Manager at the time. This division expanded rapidly over the years into such product areas as books, electronic media products, and glassware. It currently offers over 13,000 nonchemical items⁴⁷—everything the practicing chemist needs in addition to chemicals.

6.5.2. The Aldrich Glass Shop

The Aldrich glass shop grew simply enough from the need to repair laboratory glassware in-house. In the early 70s, and by arrangement with Daytime Vacuum Products, a glass shop was set up on the 4th floor of the



2001 edition of the Aldrich Stable Isotopes catalog.



940 W. St. Paul Avenue building. When the lone glass blower retired, Aldrich purchased the shop and looked to hire a glass blower to operate it. An early hire in 1974 left after a few months.⁴⁸ However, in 1975, an able



Techware CD-ROM product.



Sophisticated piece of glassware manufactured by the Aldrich Glass Shop.



Company logo from the early days.

glass blower, Dieter Damrow, was hired to operate the glass shop. Dieter stayed with the shop until his retirement in 1999, and has had a greater impact on the growth and development of the shop than anyone else. During Dieter's tenure, the glass shop grew steadily and its mission expanded to include the manufacture of new glass apparatus and

custom glassware, and the taking on of outside repair jobs. Back in 1985, the glass shop was relocated to newer quarters in the 2905 W. Hope Avenue facility.

6.6. New Lines of Business

As is clearly evident from the preceding discussion, the 70s were an exciting period for Aldrich. In addition to those mentioned in the previous sections, Aldrich availed itself of other business opportunities. Thus, in 1971, Aldrich launched its line of biochemical products with Irwin Klundt as its technical manager.⁴² However, this line of products had a brief, independent existence up until Aldrich's merger with Sigma in 1975. In 1978—free from the restrictions of the separation agreement that led to the dissolution of the Aldrich-Ventron joint venture (see Section 5.3.1)—Aldrich hired Dr. John Long, a promising young inorganic chemist, to spearhead its development and production of inorganic products. It wasn't long before Aldrich was competing successfully with ALFA Inorganics, Inc. The inorganic line of products is thriving today, enhanced by the establishment of the joint venture with APL Engineered Materials in 1995 (see Section 5.3.4). Together with the line of organometallics, it offers close to 10,000 products for, among others, the high-technology markets.

6.7. Craftsmen in Chemistry?

Just as many other companies have had to, Aldrich also had to change with the times. The "Craftsmen in Chemistry" slogan, which was in use in the late 60s, was abandoned a few years later (1975), since it was deemed politically incorrect. It wasn't until early 1978 that a new slogan, "chemists helping chemists in research and industry", began appearing in company literature. Presently, this motto is slowly being phased out in favor of its shorter version, "chemists helping chemists". Aldrich's logo also underwent a face-lift; an earlier version is depicted here. Fortunately, and unlike many other prominent chemical companies, Aldrich did not succumb to the pressure of dropping the word "chemical" from its name, during a period of time when this word had become a public relations liability.

7. Post-Merger Era

7.1. The Succession

With Aldrich now a company within Sigma-Aldrich Corporation, Alfred Bader became President of the merged company and remained President of Aldrich until early 1981. He was succeeded as President of

Aldrich by Dr. David R. Harvey (1981–1986), Dr. Jai P. Nagarkatti (1987–1999), and Dr. Clinton F. Lane (1999–Present).⁴⁹

David R. Harvey, an Oxford University graduate, started out in Aldrich-UK in August 1974 as Vice President of European Operations. As president of Aldrich, he oversaw, among others, the relocation of the distribution center to the Hope Avenue facility and the construction of the laboratory building at the Sheboygan County site. He is also credited with starting the company's Flavors & Fragrances division. David went on to become President of Sigma-Aldrich Corp. and then, in 2000, its Chairman, President, and CEO.

A graduate of East Texas State University, Jai P. Nagarkatti started his career at Aldrich in 1976 as a Process Development Chemist in the Production Laboratory. He progressed through the ranks to become Vice President of Production in 1985 and President of Aldrich in 1987. Late in 1999, he was promoted to President of Sigma-Aldrich Fine Chemicals, one of four strategic business units of Sigma-Aldrich Corp. During his tenure as president, Aldrich experienced a substantial growth in business. He oversaw a major expansion of the manufacturing plant (Pro II) at the Sheboygan County site, and worked tirelessly to integrate Aldrich more closely into Sigma-Aldrich Corp.

Clinton F. Lane, the current president, is a Purdue University graduate who was the first chemist hired for the Aldrich-Boranes, Inc. venture back in September 1972. After working as a bench chemist in Milwaukee, he moved, along with Aldrich-Boranes, Inc. to the Sheboygan County site soon after its purchase in 1977. After 13 years as Plant Manager of the Sheboygan County site, he was promoted to Vice President, Executive Vice President, and then President of Aldrich in 1999. Clint is credited with the substantial growth that both the Sheboygan County site and the line of boron-containing products have experienced. The interested reader should review Section 6.1 for more details.

7.2. The 80s and 90s

Following the merger of Aldrich and Sigma, business expectations for the merged company were soon realized. Annual double-digit growth has since been the norm, and other companies^{50,51}—Floyd Green's Aristo Custom Chemicals (USA, 1977), Makor Chemicals (Israel, 1978), Pathfinder (USA, 1984), Bio Yeda (Israel, 1986), Bristol Organics (UK, 1986), Fluka Chemie AG (Switzerland, 1989), Supelco (USA, 1993), LabKemi AB (Sweden, 1994), Research



David R. Harvey, Aldrich President (1981-1986).



Jai P. Nagarkatti, Aldrich President (1987-1999).



Clinton F. Lane, Aldrich President (1999-Present).

Biochemicals International (USA, 1997), Carbolabs (USA, 1997), Genosys Biotechnologies, Inc. (USA, 1998), Riedel-deHaën[®] Laborchemikalien GmbH & Co. KG (Germany, 1999), ARK Scientific GmbH

(Germany, 2000), First Medical, Inc. (USA, 2000), Amelung GmbH (Germany, 2000), Isotec, Inc. (USA, 2001)—have also become part of Sigma-Aldrich Corp. In 2000, Sigma-Aldrich corporate sales were over one billion dollars.⁵² The brands that make up Sigma-Aldrich Corp. are now well-known and trusted worldwide. The total number of products they offer is about 85,000 of which about 40,000 are produced.

Aldrich continued its spectacular growth in these two decades as evidenced by the purchase of several large buildings in the mid-1980s: 2905 W. Hope Avenue (currently holds the RCL collection), 1101 W. St. Paul Avenue (contains the Flavors & Fragrances products), and 1001 W. St. Paul Avenue (houses administrative offices and support departments). In 1986, Aldrich added 284 acres to the Sheboygan County site, and, in the early 90s, purchased and then added to a site at 6000 N. Teutonia Avenue in Milwaukee. In the 1990s, groupings of products, that Aldrich had offered since its early days, evolved into distinct product lines with their own technical managers, e.g., chiral, nonracemic products (~2,400 listings) and monomers & polymers (~3,100 products).

7.3. The Present and the Future

7.3.1. "A Member of the Sigma-Aldrich Family"

Today, Aldrich continues to thrive within Sigma-Aldrich Corp. and has expanded into new market sectors—such as combinatorial chemistry, active high-purity metals and inorganics, and high-purity gases—and new overseas markets. In the past decade, it has also upgraded and enlarged its Milwaukee and East Coast distribution centers to enable the company to become even more responsive to its customers.

What does the future hold for Aldrich? Aldrich's future is intimately tied to that of Sigma-Aldrich. In December 2000, Sigma-Aldrich launched a new strategic plan clearly focusing the company on "leadership in Life Science and High Technology". In fact, 75% of the company's current sales are for Life Science applications, while the remaining 25% are in a variety of High Technology areas. The other key initiatives undertaken focus on service and process improvements.⁵³ The strategic plan made Aldrich a part of the Scientific Research business unit of Sigma-Aldrich Corp. The startup of a state-of-the-art, \$25 million production plant (Pro I) near Sheboygan Falls, WI, a combinatorial chemistry product line, a wide array of active and high-purity metals, and a strong Internet presence are but



Aldrich's Teutonia Avenue site.



Pro I building at Aldrich's Sheboygan County site.

a few of the ways in which Aldrich is implementing this strategy and is continuing to evolve.

Sigma-Aldrich's corporate vision is embodied in its motto: "We Are Committed to the Success of Our Customers, Employees and Shareholders through Leadership in Life Science, High Technology and Service."

7.3.2. www.sigma-aldrich.com/aldrich

Over the past five years, Sigma-Aldrich Corp. has been implementing its strategic plan for a strong, independent presence on the Internet with the goal of eventually transacting at least 50% of sales via the Internet. In 2000, corporate Internet sales represented over 10% of sales in the USA and about 5% of sales worldwide.⁵² Ongoing updates and a vast array of useful information, coupled with a focus on ease of use and visual appeal, have characterized the corporation's Web site.

Aldrich has vigorously participated in this effort by making available free of charge not only its catalog/handbook and various specialty catalogs and promotional materials.



Photo courtesy of H.C. Brown

Professor Herbert C. Brown (1999).



Photo courtesy of B.J. Horick

Beverly J. Horick (2001), recently retired Aldrich employee with the most years of service (February 17, 1956 to February 28, 2001).

but also its vast store of MSDSs, CofAs, and product technical data. One of its goals for the near future is to make available, free of charge, its IR, UV, and NMR spectral libraries on its Web site.

8. The Role of Science and Scientists

This is a topic that is so dear to the "heart" of the company that it merits a separate treatment.

8.1. Scientists' Contributions

Aldrich is a science-based company. It was cofounded by a Ph.D. chemist, currently employs several dozen Ph.D. chemists and many hundreds of college-educated chemistry professionals. Most of its customers are scientists of all walks of life. Early on, Aldrich recognized the importance of scientists to the growth and health of the company: Scientists were the originators of many of the successful Aldrich products, as well as the main consumers of its products. As discussed in Section 4.2, a large portion of the company's collection of hard-to-find research samples, known as the Rare Chemical Library, comes from the laboratories of these scientists.

Aldrich has been fortunate to have had long-standing professional collaborations with many of the leading chemists of the second half of the twentieth century. These relationships proved advantageous not only to the company, but also to the community of chemists by making available reagents that are now indispensable for chemistry research: $\text{Me}_2\text{S}\cdot\text{BH}_3$, NaBH_3CN , and the family of Selectride[®] reducing agents, to name a few. In the early days, it was natural for Alfred Bader to turn to Louis Fieser, his Ph.D. advisor at Harvard, or Martin Ettlinger, his graduate school contemporary, for ideas on what compounds would be of interest to researchers. Subsequently, Aldrich has had significant collaborations with many other leading chemists. What follows is only a partial list (in alphabetical order):⁵⁴ E. J. Corey, Henry Gilman (deceased), Eric N. Jacobsen, Kim D. Janda, Richard Lerner, Andrew G. Myers, K. C. Nicolaou, Martin J. O'Donnell, David O'Hagan, Siegfried Pickholz (deceased), Reuben Rieke, Ian P. Rothwell, I. Herbert Scheinberg, Barry K. Sharpless, John C. Sheehan (deceased), Gilbert Stork, and Robert B. Woodward (deceased).

Perhaps more than any other factor, it was the development of ideas and technologies, invented by researchers and developed or commercialized by Aldrich, that propelled Aldrich (and later Sigma-Aldrich) to the prominent position that it is presently in. It is unquestionably the vigorous pursuit of these contacts and collaborations that will keep Sigma-Aldrich a leading technology company.

8.2. Herbert C. Brown

Aside from Alfred Bader, perhaps no other single chemist has had a greater impact on the success of Aldrich than Professor Herbert C. Brown of Purdue University. A Nobel laureate and a towering figure in chemistry, Brown not only was the catalyst and a driving force for Aldrich-Bornanes, Inc., as explained in Section 6.1, but he also served on the Aldrich Board of Directors (1972–1975) and the Sigma-Aldrich Board of Directors (1975–1979). In recognition of his lasting contributions, Aldrich not only pays royalties to the Purdue Research Foundation, but also co-sponsors the *Herbert C. Brown Award for Creative Research in Synthetic Methods* that is administered by the American Chemical Society.

8.3. Rewarding Excellence

Aldrich has also had a tradition of rewarding excellence in chemistry research by sponsoring or co-sponsoring prestigious professional awards, symposia, and student fellowships. A few examples come to mind: *ACS Award for Creative Work in Synthetic Organic Chemistry*, *ACS Award in Inorganic Chemistry*, *Herbert C. Brown Award for Creative Research in Synthetic Methods*, Project SEED, 32nd Organosilicon Symposium (Milwaukee, 1999), Asymmetric Synthesis Symposium (Milwaukee, 1998), Boron-USA meetings, and various Gordon Conferences. Moreover, Alfred Bader, Aldrich's cofounder, personally sponsors the *Alfred Bader Award in Bioinorganic or Bioorganic Chemistry*, and has helped over the years many deserving academic chemists by underwriting some of their research.⁵

9. Valued Customers, Dedicated Employees

Aldrich recognized very early on the importance of establishing strong relationships with its customers, and the necessity to provide them with valuable information related to the products that they were purchasing. Thus, it was no surprise that the Aldrich catalog was transformed from a listing of available products and prices to a "handbook" containing a wealth of information, which has made it an indispensable desk reference in many academic and industrial laboratories and libraries. Chemists active in research were not only customers, but also partners in the chemical enterprise, who were also invited to share their insights with others through such widely circulated and *free* Aldrich publications as the *Aldrichimica Acta* (which has been in existence for 34 years). It is also no secret that ideas for new products often

Table 2. Present and Former Aldrich Employees with 25 or More Years of Continuous Service^{a,b}

Adler, Wayne J.	Gorzek, Robert J.	Leitner, Lorraine	Rochwerger, Leonard L.
Ahmed, Waheeduddin	Griesinger, Alfred	Lenga, Robert E.	Roper, Mattie D.
Bader, Alfred R.	Griffiths, David W.	Lent, Mary A.	Saladin, Barbara L.
Benson, Christine F.	Gunther, Patricia A.	Lewis, Robert J.	Schreiber, Peter L.
Borenstein, Mark	Harvey, David R.	Lisztwan, Emilia M.	Settingsgaard, Jacqueline L.
Bourgeois, Shirley R.	Helmin, William T.	Malone, Rosie L.	Shortridge, Nelgene
Branski, Robert A.	Holm, Phillip L.	Mehta, Milan N.	Shuder, Diane L.
Brien, Diana M.	Horick, Beverly J.	Metz, Marian E.	Siegel, Brian S.
Brien, James J.	Jenkins, Dolores H.	Mititch, Jacqueline	Skeff, George
Bruesewitz, Richard J.	Kasprzak, Russell J.	Nagarkatti, Jai P.	Smith, Andrew P.
Creighton, Anthony J.	Kett, Jeffrey A.	Napiorkowski, Anna M.	Smith, Robert W.
Daniels, John J.	Koppel, Henry C.	Podd, Rodney L.	Stanton, Genevieve L.
Edelstein, Sara	Kopperud, Cynthia A.	Poth, Donna L.	Wallace, Kenneth J.
Farrell, Richard T.	Korthoff, Kristine L.	Pouchert, Charles J.	Ward, Stella L.
Feustel, Barbara L.	Kratzer, Phyllis C.	Pruss, Judith R.	Weber, Roger O.
Fox, Lyle G.	Kreinus, Timothy M.	Pykett, Jonathan R.	Wells, Sheila E.
Freeman, Roland P.	Kurzynski, Alice J.	Rebarchik, Joseph A.	Wickersham, Thomas W.
Gallaspy, Barbara A.	Lane, Clinton F.	Riedmaier, John E.	Wondra, Carl T.

^a As of June 2001. ^b Admittedly, length of service is an imperfect measure of an employee's contribution to the company; however, this author was at a loss to come up with a fair, objective way of recognizing those employees who have given so much to the company, but may not be mentioned in the text. I offer my apologies to those employees, whose names belong in the table, but were inadvertently left out.

came from customers. To appreciate this fact more fully, it is sufficient to consult the "Please Bother Us" section of any recent *Aldrichimica Acta* issue.

Aldrich's phenomenal success is a tribute to the vision and determination of its cofounder, Dr. Alfred R. Bader, and the dedication and hard work of thousands of former and present employees. **Table 2** is only a modest attempt at acknowledging their contributions.

10. Acknowledgments

In addition to the sources cited, I wish to acknowledge the specific assistance of (in alphabetical order): (i) Bettie Aldrich Eisendrath, Gerd Backes, Alfred Bader, Jim Brien, Tom Gandia, David Harvey, Don Hobbs, Harvey Hopps, Beverly Horick, Peter Hyland, Linda Kehren, Clinton Lane, Lorraine Leitner, Edward Niemiec, Judith Pruss, Robert Smith, Joan Suda, Robert Wandler, Tom Wickersham, and LaShannon Wilson, who provided me with valuable information and recollections either via personal communications or via source materials that they supplied to me; (ii) Brian Case, Robert Gorzek, David Harvey, Chris Hewitt, Harvey Hopps, Peter Hyland, Anthony J. La Loggia, Clinton Lane, Jai Nagarkatti, and Craig Recatto, who proofread the manuscript or sections thereof, and offered helpful comments; (iii) Jennifer L. Botic, who laid out the manuscript and this

issue of the *Acta*, and who assisted me in locating some of the photographs used; and (iv) Rebecca Zelenka, who helped with contacting former Aldrich employees. Finally, I would like to thank my wife for her patience and understanding while I was preparing the manuscript.

11. References and Notes

- (1) This brief tour of the past fifty years cannot possibly do justice to the topic. For more details and anecdotes, the interested reader is directed to the very readable book by one of the founders of Aldrich: Bader, A. *Adventures of a Chemist Collector*; Weidenfeld and Nicolson: London, U.K., 1995.
- (2) Cori, T.; Emanuel, R. N.; Harvey, D.; Klitsner, M. E. *Aldrichimica Acta* **1984**, *17*, 3.
- (3) (a) Bader, Alfred. The Building of Aldrich. My Advice to Entrepreneurs. *The Chemist*, November/December 1997, pp 1-5. (b) Buchan, P. Bruce. Three Boards and "A Bet Against the Company". *The Chemical Intelligencer*, October 1996, pp 24-29 and 41. (c) Edward, J. T. *Can. Chem. News* **1992**, *44*(6), 23. (d) Bohning, James J. Crystallizing Hamburger: Alfred Bader and the Aldrich Chemical Company, Part I. *Beckman Center News*, Spring 1991, pp 1 and 8-9. (e) Bohning, James J. Crystallizing Hamburger: Alfred Bader and the Aldrich Chemical Company, Part II. *Beckman Center News*, Fall 1991, pp 3-4. (f) Bader, A. R. *CHEMTECH* **1990** (March), 138. (g) A Chemical Company in Your Garage. An Interview with Dr. Alfred Bader. *The DEL-CHEM BULLETIN*, May 1974, pp 5-10.
- (4) While it is unquestionably the contributions of a great many dedicated employees that have made Aldrich what it is today, it is not possible in such a short overview to mention them all. The author regrets any inadvertent or necessary omissions.
- (5) Reference 1, pp 70, 101, and 185.
- (6) (a) The 500 shares of stock issued were owned 50% by Alfred R. Bader and 50% by Jack N., Frank N., and Bettie Mae Eisendrath. Professor A. F. McKay of the University of Toronto, Canada, owned only one share of stock: Bader, A. R. Alfred Bader Fine Arts, Milwaukee, WI. Personal communication, April 09, 2001. (b) Prior to cofounding Aldrich, Jack Eisendrath had attempted to start and run a number of mail order/catalog businesses (e.g., selling moccasins): Eisendrath, B. A. Washington, DC. Personal communication, April 03, 2001.
- (7) (a) Reference 1, p 70. (b) Up until the Eisendraths sold their 50% stake in the company, Bettie acted as the company's (unpaid) secretary. As of the writing of this review, Bettie was still a remarkably energetic and socially active octogenarian living in Washington, DC.
- (8) (a) Leitner, L. (née Neau; retired) Aldrich Chemical Co., Inc., Milwaukee, WI. Personal communication, March 16, 2001. (b) Horick, B. J. (retired) Aldrich Chemical Co., Inc., Milwaukee, WI. Personal communication, February 01, 2001.
- (9) (a) McKay, A. F.; Wright, G. F. *J. Am. Chem. Soc.* **1947**, *69*, 3028. (b) McKay, A. F. *J. Am. Chem. Soc.* **1948**, *70*, 1974. (c) McKay, A. F.; Ott, W. L.; Taylor, G. W.; Buchanan, M. N.; Crooker, J. F. *Can. J. Res., Sec. B* **1950**, *28*, 683.

- (10) Aldrich Chemical Co., Inc. *Diazald[®], MNNG, and Diazomethane Generators*. Aldrich Technical Information Bulletin No. AL-180; Milwaukee, WI, 1993.
- (11) Reference 1, pp 71–72.
- (12) Bader, A. R. Alfred Bader Fine Arts, Milwaukee, WI. Personal communication, March 19, 2001.
- (13) While at PPG, Anthony co-authored a paper with Alfred Bader on the easy preparation of phenyl esters of carboxylic acids by heating the acid and phenol in the presence of PPA: Bader, A. R.; Kontowicz, A. D. *J. Am. Chem. Soc.* **1953**, *75*, 5416.
- (14) Reference 1, p 74.
- (15) Jack Eisendrath continued his practice of general, family, and consumer law in Milwaukee for about 40 years. He died on November 06, 1997 at the age of 85: Knoche, Eldon. Consumers Had Advocate in Attorney Eisendrath. *The Milwaukee Journal Sentinel* [Online], November 9, 1997, main page (www.jsonline.com).
- (16) For a glimpse of Eisendrath's perspective of these events, see: (a) Lank, Avrum D. Chemist Mixes Knowledge, Savvy. *The Milwaukee Sentinel*, October 01, 1985, Part 4, pp 1–2. (b) Gillespie, Scott. Alfred Bader's Diverse Talents Led Firm to International Role. *The Business Journal Special Report* (Milwaukee), Week of September 22, 1986, p 9.
- (17) Bader, A. R. Alfred Bader Fine Arts, Milwaukee, WI. Personal communication, March 09 and April 09, 2001.
- (18) Kenney, Ray. Aldrich Firing Up All Burners. *The Milwaukee Sentinel*, September 02, 1974, Part 2, p 9.
- (19) Reference 1, p 77.
- (20) Bader, A. R. Alfred Bader Fine Arts, Milwaukee, WI. Personal communication, March 23, 2001.
- (21) Helen Bader (née Daniels) worked for Aldrich in various capacities on and off for over twenty years, whenever her family obligations permitted her to. In addition to being one of the owners of Aldrich, she was also a company director and treasurer for several years and the third company president for a very short period of time (1964). Following her death in 1989, her family established the Helen Bader Foundation, Inc. to honor her memory and continue the charitable work that she had started. The interested reader can find out more by accessing the Foundation's Web site at www.hbf.org.
- (22) Reference 1, pp 80–81.
- (23) Horick, Beverly J. Then & Now. *The Aldrich Reporter*, January 2001, p 10. When Beverly J. Horick retired from Aldrich on February 28, 2001 (after a little over 45 years of continuous service!) she set a record as the employee with the longest service to the company.
- (24) Hopps, H. B. Amarillo College, Amarillo, TX. Personal communication, February 21, 2001.
- (25) (a) Aldrich Chemical Co., Inc. The Aldrich Annual Report; Milwaukee, WI, September 03, 1969. (b) Aldrich Chemical Co., Inc. Annual Report; Milwaukee, WI, September 30, 1970.
- (26) Reference 1, p 98.
- (27) Aldrich Chemical Co., Inc. Prospectus; Milwaukee, WI, December 30, 1965; p 2.
- (28) Reference 1, p 79.
- (29) EGA from the names Ernst, Gerhard, and Alfred.
- (30) Aldrich Chemical Co., Inc. Annual Report 1971; Milwaukee, WI, March 24, 1972.
- (31) (a) Mack, H. Sigma-Aldrich Chemie GmbH, Steinheim, Germany. Personal communication, March 06, 2001. (b) Backes, G. Sigma-Aldrich Chemie GmbH, Steinheim, Germany. Personal communication, March 09, 2001.
- (32) Koppel, H. *Aldrichimica Acta* **1968**, *1*, 3.
- (33) Reference 1, p 88.
- (34) Medical Economics Company, Inc. *Physicians' Desk Reference*, 52nd ed.; Montvale, NJ, 1998; pp 2082–2086.
- (35) The statements in this paragraph should not be construed to imply that COGNEX[®] is formulated with a material obtained from Aldrich. Aldrich brand products are sold mainly for research or industrial applications and are not intended for drug or household use, unless specifically designated for that purpose.
- (36) Reference 1, pp 82–83.
- (37) Aldrich Chemical Co., Inc. *Aldrichimica Acta* (Preview Issue); Milwaukee, WI, Fall 1967.
- (38) Reference 1, p 133.
- (39) Lane, Clinton F. Greetings from the Future Leaders in Organoborane Chemicals! *Aldrich-Boranes, Inc. Newsletter*, February 1973, p 2.
- (40) For some examples, see: (a) Lane, C. F. *Aldrichimica Acta* **1973**, *6*, 21. (b) Lane, C. F. *Aldrichimica Acta* **1973**, *6*, 51. (c) Lane, C. F. *Aldrichimica Acta* **1974**, *7*, 7. (d) Lane, C. F. *Aldrichimica Acta* **1974**, *7*, 32. (e) Lane, C. F. *Synthesis* **1975**, 135. (f) Lane, C. F. *Aldrichimica Acta* **1975**, *8*, 3. (g) Lane, C. F. *Aldrichimica Acta* **1975**, *8*, 20. (h) Lane, C. F.; Kabalka, G. W. *Tetrahedron* **1976**, *32*, 981. (i) Lane, C. F. *Chem. Rev.* **1976**, *76*, 773. (j) Lane, C. F. *Aldrichimica Acta* **1976**, *9*, 31. (k) Lane, C. F.; Kramer, G. W. *Aldrichimica Acta* **1977**, *10*, 11. (l) Brown, H. C.; Lane, C. F. *Heterocycles* **1977**, *7*, 453. (m) Lane, C. F. *Aldrichimica Acta* **1977**, *10*, 41.
- (41) Aldrich Chemical Co., Inc. *Welcome to Aldrich Sheboygan Site*. Aldrich Informational Bulletin; Sheboygan Falls, WI, 1999.
- (42) Aldrich Chemical Co., Inc. The Aldrich Semimonthly Newsletter (Extra); Milwaukee, WI, April 25, 1974.
- (43) (a) Aldrich Chemical Co., Inc. Annual Report 1973; Milwaukee, WI, February 15, 1974. (b) Reference 1, p 167.
- (44) Aldrich Chemical Co., Inc. Annual Report 1974; Milwaukee, WI, February 21, 1975.
- (45) Green, F. J. *The Sigma-Aldrich Handbook of Stains, Dyes and Indicators*; Aldrich Chemical Co., Inc.: Milwaukee, WI, 1990.
- (46) Has since been replaced by the third edition, cat. no. Z10,750-6; Pouchert, C. J. *The Aldrich Library of Infrared Spectra*, 3rd ed.; Aldrich Chemical Co., Inc.: Milwaukee, WI, 1981.
- (47) Brien, J. J. Aldrich Chemical Co., Inc., Milwaukee, WI. Personal communication, March 08, 2001.
- (48) Damrow, D. (retired) Aldrich Chemical Co., Inc., Milwaukee, WI. Personal communication, February 22, 2001.
- (49) For the record, Aldrich has had the following presidents in the following order: Jack Eisendrath, Alfred Bader, Helen Bader, Alfred Bader, David Harvey, Jai Nagarkatti, and Clinton Lane.
- (50) Suda, Joan. *The Sigma-Aldrich Story. Overview of a Multinational Family of Companies*. Sigma-Aldrich Bulletin; Sigma-Aldrich Corp.: St. Louis, MO, 2001.
- (51) Sigma-Aldrich Corp. *Sigma-Aldrich Acquires Isotec to Enhance Life Science Capabilities*. Press Release; St. Louis, MO, February 16, 2001.
- (52) Suda, Joan. *An Interview with David R. Harvey*. Sigma-Aldrich Bulletin; Sigma-Aldrich Corp.: St. Louis, MO, January 2001; p 1.
- (53) Harvey, D. R. Sigma-Aldrich Corp., St. Louis, MO. Personal communication, May 05, 2001.
- (54) Many more scientists have had fruitful collaborations or a significant impact on the growth of Aldrich. The author regrets not being able to acknowledge all of them.

Monsanto Company: Roundup[®]; **Riedel-deHaën GmbH:** Riedel-deHaën[®]; **Rieke Metals:** Rieke[®]; **Sigma-Aldrich Co.:** AAPL[™], ALDRICH[®], Diazald[®], FLUKA[®], Selectride[®], SIGMA[®]; **Warner-Lambert Co.:** COGNEX[®].

Happy 50th Anniversary Aldrich!

About the Author

Sharbil J. Firsan was born and raised in Lebanon. He completed his undergraduate studies at the American University of Beirut and his graduate work on acyclic imidate and thioimidate *N*-oxides with Professor Robert M. Coates at the University of Illinois in Urbana-Champaign (Ph.D., 1986). He did postdoctoral work at the University of Oregon in Eugene, OR, and then moved to Oklahoma State University in Stillwater, OK, to become a Research Associate and then a Visiting Assistant Professor. In 1996, he joined Aldrich Chemical Co., Milwaukee, WI, as a Promotions and Publications Specialist. He is currently a Senior Promotions and Publications Specialist and Editor of the *Aldrichimica Acta*. With his wife, Leah (Leila), Sharbil enjoys outdoor activities, gardening, and travel.



Subject: article in PRAVO-translation
From: Vladimír Matouš <matous.vladimir@worldonline.cz>
Date: Wed, 6 Nov 2002 23:51:12 +0100
To: <baderfa@execpc.com>

Dear Alfred,

I am 100x sorry for my delay in translation of the article from PRAVO newspapers you have sent me nearly month ago. Please, excuse this delay and also my poor English. But I hope you will understand it.

I was very busy in last weeks, making some study for DEGUSSA, also traveling and visiting some incineration stations in the Czech Republic.

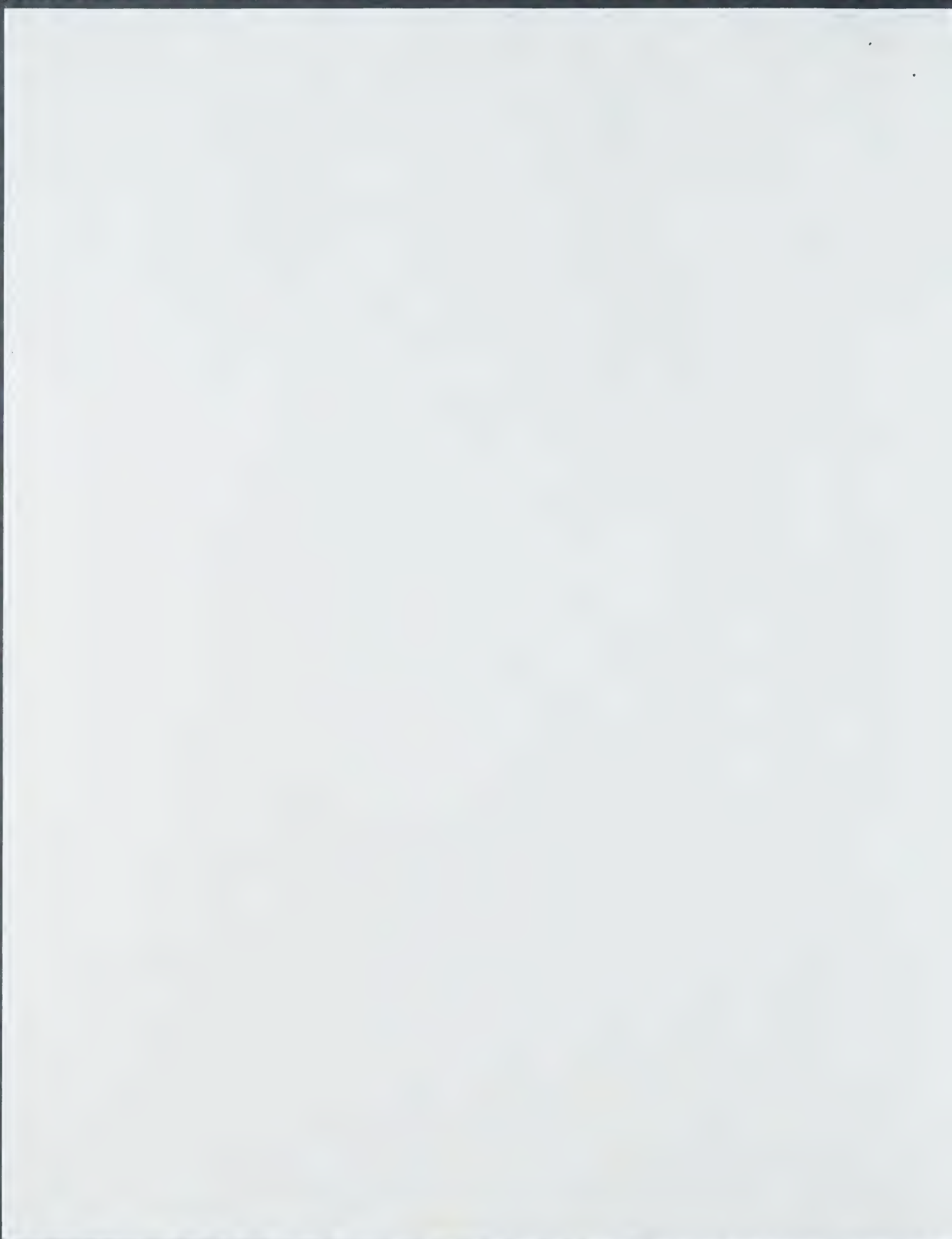
Two months ago I spent several days in DEGUSSA AG Mainz, celebrating 20 000th ton of TMT-15 (trimercapto-s-triazine, 3 Na salt) for separation of heavy metals from waste waters and flue gas.

DEGUSSA belongs among 10 world's biggest chemical companies, now.

I am glad I have still much to do. I am never boring.

Best regards to you and Isabel.

6.11.2002



To buy Rembrandt it is like to buy a toy for them

For 13 years Sotheby's tried to overcome the world price record on the market with the old masters' paintings but this summer it succeeded.

Concerning the old masters' paintings in May 1989 Christie's sold the portrait of Duke Cosima I Medicei from Pontorno, florentine mannerist at a 35.2 mil.USD (about 1 mld CK). The painting was bought for J.Paul Getty's museum in Malibu USA where belongs to its greatest attractions. The sum overcoming 35 mil.USD seemed to be invincible but prices of paintings from Picasso, Van Gogh, Renoir and Cézane have easy overcame it.

But prices of Rembrandt's or Michelangelo's paintings are only hardly reaching this limit .

Only this July the splendid painting „Killing the innocents“ by Flemish baroque painter P.P.Rubens has made a new record. The last duel in Sotheby's finished on the price 45 mil.GBP. The new buyer, Canadien multimillionair Mr.D.Thomson had to pay an additional sum of 4,5 mil.GBP (220 mil.CK) to the Sotheby's.

After the Van Gogh's „Portrait of dr.Gachet“ and Renoir's „Moulin de la Galette“ it is the third most expensive paintings' auction of the world.

But some speculations have occurred. Taking into consideration changes in the rates of exchanges (Van Gogh's and Renoir's paintings were sold in USD while Rubens in GBP) then probably value of the „Killing the innocents“ could be on the first place of the price Olympus.

In connection with Rubens' painting which Mr.Thomson has bought in Sotheby's for his father, German newspaper Die Welt published the table of the most remarkable collectors of the old masters. Interesting are not only names of the world-known rich men but also the areas where they got their money to be able to buy Rembrandt and Rubens to make pleasure for themselves.

So, what are the names of these big collectors, where are they coming from and what is the source of their money:

Alfred Bader (USA)-chemistry, Leon and Debie Black (USA)-banking, Georges Embiricos (Swiss)-logistics, Gert-Rudolf Flick(GB and Swiss)-patrimony, John Paul Getty(USA)-crude oil and patrimony, Lord Kirkham(GB)-furniture, Allicia Koplowitz (Spain)-financial investments and patrimony, Henry Kravis (USA)-banking, Ronald Lauder(USA)-cosmetics, Robert Miller(USA)-duty-free-shops, Lord Thomson (Canada)-press, Bill Gates(USA)-computers.

Two of a.m. personalities we could easy to meet also in the Czech Republic.

Ronald Lauder, US investor in TV NOVA loves an old town Cesky Krumlov and supports local Egon Schiele Centrum.

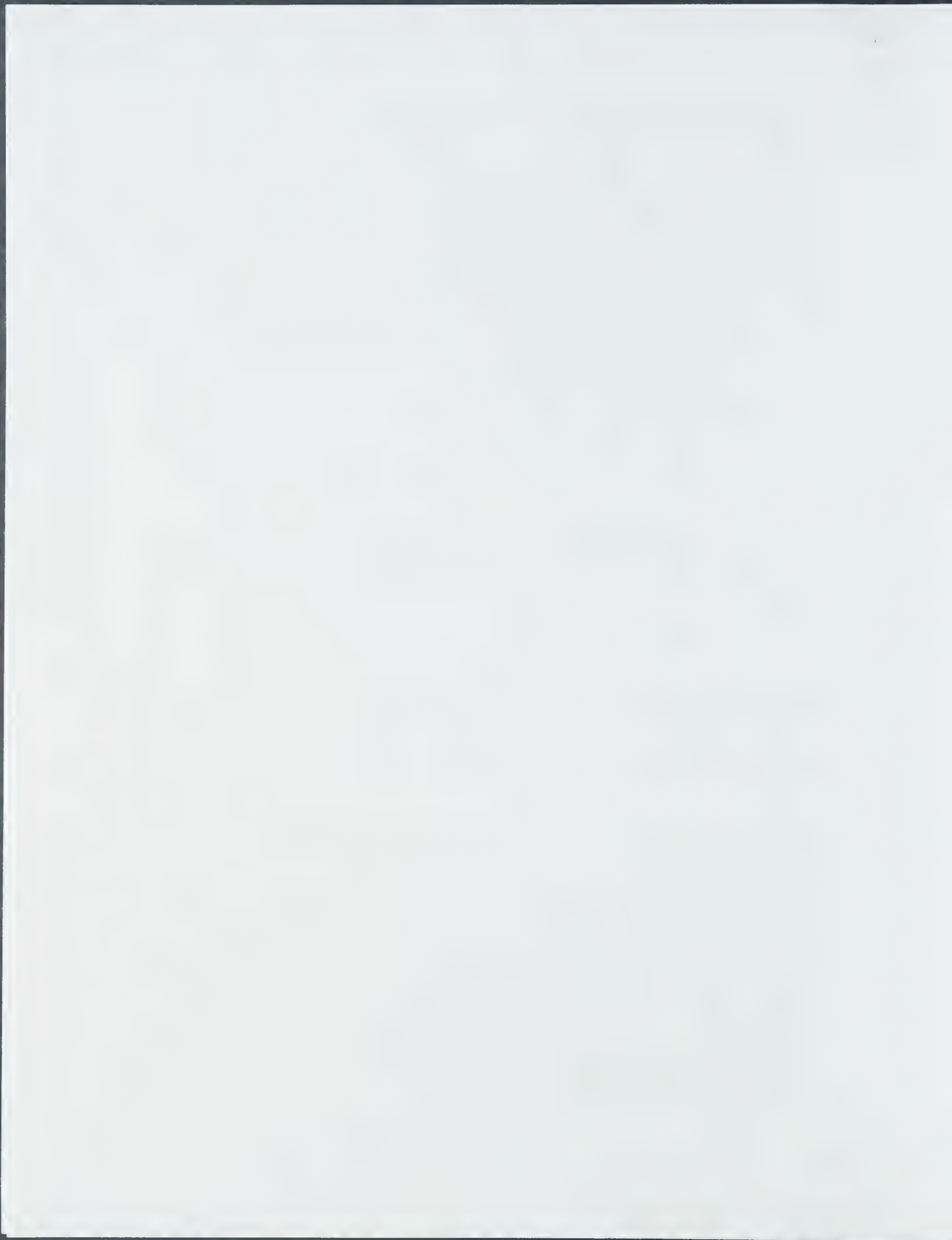
Alfred Bader loves Prague which is visiting regularly on holidays. He has even established here a fellowship for young Czech art historians, focused on 17th century.

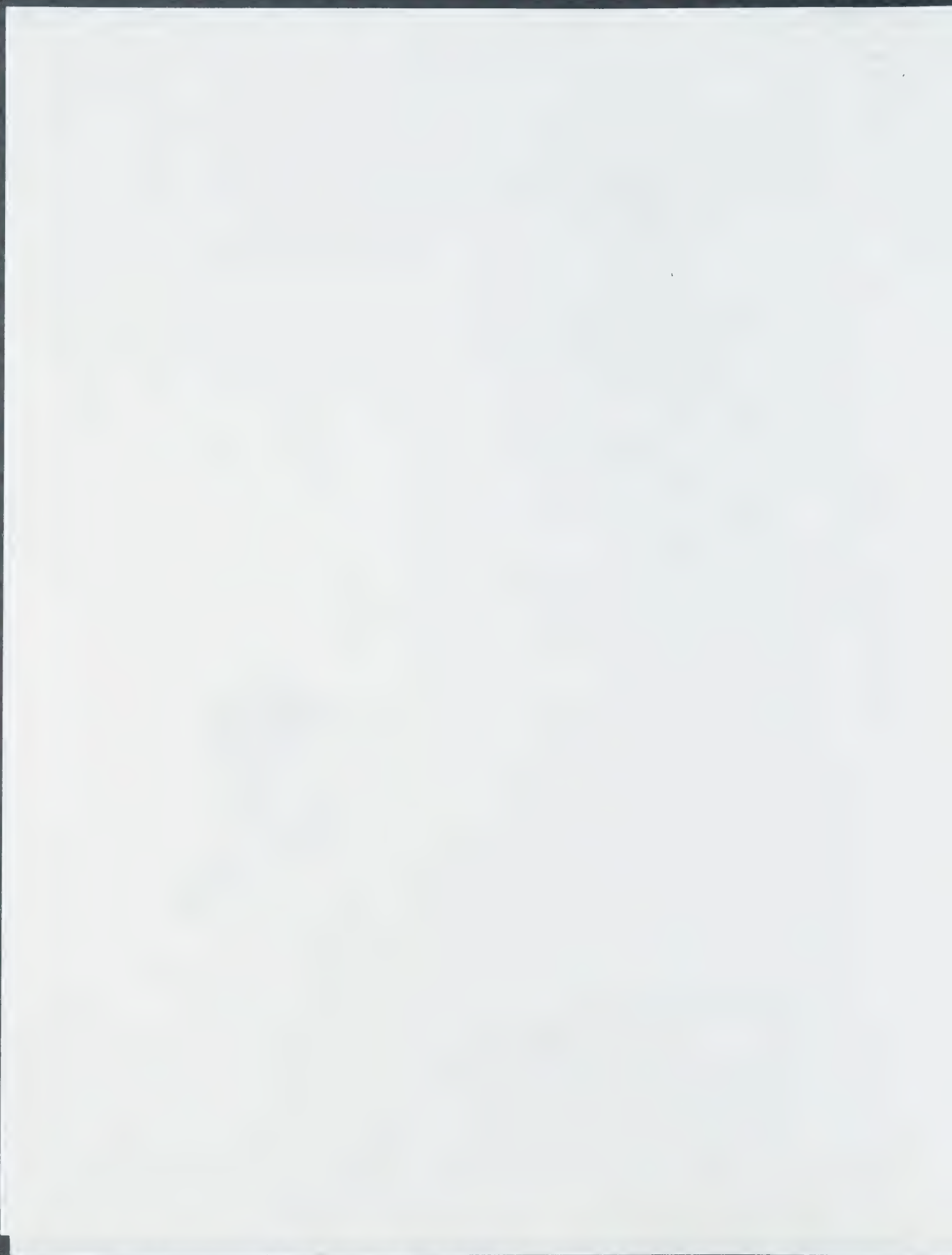
I have never met Lauder (author says) but I spoke with Alfred Bader one morning.

He has shocked me saying how modestly he lives and saves where it is possible. He doesn't waste any cent unnecessarily. If the waiter in restaurant would mark one of us as millionair after the tip, he would pointed me, I am sure (author says).

Bader never buy expensively. „I don't like to waste money. I am gaining paintings where the author is not known, easy. I have sense for quality. After that it is only a question of time to recognize who has this master painting really painted“ he said.

This is also the way how he has acquired several Rembrands. The specialists did not believe that they are originals but Alfred Bader was more clever.





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Biel recalls personal horror

See page 21

Right moves to unite

See pages 9 and 12



\$10M Rembrandt comes to town

Queen's benefactor bought work for \$55,000 in 1979

By Greg Barluk
Whig-Standard Staff Writer

KINGSTONIANS WILL SOON BE ABLE to snuggle up close to a painting by the Dutch master Rembrandt valued at \$10 million that has been donated to a Kingston art gallery.

The Rembrandt, entitled *Head of an Old Man*, has been donated by longtime Queen's benefactors Isabel and Alfred Bader and joins the collection of some 120 paintings that the couple has already given to the Agnes Etherington Art Centre at Queen's University. It will be unveiled at the gallery on Oct. 25.

Bader paid just \$55,000 for the painting when he bought it at auction in London in 1979.

"I was convinced it was a Rembrandt, but the experts at the time said it wasn't," said Bader in a telephone interview with *The Whig-Standard* from his home in Milwaukee.

An associate of Rembrandt's named Van Flieet had made an etching of this painting but scholars believed that he had been mistaken. Later it was found that he used the same difficult-to-obtain paper that Rembrandt used which showed they had worked in close collaboration.

The painting, once thought to be of Rembrandt's father, was valued at \$10 million by the Art Dealers Association of America.

"I can tell you how they arrived at that sum," said Bader. "A dealer in Holland sold a small Rembrandt for \$8 million. I think I could get more than \$10 million for it if I sold it on the private market."

"But the key is it's only one brick in the building. We plan to leave all of our paintings to Queen's when we die. That will give the gallery one of the finest collections of 17th-century Dutch painters in the world."

Please see REMBRANDT, Page 6



Head of an Old Man, painted by Dutch master Rembrandt circa 1630, has been donated to the Agnes Etherington Art Centre by longtime Queen's University benefactors Isabel and Alfred Bader.

Longtime friends killed in crash

Men died instantly when train hit pickup truck

By Jennifer Pritchett
Whig-Standard Staff Writer

TWO MEN WHO WERE KILLED WHEN A PASSENGER train collided with a pickup truck at a crossing in Napanee were longtime friends who worked together at a local roofing company.

Reginald S. Hitchens, 29, of Amherst Island and Carl Frederick Gibson, 35, of Kingston were killed instantly when Hitchens' late-model Dodge pickup was struck by a Via Rail train around 6:30 p.m. Wednesday at Townline Road in Greater Napanee.

Police say alcohol may have been a factor in the crash, but are releasing no other details.

Train No. 65, which was carrying 136 passengers, was on its way to Toronto from Montreal along the busiest rail corridor in Canada when it smashed into the truck about 30 kilometres west of Kingston.

The train carried the truck several hundred metres down the tracks before it could stop. Crews had to use a crane to pry the crushed pickup from the front of the train.

It took several hours to clear the tracks so that six other Via trains that were stopped nearby could continue on their way.

Franklin Gray, who runs a cattle farm on Townline Road along the railway tracks, said he heard a loud noise that sounded like an airplane landing as the train braked. He looked out his kitchen window and saw a train stopping.

"When you see a passenger train stop on the tracks, you know it's bad," he said.

Gray and his wife, Joan, quickly hopped in their truck and drove to the site to offer any help they could. One of the first people to arrive at the scene, Gray ended up trucking some of the emergency equipment needed by police and ambulance crews through his field because the train had stopped in an area that is difficult to reach.

"When we got there, the police told us there was nothing we could do for the men inside the truck," he said.

"They were already gone."

Gray said it was tough seeing the crash site because he'd predicted someone was going to get killed at the crossing since he had a close call there two years ago.

"I knew something was going to happen," he said. Regardless of what hour of the day it's a bad crossing, especially going north on Townline Road. I mean, I thought I looked both east and west, but really well and I didn't see the train and I didn't hear it back two years ago."

He remembers seeing the engine of the passenger train coming toward him as he was crossing the tracks heading north on Townline Road - the same direction Hitchens and Gibson were headed on Wednesday night.

"I didn't see the train until it was about 150 feet away from me," Gray said.

Please see LOCAL PEOPLE, Page 6



Equipment arrives for pipe project

By Annette Phillips
Whig-Standard Staff Writer

THE FIRST PIECES OF KINGSTON'S BIGGEST SEWER AND WATER pipe project in half a century fell into place this week with the arrival in the Catarauqui River of large pieces of dredging equipment.

A dredge and 400 ft. of piers were towed into the city late last week and fastened to piers on the north side of the La Salle Causeway.

The equipment will be used to dredge a path across the Catarauqui River for the installation of underwater sewer and water pipes.

The project is budgeted at close to \$20 million. The new pipes will replace aging sewer and water lines installed in 1956 on the river bottom. Those pipes are now at the end of their life expectancy.

Crews have been working this week to assemble the sensitive electronic equipment attached to an environmentally friendly bucket that keeps silt from seeping from the dredge as it is lifted from the river bottom.

Please see CATARAQUI'S, Page 6

The barges that will dredge the Catarauqui River wait at the La Salle Causeway before starting the sewer pipe project.

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TODAY'S WEATHER
9/17 4
Mix of sun and clouds
Details on page 2

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Today

Events

- **Kairois celebrates 30 years** - The Kairois Club will celebrate its 30th anniversary with a party from 8 to 10 p.m. at 417 Bloor St. There will be live music, refreshments and more.
- **Youth dance will be held** at the Oshawa Community Centre, 1000 Harcourt St. from 7 to 9 p.m. Cost is \$5 per person.

Tomorrow

Meetings

- **The Kingston Branch of the Ontario Genealogical Society** meets in the Wilson Room of the Kingston Frontenac Public Library, 180 John St., at 10 a.m. Visitors are welcome. For details, call 373-2666 after 5 p.m.
- **The Kingston Hard of Hearing Club** will meet at 10 a.m. at Retirement Homes, 175 Rideau St. Rick Fardon will speak on work and services in the community. All are welcome.

Events

- **St. Lawrence College, Kingston campus**, plans host for a weekend of the arts. Painting with acrylics and watercolours, photography, poetry and assemblage art are some of the workshops being offered. For details, call 544-5000, ext. 1180.
- **A sale of fall and winter children's clothes and other goods** will be held from 8 a.m. to 10 p.m. at Kingston Christian School, 1212 Woodbine Rd.
- **The annual French Services Run** takes place from 10 a.m. to 2 p.m. in the Community School Centre, 711 Patton Ave. Over 200 booths will showcase local organizations and businesses offering services in French.
- **The 22nd annual Third World Bazaar** takes place from 10 a.m. to 6 p.m. Take Highway 15 just beyond Selous Bay then follow the signs and sidewalks.
- **The Rideau Trail Association** Kingston Club, invites you to hike the Slide Lake loop and then return via the Cedar Lake trail. Bring lunch and sturdy hiking boots. Rugged terrain for 26 kilometers. Depart at 7:30 a.m. from the Big Salmon Lake parking lot. For details, call 369-3033. Rain date is Sunday.
- **A team book and bake sale** will be held at the Town Hall, 100 King Street W., from 10 a.m. to 5 p.m. with proceeds going towards a new roof for the historic Layer Cake Hall. For details, call 332-2021.
- **Heads of Hope Dinner** at Queen Street United Church begins at 7:30 p.m. Speaker Christine Neufeld of the United Church office will talk.

LOCAL NEWS



MASKED MANNEQUIN—A mannequin dressed in firefighter's uniform was used for a search-and-rescue training exercise at the Ambassador hotel.

United Way update

100% of the \$2.1 million goal has been reached.

United Way

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United Way update

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Election hopefuls to enter maze of homelessness

Educating public on woes of low-income living is aim of agency

Do you know the KINGSTON'S apartment vacancy rate is less than one per cent? Thanks it difficult, if not impossible, low-income people to find affordable housing in the city.

And that's the purpose of an exercise Monday evening for candidates in the upcoming municipal election. They'll go through "Homelessness Maze" to see what it's like to live in a shelter, a food bank, and a homeless shelter.

More than 40 per cent of Kingstonians are tenants. Half of them are spending more than one-third of their income on shelter.

More than 40 per cent of Kingstonians are tenants. Half of them are spending more than one-third of their income on shelter.

City announces plans for yard debris pickup

Instead of pushing leaves on to streets and sidewalks, you can bag them for curbside pickup, which begins Nov. 10 as part of the city's fall yard waste collection program.

The program begins Monday with the curbside collection of brush. The city is divided into five geographic regions, with collection on five successive Mondays.

To identify your region and pickup date, call 546-0000 or visit the city website www.cityofkingston.ca

Pickup of leaves also is done on five successive Mondays, beginning Nov. 10.

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Rob Tripp, City Editor
544-5000 Ext. 2111
Fax: 530-4118
Email: whiglocal@whig.com

Editorial page 4
Forum page 5
History: As we saw it page 2

LCVI celebrating its 40th year

Reunion attracting former students from across Canada and around world

By Jack Chang
Whig-Standard Staff Writer

WHEN HUNDREDS OF FORMER Loyalist Collegiate and Vocational Institute students gather for their 40th anniversary reunion, Jack Linscott will be able to share his memories of their school with them.

The headline in *The Whig-Standard* when our school was opened was "Loyalist opened in a sea of mud."

That was because the street leading to the school, Van Order Drive from Portsmouth Avenue, wasn't paved and the school itself wasn't finished.

"The contractors were still working on the building," Linscott said. "There were no doors and we joked that our first night class was a family of raccoons."

The school has changed a lot over the years.

We started out with 600 students and we grew to 1,600 at one point.

LC was Kingston's third secondary school in the public system. Kingston Collegiate and Vocational Institute was the first and Queen Elizabeth Vocational and Collegiate Institute was the second. There were two Catholic high schools: Regiopolis for boys and Notre Dame for girls. The two have since merged.

Linscott, who was the principal at LC for 24 years, will be an honoured guest at the Oct. 25 reunion.

He will be taking an active part in the opening ceremony. Cheryl Cassidy Johnston, who co-chairs the reunion with Bev Swain Averb, said of Linscott:

"There will be a big cake and he's going to cut it."

Johnston went to the school for two years, from 1963 through 1965.

"I've kept in touch all these years. It's surprising," she said. "I was involved in the 25th anniversary then the 30th, then every five years since. This is our 40th and we're not having another one until the 50th anniversary."

Between 400 and 500 people have at-



"There were no doors and we joked that our first night class was a family of raccoons," says Jack Linscott, LCVI's first and longest-serving principal, recalling the school's opening. Construction wasn't complete when the school opened.

ended the previous reunions.

"Most people came from out of town," Johnston said. "People from out of town want to come back to see the school and to reminisce their memories of the school."

"They're the ones wandering in at the last moment."

"So far this year, we've got people registered who are coming from Japan, Switzerland, California and from every province in Canada."

We have 300 registrations so far. It would be disappointing if local people don't show up.

She stressed that the reunion is for people who have attended the school, not just for graduates. Among those who attended LCVI are now a swimmer, Vicki Roth, Spt Alys J hockey players Doug Gilmour and Ken Linsman and Jiggs Terry O'Hara and Donna Hackel.

"We also have people who are doctors, surgeons, lawyers," she said. Earlier reunions tended to attract older people, but that's changing.

"We used to have people who attended in the 1960s and early '70s," Johnston said. "In the last couple of reunions, we had people who attended in the late 1970s and early '80s—more people from the later years. That's heartening, because they've been away 25 years. You have to be away at least 25 years before you want to come back."

People interested in the reunion can call Johnston at 613-342-8888 or e-mail kimstacey@browns.ca

Council puts off service review

By Annette Phillips
Whig-Standard Staff Writer

A LONG-AWAITED REVIEW OF CITY services will be left for the next council to deal with, politicians have decided.

A formal review of services—an exercise that could lead the city to privatize some of its operations—won't be complete before the Nov. 10 municipal election.

Council adopted a cumbersome process this week for reviewing services that is to begin the end of next month, after the election installs a new council.

Outgoing Councillor Bill Campbell, who isn't seeking re-election, voiced concern that a real service review will never be done in Kingston.

"For years we've been asking for this report," Campbell said. "Now we have a report. We're moving into year seven. It's time to get going."

"There has to be a political will to either make change or not make change."

With City Hall staff already handling some 150 projects in addition to their regular work, Councillor Rick Downes wondered what project will come off the table so staff and council can tackle the service review.

Bert Meunier, the city's chief administrator, agreed that political will is needed to push the service review through. He cautioned council to do a full examination of services without speculating on what the outcome might be.

A review of services for the purpose of getting out of certain activities may not work, he said.

"It's not likely you are going to find many activities you want to get out of," Meunier said.

Queen's solar car ready to tackle Oz

MEMBERS OF THE QUEEN'S UNIVERSITY Solar Team are hoping to finish in the top three this week in the 2003 World Solar Challenge in Australia.

The 3,010-kilometre race, which runs from the north to the south of Australia, is expected to be less challenging than the recent American Solar Challenge.

The 10-member Queen's team had the two-seater solar car that completed the 3,890-kilometre race across the United States.

Queen's is the only Canadian university to enter this year's World Solar Challenge.

The team members are currently preparing the car, Gemini, for scrutineering and qualifying.

They have also been helping the Puerto Rican and German teams with their motor controllers, according to a news release.

The Australian race starts Sunday in Darwin and finishes in Adelaide on Oct. 28.

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THE KINGSTON WHIG-STANDARD FORECAST

Vividly cloudy. Winds light. High 9.

Lightly cloudy. Low 4.

Slightly cloudy. High 11. Low 5.

Today's UV index: 1.7 Low. Time to burn: 1 hour 22 minutes.

5-Day Forecast

Day	Low	High
Today	4	9
Monday	5	11
Tuesday	4	10
Wednesday	5	11
Thursday	6	12

UV forecast

Today's UV index: 1.7 Low. Time to burn: 1 hour 22 minutes.

5-Day Forecast

Day	Low	High
Today	4	9
Monday	5	11
Tuesday	4	10
Wednesday	5	11
Thursday	6	12

U.S. and World Forecast

City	Forecast	Temp
Aspen	sunny	18/1
Atlanta	partly cloudy	21/10
Atlanta City	partly cloudy	14/5
Boston	partly cloudy	13/5
Chicago	sunny	8/1
Charlotte	showers	20/8
Chicago	showers	19/5
Chattanooga	showers	15/2
Denver	sunny	24/2
Detroit	partly cloudy	12/3
Houston	partly cloudy	20/9
Los Angeles	partly cloudy	20/15
Las Vegas	sunny	30/15
London	partly cloudy	17/10
Los Angeles	partly cloudy	20/15
Madrid	partly cloudy	20/15
Miami	partly cloudy	23/13
Montreal	partly cloudy	27/16
New York	partly cloudy	13/7
Phoenix	sunny	30/21
Pittsburgh	partly cloudy	21/12
Portland	partly cloudy	20/13
San Francisco	partly cloudy	20/13
Seattle	partly cloudy	17/12
St. Louis	partly cloudy	18/9
Washington	showers	14/7
World	city	temp
Amsterdam	partly cloudy	12/6
Antwerp	partly cloudy	12/6
Auckland	partly cloudy	17/12
Bangkok	partly cloudy	30/24
Berlin	partly cloudy	11/3
Buenos Aires	partly cloudy	12/6
Calcutta	partly cloudy	30/24
Chennai	partly cloudy	30/24
Delhi	partly cloudy	30/24
Hankou	partly cloudy	12/6
Hong Kong	partly cloudy	20/16
London	partly cloudy	12/6
Los Angeles	partly cloudy	20/15
Manila	partly cloudy	27/19
Medan	partly cloudy	27/19
Montreal	partly cloudy	27/16
Osaka	partly cloudy	17/12
Paris	partly cloudy	17/12
Perth	partly cloudy	20/13
Port of Spain	partly cloudy	27/19
San Francisco	partly cloudy	20/13
Seattle	partly cloudy	17/12
Shanghai	partly cloudy	20/16
Singapore	partly cloudy	27/19
Sydney	partly cloudy	20/13
Taipei	partly cloudy	27/19
Tokyo	partly cloudy	20/13
Vancouver	partly cloudy	17/12
Victoria	partly cloudy	17/12
Yokohama	partly cloudy	20/16

Zellers

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IMPORTANT CORRECTION NOTICE

On page 9 of our October 19th-24th, 2003 flyer, we advertise a "Special Buy Cashmere Scarf" at \$14.97. We have discovered that the scarf is not cashmere, but rather acrylic. As a result of this error, we have removed these scarves from our shelves.

We will, however, be offering instead a Giletta Vanderbilt Chenille Scarf at 1/2 price for \$4.97. Anyone who has already purchased the "Cashmere Scarf" may return it for a full refund.

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DISCOUNT SUPERCENTERS

CORRECTION NOTICE

The warranty information for the Crest Master 902B Hand Drive advertised on page 2 of our October 10th - 16th flyer is incorrect. The correct coverage is a 1-year warranty SKU 1002089.

We apologize for any inconvenience. It may have caused our valued customers.

CORRECTION

The Saturday, Oct. 11 ad from Cleveland Travel & Cruise and Air Transat. Holidays should have read. All pricing is based on 7-night stays during the advertised periods. We apologize for any inconvenience.

HYPNOTISM

AN EXTENSIVE 3 MONTH COURSE TO BECOME A PROFESSIONAL HYPNOTHERAPIST

Learn how to hypnotize people to lose weight, quit smoking, lose weight, overcome fears, etc. Enhance your confidence, self-esteem, and success. Primary and various skills in self-hypnosis and Ericksonian Hypnosis. Register for a 3-month course. For more details call: 1-800-465-7323. Fee: \$1800. \$1000 for students.

Homes That Sparkle From People Who Shine!

merry maids

One less thing to worry about.

enter to Win \$500

worth of Maid Services

2 winners

• Customized cleaning services to meet your particular needs and budget.

• Bonded and insured employees.

• Thoroughly screened, trained employees.

• We bring our own equipment and supplies.

• Quality Service Guarantee.

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merry maids

One less thing to worry about.

560 O'Connor Drive
389-9016

Website: www.formerrymaids.com/0831

Our thoroughly-trained cleaning team will ensure your home and our reputation remain spotless.

Today

- Seniors painter who meets at Princess United Church have an art show at 10 a.m. at Frontenac Mall from 10 a.m. to 5 p.m.
- Kairos celebrates 30 years of community service from noon to 4 p.m. at 417 Bloor St. There will be refreshments and music.
- A youth dance will be held at the (Catholic) at 106 Harcourt with Lunch Hall from 7 to 9 p.m. Cost is \$5 per person.

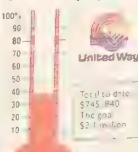
Tomorrow

- The Kingston Branch of the Ontario Genealogical Society meets in the Wilson Room of the Kingston Frontenac Public Library, 130 John St., at 10 a.m. Visitors are welcome. For details, call 373-2656 after 5 p.m.
- The Kingston Hard of Hearing Club will meet at 10 a.m. at Rideau Hall, 175 Rideau St. Rick Fardon will speak on work and services in the community. All are welcome.

Events

- St. Lawrence College, Kingston campus, plays host to a weekend of the arts. Painting with acrylics and watercolours, photography, poetry and assemblage art are some of the workshops being offered. For details, call 544-5000, ext. 1180.
- A sale of fall and winter children's clothes and other goods will be held from 8 a.m. to 1 p.m. at Kingston Christian School, 2212 Woodbine Rd.
- The annual French Services Fair takes place from 10 a.m. to 2 p.m. in the Community School Centre, 711 Dalton Ave. Over 30 booths will showcase local organizations and businesses offering services in French.
- From 10 a.m. to 11 a.m. Third World Bazaar takes place from 10 a.m. to 5 p.m. Take Highway 15 just beyond 400 Ave. Then follow the signs and yellow flag.
- The Rideau Trail Association Kingston Club, invites you to hike the Slide Lake loop and then return to the Cedar Lake trail. Bring lunch and sturdy hiking boots. Rugged terrain for 26 kilometers. Depart at 7:30 a.m. from the Big Salmon Lake parking lot. For details, call 389-9028. Rain date is Sunday.
- A plant book and bake sale will be held at the Thorn Hill Main Street in Bath, from 10 a.m. to 5 p.m. with proceeds going towards a new roof for the historic Lyster-Cake Hall. For details, call 852-5885.
- Beads of Hope Dinner at Queen Street United Church begins at 5:30 p.m. Speaker Christine Noufflet of the United Church office will talk.

United Way update



about New Options in Combating the HIV/AIDS Epidemic. Globally Cost is by donation. All are welcome.

• The search-and-rescue symposium presents an outdoor display of the latest high-tech search-and-rescue equipment, navigational aids and survival gear from 9 a.m. until noon in the parking lot of the Ambassador Hotel. At 1:30 p.m. there will be an outdoor demonstration at the Portsmouth Olympic Harbour featuring the OPP Golden Helicopters precision motorcycle team, a Toronto Fire Service heavy urban search-and-rescue demonstration, Canadian Forces aircraft, the OPP Marine Unit, Canadian Coast Guard Rescue and Wave Centre.

• The Lennox and Addington Studio Tour takes place in the Napanee area from 10 a.m. to 5 p.m. Visit 22 artists at work in their studios. There will be painting, dollmaking, glassmaking, furniture making, photographic weaving and more. The Napanee Photo Club will be showing its work at the courthouse. Admission is free and brochures are available at libraries and stores throughout the area. Visit www.horizons.net/ator for more information.

• The Friends of Pycroft Park is holding a trail sweep to get the trails in shape for winter at 8:30 a.m. at the trail centre. Bring lunch and gloves, then join the group for a chili supper before you go home. For details, call 376-3829.

• The Modern Fuel Gallery presents its annual juried art auction at 21A Queen St. at 7:30 p.m. For details, call 545-9883.

• The Batterssea Pumpkin Festival takes place from 10 a.m. to 4 p.m. at the baseball field in Batterssea. There will be an eco-fair, a children's obstacle course and entertainment by the Crest Cowboys. Cost is \$3 per person, \$15 per family and children aged 2 and under are admitted free.

• Oktoberfest at the Kingston Sherrin Club, 2380 Princess St., begins at 7:30 p.m. Cost is \$12 per person. For details, call 384-9551 or 384-2082.

LOCAL NEWS



MASKED MANNEQUIN - A mannequin dressed in flight safety equipment looks out over the crowd attending the trade show portion of the search-and-rescue conference underway at the Ambassador hotel.

Election hopefuls to enter maze of homelessness

EDUCATING public woes of low-income living is aim of agency

Did you know the KINGSTON'S apartment vacancy rate is less than one per cent? Thanks to a difficult, if not impossible, low-income people to find affordable housing in the city.

And that's the purpose of an exercise Monday evening local candidates in the upcoming municipal election. They'll go through 'Homeless Maze' to see what's like to be without safe and affordable housing, a problem for thousands of people in the Kingston area.

Hopefully, what to learn will benefit Kingston as a whole.

After they've gone through the maze, we'll ask them why they learned from that experience and how they'll use that knowledge to benefit homeless and low-income people in this area.

Since I'm the moderator of this exercise, I met yesterday with some members of the Social Issues Networking Group, which is sponsoring this event. They are Tara Kair, Jeanette Melo, Nancy Bayly, Cara Nelson, Linda Stevens and Maria Matovic.

Tara is an eviction avoidance worker. Jeanette is a community support worker. Nancy advocates for low-income people. Cara is the executive director of Peer Support of Kingston, which advocates for people with mental health issues. Linda is a community development worker for North Kingston Community Health Centre and Maria is a housing outreach worker.

The original plan was to involve the candidates for the provincial election

as well, but the group that organizes the Homeless Maze had a scheduling conflict and couldn't come to Kingston until Monday.

The Ottawa-based group consists of former homeless people and they're going from city to city to educate the public about the problems associated with homelessness.

They have a message to tell. Let's hope that our would-be politicians and the general public will listen.

Conversation pieces: Consultations to all those who contributed to the recent Breast Cancer Walk/Run, held Oct. 4.

Not all the donations have been collected yet, but the total amount so far has already surpassed last year's total of \$1.3 million.

It's the largest one-day fundraising event in Kingston - 2,000 people participated.

Thank you to you all.

\$300 lunch and \$100 Hawaiian breakfast.

Mad as hell about wasted tax dollars and don't know what to do about it? You can't live on \$300 a month - the amount a single person on welfare receives. That's for everything: housing, food, utilities and clothing.

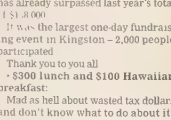
People who have jobs - but low-paying jobs - don't fare any better when it comes to finding affordable housing in Kingston. Often, these families have to choose between paying the rent and buying a winter coat for their kids.

Many of us have known about this problem for years and we've been working hard to ease the suffering. Many agencies that I've been involved with for years - such as the United Way and the Salvation Army - have been raising funds to alleviate this problem. But they can't solve it.

It's a political problem and it requires a political solution. That's why the group hopes to educate our city council candidates about this issue.

It's a chance for them to experience the frustrations and hopelessness of the homeless.

The original plan was to involve the candidates for the provincial election



JACK CHIANG

Jack Chiang can be reached at 544-5000, ext. 210, or jchiang@thewhig.com

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544-5000 Ext. 211
Fax: 530-4118
E-mail: whlocal@thewhig.com

LCVI celebrating its 40th year

Reunion attracting former students from across Canada and around world

By Jack Chiang
Whig-Standard Staff Writer

WHEN HUNDREDS OF FORMER LOYALIST COLLEGIATE and Vocational Institute students gather for their 40th anniversary reunion, Jack Linscott will be able to share his memories of their school with them.

The headline in *The Whig-Standard* when our school was opened was 'Loyalist opened in a sea of mud,' chuckled Linscott, LCVI's first and longest-serving principal.

That was because the street leading to the school, Van Order Drive from Portsmouth Avenue, wasn't paved and the school itself wasn't finished.

The contractors were still working on the building, Linscott said. 'There were no doors and we joked that our first night class was a family of raccoons.'

The school has changed a lot over the years.

'We started out with 600 students and we grew to 1,600 at one point.'

LCVI was Kingston's third secondary school in the public system. Kingston Collegiate and Vocational Institute was the first and Queen Elizabeth Vocational and Collegiate Institute was the second. There were two Catholic high schools: Regiopolis for boys and Notre Dame for girls. The two have since merged.

Linscott, who was the principal at LCVI for 24 years, will be an honoured guest at the Oct. 26 reunion.

He will be taking an active part in the opening ceremony. Cheryl Cassidy Johnston, who co-chairs the reunion with Beth Swain Laver, said of Linscott, 'There will be a big cake and he's going to cut it.'

Johnston went to the school for two years, from 1963 through 1965.

'I've kept in touch all these years. It's surprising,' she said. 'I was involved in the 25th anniversary, then the 30th, then every five years since. This is our 40th and we're not having another until the 50th anniversary.'

Between 400 and 500 people have at-



There were no doors and we joked that our first night class was a family of raccoons, says Jack Linscott, LCVI's first and longest-serving principal, recalling the school's opening construction wasn't complete when the school opened.

ended the previous reunions.

'Most people came from out of town, Johnston said. 'People from out of town want to come back to see the school and to rekindle their memories. It's hard to get local people to come. They're the ones wandering in at the last moment.'

So far this year, we've got people registered who are coming from Japan, Switzerland, California and from every province in Canada.

We have 300 registrations so far. It would be disappointing if local people don't show up.'

She stressed that the reunion is for people who have attended the school, not just for graduates. Among those who attended LCVI are not a hockey player Doug Gilmour and Ken Linsman and judges Terry O'Hara and Donna Hackitt.

'We also have people who are doctors, surgeons, lawyers,' she said. 'Earlier reunions tended to attract older people, but that's changing.'

'We used to have people who attended in the 1950s and early '70s,' Johnston said. 'In the last couple of reunions, we had people who attended in the late 1970s and early '80s - more people from the later years. That's heartening, because they've been away 25 years. You have to be away at least 25 years before you want to come back.'

'People interested in the reunion can call Johnston at 613-342-8688 or e-mail kinstesca@brown.ca

City announces plans for yard debris pickup

THE WHIG-STANDARD

THE CITY HAS ISSUED A POLITE reminder about local laws that prohibit amateurs yard cleaners from blowing or raking leaves onto streets and sidewalks.

City Hall warns that the leaves can create slippery conditions for pedestrians and cyclists and can clog storm drains, potentially leading to back-ups.

As well, a city bylaw states that anyone throwing, placing or depositing debris anywhere private or municipal property in the city may face a fine of up to \$500.

Instead of pushing leaves onto streets and sidewalks, you can bag them for curbside pickup, which begins Nov. 10 as part of the city's fall yard waste collection program.

The program begins Monday with the curbside collection of brush. The city is divided into five geographic regions, with collection on five successive Mondays.

To identify your region and pickup date, call 546-0000 or visit the city's Web site: www.ontokingston.ca

Pickup of leaves also is done on five successive Mondays, beginning Nov. 10.

THE KINGSTON WHIG-STANDARD FORECAST

Day	Temperature	Conditions
Today	13 to 20	Light rain
Tomorrow	10 to 17	Cloudy with light rain
Monday	10 to 17	Cloudy
Tuesday	10 to 17	Cloudy
Wednesday	10 to 17	Cloudy
Thursday	10 to 17	Cloudy
Friday	10 to 17	Cloudy

Region	Forecast
Edmonton	P Cloudy 01
Calgary	P Cloudy 01
Winnipeg	P Cloudy 01
Regina	P Cloudy 01
Saskatoon	P Cloudy 01
Victoria	P Cloudy 01
Vancouver	P Cloudy 01
Seattle	P Cloudy 01
Portland	P Cloudy 01
San Francisco	P Cloudy 01
Los Angeles	P Cloudy 01
Phoenix	P Cloudy 01
San Diego	P Cloudy 01
Las Vegas	P Cloudy 01
Albuquerque	P Cloudy 01
Denver	P Cloudy 01
Chicago	P Cloudy 01
St. Louis	P Cloudy 01
Indianapolis	P Cloudy 01
Columbus	P Cloudy 01
Philadelphia	P Cloudy 01
New York	P Cloudy 01
Boston	P Cloudy 01
Washington	P Cloudy 01
Atlanta	P Cloudy 01
Miami	P Cloudy 01
Fort Lauderdale	P Cloudy 01
Orlando	P Cloudy 01
San Antonio	P Cloudy 01
Houston	P Cloudy 01
Phoenix	P Cloudy 01
San Diego	P Cloudy 01
Las Vegas	P Cloudy 01
Albuquerque	P Cloudy 01
Denver	P Cloudy 01
Chicago	P Cloudy 01
St. Louis	P Cloudy 01
Indianapolis	P Cloudy 01
Columbus	P Cloudy 01
Philadelphia	P Cloudy 01
New York	P Cloudy 01
Boston	P Cloudy 01
Washington	P Cloudy 01
Atlanta	P Cloudy 01
Miami	P Cloudy 01
Fort Lauderdale	P Cloudy 01
Orlando	P Cloudy 01
San Antonio	P Cloudy 01
Houston	P Cloudy 01

City	Temp	Conditions
Aberdeen	12/20	cloudy
Amsterdam	11/22	cloudy
Bangkok	28/30	cloudy
Buenos Aires	12/22	cloudy
Calcutta	24/30	cloudy
London	11/15	cloudy
Manila	26/30	cloudy
Mexico City	18/24	cloudy
Paris	10/15	cloudy
Seoul	10/15	cloudy
Singapore	28/30	cloudy
Tokyo	15/20	cloudy
Washington	12/18	cloudy

Queen's solar car ready to tackle Oz

THE WHIG-STANDARD

MEMBERS OF THE QUEEN'S UNIVERSITY Solar Vehicle Team are hoping to finish in the top three this weekend in the 2003 World Solar Challenge in Australia.

The 3,010-kilometre race, which runs from the north to the south of Australia, is expected to be less challenging than the recent American Solar Challenge.

The 10-member Queen's team had the two-wheeler solar car that completed the 3,890-kilometre race across the United States.

Queen's is the only Canadian university to enter this year's World Solar Challenge.

Team members are currently preparing the car, Gemini, for scrutineering and qualifying.

They have also been helping the Puerto Rican and German teams with their motor controllers, according to a news release.

The Australian race starts Sunday in Darwin and finishes in Adelaide on Oct. 28.

enter to Win \$500 worth of Home Cleaning Service 2 Winners

Draw will take place Wednesday, Nov. 5th. Deadline for Ballots is Tues., Nov. 4th @ 5:00 pm

For adults who need help with reading and writing

1-800-465-7323

Zellers Better and better

IMPORTANT CORRECTION NOTICE

On page 9 of our October 18th-24th, 2003 flyer, we advertise a 'Special Buy Cashmere Scarf' at \$14.97. We have discovered that the scarf is not cashmere, but rather acrylic. As a result of this error, we have removed these scarves from our shelves.

We will, however, be offering instead a Gloria Vanderbilt Chenille Scarf at 1/2 price for \$4.97. Anyone who has already purchased the 'Cashmere Scarf' may return it for a full refund. We apologize for any inconvenience.

Visit to learn how we are

enter to Win \$500 worth of Maid Services 2 winners

merry maids

enter to Win \$500 worth of Maid Services 2 winners

Customized cleaning services to meet your particular needs and budget.

Bonded and insured employees.

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Council puts off service review

By Annette Phillips
Whig-Standard Staff Writer

A LONG-AWAITED REVIEW OF CITY services will be left for the next council to deal with, politicians have decided.

A formal review of services - an exercise that could lead the city to privatize some of its operations - won't be complete before the Nov. 10 municipal election.

Council adopted a cumbersome process this week for reviewing services that is to begin the end of next month, after the election installs a new council.

Outgoing Councillor Bill Campbell, who isn't seeking re-election, voiced concern that a real service review will never be done in Kingston.

For six years we've been asking for this report,' Campbell said. 'Now we have a report. We're moving into year seven. It's time to begin the end of next month, after the election installs a new council.'

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EDITORIAL PAGE

JOEL RASBACH, Editor

What was Rock thinking?

Politicians must avoid the appearance of impropriety

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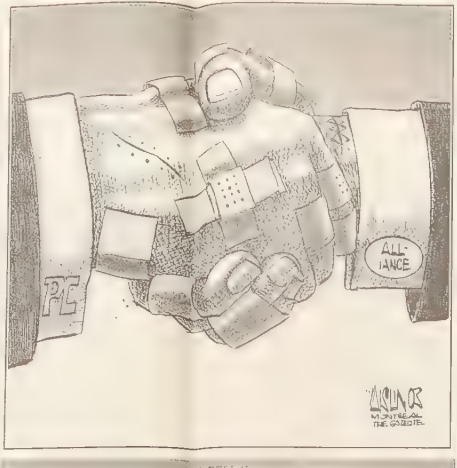
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StatsCan will keep control

Statistics Canada would like to... (text continues)

Parliament failed to fight judge-made law

When the Charter of Rights and Freedoms was first being debated... (text continues)

Canada needs a united right

All Canadians, even those who don't lean to the political right... (text continues)

Union would give hope to right

It doesn't always happen in politics, but in this case... (text continues)

Accountability is a serious issue

What do citizens do if they learn that an issue of public importance... (text continues)

LETTERS TO THE EDITOR are welcome at our mailing address... (text continues)

Health care: We need a real common sense revolution

How satisfying it was to read two stories in my Oct. 7 Whig Standard... (text continues)

Private versus public health facilities will continue to be a contentious issue... (text continues)

So-called public-private partnerships have a terrible record because too often the responsible public administration loses control... (text continues)

Where hospitals are concerned, the services of window cleaners, janitors and catering services may be purchased from the private sector... (text continues)

What about new hospitals, new MRIs, etc.? The temptation to avoid up-front capital expenditures... (text continues)

By how much? A private investor who builds a hospital must anticipate a much higher rate of return than he would get from alternative investments... (text continues)

We are now at a fork in the road in the health care system... (text continues)



Sister Rosemarie Kugel, president of the Religious Hospitallers of St. Joseph, and Hotel Dieu Hospital executive director Hugh Graham stand beside the statue of St. Joseph outside the hospital's main entrance.

Candidates have mandate to oppose landfill expansion

As political candidates in the Nanapan area... (text continues)

A petition of over 3,000 signatures and over 600 signed letters... (text continues)

The provincial divisional court recently ruled that the existing terms of reference for the dump expansion... (text continues)

Premier-designate Dalton McGuinty publicly promised during his recent visit that he would pull the plug on an appeal of the court decision... (text continues)

These candidates who did not attend the waste management meetings... (text continues)

Coalition governments would ease our democratic deficit

MENTION COALITION GOVERNMENT to the average Canadian and you are likely to be reminded of the instability of the Israeli or Italian governments... (text continues)

While it is true that coalitions are more common in systems that practice proportional representation... (text continues)

This was the case with the Trudeau minority from 1972-74... (text continues)

ence between them. It was the "his" versus the "his" and elections were contests between two similar teams... (text continues)

When you consider the system between the two, the situation becomes more complicated... (text continues)

While it is true that coalitions are more common in systems that practice proportional representation... (text continues)

How a deadly disease influenced Canada's early history

WHEN ONE PONDERS THE FORCES that shaped Canada as we know it, certain things like the fur trade, missionary zeal and the impact of foreign wars may come to mind... (text continues)

Indeed, if one ventures a modest extrapolation of Bown's argument about how scurvy affected history... (text continues)



By PETER BLACK

was doomed if the disease wasn't been. Luckily for him and the future of French exploration, he came upon a now healthy native who, only days before, had been afflicted with scurvy... (text continues)

Historians are fit to be tamed by the arrival of French ships... (text continues)

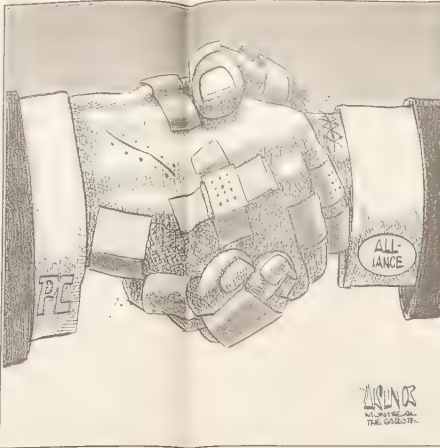
EDITORIAL PAGE

What was Rock thinking?

Politicians must avoid even the appearance of impropriety... After Rock moved to the ethics commissioner, he prohibited the minister from involving himself in any dealings directly related to the Irving family...

Politics must avoid even the appearance of impropriety

Only after the grant was first discussed in cabinet in May 2002 almost a year after the Irving junkie (which, by the way, exceeded the \$200 limit for acceptable gifts to ministers) did Rock approach the ethics commissioner... Let's review two fortuitous things come down the pike for the Irving family after they became a cabinet minister...



Canada needs a united right

All Canadians, even those who don't lean to the political right, should welcome reports that the Progressive Conservative and Canadian Alliance parties are about to merge... The consolidation of two small "ill-conservative" parties into one entity should create a real alternative to the Liberal establishment...

Union will give hope to right

It doesn't always happen in politics, but in this case sinner heads have prevailed and, despite all the obstacles that lie ahead, the Progressive Conservative party and the Canadian Alliance say they are at long last moving toward merger... To be sure, this is not a love match; it's a marriage of convenience...

StatsCan will keep control

Statistics Canada would like to see the recent straight concerning unannounced information on the store. US defence firm hired to do Canada's census Oct 10... Although Statistics Canada has contracted out a portion of the work required for the 2006 census, Statistics Canada will maintain full control of all aspects of the census...

Parliament failed to fight judge-made law

When the Charter of Rights and Freedoms was first being debated, there was significant concern about the possibility that an unelected judge could start "making law" by interpreting the Charter in ways never authorized, or even considered, by Parliament... The Liberals acknowledged this possibility and countered that this was why the notwithstanding clause was included in the Charter...

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FORUM

Health care: We need a real common sense revolution

How satisfying it was to read two stories in my Oct. 7 'Wing Standard'... Private versus public health facilities will continue to be a contentious issue. The choice is not always obvious. A classic principle of running any business (including the delivery of public services) is to be very careful in determining the business you are in...

Accountability is a serious issue

What do citizens do if they feel that an issue of public importance was decided in a "backroom"? This is the question posed by Ontario Information and Privacy Commissioner Ann Cavoukian and Assistant Commissioner Tom Mitcham... By how much? A private investor who builds a hospital must anticipate a much higher rate of return than he would get from a public hospital...

Coalition governments would ease our democratic deficit

MENTION COALITION GOVERNMENT to the average Canadian and you are likely to be reminded of the instability of the Israeli or Italian governments, the French or German governments after the First World War, or some other unstable, pre-fascist regime... While it is true that coalitions are more common in systems that practise proportional representation, they need not necessarily be associated with them...



Sister Rosemarie Kugel, president of the Religious Hospitaliers of St. Joseph, and Hotel Dieu Hospital executive director Hugh Graham stand beside the statue of St. Joseph outside the hospital's main entrance.

How a deadly disease influenced Canada's early history

WHEN ONE PONDERS THE FORCES that shaped Canada as we know it, certain things like the fur trade, missionary zeal and the impact of foreign wars may come to mind, but rarely does scurvy (vitamin C deficiency) engage the historical imagination... The deadly disease was introduced to the continent by European explorers and missionaries in the late 15th and early 16th centuries...

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Candidates have mandate to oppose landfill expansion

As political candidates in the Nanaimo area enter the final stretch of their municipal election campaigns, we would like to remind both newcomers and incumbents that they have a mandate to continue the current opposition to the proposed Richmond landfill expansion... A petition of over 3,000 signatures and over 600 letters against the proposed dump expansion were presented to the Greater Nanaimo Council...

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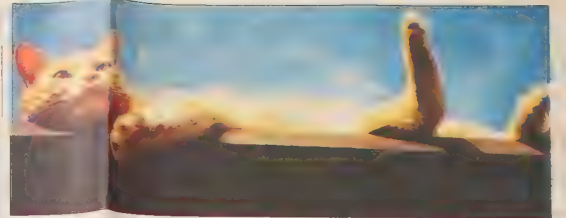
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LOCAL NEWS



Malcolm the cat lounges on a sunny afternoon. If a tough new bylaw on household pets goes through, cats won't be able to run freely around the city and their owners will have to pay annual registration fees.

'Dogs will come. Cats will not.'

Enforcing the city's proposed new pet bylaw could be difficult

By Annette Phillips
Whig-Standard Staff Writer

HOW TO STOP CATS FROM TRESPASSING will be one of the first challenges bylaw officer face if council passes a tough new animal control bylaw in the coming weeks.

Councilors gave preliminary approval Tuesday to a bylaw that limits the number of house pets in urban houses to six. Apartment dwellers will be allowed a maximum of two dogs and two cats.

The bylaw would introduce a new fee structure and require annual licensing of dogs and cats.

Cats are the main target of the new bylaw which attempts to blend bylaws from the three former municipalities that merged in 1998.

Tarantulas, snakes and other exotic pets would be exempt from the bylaw and, as long as they are kept indoors, council is putting no limits on their

numbers or species.

Indoor cats, however, would have to be licensed at a cost of \$10, or \$5 for a spayed or neutered feline.

The city has an estimated 700 to 800 cats currently registered and apprehends roughly two cats a day.

Most of the registrations happen because pet owners must pay the fee in order to free an apprehended animal from the pound, bylaw officer Kim Leonard said.

The bylaw would make licensing and a registration fee an annual requirement. City staff would like to use revenue from the bylaw to hire at least one new enforcement officer.

"We would need increased enforcement," Leonard told councilors.

Terry Wilkins, the city's chief bylaw officer, said enforcement will be difficult for indoor cats unless city officials know about the cat's existence. For that, they'll rely on the honesty of pet owners.

Wilkins also acknowledges that a trespassing clause would be tough to enforce, even with additional personnel.

Bylaw officers don't search the city looking for unleashed cats or dogs, but they round up animals that are the subject of complaints. Wilkins said, acknowledging that dogs are much easier to arrest.

"A dog will come. Cats will not." City staff will never be able to control the real problem animals, like skunks, raccoons and squirrels, Wilkins said.

"We don't have the resources to deal with those," he said.

"We cannot, as a city, look after all the wildlife."

Many of the proposed pet restrictions apply to houses within city limits. Residents with more pets than the bylaw allows would be allowed to keep them as long as they're registered, Wilkins said.

City councilors poked some fun at the bylaw and questioned the ability of staff to enforce many of the provisions, but gave preliminary approval anyway.

The bylaw requires three readings at a formal council meeting before it becomes law.

Kingston's normal practice is to give a bylaw first and second readings at one time and reserve the third readings for the following council meeting.

Babiuk vows to bring council and citizens closer together

By Patrick Kennedy
Whig-Standard Staff Writer

COMMUNICATION IS ROD BABIUK'S bread and butter and something he, as a member of the new city council, would try to improve to foster productive debates around the horseshoe.

"One of the keys to improving the way a city does business is to improve the relationship with councilors and the city at large," said British Columbia-born Babiuk, who works with the city as a public relations consultant with the Canadian military.



BABIUK Communication is key

"We have to get our house in order. If the mayor doesn't have enough procedural powers to rein in certain people, then maybe look at changing the rules. But we have to get our house in order, make a commitment to listen and try to proactively engage in debate with fellow councilors."

Babiuk is seeking the Loyalist-Cataraqui seat, District 2, along with incumbent Kevin George and the city's former cultural services manager, Dave Morgan.

The district encompasses the area north of Taylor-Kidd Boulevard and west of Gardiners Road to Collins Creek, including the growing Cataraqui Woods neighborhoods.

The urge to fling his hat in the political ring hit shortly after Babiuk left a 24-year military career to put down what he hopes are permanent roots in the Limestone City.

"I've always been interested in community service and community affairs," said Babiuk, 46, who is married and has one teenage daughter.

As a professional communicator, he served as a military public-affairs officer in Bosnia and other locales - Babiuk said he realizes the importance of face-to-face dialogue, discussing is-

Rembrandt so talented so young

Continued from Page 1

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Cataraqi's shallowness a problem for work crews

Continued from Page 1

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"We'll have a tough time maneuvering."

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'Local people try to avoid it because it's dangerous'

Continued from Page 1

There's one problem is that the tracks rest on top of a sand hill and it's not a very good foundation for the tracks.

There are two vias on each side of the crossing warning of the railway, but there are no flashing lights.

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only selected vehicles at this sale for \$199.00. *MSRP. Excludes taxes, license, title, and destination. Dealer's price. †MSRP. Excludes taxes, license, title, and destination. Dealer's price.

Man found guilty in wife's death

By Jeremy Ashley
BELLEVILLE/Expre News Network

RICHARD LOYD, 74, SAID EXPRESS himself as Mr. Justice Richard Byers of Superior Court found him guilty of manslaughter in the 2001 slaying of his 49-year-old wife, Beverly.

Beverly Loyd was found dead in the couple's Strathcona Drive home on the morning of Sept. 23, 2001.

Lloyd, who was initially charged with second-degree murder in the homicide, will remain in custody until his sentencing on Nov. 4.

The body of Beverly Loyd was found inside the master bedroom of the couple's home. She had been stabbed 10 times in the back and chest by Richard Lloyd earlier in the day.

Richard Lloyd, who was at the home when police arrived, was taken to hospital for treatment of 22 self-inflicted stab wounds to his neck, chest and wrists.

THE SLOW LANE

GEORGE GETS CAUGHT TAKING HIS DAILY LAUNDRY RIDE.

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'Local people try to avoid it because it's dangerous'

Continued from Page 1

...problem is that the...small and...crossing...train coming...Hitchins' track...to the tracks about 300 m...to the east. Gray pointed to a line of trees that he says block the view of the tracks, partially blocking a view of the tracks.

There are two signs on each side of the crossing warning of the railway, but there are no flashing lights. Over the course of about an hour...terday afternoon, five trains, four of which were Via Rail's, passed the busy crossing.

At the crash site, there were just a couple of pieces of metal remaining on the grass near the tracks.

They will probably do something now, but it's too bad something like this had to happen first," Gray said. "This is a busy spot. I feel bad about what happened [on Wednesday night] even though I didn't even know these people," he said.

"I think something could have been done before. I would have been real stupid if it had to have been someone that I knew."

Cher Powers, who also lives near the crash site, agreed that it is difficult to see trains approaching the Townline crossing.

"A lot of local people try to avoid it because it's dangerous," she said. "You just can't see. A lot of the trains are quiet, especially the passenger ones."

Powers' own grandfather, Albert Dowdle, was killed 40 years ago when he was crossing the tracks on Perry Road, a crossing that now has flashing lights.

It's really sad that something like this happened, she said. Both the Hitchins and Gibson families are still trying to come to terms with what happened on Wednesday night.

Tracy Monk, who lost her older brother Reg Hitchins, said her brother was the kind of guy who would do anything for anyone.

"He was willing to help anyone," she said. "He was just a friendly guy. She saw him for the last time on Thanksgiving Sunday when the family had dinner at her home in Belleville."

"He brought an apple and a pumpkin pie," she recalled. "He was playing with the kids and just having a fun day. It was good day."

She also remembers how he loved to spend time with his two nephews "he loved kids," she said. She also said he loved his dog, a black lab named Belle.

He will be missed, she said. Both Hitchins and Gibson worked for Covertie Roofing in Kingston. Police and CN continue to investigate the cause of the accident.



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Catarqui's shallowness a problem for work crews

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See it

Dr. Alfred Bader, who has donated a small Rembrandt to the Agnes Eberington Art Centre, will give a lecture about the painting on Oct. 26 at 7 p.m. The painting will be unveiled at 2 p.m.

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By Patrick Kennedy
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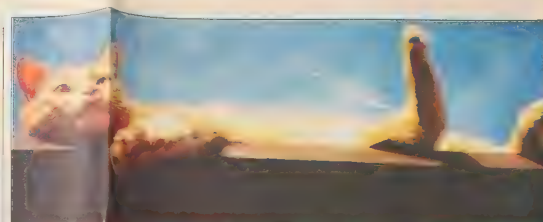
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BABIUK: Communication is key



Malcolm the cat lounges on a sunny afternoon. If a tough new bylaw on household pets goes through, cats won't be able to run freely around the city and their owners will have to pay annual registration fees.

'Dogs will come. Cats will not.'

Enforcing the city's proposed new pet bylaw could be difficult

By Annette Phillips
Whig-Standard Staff Writer

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GO WEST FOR THE BEST!
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LOCAL NEWS

Third man arrested in boxer's murder

One suspect did time at Kingston halfway house

By Adrian Humphreys
TORONTO/CanWest News Service

A CAREER CRIMINAL, WHO WAS ONCE told by a judge he was "in the major leagues" of crime, is the third man arrested in the slaying of Eddie (Hurricane) Melo, a former Canadian boxing champion and high-profile Mafia enforcer.

Delio Pereira, 50, of Toronto joins the owner of an Ontario trailer park and a violent inmate on a pass from a correctional centre as those accused in the unfolding conspiracy to murder Melo.

Melo was shot dead by Charles Gagne, 40, in a parking lot outside a Mississauga cafe on April 8, 2001, along with his cousin, Joao "Johnny" Pavao. Gagne was arrested in July and pleaded guilty last month to two counts of second-degree murder in an agreement with authorities that will see him testifying at future proceedings. He was on a temporary pass from the Portsmouth Community Correctional Centre in Kingston, a federal halfway house.

Although sentenced to life in prison, the plea allows Gagne to apply for parole in 12 years.

Shortly before his plea, police arrested Manuel (Mike) DaSilva, 52, at the Deer Lake Trailer Park in Huntsville, Ont., which he owns and operates, police said. He is charged with two counts of first-degree murder.

Police allege DaSilva hired Gagne to kill Melo.

Pereira was arrested Tuesday in Toronto. He is charged with being an accessory to murder and conspiracy to commit murder.

"Investigation further revealed that a third person was involved with planning the murder," said Const. Todd Moore of Peel Regional Police.

Pereira knew both Gagne and DaSilva, he said.

In the 1970s, DaSilva accused Julian Fantino, then a sergeant but who is now Toronto's chief of police, and other officers of forcing a false confession out of him.

In court in support of his allegations — which were dismissed by a jury — he testified Sgt. Fantino said to him during an arrest, "If you were Pereira, I'd put a bullet in your head," an aggravator reference to Delio Pereira, DaSilva said in court.

Pereira has a long criminal history and an apparent fondness for firearms. He has 30 convictions in 27 years and has been banned from possessing firearms three times.

At a sentencing for a previous charge, Justice John Hamilton told Pereira: "You're in the major leagues" of criminality and said he "never learns from his sentences."

Melo was a brilliant boxer who turned professional at the age of 17 and later took the Canadian middleweight championship title. He became involved with the Cotroni crime family of Montreal and used his muscle on behalf of the Mafia clan.



HELPING HAND — Valentina Diatlova (left), 81, was too frail to go up to receive her citizenship certificate,

so RCMP Const. Chantal Viers and RMC acting commandant Col. Brian Wilson came to her instead.

Online poll ranks Queen's fifth in education quality

By Tamlin McMahon
Whig-Standard Staff Writer

QUEEN'S UNIVERSITY PRINCIPAL BILLY Leggett says he's pleased with the university's fifth-place standing in a recent survey that polled 26,400 students on the quality of education offered at 38 Canadian universities.

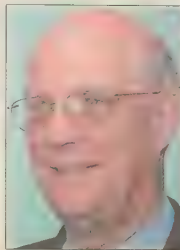
Trent University in Peterborough topped the list, followed by Brock University, the University of Guelph, University of Sherbrooke and Queen's.

For the second year in a row, the University Report Card found that large, urban schools had the most difficulty delivering a successful mix of undergraduate services.

"We're pleased overall with the rankings," Leggett said. "In most areas we ranked well up in the listings and certainly overall we were pleased."

The principal questioned the significance of a survey that measured the opinions of students who usually only attend one university and may never have visited Queen's.

"This is an opinion survey that essentially invites students to dial in on the Internet and express their views when they have no appropriate way of making a comparison," he said.



LEGGETT: Questions survey results

"How much weight do you give the assessment of a student who has only attended one university?"

The quality-of-education index reflects students' satisfaction in the quality of teaching, faculty's knowledge of subjects, effectiveness of teaching methods, usefulness of faculty feedback and availability of faculty and

teaching assistants to students outside the class.

Queen's fared better than some of the university's bigger schools that were ranked much lower, such as the University of Calgary (32), the University of Alberta (33), the University of British Columbia (34) and the University of Toronto's main campus (37).

Leggett said the findings came as no surprise because Queen's surveys its graduates every year. He also predicted the rankings will "bump around" over the years because of the survey's questionable methodology.

"It's difficult to imagine they have a quantitative basis for the assessment," he said.

Using an online survey, students were given the opportunity to assess their university in nine categories and 58 areas of student life. There were more than 100 questions on the survey.

Results of the second annual University Report Card were released this week by Uthink, an online market-research firm, and The Strategic Counsel, a public opinion and market-research firm.

The complete results are available at www.universityreportcard.com

15 YEARS OF YOUR DAILY NEWS

HISTORY: As we saw it

THE WHIG-STANDARD, CANADA'S OLDEST CONTINUOUSLY PUBLISHED DAILY NEWSPAPER, PRESENTS SOME SNAPSHOTS OF THE NEWS FROM OUR PAGES OVER THE YEARS.

Compiled by Pamela Oakley
Whig-Standard Staff Writer

WEDNESDAY, OCTOBER 17, 1928

In the face of growing competition from the motor car as a mode of travel, the electric railways in Canada during 1927 carried 32,687,358 more passengers than in 1926, according to a report compiled by the Dominion Bureau of Statistics. A total of 781,388,194 fare passengers were carried by the various electric transportation systems in the Dominion.

Principles of the Invisible Empire, Knights of Ku Klux Klan, including Protestantism and law and order, were enunciated by Daniel C. Grant, Provincial organizer, who declared that the Order would "clean up Wapping," at a meeting there last night.

He told his audience that the Ku Klux Klan was going to "abolish vice, wantonness and graft."

After declaring that Canada should co-operate with the United States for the construction of the St. Lawrence

waterway, and that Toronto should be made a seaport immediately, W.E. Maclean said, "We are going to have it despite Montreal." The Toronto MP was addressing the Danforth Business Men's Association. He asserted that Canada "had to make a treaty with the United States for the construction of the waterway."

"I will say to the people of Montreal 'hands off.' We are as much entitled to have ships to Toronto as you are to bring them to Montreal."

Vandals invaded the wild bird sanctuary in Belleville yesterday and killed all but none of the twenty three wild Canada geese sheltered there.

The birds were shot without regard to whether they were pinnioned and helpless on the ground or whether they were free to take wing.

The "sportsmen" came by automobile. They were interrupted by David Scott, resident near the sanctuary who heard shots and ran to investigate. The men fled, taking seven of the geese with them and leaving seven dead on the ground.

For sale: On this date in 1898, Sicily's was selling May-Belle silk blommers for 69 cents a pair and Morley's English cashmere hose for 98 cents a pair.



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Author, chemist, philanthropist speaks at UTM

Collector delights audience with tales of art finds

By JOHN STEWART Staff

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Which is why he owns some of the most beautiful paintings in the history of the world.

"I love going to little auctions and looking at dirty old paintings," Bader told about 100 people Thursday in the second in the Canadian Perspectives annual lecture series at the University of Toronto at Mississauga.

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The 78-year-old gave an hour-long slide presentation filled with stories that were as stunning as the art he lovingly exhibited.

Some of his most prized pieces are works by 17th Century Dutch masters that are not yet attributed. "It is such fun to buy pictures just for their beauty," he exulted. The element of "mystery" in the eventual discovery of the identity of the painter just adds another tantalizing twist.

Kirpan rule irks trustee

Despite the objections of its vice-chairman, the Dufferin-Peel Catholic District School Board has unanimously approved a policy that allows Sikh students to wear kirpans to school.

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A series of human rights and court rulings have concluded that it is discriminatory to prevent baptized Sikhs from wearing the ceremonial dagger to school. Male Sikhs are required to wear the kirpan under their religious doctrine.

"Is a kirpan not a knife?" Scerri asked Superintendent Paul McMorrow at Tuesday night's meeting of the board. "Doesn't this bring us to a crossroads?" Scerri said.

He wondered if the right of Sikh students to wear the dagger doesn't conflict with Ontario's Safe Schools legislation, which requires schools to suspend a student automatically for taking any weapon onto school property.

Scerri said he has no objection to the kirpan on religious grounds. "I understand it is a religious item, but it still is a weapon."

In response to a question from Scerri, McMorrow said it is, "not within the board's rights" to ban kirpans from school property. Some students do voluntarily choose not to wear the kirpan, but the board cannot prohibit it, he said.

The superintendent said the kirpan is a religious symbol, which could potentially be used as a weapon, "just as a crucifix could be."

The right to wear kirpans in public schools was established after a celebrated case in the Peel public school system, where the Ontario Human Rights Commission overturned a board policy prohibiting them. The commission's website uses the banning of the kirpan as an example of religious discrimination.

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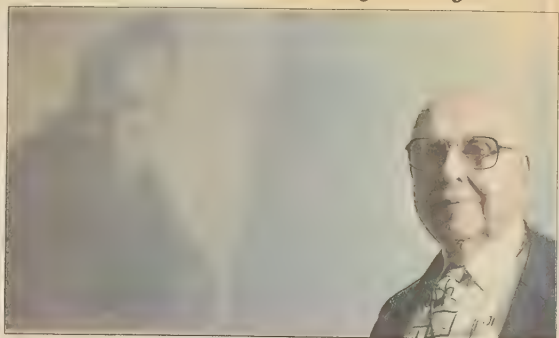
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Wonderland bus is ready to run

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Mississauga Transit will now deliver passengers from Square One Shopping Centre directly to Canada's Wonderland on weekends.
From July 2 to September 2, the buses will run daily from Mississauga's City Centre Transit Terminal to the nation's largest theme park.
Mississauga Transit Route 88, dubbed the Wonderland Express, will provide non-stop service on weekends for a one-way cash only \$5 fare.
Families of four can ride the bus for \$15.
This marks the fourth year Canada's Wonderland bus service has been provided to Mississauga residents.
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Brick barbecue brings in bucks

Pam Edwards of the YMCA, left, gets her hot-dog loaded up by Charlie Rina and Vicky Loisi of The Brick at a barbecue fundraiser for the YMCA held last weekend. For two dollars customers coming to the furniture store got a hot-dog and drink with all the money going to support the YMCA of Mississauga. All Brick stores across Canada are participating in the event that continues this weekend.

Survey says snuff out coal

By JOHN STEWART Staff

Mississaguans and other residents of the 805 region want coal-fired power plants, such as Lakeshore Generating Station, phased out sooner rather than later.
More than 70 per cent of respondents in Peel, Halton, York

and Durham regions want the coal-fired plants — among the leading contributors to greenhouse gases and smog — shut down by 2007. That coincides with the position taken by opposition parties at Queen's Park.

Only 15.6 per cent of voters said they agreed with the Conservative government's position to close, or convert the coal-fired plants by the year 2010.

The poll, based on a survey of 600 voting age residents, was commissioned by the Ontario Clean Air Alliance (OCAA), a coalition of environmental groups.

"This doesn't surprise us at all," Jack Gibbons, chair of OCAA, said yesterday. "Why would residents want to continue to suffer through another 12 years of smog alerts? We're trying to show the government that it's in their best interests to phase out the coal plants by the year 2010, or sooner."

The Ontario government has already set ambitious targets, based on the international Kyoto accord, to reduce emissions of smog, acid rain and mercury by 2010.

"A phase-out of coal would help them reach those goals at the lowest possible cost," says Gibbons.

The government has already committed that Lakeshore — one of the oldest plants in the province — will stop burning coal by the end of April 2005. It will likely either be converted to a gas-burning plant, or closed.

Ontario Power Generation, which owns the plant built in 1962, has it on the market, but Gibbons says there's no sign of any buyers on the horizon. Some of the private sector power suppliers who are coming into the deregulated market in Ontario considered buying Lakeshore, but concluded it would cost too much to convert the plant.

Gibbons also deems it likely that the site may simply cease to operate then, since he sees no signs that OPG plans to convert it to gas.

"I think that's a real possibility," he said of shutting the plant's doors. "The Learn plant has been closed for years in Toronto and it's still standing there."

The possibility of converting the property to another land use is attractive, but, "there's a huge environmental liability for the site." The cost of remediating the site to standards required to allow redevelopment may be so high that redevelopment becomes uneconomic.

Public Works are on display

A truck pull, rodeo and a gruelling obstacle course are on the schedule in the next few days as Peel Region officials celebrate Public Works Week 2003.

Public Works Week, a North American-wide event held each May, continues through Saturday as Peel Region officials recognize the contributions of public works initiatives to the community.

This year's theme in Peel is The Strength of Public Works. "This is our opportunity to really showcase what we do," said Mitch Zamogic, Peel Region's public works commissioner. "Public Works Week provides an ideal forum to educate, inform and demonstrate to residents, first-hand, the dedication and excellence of our staff."

Residents are invited to participate in several activities this week to learn more about public works programs and how such initiatives directly contribute to their standard of living, said Zamogic.

- Scheduled events include:
- truck-driving rodeo (Thursday, May 22, 9 a.m. at 10 Peel Centre Dr., Brampton) — men and women will compete in massive single and tandem-axle trucks as they maneuver through five stations to demonstrate truck-driving skills;
 - obstacle course (Friday, May 23, 10 a.m. at 10 Peel Centre Dr.) — Peel Region staff will compete in teams to complete activities representing the four different areas of public works;
 - truck pull (Saturday, May 24, 11 a.m. at 10 Peel Centre Dr.) — public works employees will compete against one another by pulling single or double-tandem trucks; and
 - open house (Saturday, May 24 from 10 a.m. to 2:30 p.m. at 10 Peel Centre Dr. and 1180 Lakeshore Blvd. in Mississauga) — demonstrations and workshops, public works vehicles, free barbecue, face-painting and giveaways are part of the day's events.

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Author, chemist, philanthropist speaks at UTM

Collector delights audience with tales of art finds

By JOHN STEWART
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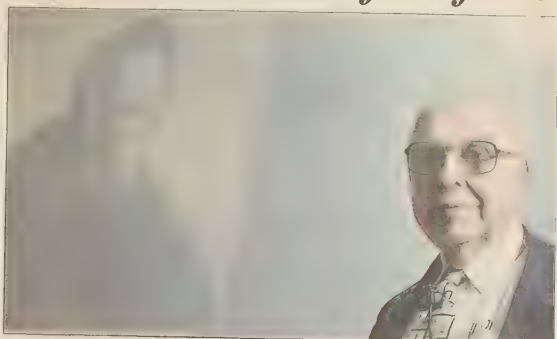
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Choose from: Weeping Caragana, Weeping Pussywillow and Arctic Willow

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Choose from Selected Ulm, Maple, Ash and Locust

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Next stop, Canada's Wonderland
Mississauga Transit will now deliver passengers from Square One Shopping Centre directly to Canada's Wonderland on weekends.
From July 2 to September 2, the buses will run daily from Mississauga's City Centre Transit Terminal to the nation's largest theme park.
Mississauga Transit Route 88, dubbed the Wonderland Express, will provide

non-stop service on weekends for a one-way cash only \$5 fare.
Families of four can ride the bus for \$15.
This marks the fourth year Canada's Wonderland bus service has been provided to Mississauga residents.
For more information, call Mississauga Transit at 615-4636 or visit the web site at www.mississaugatransit.com



Brick barbecue brings in bucks

Pam Edwards of the YMCA, left, gets her hot-dog loaded up by Charlie Filina and Vicky Lois of the Brick at a barbecue fundraiser for the YMCA held last weekend. For two dollars customers coming to the furniture store got a hot-dog and drink with all the money going to support the YMCA of Mississauga. All Brick stores across Canada are participating in the event that continues this weekend.

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Survey says snuff out coal

By JOHN STEWART Staff

Mississaugans and other residents of the 905 region want coal-fired power plants, such as Lakeview Generating Station, phased out sooner rather than later.
More than 70 per cent of respondents in Peel, Halton, York

and Durham regions want the coal-fired plants — among the leading contributors to greenhouse gases and smog — shut down by 2007. That coincides with the position taken by opposition parties at Queen's Park.

Only 15.6 per cent of voters said they agreed with the Conservative government's position to close, or convert the coal-fired plants by the year 2015.

The poll, based on a survey of 500 voting-age residents, was commissioned by the Ontario Clean Air Alliance (OCAA), a coalition of environmental groups.

"This doesn't surprise us at all," Jack Gibbons, chair of OCAA, said yesterday. "Why would residents want to continue to suffer through another 12 years of smog alerts? We're trying to show the government that it's in their best interests to phase out the coal plants by the year 2010, or sooner."

The Ontario government has already set ambitious targets, based on the international Kyoto accord, to reduce emissions of smog, acid rain and mercury by 2010.

"A phase-out of coal would help them reach those goals at the lowest possible cost," says Gibbons.

The government has already committed that Lakeview — one of the oldest plants in the province — will stop burning coal by the end of April 2005. It will likely either be converted to a gas-burning plant, or closed.

Ontario Power Generation, which owns the plant built in 1962, has it on the market, but Gibbons says there's no sign of any buyers on the horizon. Some of the private sector power suppliers who are coming into the deregulated market in Ontario considered buying Lakeview, but concluded it would cost too much to convert the plant.

Gibbons also deems it likely that the site may simply cease to operate then, since he's seen no signs that OPG plans to convert it to gas.

"I think that's a real possibility," he said of shutting the plant's doors. "The Hearn plant has been closed for years in Toronto and it's still standing there."

The possibility of converting the property to another land use is attractive, but, "there's a huge environmental liability for the site." The cost of remediating the site to standards required to allow redevelopment may be so high that redevelopment becomes uneconomic.

Public Works are on display

A truck pull, rodeo and a grueling obstacle course are on the schedule in the next few days as Peel Region officials celebrate Public Works Week 2003.

Public Works Week, a North American-wide event held each May, continues through Saturday as Peel Region officials recognize the contributions of public works initiatives to the community.

This year's theme in Peel is The Strength of Public Works. "This is our opportunity to really showcase what we do," said Mitch Zamoje, Peel Region's public works commissioner. "Public Works Week provides an ideal forum to educate, inform and demonstrate to residents, first-hand, the dedication and excellence of our staff."

Residents are invited to participate in several activities this week to learn more about public works programs and how such initiatives directly contribute to their standard of living, said Zamoje.

Scheduled events include

- truck-driving rodeo (Thursday, May 22, 9 a.m. at 10 Peel Centre Dr., Brampton) — men and women will compete in massive single and tandem-axle trucks as they maneuver through five stations to demonstrate driving skills.

- obstacle course (Friday, May 23, 10 a.m. at 10 Peel Centre Dr.) — Peel Region staff will compete in teams to complete activities representing the four different areas of public works;

- truck pull (Saturday, May 24, 11 a.m. at 10 Peel Centre Dr.) — public works employees will compete against one another by pulling single or double tandem trucks; and

- open house (Saturday, May 24 from 10 a.m. to 2:30 p.m. at 10 Peel Centre Dr. and 1150 Lakeshore Blvd. in Mississauga) — demonstrations and workshops, public works vehicles, free barbecue, face-painting and giveaways are part of the day's events.

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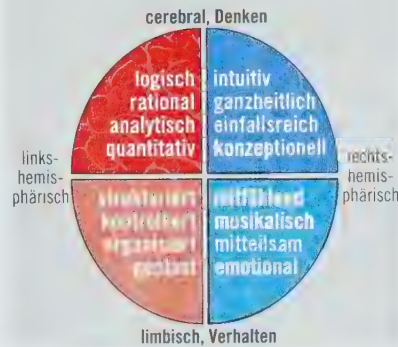
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Quelle: profil

profil infografik-noa

den Einsparungsmaßnahmen zum Opfer gefallen.“ Legasthietrainerin Nuhl kann ebenfalls keine Verbesserungen entdecken: „Meiner Erfahrung nach wurde heuer so ziemlich alles gestrichen, was gestrichen werden konnte. Warum bringen denn so viele Eltern ihre Kinder zu den privaten Trainings, wenn ihnen an den Schulen angeblich so effizient geholfen wird?“ Außerdem sei zu berücksichtigen, dass ordentliches Dyslexietraining in kleinen Gruppen oder im Idealfall einzeln zu praktizieren sei. Solche Bedingungen werde man an den Schulen definitiv nicht vorfinden.

Förderkurse. Manche Schulen bieten spezielle Förderkurse an, allerdings maximal zweimal pro Woche. Bei der Komplexität des Phänomens reicht das selten, um den Kindern eine ausreichende Hilfestellung zu bieten. Es gibt auch etliche ausgezeichnete Lehrer, aber viele andere sind mit dem Problem schlicht überfordert. Je länger man aber ein betroffenes Kind mit seinen Problemen allein lässt, desto größer wird die Gefahr von Folgeproblemen. Diese auch als „Sekundärlegasthenie“ bekannten psychischen und physischen Schwierigkei-

ten bedürften erst recht einer speziellen Behandlung. Andreas Mikula, Mitbegründer der Vorarlberger Initiative Lega, weist darauf hin, „dass 27 Prozent der Legasthener später straffällig werden. 43 Prozent der achtjährigen Legasthener haben psychische Auffälligkeiten.“ Laut Mikula gibt es in Vorarlberg zwar ein gewisses Problemverständnis der Schulbehörden sowie ein Netzwerk von Hilfsangeboten, aber die schulische Förderung reiche – wie in den meisten anderen Bundesländern – bei

www.legasthenie.at

Erster Österr. Dachverband für Legasthenie,
Tel.: 0463/556 60

www.wll.at

Wiener Landesverband Legasthenie
Tel.: 01/526 49 63 bzw. 0676/597 54 12

www.lega.at

Initiative Lega in Vorarlberg
Tel.: 05572/536 58 38 63 bzw.
Hotline 0676/677 99 22

www.legakids.net

Übungsseite für Kinder mit dem Lese- und Rechtschreibmonster

weitem nicht. Mit einer Petition versuche man, von der öffentlichen Hand eine Teilabgeltung für die Kosten der privaten Förderkurse zu bekommen. Es sollte, so Mikula, allen Verantwortlichen zu denken geben, wie oft legasthene Kinder tatsächlich von höherer Bildung ausgeschlossen bleiben: „Wenn man deutsche Zahlen heranzieht, so sticht ins Auge, dass nur 1,6 Prozent der dortigen Legasthener ein Gymnasium besuchen – gegenüber 37 Prozent der ‚normalen‘ Kinder.“

„Deutsch, nicht Legasthenisch“

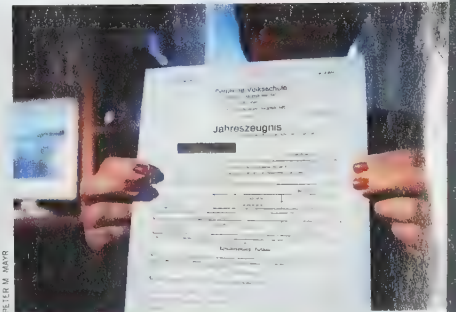
Die endlose Leidensgeschichte einer Mutter mit drei legasthenischen Söhnen.

Bettina M. ist Mutter dreier Söhne, heute 21, 16 und zwölf Jahre alt. Alle drei sind Legasthener, zwei davon mit einer besonders schweren Ausprägung. 14 Jahre lang dauert nun schon das familiäre Martyrium. „Legasthenie“, sagt die Mutter, „bedeutet nicht nur Probleme beim Lesen und Schreiben, es können auch Probleme beim Rechnen sein, beim Sprechen, motorische Probleme und vieles mehr. Bei Peter war es alles zusammen.“

Der älteste der drei Buben musste wiederholt die Schule wechseln. Die Lehrer hatten für die Probleme kaum Verständnis, folglich gab es auch keinen speziellen Legasthenieunterricht. Peter wurde als lernschwach eingestuft oder, wie es die Mutter formuliert, „als Idiot“. Erst in einer Waldorfschule fand er endlich die für ihn geeigneten Rahmenbedingungen. Vor allem schenkte man ihm dort Zeit, und die benötigten legasthene Kinder besonders: „Sie leben in einem ständigen Kampf mit der Zeit“, erklärt Frau M. Und das auch im buchstäblichen Sinn: „Peter

kann nicht einmal die Uhrzeit ablesen. Er ist sofort verwirrt.“

Auch mit Fritz, dem Jüngsten, gab es Probleme größeren Ausmaßes. „Er konnte überhaupt nicht sprechen“, klagt die Mutter. „Dabei war er offensichtlich ein kluges Kind, das mit fünf schon lesen und mit Minuszahlen umgehen konnte.“ Fritz stellte die Familie vor ein Rätsel. Er redete ununterbrochen, aber in seiner eigenen Sprache, die außer seinem Bruder Peter niemand verstand. „Die beiden waren auf derselben Welle. Ich weiß nicht, wie das funktioniert hat“, sagt die Mutter, „aber es hat funktioniert.“ Mutter und Sohn durchleben noch einmal das Drama, das es schon mit Peter gegeben hat. Schulwechsel, Unverständnis. „Sie können sich nicht vorstellen, welcher Horror das für eine Familie ist. Der Bub hatte keine Kindheit. Er hat Tag und Nacht gelernt.“ Wachsende Hilflosigkeit stellte sich ein. „Ich habe nirgendwo Hilfe gefunden“, erzählt die Mutter, „bei keinem Arzt, bei keinem Lehrer, bei niemandem.“ Nach



Bettina M. mit Jahreszeugnis eines ihrer Söhne „Was für ein Horror das für die Familie ist“

zahllosen Behandlungen, musikalischen und psychologischen, lautete der Befund der Lehrer, Fritz sei reif für die Sonderschule, behindert, ohne Chance auf Besserung. Auf die Frage von Frau P., ob es denn in Österreich keine Schule gebe, wo man sich mit Legasthenern auseinandersetze, antwortete die Beamtin im Bezirksschulrat: „Hier in Österreich spricht man in der Schule Deutsch, nicht Legasthenisch.“ Sieben Jahre später ist Frau M. überzeugt, dass ihre drei Buben maturieren werden. „Diese Menschen denken anders“, sagt sie. „Vielleicht ist mein ältester Sohn gerade deswegen ein so begabter Mathematiker, weil er in anderen Bereichen die größten Defizite hat.“

Zweimal Leben

Zeitgeschichte. Der österreichische Lieben-Preis war vor hundert Jahren ähnlich prestigeträchtig wie der Nobelpreis. Er wurde auch ein Opfer der Nazis. Jetzt wird er wiederbelebt.

Von Georg Hoffmann-Ostenhof

Als es 1862 ans Sterben ging, schrieb der alte Ignaz Lieben, ein reicher jüdischer Bankier zu Wien, sein Testament. Darin verfügte er unter anderem, dass der Betrag von 10.000 Gulden „für das allgemeine Beste“ verwendet werde. Adolf Lieben erfüllte den letzten Wunsch seines Vaters. Zu dieser Zeit ein junger Chemie-Dozent, bestimmte Adolf, den größten Teil der Stiftung, 6000 Gulden, „immerwährend der Förderung wissenschaftlicher Forschungen im Gebiet der Physik und Chemie“ zu widmen.

Der Ignaz-Lieben-Preis wurde in der Folge von der Österreichischen Akademie der Wissenschaften an junge österreichische Forscher der Naturwissenschaften vergeben. Für die österreichisch-ungarische Monarchie war er bald ähnlich prestigeträchtig, wie es der – später gestiftete – Nobelpreis für die Welt werden sollte. Tatsächlich las sich die Liste der Lieben-Preisträger wie ein Who's who der österreichischen Naturwissenschaftler-Elite zwischen 1865 und 1937. Vier von ihnen, Fritz Pregl, Otto Loewi, Karl von Frisch und Viktor Hess, wurden auch mit dem Nobelpreis geehrt.

All das war bis vor kurzem vergessen. Nichts erinnerte mehr daran. Wegen Verfolgung der Stifterfamilie unter den Nazis eingestellt, wurde der Preis nach 1945 nicht mehr vergeben. Bis Robert Rosner, ein heute 80-jähriger Chemiker und Wissenschaftshistoriker, im Verlauf der Recherchen für seine Arbeit über die Geschichte der Chemie in Österreich auf den Lieben-Preis stieß. „Das ließ mich nicht los. Die Geschichte des Preises faszinierte mich“, erzählt Rosner. Er lancierte die Idee, den Preis wiederzubeleben, und fand Mitstreiter in der Akademie der Wissenschaften und der Universität Wien. Nur ein Stifter fehlte. Rosner fand ihn im amerikanischen Unternehmer Alfred Bader, mit dem er seit drei Jahrzehnten befreundet ist.

Rosner und Bader entkamen dem mörderischen Zugriff der Nazis auf dieselbe Weise. Beide verließen Österreich 1939 im Alter von 14 Jahren in einem so genannten Kindertransport, in plombierten Zügen, nach England. Damals kannten sie einander nicht. Rosner kehrte nach 1945 nach Wien



Die Liebens Ein Jahrhundertwendefoto mit dem Preisstifter Adolf Lieben (links, stehend)

zurück, wo er Chemie studierte und in der Industrie arbeitete. Später, bereits Pensionist, graduierte Rosner noch in Geschichte.

Bader, so erzählt Rosner, wurde, im Unterschied zu ihm selbst, während des Krieges von den Engländern als „enemy alien“ nach Kanada deportiert. Dort begann seine fabulöse Karriere. Einige kanadische Universitäten wollten den jungen jüdischen Ausländer nicht aufnehmen. Die Queen's University schließlich akzeptierte ihn als Chemiestudenten. In Harvard promovierte er und machte sich nach einigen Jahren selbstständig. Er gründete in den USA das Unternehmen Aldrich (seit 1992 Sigma-Aldrich), das sich zum Weltmarktführer im Bereich der Forschungskemikalien entwickelte.

Kindertransport. Nicht erst seit er sich Anfang des vergangenen Jahrzehnts aus dem aktiven Geschäftsleben zurückzog, betätigt sich Bader, der zu den reichsten Amerikanern zählt, als großzügiger Mäzen. Unter anderem stiftete er der kanadischen Universität, die ihm seinerzeit das Studium ermöglichte, ein englisches Schloss aus dem 15. Jahrhundert als Dependence. Nach seiner Pensionierung schließlich begann Bader eine zweite Karriere: Der Ex-Österreicher wurde zu einem wichtigen Kunstsammler und Galerienbesitzer. Seine Spezialität: alte Meister.

Als Robert Rosner – mit dem Bader in der Nachkriegszeit zunächst geschäftliche

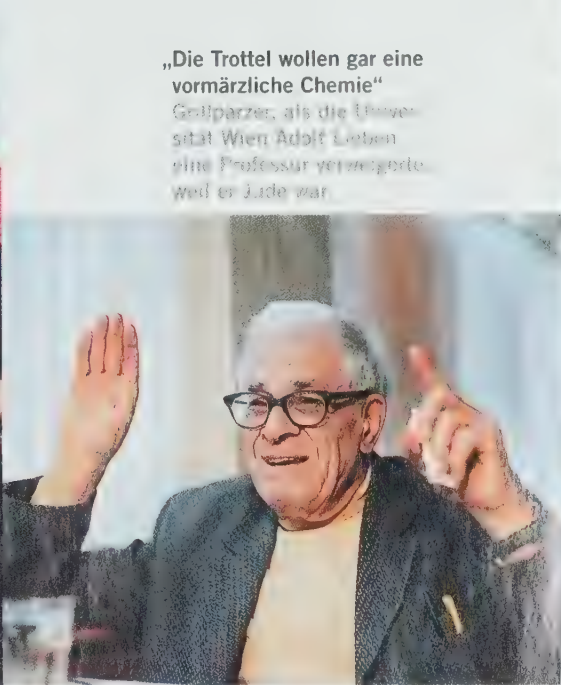
Kontakte pflegte, aus denen sich in der Folge eine Freundschaft entwickelte – ihm von seinem Lieben-Preis-Projekt erzählte, war er begeistert. „Als ich nach 1945 erstmals wieder nach Österreich reiste, hätte ich mir nicht vorstellen können, einmal einen Preis für Österreicher zu stiften“, meint Bader. „Immer wenn ich einen Österreicher traf, der älter als ich war, fragte ich mich, was der wohl 1938 getan hat. Nun sind aber die meisten alten Nazis gestorben, und ich fühle, dass die junge Generation einfach besser als die alte ist.“

Der Kreis der möglichen Preisträger soll jedoch nicht auf österreichische Forscher beschränkt sein, sondern an junge Wissenschaftler aus jenen Ländern verliehen werden, die einmal Teil der österreichisch-ungarischen Monarchie waren: Deshalb kommen Molekularbiologen, Chemiker und Physiker aus Bosnien, Kroatien, der Slowakei, Slowenien, Tschechien Ungarn und Österreich infrage. Bader: „Wir erneuern den Preis in politisch interessanten Zeiten, in denen die EU-Erweiterung die ehemals österreich-ungarischen Länder wieder zusammenbrachte – in einem modernen großen Europa.“

Den Preis hat Bader mit jährlich 18.000 Dollar dotiert. Warum gerade 18.000? Im Hebräischen haben die Buchstaben auch Zahlenwerte. „18 steht für Leben“, antwortet Bader und erinnert daran, dass die ursprüngliche Preissumme von 6000 Gul-



Alfred, Isabel Bader „Die alten Nazis sind tot“



„Die Trottel wollen gar eine vormärzliche Chemie“

Grillparzer, als die Universität Wien Adolf Lieben eine Professur verweigerte, weil er Jude war.

Rosner Der Motor der Wiederbelebung des Preises

Der Preis und die Stifter

Eine Ausstellung über die Familie Lieben und ein Symposium.

Anlässlich der Reaktivierung des Ignaz-Lieben-Preises und der ersten Verleihung seit 1937 werden mehrere Veranstaltungen organisiert.

Die Preisverleihung an einen ungarischen Naturwissenschaftler findet am 9. November in Anwesenheit des neuen Stifters, des amerikanischen Unternehmers und Kunstmäzens Alfred Bader, in der Österreichischen Akademie der Wissenschaften statt. Information zur Preisausschreibung und Bewerbungsunterlagen: http://www.oew.ac.at/stipref/frame_eben.html.

Am gleichen Tag beginnt ein zweitägiges Symposium im Festsaal der Universität unter dem Titel:

Mäzenatentum und naturwissenschaftliche Forschung in Österreich.

Ebenfalls am 9. November wird die Ausstellung „Die Liebens. 150 Jahre Geschichte einer Wiener Familie“ im Jüdischen Museum Wien in der Dorotheergasse 11 in der Wiener Innenstadt eröffnet. Die Ausstellung läuft bis zum 5. April 2005.

den von der Familie Lieben zweimal erhöht worden war: 1898 um 36.000 (zweimal Lieben) Kronen und 1908 um weitere 18.000 Kronen.

Dass die Familie Lieben bei der Höhe der Preisgelder an die jüdische Zahlenmystik dachte, ist eher unwahrscheinlich. Um die Jahrhundertwende schien die Integration des jüdischen Großbürgertums in die Gesellschaft der Kaiserstadt weit gehend gelungen, die meisten Liebens waren getauft und assimiliert. Anlässlich der Neustiftung des Preises gestaltet das Jüdische Museum in Wien nun eine Ausstellung: „Die Liebens. 150 Jahre Geschichte einer Familie“.

Es ist eine ruhmreiche Geschichte von Kaufleuten, Bankiers, Salondamen, Mäzenen, Wissenschaftlern und Künstlern. Die Vorväter, darunter auch Ignaz Lieben, mussten aufgrund des beschränkten Wohnrechts für Juden um die Toleranz in Wien ansuchen. Noch Adolf Lieben, Ignaz' Sohn, war zunächst eine universitäre Karriere in Wien verwehrt. Der brillante Chemiker hatte lange Zeit keine Aussicht auf eine Lehrkanzel, weil er Jude war. Auch die Fürsprache Grillparzers, eines engen Freundes der Familie, im Unterrichtsministerium half nichts, worauf er gesagt haben soll: „Diese Trottel wollen gar eine vormärzliche Chemie.“ Erst nach der Gleichstellung der Juden im Jahr 1867 wurde Adolf Lieben ein angesehener Professor für organische Chemie. Ignaz' En-

kel, Robert Lieben, ging als Pionier in die Radiogeschichte ein. Marie-Louise von Motesiczky, eine Urenkelin von Ignaz Lieben, machte Karriere als Malerin und gilt heute als eine der wichtigsten Künstlerinnen des frühen 20. Jahrhunderts.

Moderne Elite. Die Ausstellung im Jüdischen Museum malt das Panorama einer glanzvollen Zeit: der Zeit des Fin de Siècle, der prachtvollen Ringstraßenpalais und ihrer Besitzer, der großen Patrizierfamilien Wertheimstein, Auspitz, Schey, Todesco und eben Lieben, die vielfach untereinander verwandt und verschwägert waren und mit ihrer liberalen Gesinnung, ihrem Kunstverstand und ihren wissenschaftlichen und wirtschaftlichen Erfolgen zu den bestimmenden modernen Eliten des Landes gehörten.

Als die Lieben-Stiftung 1923 als Folge der Inflation wertlos geworden war, beschloss die Nachkommen der ursprünglichen Stifter, jährlich einen Betrag von 1000 Schilling (heute ungefähr 7000 Euro) an die Akademie der Wissenschaften zu überweisen, damit der Preis weiter bestehen bleibe.

Im April 1937, genau 75 Jahre nach der Gründung der Lieben-Stiftung, erhielt die Akademie ein letztes Schreiben, in dem die Überweisung der jährlichen 1000 Schilling avisiert wurde. Der Verfasser dieses Schreibens, Heinrich Lieben, wurde sieben Jahre später in Auschwitz ermordet. ■



Wolfgang Prentner

Selbstständiger IT-Ziviltechniker in Wien.

Klingende Netze

Apple startet paneuropäischen Musik-Download und stellt den neuen iPod Photo vor.



Internet-Musik. Wie immer, wenn Apple eine Innovation vorbereitet, waren im Vorfeld allerlei Gerüchte kursiert, am 26. Oktober präsentierte Steve Jobs seine jüngsten Entwicklungen schließlich im kalifornischen San José: Apple eröffnet den EU iTunes Music Store – eine paneuropäische Version seines Online-Service, der es auch Österreichern ermöglicht, für je 99 Cent Songs aus dem Internet zu laden. Jeder bezahlte Song lässt sich auf den iPod überspielen und bis zu siebenmal auf CD brennen, dann verhindert ein integrierter Kopierschutz die weitere Vervielfältigung. Der EU iTunes Music Store bietet vorerst eine Auswahl von rund 700.000 Titeln. In den USA und Großbritannien ist der Internet-Musikladen, der legale Downloadmöglichkeit bietet, bereits ziemlich erfolgreich: 150 Millionen Songs wurden bisher verkauft, Apples Marktanteil in dem Segment beträgt eigenen Angaben zufolge 70 Prozent. Zudem stellte Jobs auch den neuen iPod Photo vor, der mit einem Farbdisplay ausgestattet ist und dadurch nicht nur zum Musikhören, sondern auch als mobiles Fotoalbum genutzt werden kann. *Das Gerät gibt es in einer 40-GB-Version um 549 Euro und in einer 60-GB-Ausführung um 659 Euro.*

Neuer iPod Photo Mobiles Fotoalbum mit Farbdisplay

Chronik am Chronometer

Swatch und Microsoft präsentieren die Info-Uhr.



Accessoire. Information sollte immer und überall verfügbar sein – das ist eine der wichtigsten Parolen im digitalen Zeitalter. Vor zwei Jahren hat Microsoft eine Technologie vorgestellt, welche die traditionelle Armbanduhr in ein Mini-Terminal verwandelt. Mit dem Partner Swatch präsentierte man nun in den USA die „Swatch Paparazzi“, auf die unter anderem Nachrichten, Lokaltipps, Börsenkurse, Wetternachrichten und Tageshoroskope via Satellit geschickt werden können. Swatch-Besitzer müssen diese Services unter www.msndirect.com abonnieren. Derzeit gibt es die Info-Uhr für 150 Dollar nur in den USA, 2005 soll sie auch in Europa erhältlich sein.

Swatch Paparazzi
News auf die Armbanduhr

Was ist Flash

Programm des Softwareherstellers Macromedia zum Erstellen von vektorbasierten Animationen auf Websites. Zum Abspielen ist ein Plug-in erforderlich.

... Plug-in

Engl. für „einstecken, einstöpseln“; Hilfsprogramm, das die Funktionalität eines Web-Browsers erweitert, etwa um bestimmte Dateitypen (z. B. PDF, Sound, Video) darzustellen. Meist werden Plug-ins zum Download auf der Hersteller-Website angeboten.

... Online-Game

Spiele im Netz sind meist gratis. Wenn ein Spiel einen gewissen Bekanntheitsgrad erreicht hat, verdienen die Produzenten jedoch an Versionen für Spielkonsolen und Handys oder am Verkauf von Werbeartikeln.



Gameworld

Fliegende Pinguine

Internet. Simple Spiele sind im Web oft am erfolgreichsten, das hat die Moorhuhnjagd vor Jahren bereits bewiesen. Ebenso einfach ist das aktuelle Spiel „Yetisports“: Ein zotteliger, weißer Bär katapultiert Pinguine durch die Gegend und sammelt dafür Punkte. Mehr als 250.000 Anwender weltweit haben das in Österreich produzierte Online-Game bereits gespielt, in der neuesten Version geht der Yeti auf die Skipiste. Das Flash-Spiel ist unter www.yetisports.org im Netz zu finden, eine Version fürs Handy lässt sich auf www.t-zones.at herunterladen.

Online-PLUS

E-Mail ist für mich das wichtigste kommunikative Element im Internet, ich recherchiere auch zu Produkten und Technologien und kaufe Bücher ein.

Online-MINUS

Spam.

Favoriten

Wichtige Websites für mein Fachgebiet IT-Sicherheit.
www.securityfocus.com
www.dshield.org
www.heise.de/security
www.golem.de

PFADFINDER

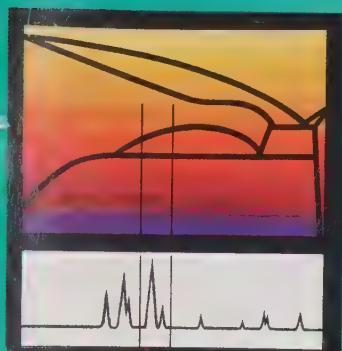
Schöne Bilder

Foto-Communities im Netz

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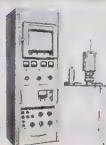
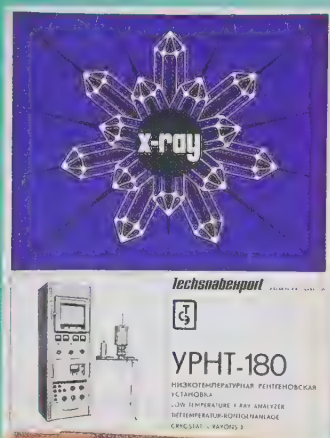
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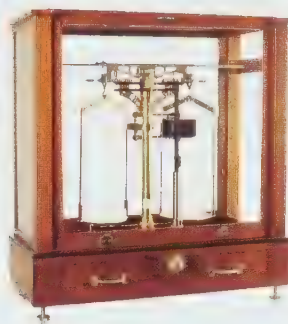
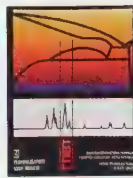
In this issue:

Bellstein Unbound

**The First North American
Petroleum Refinery**

**Hargittai Interviews
Gabor Somorjai**





On the cover

CHF houses a vast collection of artifacts and archives. Recent donations to the instrument collection include the three-foot Seederer-Kohlbusch balance (ca. 1936) featured on our cover; see the story on page 21. The instruments are complemented by vintage instruction manuals. The three reproduced here are a high-temperature X-ray unit manufactured by the Russian firm Technabexport (left), a cellulose digester plated with high-grade stainless steel, by Carl Canzler of Düren, Germany (center), and a low-temperature X-ray analyzer, also by Technabexport. Photos by Greg Tobias.



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Beilstein Unbound

Unraveling the Handbuch der Organischen Chemie

By Michael D. Gordin

“Beilstein” is well known as the comprehensive and essential reference work for organic chemists. Much less is known about Friedrich Konrad Beilstein—who he was and how he produced this vital text. Michael Gordin provides insight into Beilstein’s pedagogical story and contributions.

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The First North American Petroleum Refinery

By Martin D. Saltzman

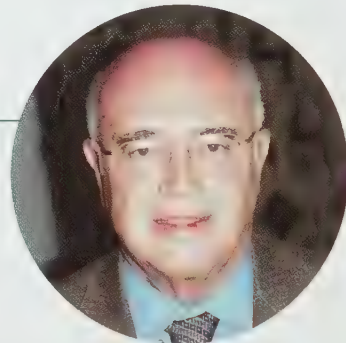
When Samuel Kier found his brine well increasingly polluted with petroleum, he began looking for profitable uses for the substance. Once he succeeded, he needed more petroleum, and in 1854 he built the first commercial petroleum refinery.

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Gabor Somorjai

By István Hargittai

Gabor Somorjai discusses developments in surface chemistry, including his personal contributions to the field.

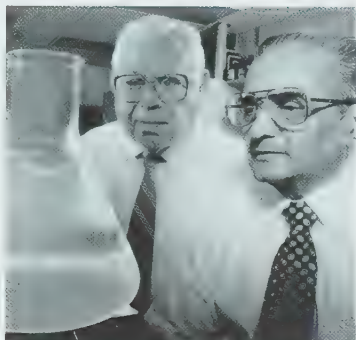


Chemical Heritage

Newsmagazine of the Chemical Heritage Foundation

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Winter 2003/4



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Our Readers Write

More Chemistry at War

The article entitled "The 42d Chemical Laboratory Company in World War II" (*CH*, Winter 2002/3, p. 12) reminded me of a group of small, apparently unheralded, quartermaster laboratory units created during World War II to deal with petroleum. The primary duty of these units, which comprised 3 officers and 15 enlisted men, was to test, approve, and utilize all petroleum products, both our own and enemy stock. The units were eventually stationed at bases in combat zones all over the world. Petroleum products shipped on merchant marine and navy tankers could become contaminated, and these units were able to test whether the products still fell within the standard specifications, and if they did not, whether they could be used for purposes other than those originally intended. A lot of money and resources were saved.

The army, in its infinite wisdom, placed me—an enlisted man with a B.A. in biochemistry and some hospital laboratory experience—in one of the units. I was sent to Tulsa University for a month of training in petroleum testing. On my return to Camp Lee, in Virginia, I was placed in the 929th Petroleum Products Laboratory Unit, which eventually set up a laboratory at Tana Merah Bay, New Guinea. We had an infantry outfit guarding the tanks containing petroleum products, mainly aviation gasoline. In this isolated area about 40 miles west of Hollandia, we carried out petroleum testing for about a year. I was fortunate in a way, as I left New Guinea and returned to the States on a medical discharge when the war ended. New Guinea was not the greatest environment in which to stay healthy—nor for working in a laboratory without air conditioning, given the hot and humid atmosphere.

Nathan Radin
Atlanta, Georgia

All That Glisters . . .

When I was a chemical engineering student at Columbia University in the 1930s, there was a chemical museum on the first floor of Havemeyer Hall. One unusual item was a 19th-century

Russian tea set supposedly made of aluminum. One of our professors, Colin Fink of electrochemical fame, told us that since platinum was cheaper than the very rare and expensive aluminum at the time, the set was actually made of platinum plated with aluminum. This set was made as a gift to the tsar.

The museum is no longer there, although there were some artifacts in a hallway case when I visited Columbia last year. Nobody there seemed to remember the set. Can anyone confirm my recollection, and if it is true, where is the tea set now?

Saul Ricklin
Bristol, Rhode Island

The Spirit of Energy

I share Christopher Stanwood's enthusiasm for *Introduction to Chemical Engineering Thermodynamics*. I studied the subject in a course in the early 1950s and then bought the 1959 edition that I still study today. Just as animate life is possessed of the spirit of life, the inanimate world is possessed of the spirit of energy. This spirit that manifests itself in so many different forms is a wonder and delight. The authors of this work, from the 1959 edition by Joseph Mauk Smith and Hendrick C. Van Ness (490 pages long) to the 2001 edition, with Michael M. Abbott (789 pages long), have aroused interest in and quantified the great mystery of energy in an admirable way.

Arthur L. Thomas
Greenwich, Connecticut

More on "Inorganic Chromatography"

The article by Hamish Small on ion chromatography at Dow (*CH*, Fall 2003, p. 10) described admirably the development in Dow's laboratories of the use of their ion-exchange resins in chromatographic columns for the separation of inorganic cations and anions. But the author did not refer to pertinent earlier work. Before coming to the United States in 1954 I carried out research on inorganic chromatography in Argentina (see, e.g., "Nuevos Ensayos de Chromatofia Inorganica," *Industria y*

IN FUTURE ISSUES

- Chemistry and 18th-century carriage coatings
- A pioneering Japanese instrument maker
- Chester Fisher's favorite alchemical painting
- French textbooks as scientific literature
- Pills and capsules industrialized
- Ethylamines in World War II

PLUS

- An interview by István Hargittai: Gunther Stent

AND MUCH MORE

Quimica 12 [1950], 9–10.) Indeed, when in 1953 I sent a book manuscript on the topic to Marin in Barcelona, the firm cited the existence of two other books on the subject, by F. H. Pollard and J. F. W. McOmie in English and by Michael Lederer in French, as reasons not to publish it.

Others I might cite include the work of Frank H. Spedding using ion-exchange resins to separate ions of the lanthanide series (*JACS*, 1947–1952); the work of K. A. Kraus and collaborators (*JACS*, 1949–1954); and the work on chromatography of ions on organic substrates by H. Erlenmeyer in Switzerland, and on aluminum oxides by G. M. Schwab in Munich.

Ricardo O. Bach
Lake Wylie, South Carolina

The author replies:

In response to your remarks on my article, had I been writing a comprehensive review of inorganic chromatography, I would certainly have recognized the contribution of many people from the past, people such as Spedding, Kraus, or Lederer. But that was not the purpose of the article. Its purpose was to describe, as briefly as possible and for nonspecialist readers (i.e., not just for chromatographers), the work that we did at the Dow Chemical Company to develop a fast, sensitive chromatographic method for the analysis of mixtures of inorganic

CHF on the Move

Priestley Society Season Opens with Biotechnology Emphasis

In September the Joseph Priestley Society began its second full year with its largest meeting attendance to date: 115 people. Featured speaker Carl Feldbaum, president of the Biotechnology Industry Organization (BIO), pointed out that biotechnology is a new arrival to chemistry and the experimental sciences and highlighted some events in the field's history: "This year is the 50th anniversary of Watson and Crick's discovery of the double helix, the 30th year since the key breakthrough with recombinant DNA, the 20th year since the advent of the polymerase chain reaction technique of expanding DNA, and the 10th anniversary of the founding of BIO."

Believing that partnerships are fundamental to the great advances in biotechnology, Feldbaum introduced the audience to the alliances that led to recombinant DNA, the founding of Genentech, and production of recombinant insulin. In the early days of biotechnology, the 1970s and early 1980s, "industrial partnerships and applications were front and center." By the mid-1980s, health-care applications had come to dominate biotechnology, followed by agricultural uses. "And that brings us to today's third wave: industrial and environmental biotechnology," Feldbaum said. He optimistically

A record 115 people attended the first Joseph Priestley Society meeting of the 2003-2004 season, including William Frey (business director of bio-based materials at DuPont) and Hank Whalen (director of industry relations at ACS).

predicted the future success of this trend: "This wave looks to be a tsunami."

At the top of the list of future applications of biotechnology is turning biomass into energy. The biotech process for cracking cellulose could provide a huge renewable source of raw materials for making plastics, fibers, and fuel. "Raw materials such as wood-product manufacturing residues, municipal solid waste, and agricultural waste could supply enough dry biomass to make 50 billion gallons of ethanol—about one-quarter of current gasoline consumption," Feldbaum declared. At the conclusion of his talk, he announced that BIO would hold its first World Congress on Industrial and Environmental Biotechnology in Orlando in February or March 2004. (Information will be available at www.bio.org.)

Feldbaum's presentation was followed by a special symposium, "Partnering in Industrial Biotechnology: Opportunities at a Historic Turning Point," organized by CHF. Speakers and audience members discussed emerging partnerships between traditional chemical companies and small biotech firms, leading to new, mass-market, bio-based products, including bioplastics, biocatalysts, and other innovative materials.

The first set of speakers, from three small biotech start-ups, discussed the future of their field. Barry Marrs, executive director of the Fraunhofer Center for Molecular Biology, gave an introductory lecture and moderated the



Carl Feldbaum (president of BIO) was the speaker at the September meeting of the Joseph Priestley Society, which was conducted by Wayne Tamarelli (chair of the Joseph Priestley Society Executive Committee).

panel, which included Richard Wool, president and CEO of Cara Plastics; Jim Sharpe, vice president for business development at VerdiZyme; and James Barber, president and CEO of Metabolix.

The next set of panelists talked about joint ventures, partnerships, and strategic alliances. Arthur Daemmrich, policy analyst at CHF, moderated the discussion. In introducing the panel, he commented: "Some 20,000 alliances have been formed since 1988, but the funding, media attention, and analysis have gone primarily to pharmaceuticals and agriculture. Bioplastics, catalysts, and innovative materials have played a secondary role at best. This imbalance has begun to change only in the very recent past." The panelists included John Pierce, director of biochemical sciences and engineering and central R&D at DuPont; Kelly Triplett, vice president for R&D at Akzo Nobel Chemicals; and Bo Miller, cochair of the corporate biotechnology steering team at the Dow Chemical Company.

Neil Gussman
Public Affairs



Bo Miller (cochair of the corporate biotechnology steering team at the Dow Chemical Company) and Richard Wool (president and CEO of Cara Plastics) spoke at the biotechnology symposium immediately following the September meeting of the Joseph Priestley Society.

Barbara S. Schilberg (managing director and CEO of BioAdvance), Carol Thompson (vice president of strategic membership services at the Eastern Technology Council), and Fritz Bittenbender (president of the Pennsylvania Biotechnology Association) attended their first Joseph Priestley Society luncheon in September. Bittenbender introduced the speaker, Carl Feldbaum. All photos by Greg Tobias.



CHF on the Move

Alfred Bader Presents 2003 Ulliyot Public Affairs Lecture

Wind and rain from Hurricane Isabel darkened the late afternoon sky as noted art collector and scientist Alfred Bader stepped to the podium to deliver the 2003 Ulliyot Public Affairs Lecture. Undaunted by the weather, the intrepid entrepreneur spoke to an audience of more than 100 who braved the storm to hear Bader's talk, "Learning from Experience: The Aldrich Story, the Rocky Road to Success."

In 1999 Hurricane Floyd disrupted the Ulliyot Public Affairs Lecture, the only time the annual event has been cancelled since its inception in 1990. Fortunately, Hurricane Isabel dealt only a glancing blow to the City of Brotherly Love. The second Ulliyot Public Affairs Lecture in CHF's Ulliyot Meeting Hall proceeded without a problem, but not without several references to Isabel—both to the now-famous storm and to Bader's wife and constant companion of the same name.

Even Horatio Alger would be impressed by Alfred Bader's rags-to-riches life and the success he has achieved. Bader fled Austria for Britain when the Nazis began their reign of terror in his

hometown. After the war began, the British deported him to Canada in 1940; there, he was educated first in the internment camp, then at Queen's University. After the war he received a Ph.D. in chemistry from Harvard, then worked as a research chemist at the Pittsburgh Plate Glass Company (PPG).

Bader said the inspiration for his business came while he was still a graduate student at Harvard. He needed to make one more compound to complete his degree requirements. He ordered the reagents he needed from Eastman Kodak, the leading distributor of fine chemicals in America in the late 1940s. Six weeks after placing the order, Bader had not received the materials and had heard nothing. He sent an inquiry about the order, stressing the urgency of his request, and received in reply a postcard from Eastman Kodak: "Do not contact us again. We will send your order when we have the material."

While still working at PPG, he began the Aldrich Chemical Company, a mail-order business that supplied chemicals in small quantities. The first Aldrich catalog was a single mimeo-

graphed sheet with one product offered for sale. As the business grew, Aldrich carried first tens, then hundreds, then thousands of products. As the product line expanded, Bader was careful to add new products not listed in the Eastman Kodak catalog because, as nearly everyone told him, "No one could compete with Eastman Kodak."

In the 1970s Bader realized that Aldrich could indeed compete with Eastman Kodak. His belief was confirmed when Eastman Kodak ran an advertisement admitting that they had customer-service problems; they asked customers to order through dealers rather than through Eastman Kodak directly. Aldrich immediately began using an advertisement with CEO Bader's picture, the headline "Please Bother Us," and the declaration "We hope we will never get so big that you can't come to us when you have a question." Throughout the history of Aldrich, Bader stressed customer service.

Bader then described the merger of Aldrich with the life-sciences company Sigma in 1975 to become Sigma-Aldrich, a company with current annual sales of more than a billion dollars. In 1988 Sigma-Aldrich bought Fluka Chemicals and became the world's largest supplier of chemicals for research. Eastman Kodak no longer competes with Sigma-Aldrich.

Bader left Sigma-Aldrich in 1992, publicly announcing that he was expelled. In the decade that followed, Bader published his autobiography, *Adventures of a Chemist Collector* (available from CHF), and became an internationally renowned art dealer. Collecting art has been a lifelong passion for Bader and one that he has successfully combined with his interest in chemistry: he illustrated his chemical catalogs with the fine art he has collected since his 20s. The artwork gave his sales literature a distinctive look and gave Aldrich a unique identity in the marketplace, which it retains to this day.

The day after the Ulliyot Lecture, Bader presented a CHF Brown Bag Lecture in which, assisted by his wife, he led the audience in a wide-ranging discussion of the iconographic richness



Alfred Bader (right) signs a copy of his autobiography, *Adventures of a Chemist Collector*, for David Alcorn (chairman of the membership committee of CHF's Joseph Priestley Society) and his wife, Winifred.

All photos by Stuart Watson.



Barbara Ulliyot gives Alfred Bader the Philadelphia Bowl, the traditional gift Ulliyot Public Affairs Lecturers receive after their talks.



CHF held a reception in the Dow Public Square following Baber's lecture.



Isabel and Alfred Bader with P. Roy Vagelos, former chairman of Merck.

and research potential of the CHF Eddleman and Fisher Collections of alchemical art. Later that afternoon he presented a talk at the Philadelphia Museum of Art on the Rembrandt Research Project.

In addition to their philanthropic activities (which have included helping his Canadian alma mater, Queen's University, acquire a castle in England), Bader and his wife travel the world, collecting fine art. He operates a gallery in Milwaukee whose collection can be browsed online at www.alfredbader.com.

The Ulyot Lecture

This year's lecture was the 13th in a distinguished series and the 2nd to be held in the Glenn Edgar and Barbara Hodsdon Ulyot Meeting Hall at CHF.

The Ulyot Public Affairs Lecture was established in 1990 by Glenn Edgar Ulyot to emphasize to the general public the positive role that the chemical and molecular sciences play in our lives. Ulyot Lectures, held annually and open to the public, are jointly sponsored by the Chemical Heritage Foundation, the Department of Chemistry at the University of Pennsylvania, the Departments of Chemistry and Biochemistry at the University of the Sciences, and the Philadelphia and Delaware sections of the American Chemical Society.

This year's event was supported by Albany Molecular Research, Promega Corporation, and Strem Chemicals.

Neil Gussman
Public Affairs

Dreyfus Foundation Director Visits CHF

Two representatives from the Camille and Henry Dreyfus Foundation—newly appointed executive director Mark Cardillo and associate director Gerard Brandenstein—recently made their first visits to CHF. During their extensive tour of CHF, they viewed many of the current exhibits and the rare book collection and learned about the oral history program.

CHF and the Dreyfus Foundation share a long and productive history, beginning with their joint support of the traveling exhibit *Robert Burns Woodward and the Art of Organic Synthesis* in 1990. CHF later helped process and archive the Dreyfus Foundation's historical records, and the two organizations worked together yet again to establish the CHF Fellows in Chemical Education program. Most recently, the Dreyfus Foundation awarded CHF funds for preservation of the R. B. Woodward Papers, a collaborative project with Harvard University.

We congratulate Mark Cardillo on his recent appointment and look forward to partnering with the Dreyfus Foundation in the future.

Jeffrey McDaniel
Development

CHF's Newest Volunteer Excels

Have you visited CHF's newly designed Web site? One of the new features you'll find there is the ability to search the abstracts of interviews in CHF's oral history collection (see sidebar, next page). Want to learn about individuals who were involved in the Manhattan Project? A quick keyword search returns 11 results. Does biochemistry interest you? Just type "biochemistry" in the keyword field and click on the search button to find that CHF holds oral histories of 14 individuals with connections to that field.

The decision to restructure our old Web site and give it a facelift allowed us to rethink how the oral histories were presented on the site. A searchable database seemed ideal, because it would allow researchers to perform quick and meaningful text searches, which were impossible to do on the old site. The decision to make this change, however, left us faced with the challenge of converting information contained in the existing oral history Web pages and in various word-processing documents into structured data for a searchable database. How would we pull it all together? We thought we were faced with a massive cut-and-paste job when we

CHF on the Move



Charlie Fean. Photo by Greg Tobias.

were rescued—by a volunteer who just wanted to contribute and “give back.” He also happened to be an experienced database developer.

Charlie Fean, a retired computer consultant who volunteers his time and services for CHF’s publishing operations, developed techniques that extracted the information from all the separate Web pages and word-processing documents and combined it into one extensive Microsoft Excel document. Created by our outside database development firm to enable us to collect the data before the database was built, the Excel document was organized into tables that reflected the structure of the database; once all the columns were filled with the appropriate information, the data could be “poured” or “dumped” from the Excel document into the database. Fean’s considerable programming skills allowed him to manipulate the data located in the various documents and

flow it into the Excel sheets with apparent ease.

The site launched on 1 July, but Fean continues to add information to each oral history record, including the subject’s educational history, professional experience, and honors, as well as the detailed table of contents for each oral history. “It’s interesting,” Fean says. “And as long as I feel I am making a contribution, I will be happy to stay.”

Fean began his career as a chemist at Allied Chemical Corporation in Morristown, New Jersey. He then earned an MBA, moved into sales, and eventually became a product manager. He left Allied Signal to establish his own company, American Fluid Conditioning, which supplied a range of equipment and devices to the biotechnology industry. As part of running the company, he began developing a number of computer systems to streamline operations.

Looking back now, Fean admits he was a bit ahead of the curve when he founded American Fluid Conditioning in 1978, years before the biotech boom, and the company struggled to remain profitable. He discontinued operations in 1996 and decided to put his extensive computer skills to use by working as a consultant, structuring and managing databases and primarily using Excel for business-process analysis and pro-

ductivity solutions. He also decided to learn more about the Internet and Web-site development and eventually built two business Web sites.

When Fean retired from consulting and Web-site development, he discovered that he was spending more and more time in Philadelphia and less and less time in his suburban home. He soon moved into an apartment in a great location—just a few blocks from the Chemical Heritage Foundation. Naturally, he began attending more events at CHF, including the Priestley Society lecture series. It was at one of those lectures last spring that Fean learned CHF was looking for volunteers. The publications area was a natural fit, as the group was working on launching the new Web site and was delighted to take advantage of Charlie’s database and Web experience.

To learn about CHF’s Oral History Program and to search the collection, visit www.chemheritage.org and click on “Collections & Exhibits.”

Shelley Geehr
Gwen Burda
Publications

Do you have a special skill or a willing pair of hands? CHF is looking for volunteers to work in various areas. Please contact Akua Asiamah at (215) 925-2222, ext. 225, or at akua@chemheritage.org, if you would like to join our volunteer program. Or visit www.chemheritage.org and click on “Helping CHF” to read about specific opportunities and fill out an online application.

Oral History at CHF

Oral History at CHF

The Oral History Program at CHF aims to create a collection of comprehensive interviews with leading figures in the chemical and molecular sciences and related process industries. The interviews provide autobiographical accounts that supplement material already available in the written record.

Through its Beckman Center for the History of Chemistry, CHF has conducted more than 270 oral history interviews, nearly 200 of which are ready and available for use by researchers. Abstracts of these, as well as biographical information about the interviewees, are available on our Web

site at www.chemheritage.org (click on “Collections & Exhibits”).

A bound copy of each oral history interview and all information pertaining to the interview are deposited at CHF’s Othmer Library of Chemical History. Individuals may also order bound copies or audiotapes of the interviews, and they may access the research file (some restrictions apply).

Questions? Contact the oral history coordinator at oralhistory@chemheritage.org or (215) 925-2178, ext. 270. You may also write to Oral History Coordinator, Chemical Heritage Foundation, 315 Chestnut Street, Philadelphia, PA 19106.

New Books from CHF

CHF is introducing two new titles for historians, industrialists, and anyone interested in the history of 20th-century chemical achievement.



2003. 335 pp., illus., notes, index
Cloth, 6 x 9, ISBN 0-941901-24-0
\$40.00

Fritz Haber: Chemist, Nobel Laureate, German, Jew

Dietrich Stoltzenberg

Winner of the German Chemical Society's author's prize;
now abridged by the author and translated into English

Praise for the German edition

Stoltzenberg has written a fine biography of this deeply flawed individual. . . . This sympathetic and comprehensive account . . . should appeal to general readers as well as to historians and all those interested in the social responsibility of science.

—David Cahan, *Nature*

Stoltzenberg's biography of Haber succeeds admirably in enlivening the many facets of this remarkable man and his extraordinary career as a creative academic, a leading member of the Kaiser Wilhelm Society, a shrewd businessman and an influential advisor to various governments in Berlin. But Stoltzenberg is equally adept at presenting Haber the private man, who had to fight prejudice, endure two broken marriages, and, finally, emigration when the Nazis came to power in 1933. . . . leaves little to be desired, the remarkable achievement of a professional chemist turned historian.

—Peter Alter, *Ambix*

[T]he most detailed, best documented portrait we have of a remarkable and still controversial scientist. —Jeffrey A. Johnson, *Isis*

[An] excellent biography. . . . —Max Perutz, *New York Review of Books*

The Chemical Industry at the Millennium

Maturity, Restructuring, and Globalization

Edited by Peter H. Spitz

Why has the chemical industry—an industry that provides so many of the essentials of modern life and that boasted a 4-percent growth rate in the early 1990s—been shunned by individual investors and money managers? In *The Chemical Industry at the Millennium*, Peter Spitz and a team of industry experts look at this complex and fascinating industry. Concentrating on basic and specialty chemicals, the chapter authors examine many of the trends and market factors that have affected the chemical industry in the recent past. The book offers an insider's view of the restructuring and reengineering crazes and the improvements and roadblocks offered by information technology and the Internet. Other factors that came into play include the impact of environmental regulations and globalization and the financial community's demand for greater shareholder value, and each is discussed in turn.

The Chemical Industry at the Millennium is a must read for industry professionals and anyone else interested in the changes and challenges facing a great and essential industry.

2003. 400 pp., notes, bibl, index
Cloth, 6 x 9, ISBN 0-941901-34-3
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Scaling Up: Science, Engineering, and the American Chemical Industry

Structures of Life: Observing and Analyzing Proteins, DNA, and Viruses

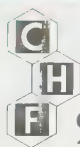
CHF has designed five exciting traveling exhibits that bring to light the unique histories, personalities, and developments in the chemical and molecular sciences and related technologies and industries. Institutions across the country—including schools, museums, research centers, and corporations—have hosted these exhibits, which display accessible texts and lively images that appeal to a variety of audiences.

Most exhibits cover twelve panels. Designed for easy display, they may be hung on the wall or may rest on sturdy easels. The panels display numerous paintings, drawings, photographs, and other visual material in color or in black and white, as well as explanatory text.

Each exhibit has a handsomely designed and illustrated companion book. For visitors, the books are perfect reminders of what they saw—and where they saw it.



The only charge for the exhibits is the cost of shipping to the next destination. Exhibit books cost \$8.00 each (\$12.00 for *Chemistry is Electric!*), and we offer discounts on large orders. To find out more, discuss availability, or schedule a CHF Traveling Exhibit, please contact Greg November at (215) 925-2222, ext. 222, or e-mail gregn@chemheritage.org, or write Greg November, Chemical Heritage Foundation, 315 Chestnut Street, Philadelphia, PA, 19106-2702; fax: (215) 925-1954.



Chemical Heritage Foundation
315 Chestnut Street
Philadelphia, Pennsylvania 19106-2702
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National Organization for the Professional Advancement
of Black Chemists and Chemical Engineers
The North American Catalysis Society
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Society for Applied Spectroscopy
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Synthetic Organic Chemical Manufacturers Association

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Dr. Alfred R. Bader
2961 N Shepard Ave
Milwaukee, WI 53211-3435





Dr. Alfred Bader grew up in Vienna in the 1920s. After Kristallnacht, his mother applied for him to leave on the Kindertransport to Great Britain. On December 10, 1938, Alfred said good-bye at Vienna's train station. While in Great Britain, Alfred worked to continue his education until, with other Jewish refugees over age 16, he was sent to an internment camp in Canada. Once again, Alfred worked hard to continue learning. After his release in November of 1941, he applied to and was accepted at Queens University in Ontario. Later, he earned his doctorate in organic chemistry at Harvard University. In 1951, Dr. Bader co-founded Aldrich Chemical Company, which today, as Sigma-Aldrich is one of the world's largest suppliers of research chemicals.

Name: Alfred Bader

Birthplace: Vienna, Austria

Birthdate: April 29, 1924

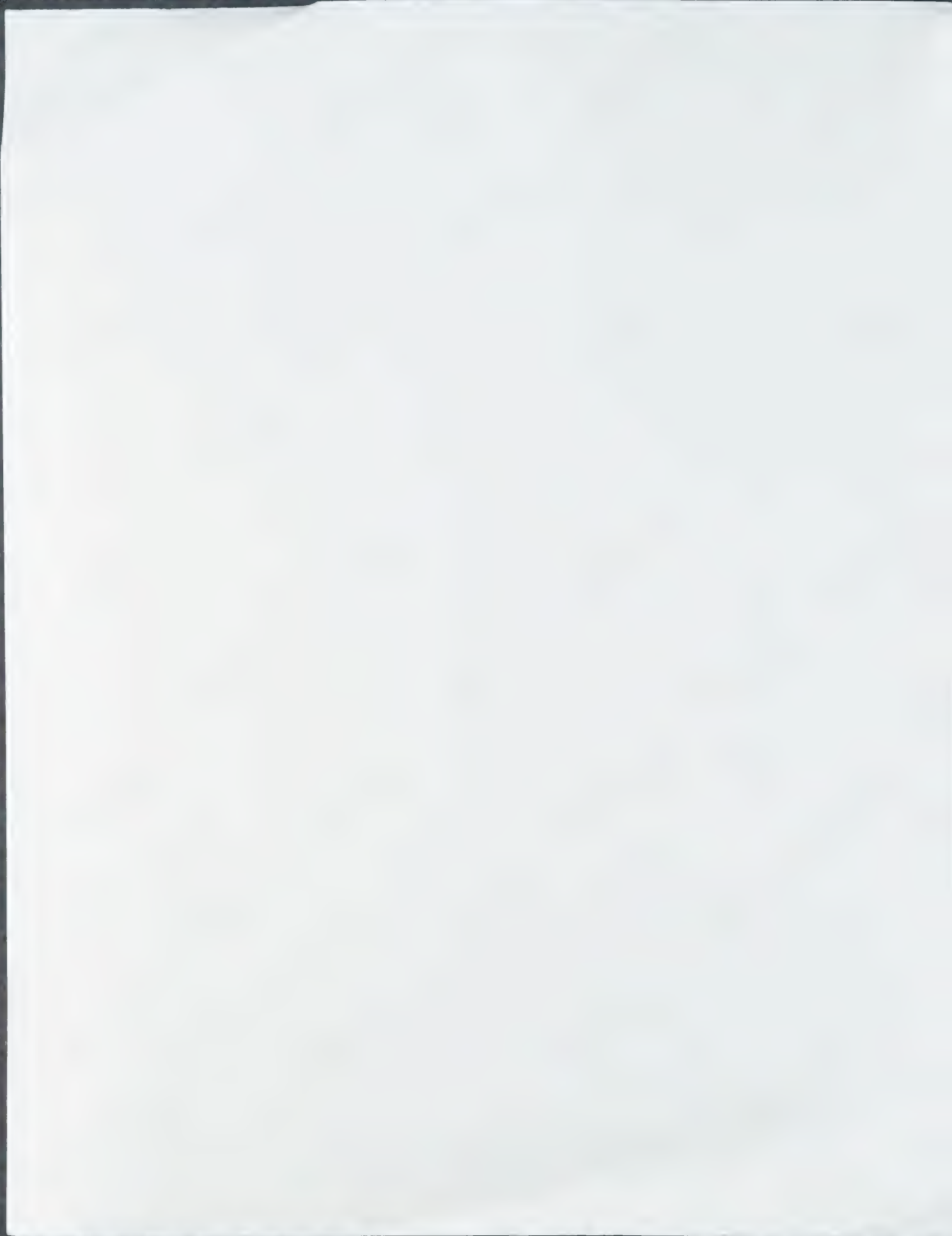


Alfred and his sister Maria circa 1927 - Alfred age 4, April, May, 1928

When asked to share any life lessons for young people, Dr. Bader replied, "Six days you shall labor" is one of the Ten Commandments." Dr. Bader has clearly lived by this precept. Through his hard work, he established a global chemical company, became a generous philanthropist and grew to be an avid art dealer.

Interview conducted by Milwaukee Jewish Day School student:
BEN CULLY

Alfred Bader



Biography

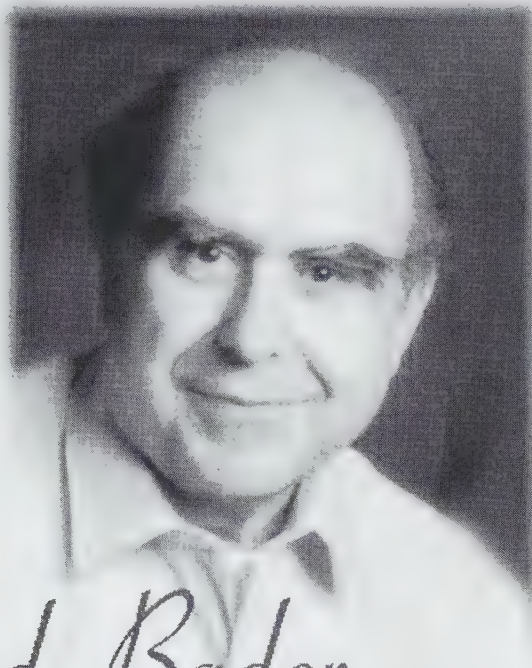
Symposium

Photogallery

Fellowships

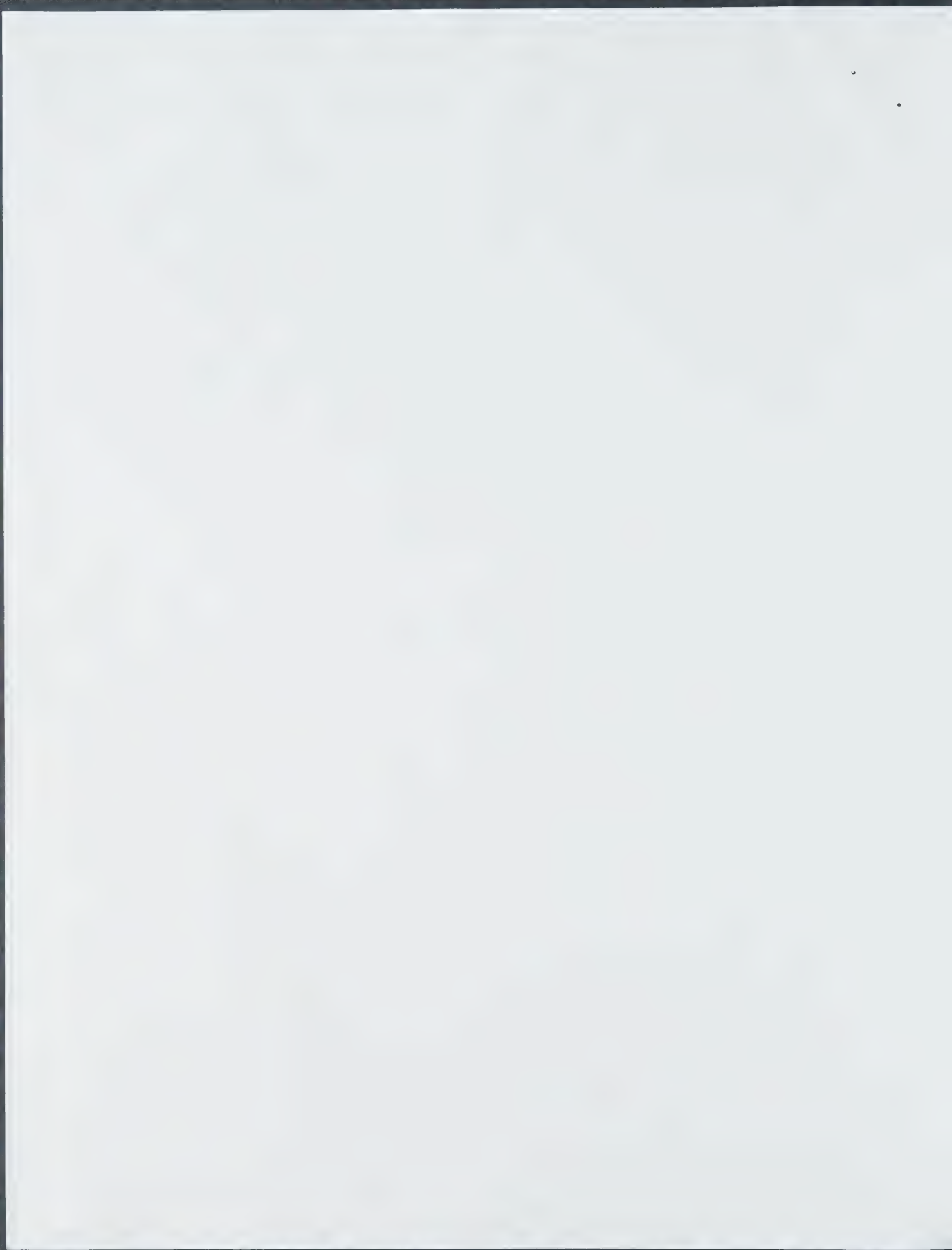
Awards

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Alfred Bader

Chemist and Art Collector



Biography

Symposium

Photogallery

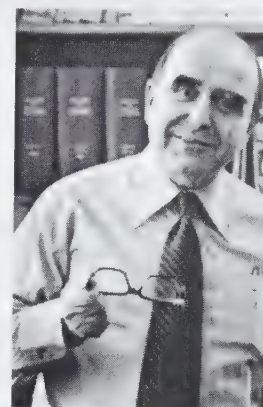
Fellowships

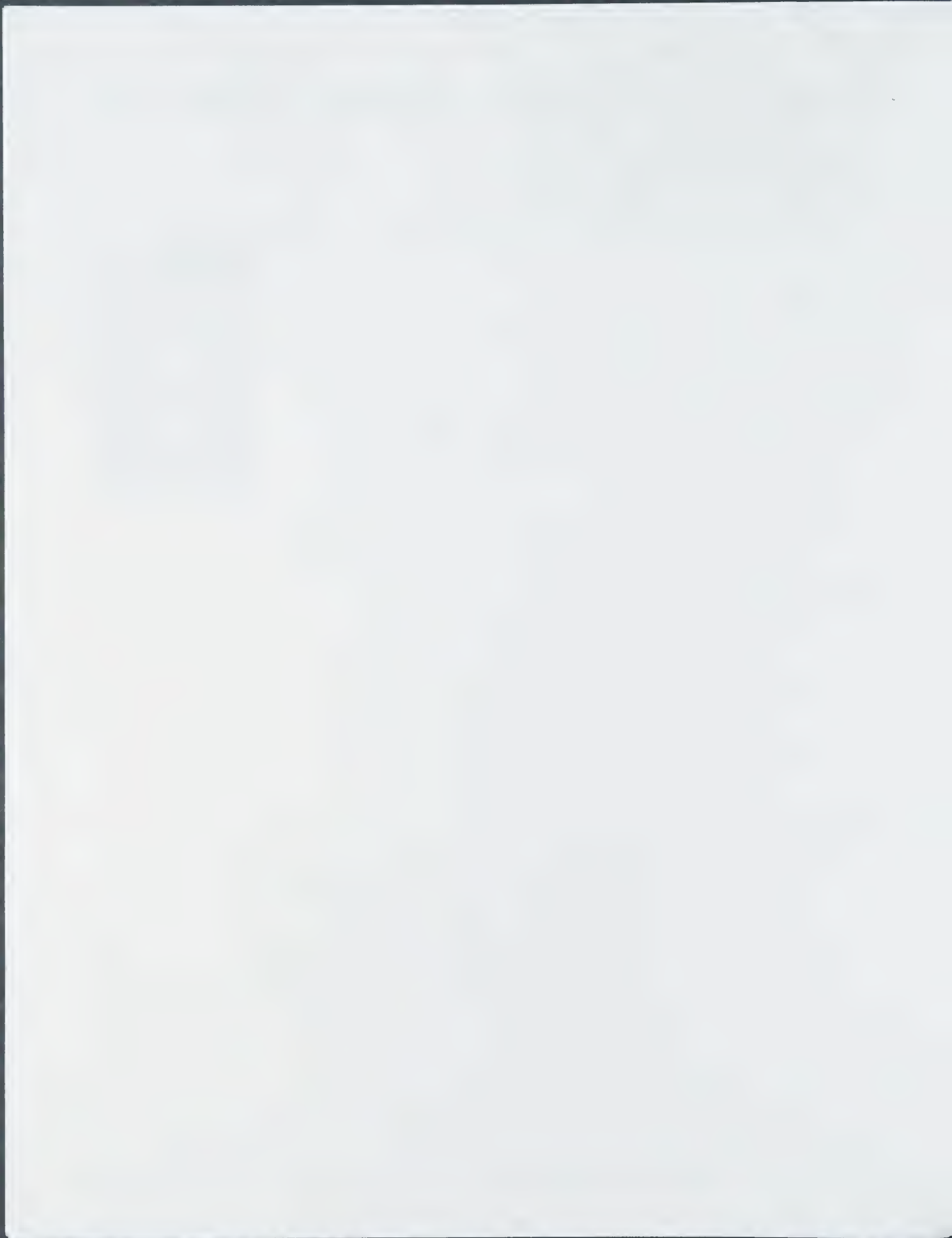
Awards

Links

Alfred Bader Biography

- Born:** Vienna, Austria, April 28, 1924
- Citizenship:** U.S. citizen
- Personal:** Married to Isabel Bader. Two sons, David and Daniel.
- Education:** BSc (Engineering Chemistry); Queen's University, Kingston, 1945
BA (History); Queen's University, 1946
MSc (Chemistry); Queen's University, 1947
MA (Chemistry); Harvard University, 1949
PhD (Chemistry); Harvard University, 1950
- Honorary Degrees:** DSc University of Wisconsin-Milwaukee, 1980
DSc Purdue University, 1984
DSc University of Wisconsin-Madison, 1984
LLD Queen's University, 1986
DUniv University of Sussex, 1989
DSc Northwestern University, 1990
DSc University of Edinburgh, 1998
DSc Glasgow University, 1999
DSc Masaryk University, 2000
- Positions Held:** Research Chemist, Pittsburgh Plate Glass Co., 1950-53
Group Leader, Pittsburgh Plate Glass Co., 1953-54
Chief Chemist, Aldrich Chemical Co., 1954-55
President, Aldrich Chemical Co., 1955-81
Chairman, Aldrich Chemical Co., 1981-91
President, Sigma-Aldrich Corporation, 1975-80
Chairman, Sigma-Aldrich Corporation, 1980-91
Chairman Emeritus, Sigma-Aldrich Corporation, 1991-92



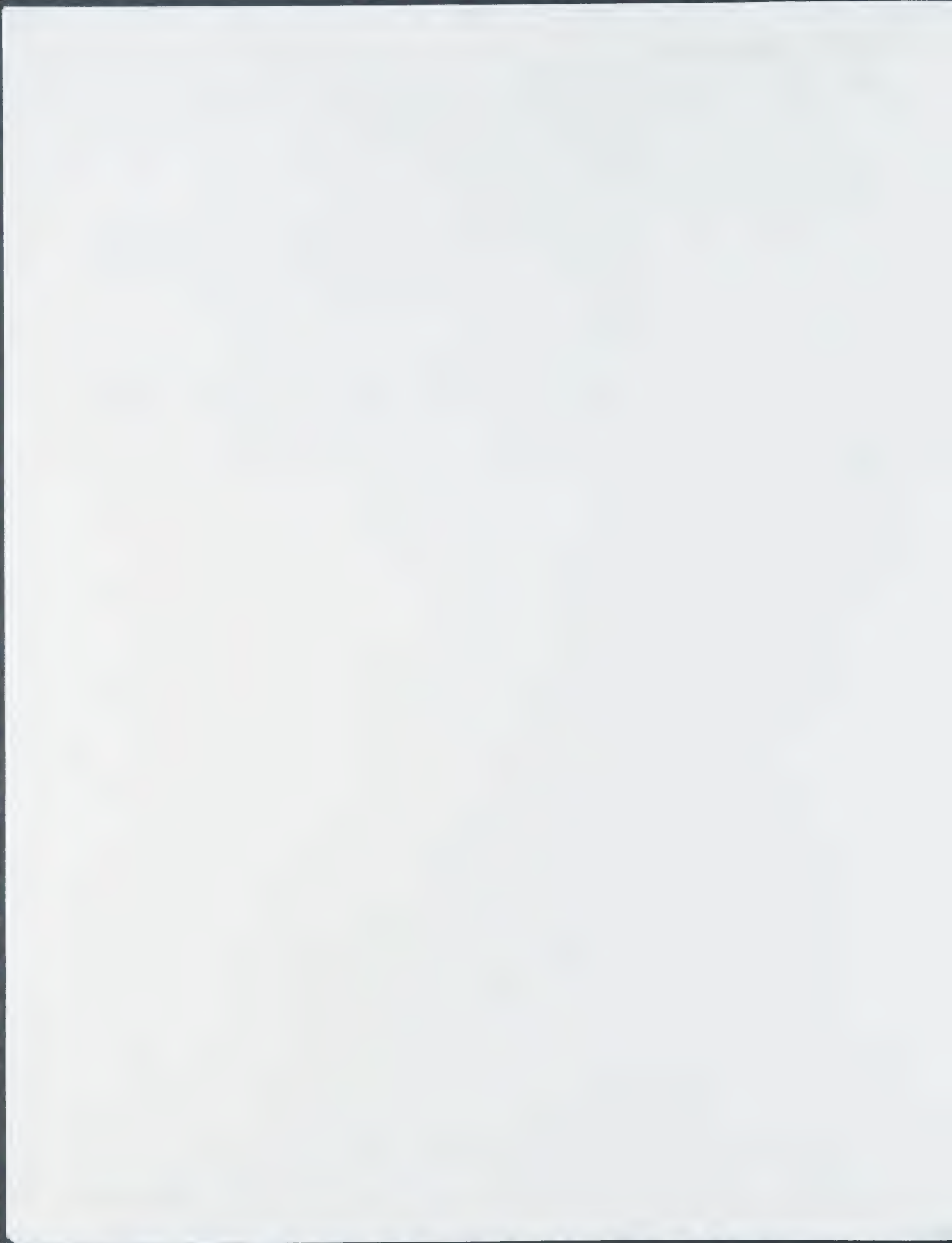


Honors:

Milwaukee Section (American Chemical Society) Award, 1971
Honorary Fellow, Royal Society of Chemistry, 1990
Fellow of the Royal Society of Arts
Guest Curator, Milwaukee Art Museum 1976 and 1989
Winthrop-Sears Medal, 1980
Fellow, Wisconsin Academy of Sciences, Arts & Letters
The J. E. Purkyne Medal of the Czech Academy of Sciences, 1994
Charles Lathrop Parsons Award, American Chemical Society, 1995
Honorary Citizen, University of Vienna, 1995
Honorary Fellow, Chemical Institute of Canada, 1996
Boron USA Award, 1997
Gold Medal, American Institute of Chemists, 1997
American Chemical Society Award: 'One of the Top 75 Distinguished Contributors to the Chemical Enterprise in the Last 75 Years', 1998
CBE (Commander of the British Empire), 1998

Author:

Adventures of a Chemist Collector, Weidenfeld and Nicolson, London, 1995



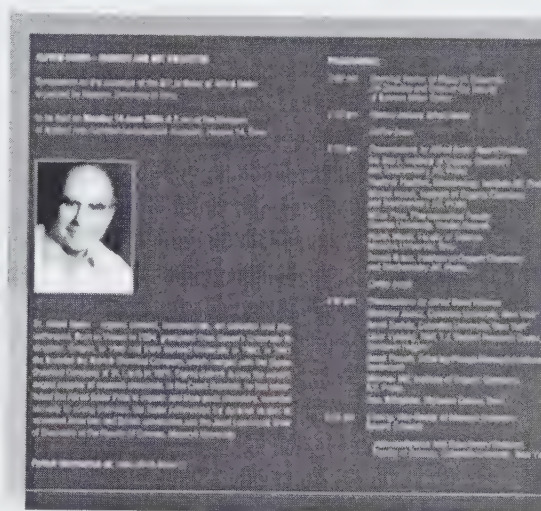
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Alfred Bader - Chemist and Art Collector

Symposium on the occasion of 80th birthday of Alfred Bader organized by the Masaryk University in Brno

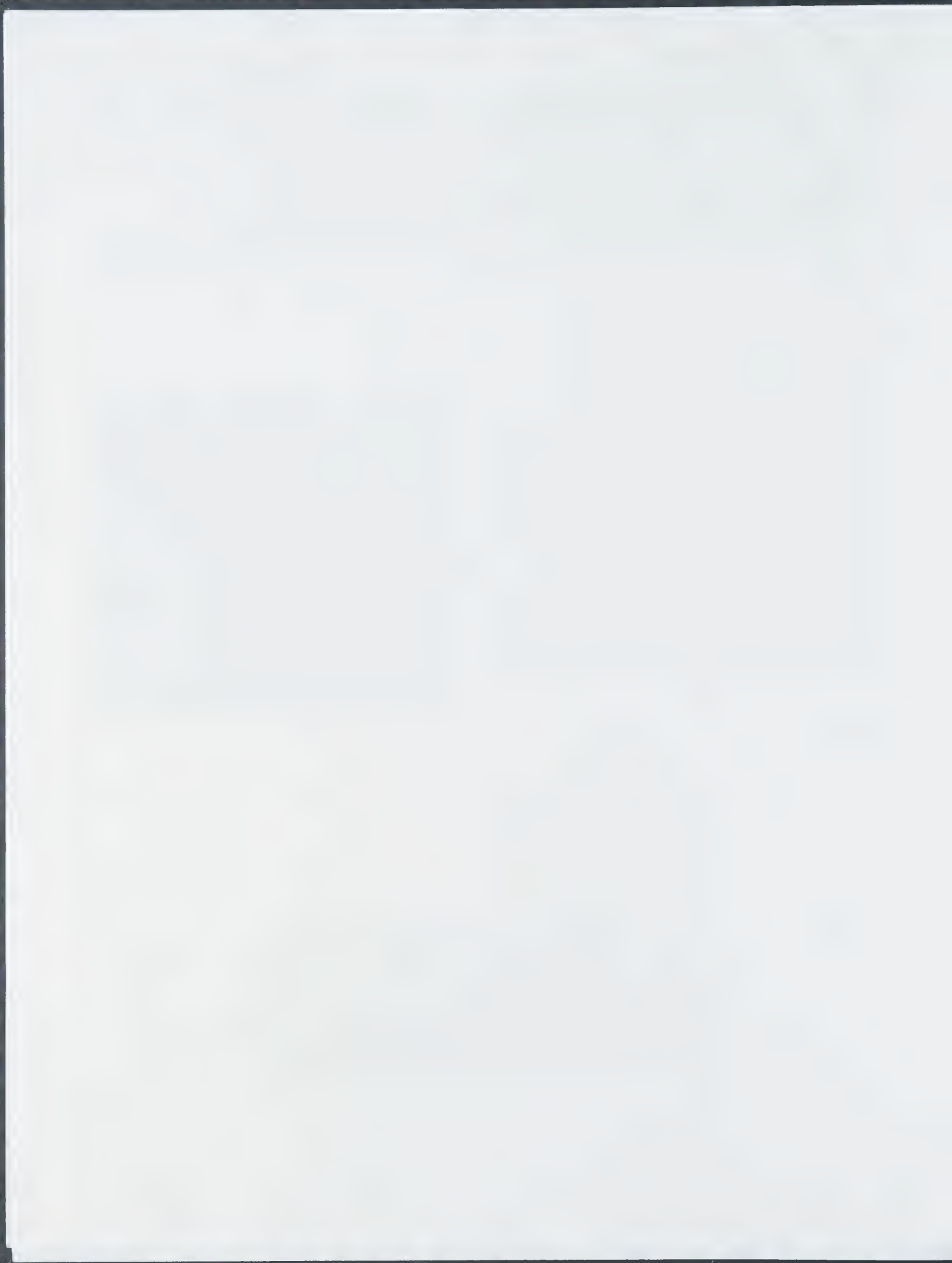
to be held on Monday 14 June at 2 pm
at the Museum of Applied Arts, Moravian Gallery,
Husova 14, Brno, Czech Republic

Dr. Alfred Bader - organic chemist, businessman, art collector and philanthropist. Born in Vienna in 1924, graduated from Queen's University in Kingston, Ontario, in 1945 and from Harvard University in 1950. In 1951 he founded the Aldrich Chemical Company, which merged with the Sigma Chemical Company of St. Louis in 1975. Sigma-Aldrich is now the world's largest supplier of research chemicals. In the Czech Republic, he has established the Alfred Bader Prize in organic and bioorganic chemistry, awarded annually to young chemists, the Bader Fellowships for doctoral studies in chemistry at renowned American and British universities and for study of art history at museums and galleries, the Josef Loschmidt Chair of Chemistry at the Faculty of Science, Masaryk University.



Program:

- 2.00 pm *Opening:* Rector of Masaryk University Jiří Zlatuška and Dean of the Faculty of Science Milan Gelnar
- 2.10 pm *Plenary lecture:* Alfred Bader
- Coffee break*
- 3.15 pm *Presentations by Alfred Bader Award Holders*
Ivo Starý, Institute of Organic Chemistry and Biochemistry AS, Praha
Vladimír Havlíček, Microbiology Institute AS, Praha
Michal Hocek, Institute of Organic Chemistry and Biochemistry AS, Praha
Milan Pour, Pharmaceutical Faculty, Charles University, Hradec Králové
Radek Marek, Faculty of Science, Masaryk University, Brno
Tomáš Kraus, Institute of Organic Chemistry and Biochemistry AS, Praha
- Coffee break*



4.30 pm

Presentations by Alfred Bader Fellows

Stanislav Jaracz, Columbia University, New York *

Kamil Godula, Columbia University, New York *

Libor Vyklický, IBM, T.J. Watson Research Center, Yorktown Heights *

Kamil Paruch, Schering-Plough Research Institute, Kenilworth

Miloslav Nič, Institute of Organic Chemistry ICT, Praha

Zora Wörgötter, Moravian Galery, Brno

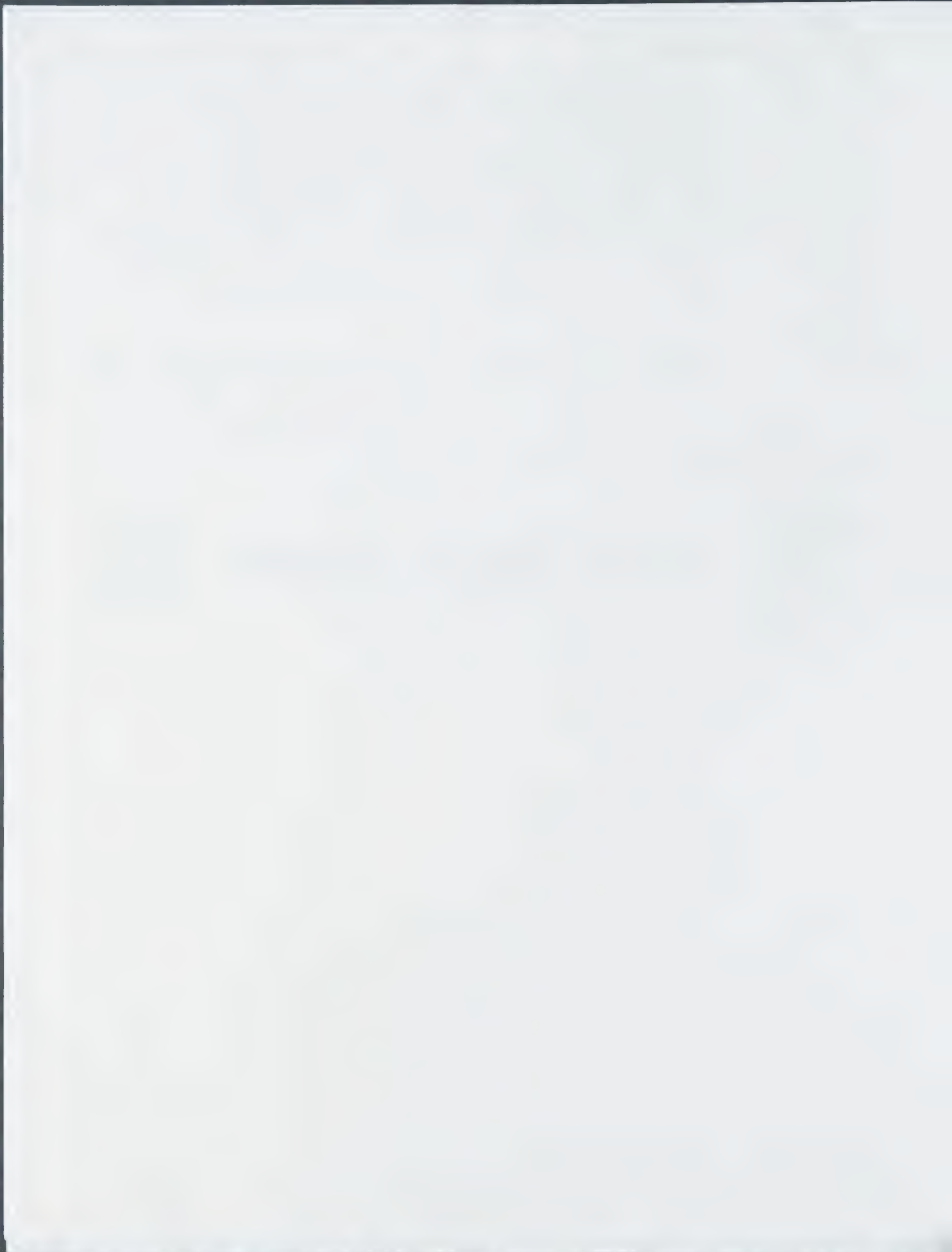
5.15 pm

Closing: Vice-Rector of Masaryk University Eduard Schmidt

* *videoconference with* Dean Henry Pinkham, Faculty of Science, Colur University, New York

Symposium is organized with financial support from:





Biography

Symposium

Photogallery

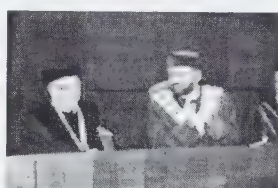
Fellowships

Awards

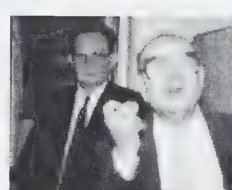
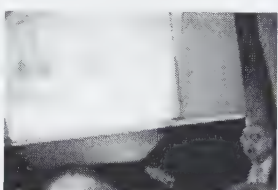
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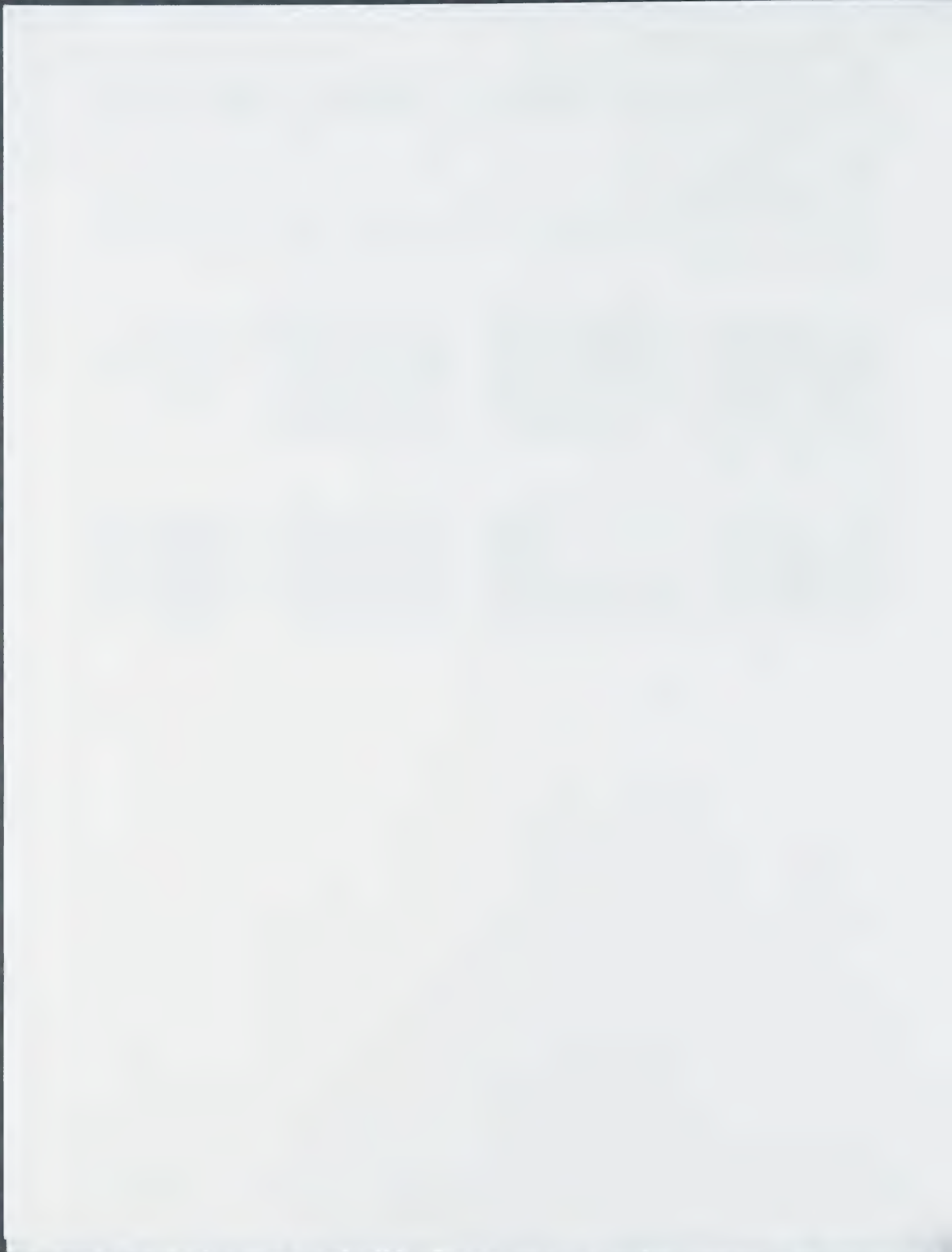
Photogallery

Inauguration of Honorary Doctorate of Masaryk University Brno, XXXX, 199X



Lecture at the Faculty of Science of Masaryk University Brno, XXXX, 199X





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Alfred Bader Fellowships

Bader Postgraduate Fellowships in Chemistry support a study of young Czech students at Harvard University, Columbia University, Imperial College of London and University Pennsylvania. The Fellowships provide a three years support and cover also travel expenses (return ticket). Suitable candidates are selected based on their academic records and the letter recommendation. More information (in Czech) and contact addresses can be found in [instructions](#).

Holders of Bader Fellowships from Harvard University in Cambridge:

1994-1996	Chytil Milan
1997-1999	Vojkovský Tomáš
1999-2001	Váchal Petr
1999-2002	Štorek Michal
2004-now	Ševečka Marek
2005-now	Švenda Jakub

Holders of Bader Fellowships from Columbia University in New York:

1994-1996	Řezáč Miroslav
1995-2000	Paruch Kamil
1999-2003	Vyklický Libor
1998-now	Jaracz Stanislav
2000-now	Godula Kamil

Holders of Bader Fellowships from Imperial College of London in London:

1992-1995	Nič Miloslav
-----------	------------------------------

Holders of Bader Fellowships from University of Pennsylvania in Philadelphia:

????-????	Šmidrkal Jan
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Alfred Bader Prizes

Awards for young Czech scientists are awarded annually to recognize outstanding contribution organic and bioorganic chemistry. The awards were founded and are financially supported Alfred and Isabel Bader. The award consists of 100.000 CZK and a certificate. Condition competition are announced by the Czech Chemical Society.

Holders of Alfred Bader Prizes for Organic Chemistry

1994	Starý Ivo
1995	Smrčina Martin
1996	Havlíček Vladimír
1997	Lhoták Pavel
1998	Hoskovec Michal
1999	Hocek Michal
2000	Círka Vladimír
2001	Pour Milan
2002	Vyskočil Štěpán
2003	Kraus Tomáš

Holders of Alfred Bader Prizes for Bioorganic Chemistry

2002	Marek Radek
2003	Damborský Jiří

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Links

Foundations Established by Alfred and Isabel Bader

[Helen Bader Foundation](#)

No

Awards Funded by Alfred and Isabel Bader

[Czech Chemical Society \(CZ\)](#)
[The Canadian Society for Chemistry](#)
[The Chemical Institute of Canada \(1\), \(2\), \(3\)](#)
[The American Chemical Society](#)

Fellowships Funded by Alfred and Isabel Bader

[Postdoctoral Fellowships for Czech Chemists \(CZ\)](#)
[Bursaries at University of Glasgow](#)

Lectures and Seminars Given by Alfred Bader

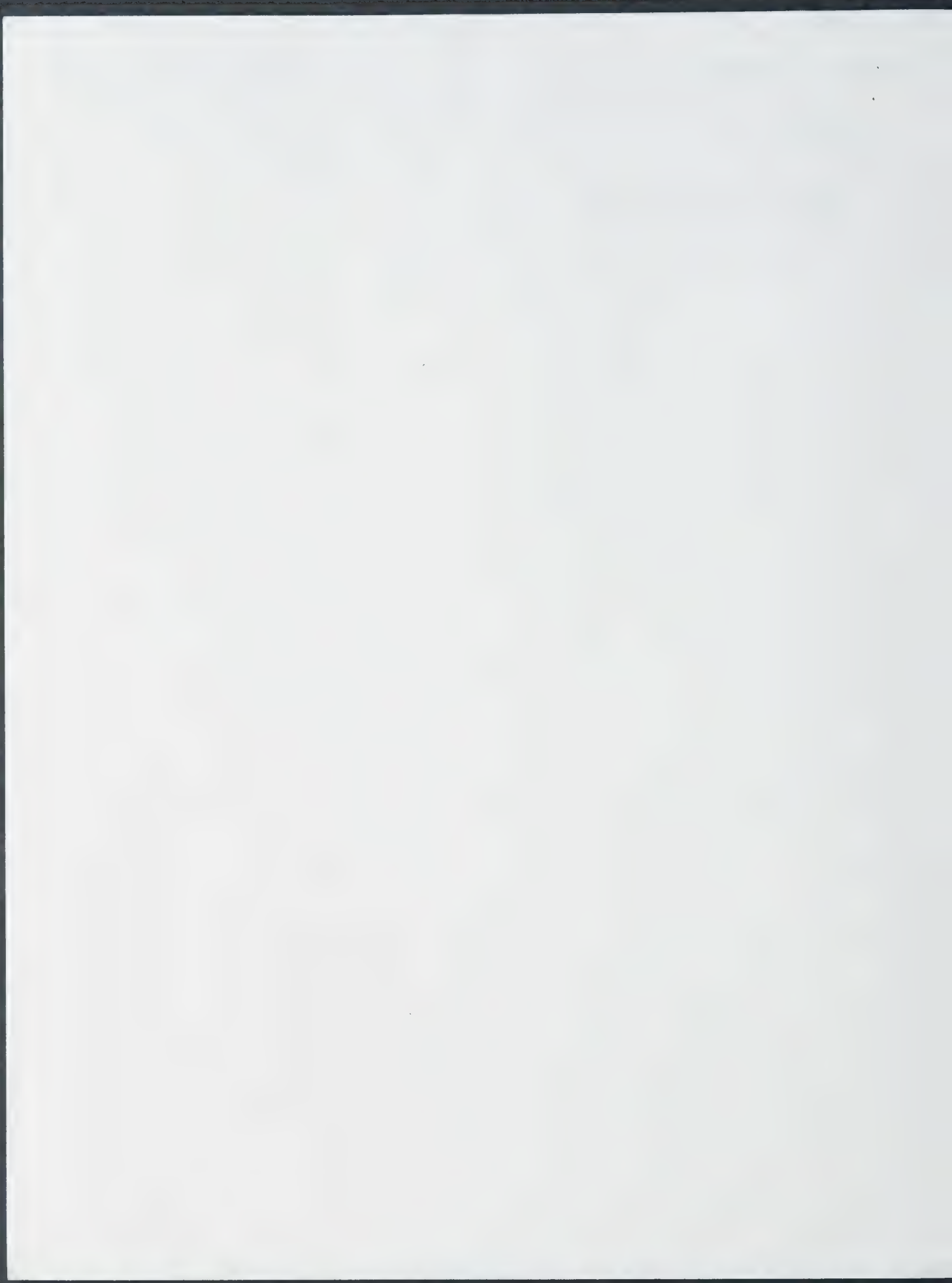
[Masaryk University in Brno](#)
[University of Missouri in St. Luis \(1\), \(2\)](#)
[University of Leicester \(1\), \(2\)](#)
[Ulliyot Public Affairs Lecture \(1\), \(2\), \(3\)](#)

Articles about Alfred and Isabel Bader

[Czech World \(CZ\)](#)
[Alfred Bader: Chemist cares for Karlin, The Prague Post \(CZ\)](#)
[Helen Bader Foundation](#)
[Gallery of Chemists' Photo-Portraits and Mini-Biographies, MSU](#)
[Canadian Literature](#)
[Theatre at University of Toronto \(1\), \(2\), \(3\)](#)
[About ICS](#) *ISC*
[Art collector finds a home for Rembrandt](#)
[Pittsburgh high-tech firm taps Bader as a 'lifeline', The Business Journal](#)
[Book: Adventures of a Chemist Collector, Wisconsin Academy Review](#)

Paintings and Art

[Alfred Bader Fine Arts \(1\), \(2\)](#)
[Internet Art Resources](#)



TURIN'S FIRST LADY

**Patrizia Sandretto
Re Rebaudengo**

Turin gave us Arte Povera, the last major movement to come out of Italy, yet it has long jostled with Milan for prominence on the international art scene. Now plastics heiress Patrizia Sandretto Re Rebaudengo has tipped the scales in the city's favor. A streamlined beauty whose quick smile and scarlet-streaked hair do little to hide her iron resolve, Sandretto, 42, entered the art world a decade ago as a collector, buying avidly during the depths of the market's malaise. Her acquisitions, though resolutely contemporary, have ranged widely: She has works by British artists Tony Cragg, Anish Kapoor and Julian Opie; major American women artists such as Cindy Sherman and Barbara Kruger; L.A. artists Charles Ray and Jason Rhoades; and, naturally enough, fellow Italians Vanessa Beecroft and Maurizio Cattelan. (Cattelan's replica of the "Hollywood" sign, erected in Palermo during the last Venice Biennale, was underwritten by Sandretto.) Her foundation also sponsors an annual artist's prize as well as projects in Europe and Japan. Sandretto sits on the international councils of the Museum of Modern Art in New York and the Tate in London and is a supporting member of Turin's spectacular Castello di Rivoli. In September she launched her own museum, the Fondazione Sandretto Re Rebaudengo Center for Contemporary Art, the first space built specifically for contemporary art in Italy since 1988. She has been astute in choosing her team: The artistic director is Francesco Bonami, the curator of the 2003 Venice Biennale and a longtime associate of Sandretto; the architect is London-based Claudio Silvestrin, a high priest of minimalism. The 37,600-square-foot space will operate as a *kunsthalle*—the first show, of works by 63 young Italian artists, will be followed by American video artist Doug Aitken's "New Ocean" project, opening in January. "With the Castello di Rivoli and the Fondazione Sandretto, Turin is set when it comes to contemporary art," says Bonami. "It has no rival in Italy now." Clearly, neither does she.

**50 WHO
MATTERED
IN 2002**

ENTERPRISING POWER

Ron Bourgeault

He became New England's premier Americana auctioneer the old-fashioned way—by pursuing high-wattage collections and catering to clients with swift service and agreeable terms. Ron Bourgeault, 56, got his fledgling Northeast Auctions in Portsmouth, New Hampshire, off the ground in 1987 by taking tycoon pal and megacollector Eddy Nicholson's advice and mailing free catalogues to thousands of prospective buyers. Since then, sales have exploded, from less than \$5 million in 1986 to \$25 million in 2002. In another smart move, Bourgeault brought in Albert Sack as a furniture expert after the renowned Americana firm Israel Sack closed its doors last January. Northeast continues to excel, turning up quality merchandise in a very thin market. It posted record sales this year of \$7.4 million at its annual centerpiece August auction in Manchester.

POWER FINANCING

Alfred Bader

New York dealer Otto Naumann stole the spotlight at this year's Maastricht fair by exhibiting the signed 1635 Rembrandt *Minerva*, asking price \$40 million. While Naumann was responsible for snaring the work from a Japanese collection, it was Milwaukee dealer-collector Alfred Bader who wrote the check. Bader, 78, who emigrated to Canada from Austria before the war and made a fortune in chemicals, is the money behind most of Naumann's big acquisitions—as well as those of London dealers Clovis Whitfield and Philip Mould of Historical Portraits. For the past several months, *Minerva* has been on display at the Museum of Fine Arts in Houston, which is hoping to raise the funds to purchase it. Some find the picture "ugly," yet its rarity and incredible condition are undeniable. "Frankly, I'm not certain which way to hope," says Bader, noting that the painting would fit nicely into his own collection, promised to his alma mater, Queens University, in Kingston, Ontario. "I'll be happy if they buy it, and I will not be unhappy if they don't."

FOGG'S DAY IN LONDON TOWN

Sam Fogg

This year's most sensational auction purchase was, hands down, Peter Paul Rubens's *Massacre of the Innocents*, which fetched a very Rubenesque record £49.5 million (\$77 million). Charged debates about the work's authorship and a short-lived controversy over its export from Austria added to the drama. The winning bid came from London dealer Sam Fogg, who was reportedly acting on behalf of Canadian media mogul David Thomson. Being the Rubens's buyer of record is the latest uptick in the rise of 48-year-old Fogg. A longtime leader in medieval books and manuscripts, he has expanded into European works of art and Asian and Islamic books, manuscripts and objects (including Afghan and Tibetan material, fields with thorny looting issues). Two years ago he opened well-appointed, three-storey premises on Clifford Street, where his latest triumph, an exhibition of museum-quality stained glass, is currently on view. It's a far cry from his beginnings on Portobello Road two decades ago.

Italian Sculpture

From the Gothic to the Baroque

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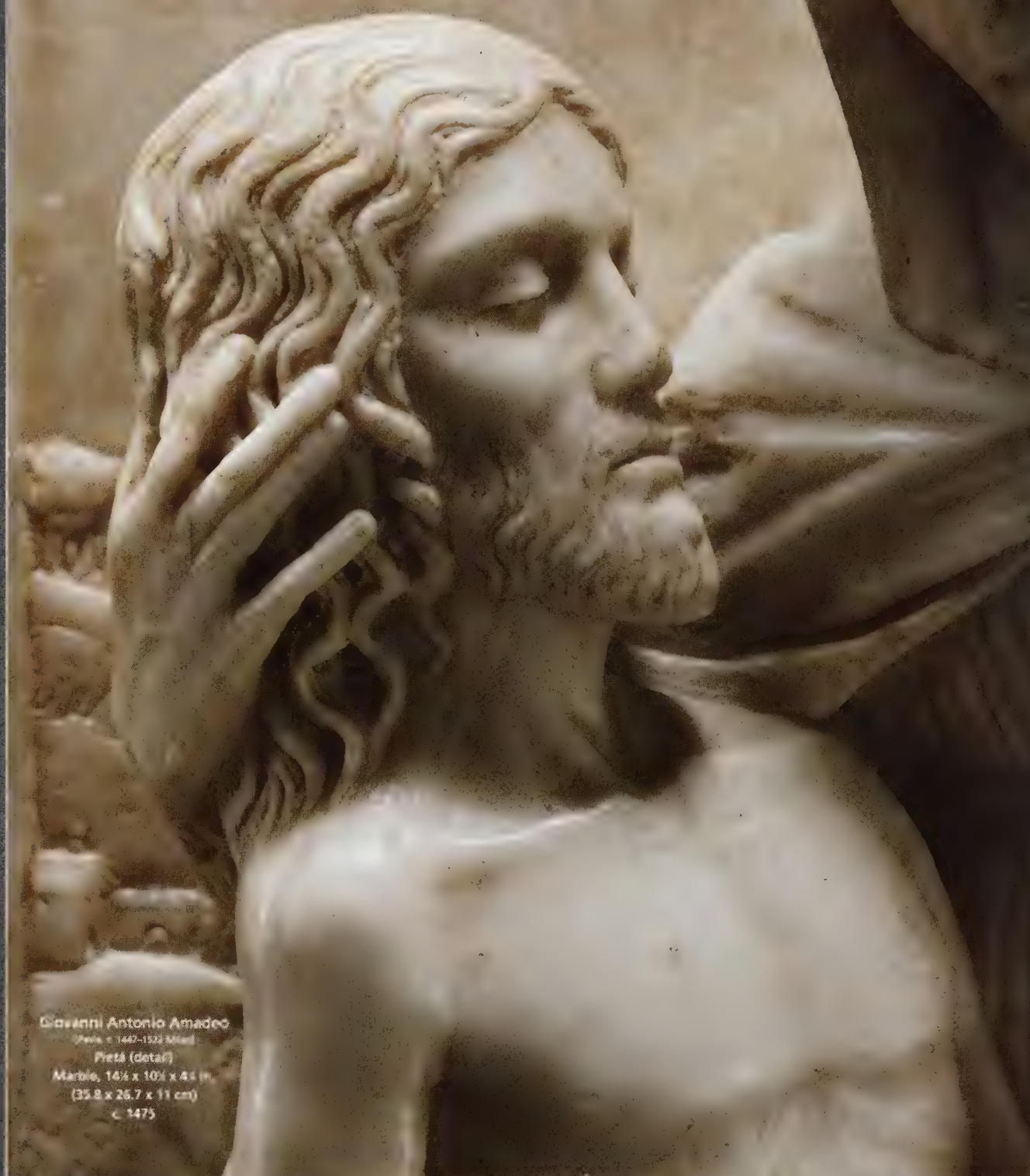
(c. 1667–1732 Milan)

Prati (detail)

Marble, 14 1/4 x 10 1/2 x 4 1/2 in.

(35.8 x 26.7 x 11 cm)

© 1975



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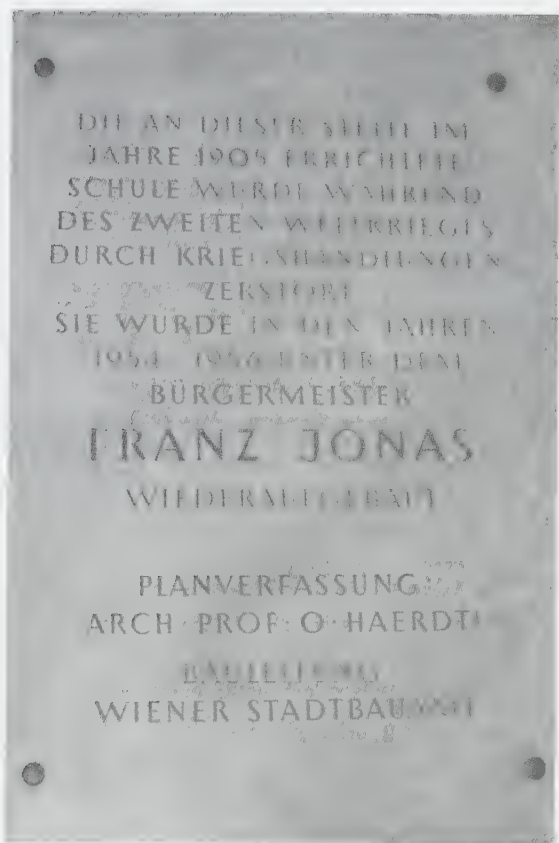
Volksschule Czerninplatz 3

1905 - 2005



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100 Jahre plus
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Volksschule Czerninplatz 3
1905 - 2005



IN DIESEM JAHR GIBT ES VIELE JUBILÄEN,

derer es gebührend zu gedenken und die zu feiern lohnt:
60 Jahre Zweite Republik, 50 Jahre Staatsvertrag und zehn
Jahre österreichische EU- Mitgliedschaft.

Gerade die Geschichte der Schule am Czerninplatz ist ein Symbol dieser für Österreich sehr wichtigen Zeit. Sie wurde im Krieg zerstört und in Zeiten des erfolgreichen Wiederaufbaus in Wien im modernen Stil neu errichtet. Eine für den Unterricht besonders durchdachte architektonische Raumplanung wurde mit aktuellen pädagogischen Konzepten kombiniert und schuf somit ideale Voraussetzungen für einen erfolgreichen Unterricht. Das Engagement der Schulleitung, der LehrerInnen und der Eltern schaffen jedoch erst ein besonderes Lernklima, welches den Kindern ermöglicht, sich für die künftigen Herausforderungen in ihrem Leben entsprechend vorzubereiten.

Schule ist immer auch ein Spiegel ihrer Zeit und ein frühzeitiger Indikator für aktuelle Entwicklungen. Durch spezielle Fördermaßnahmen, individuelle Lernbetreuung, projektorientierten Unterricht, flexible Schuleingangsphase und Angebote durch offene Lernformen wird stetig ein erweitertes Schwerpunktprogramm angeboten.

Ich darf der Schule am Czerninplatz meine besten Grüße übermitteln und meinen Dank für ihr bisheriges Engagement aussprechen und wünsche den Jubilaren noch viele erfolgreiche Jahre im Dienste unserer Jugend.

Ihre Stadtschulratspräsidentin

Susanne Brandsteidl

Dr. Susanne Brandsteidl

100-JAHR-FEIER VOLKSSCHULE CZERNINPLATZ

Die Erhaltung unserer Schulen im Bezirk ist für mich ein wichtiger Faktor. Im Bezirksbudget wird alljährlich ein großer Anteil für die Instandhaltung und Sanierung aufgewendet, um unseren Schülerinnen und Schülern eine angenehme Atmosphäre zu schaffen.



Bei der Vielzahl unserer Schulen ist es nicht leicht, alle Wünsche zu erfüllen. Um so mehr bemüht sich die Bezirksvertretung gemeinsam mit der Schulverwaltung, Schwerpunkte festzulegen, was in welchen Schulen gemacht werden muss.

Ein Jubiläum soll auch dazu dienen, darüber nachzudenken, wie es in der Vergangenheit war und wie die Zukunft besser werden kann.

Leider sind nicht alle politischen Vertreter dieser Meinung, und so kommt es manches Mal zu sehr unterschiedlichen Auffassungen, wie Schulpolitik betrieben wird.

Im Rahmen meiner Möglichkeiten bin ich immer bemüht, unseren Kindern die beste Ausbildung zukommen zu lassen, da diese, neben der Erziehung, ein wesentlicher Schwerpunkt für wichtige Mitglieder unserer Gesellschaft ist.

Ich danke all jenen, die daran mitwirkten und wünsche den Kindern, Eltern und LehrerInnen der Schule einen zufriedenstellenden Lebensweg.

Mit freundlichen Grüßen

A handwritten signature in black ink, appearing to read 'Gerhard Kubik'. The signature is stylized and cursive.

Gerhard Kubik
Bezirksvorsteher



SEHR GEEHRTE SCHULGEMEINSCHAFT
der Volksschule Czerninplatz!

Der Anlass des hundertjährigen Jubiläums erlaubt es, einen Blick auf die geschichtsträchtige Vergangenheit dieses Schulstandortes zurück zu werfen:

Zu Beginn des 20. Jahrhunderts errichtet, wurde „das Haus“ gleichsam zweifach zerstört :

Zum einen konnten die Reformen Otto Glöckels vor dem Zweiten Weltkrieg nicht zu Ende geführt werden, zum anderen wurde das Gebäude 1945 völlig zerstört.

Mit Mitteln aus dem damals zur Verfügung stehenden Kulturbudget der Stadt Wien wurde der international angesehene Architekt Prof. O. Haerdtl mit dem Schulneubau beauftragt, der sein Raumkonzept durch großflächige Fresken von Prof. Herbert Tasquill ergänzen ließ. Damit hielten bunte Farben Einzug in die Schule, die den SchülerInnen in hellen, lichtdurchfluteten Klassenzimmern und geräumig angelegten Gängen die Voraussetzung einer positiven Lernatmosphäre schufen, die bis heute ihre Gültigkeit bewahrt hat.

Die Volksschule Czerninplatz bietet durch die ständige Anpassung des traditionellen Angebotes schon heute ihren AbsolventInnen den Grundstein zu einer bestmöglichen individuellen Ausbildung für eine Gesellschaft von morgen. Zeitgemäße pädagogische Maßnahmen, wie offene Lernformen, Projektunterricht, ein selektionsfreier Schuleingang, computerunterstütztes Lernen, Feste und Zusatzangebote am Nachmittag sowie die Weiterarbeit an einer zukunftsorientierten Pädagogik werden noch für viele Generationen Leopoldstädter SchülerInnen erfolgreiche Ausbildungen ermöglichen.

Dazu wünsche ich allen Beteiligten viel Freude und viel Erfolg!

BSIn Regina Grubich-Müller

UNSERE KINDER

Die Volksschule Czerninplatz ist seit 100 Jahren und auch heute ein beliebter Standort für unsere Kinder, um ihnen einen guten Start für ihre zukünftige Ausbildung zu garantieren.

Die individuelle Betreuung durch offene Lernformen und der Zeit entsprechend pädagogische Maßnahmen sind ein Punkt unter vielen, weshalb unsere Kinder diese Schule besuchen.

Der Elternverein versucht mit Hilfe aller Eltern, diese zukunftsorientierten Lernformen, durch Schulbuchausstellungen, zusätzliche Lehrmittel und vieles mehr zu unterstützen.

Dies kann nur durch die gute Zusammenarbeit mit den Elternvertretern aller Klassen und dem vorbildlichen Einsatz unseres Kassiers, Hrn. Andreas Rubik, und unserer Schriftführerin, Fr. Martina Havelka, ermöglicht werden.

Durch die Zusatzangebote, welche am Nachmittag angeboten werden, wie Eislaufen, Computerkurs, Bildnerisches Gestalten, Judo, etc., erhalten die Kinder eine Vielfalt an Möglichkeiten, neue oder auch bestehende Interessen zu entdecken.

Dies alles ist natürlich nur durch ein starkes Lehrerteam und eine gute Schulleitung möglich, welche unseren Kindern diese Ausbildung bieten können.

Ein Grund mehr unseren Kindern den Start ins Leben an dieser Schule zu ermöglichen.



Ing. Andrea Fink

Ing. Andrea Fink
Obfrau des Elternvereines



DIE ZUKUNFT GEHÖRT DEN KINDERN

Wie heute, war auch vor hundert Jahren der Spruch „Die Zukunft gehört den Kindern“ gültig. Schon damals war die Schule am Czerninplatz als ausgezeichnete Schulstandort bekannt. Viele heute bekannte Persönlichkeiten, wie Prof. DDr. Viktor Frankl, DDr. Alfred Bader, Prof. Dr. Djerassi, der Erfinder der Antibabypille und die Atomphysikerin Dr. Lise Meitner, die für den Nobelpreis vorgeschlagen wurde, waren SchülerInnen am Czerninplatz. Weitergehende Ausbildung über die Schulpflicht hinaus war zu dieser Zeit jedoch noch Luxus und Männern vorbehalten.

Das NS-Regime und der 2. Weltkrieg hinterließen auch bei dieser Schule ihre grausamen Spuren. Jüdische Kinder durften die Schule nicht mehr besuchen, und nur wenige von ihnen überlebten diese schreckliche Zeit. Die Schule selbst wurde in dieser Zeit zerstört, wodurch auch viel Dokumentationsmaterial verloren ging.

Im Zuge des Wiederaufbaues durch die Gemeinde Wien entstand die Schule im Stil der Moderne nach Plänen von Prof. Oswald Haerdtl ganz neu: Großzügige Raumaufteilung und Grünanlagen, helle Klassenzimmer und pädagogisch zweckmäßige Innenarchitektur lassen die Aufbruchstimmung in der Zweiten Republik spüren. Drei monumentale Fresken des berühmten Malers Univ. Prof. Herbert Tasquil schmücken die jeweiligen Stockwerke des Schulgebäudes.

Auch eine Schulpolitik, die ab den 70er-Jahren Chancengleichheit für alle Kinder schuf, brachte neue Perspektiven. Die stärkere individuelle Lernbetreuung seit den 80er-Jahren ermöglichte, die besonderen Fähigkeiten eines jeden Kindes zu entwickeln. Computerunterstützter Unterricht, Zusatzangebote im Freizeitbereich sowie projektorientierter Unterricht bereiten die Kinder auf die Chancen und Herausforderungen der heutigen Zeit vor. Neben einer qualitätsvollen Wissensvermittlung ist auch ein Klima der Toleranz, Weltoffenheit und Menschlichkeit von großer Bedeutung.



Schuljahr 2004/2005

- 1.Reihe: v.li** Schoiswohl Marianne, Resch Andrea, Schuster Rosemarie, Dir. Kauf Elisabeth, Bogner Monika,
Mag. Zellhofer Eva-Maria, Schmid Elisabeth
- 2.Reihe: v.li:** Gründler Renate, Kerschenbauer Sigrid, Schlegel Monika, Neumaier Susanne, Lechner Andrea,
Pressl Gabriele, Schneider Silvia, Mag. Bernauer Judith

Die Schulleitung, ein engagiertes Lehrerinnen- Team und ein aktiver Elternverein werden auch weiterhin für eine ausgezeichnete Ausbildung der Kinder am Czerninplatz sorgen, denn ...

„Die Zukunft gehört den Kindern.“

Ihre Direktorin

Kauf Elisabeth

Elisabeth Kauf

GESCHICHTE DES SCHULSTANDORTES CZERNINPLATZ 3.

Die Eröffnung der ersten Bürgerschule in der Leopoldstadt

Am 16. Oktober 1872 wurde in der Czerningasse die erste Bürgerschule in der Leopoldstadt feierlich eröffnet. Direktor der ersten Knaben-Bürgerschule (220 Knaben) war Herr Franz Kaschl und Direktor der ersten Mädchen-Bürgerschule (228 Mädchen) Herr Laurenz Mayer. Schuldienner und Hausbesorger war Herr Georg Pargfrieder.

Die Finanzsektion stellte für den Bau einen Betrag in der Höhe von 123 164 Gulden zur Verfügung. Die Bau- und Einrichtungskosten betragen letztendlich aber nur 109 300 Gulden.

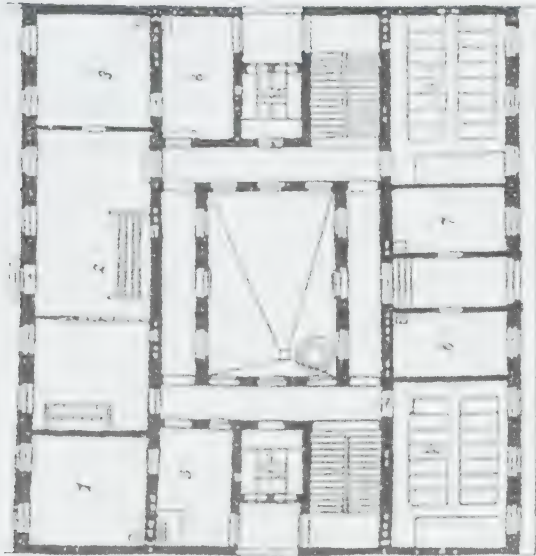
Glücklich war man auch mit der günstigen Lage des Schulhauses. Einerseits war es angebaut an einen großen, schattigen Garten, und andererseits „berührte es keine geräuschvollen Verkehrswege“. Ein Nachteil machte sich jedoch schnell bemerkbar: Der Schulbau war ursprünglich als Volksschule gedacht und daher etwas zu klein für eine Doppel-Bürgerschule.

Im „Technischen Führer durch Wien“ aus dem Jahre 1873 finden wir folgenden Eintrag, der uns das Schulgebäude näher beschreibt: *„Städtische Bürgerschule für Knaben und Mädchen, Leopoldstadt, Czerningasse Nr. 11 a (G, 4). Dieses für 1082 Kinder bestimmte Schulgebäude wurde nach den Entwürfen des städtischen Ober-Ingenieurs G. Hausmann im Jahre 1871 und 1872 ausgeführt. Die Baustelle wurde von der alten Realität Nr. 11 in der Czerningasse abgetrennt, besitzt bei einer Länge von 28m eine Gesamtfläche von 976 m², wovon 310 m² auf die Höfe und den Sommer-Turnplatz entfallen, während ein Area, von 666m² wirklich verbaut ist. Die Situation des Bauplatzes erlaubte nur die Herstellung eines für beide Schulen gemeinschaftlichen Einganges, an welchem beide Aufnahmszimmer liegen.*

Zwei bequeme Treppen führen in die Stockwerke zu den Lehrzimmern beider Schulen.

Die Trennung der Schulen in den einzelnen Etagen ist durch Glaswände mit versperrenbaren Doppelthüren vermittelt.

Das Kellergeschoss enthält bloß die erforderlichen Keller- und



Bürgerschule
Plan

Heizräume.

Zu ebener Erde befinden sich ausser der Dienerwohnung (1) ein geräumiger Turnsaal (2) mit Garderobe (3) und Turnlehrerzimmer (3), ein Lehrzimmer für Knaben (4), ein Lehrzimmer für Mädchen (5), je ein Ausnahmszimmer für Knaben und Mädchen (6 und 7) und ein Requisitenzimmer (8).

Die drei Stockwerke enthalten sieben Lehrzimmer für Knaben und sechs Lehrzimmer für Mädchen; ferner zwei Lehrmittel-, zwei Directions- und zwei Conferenz-Zimmer.

Im 3. Stockwerk ist ausser den beiden Direktorswohnungen, noch ein grosser Zeichensaal angeordnet, welcher derzeit von der gewerblichen Fortbildungsschule für Mädchen benützt wird.“

Die Schülerzahlen der Bürgerschule Czerningasse 11 (bzw. ab 1883 Czerninplatz 3) waren bis zum Schuljahr 1877/78 stark angestiegen.

Es war zu befürchten, dass der Andrang sich von Jahr zu Jahr weiter steigern werde. Eine Reorganisation des Volks- und Bürgerschulwesens war daher notwendig geworden.

Der Ortsschulrat des II. Bezirkes beantragte beim Gemeinderat: Die Installierung einer fünfklassigen Volksschule mit daran anschließender Bürgerschule.

Das Jahr 1885 brachte eine erste Veränderung am Schulstandort Czerninplatz 3 mit sich.

Es dürfte sich auch die vorhin erwähnte Reorganisation des Volks- und Bürgerschulwesens bereits ausgewirkt haben. Die Bürgerschule für Knaben (436 Schüler) mit ihrem Direktor Herrn Franz Kaschl übersiedelte in ein Schulgebäude in der Holzhausergasse 3. Die Bürgerschule für Mädchen (385 Schülerinnen) mit Dir. Laurenz Mayer verblieb am Czerninplatz 3, und dazu kam eine Volksschule für Knaben und Mädchen (709 SchülerInnen) unter dem Direktor Franz Geist.

Die Bedeutung der Bildung bekam einen immer größeren Stellenwert, und somit wuchs auch der Bedarf an Schulneubauten.

Am 17. Mai 1888 wurde der Bau eines dreistöckigen Traktes auf dem Gartenareal hinter der bestehenden Bürgerschule begonnen und Anfang November 1888 zur Benützung freigegeben. Die Bürgerschule übersiedelte in den Hoftrakt. Den Gassen- und den Hoftrakt verband man mit einem ebenerdigen Verbindungsbau. Der Verbindungsbau beinhaltet 2 Turnsäle und einen überdachten Zugang zur Mädchen-Bürgerschule. Im Gassentrakt – in dem nun eine Volksschule für Mädchen und eine Volksschule für Knaben untergebracht war – wurden zwei Eingänge für Knaben und Mädchen geschaffen.

Über einen neuerlichen Schulzubau, einen größeren Schulumbau oder einen Schulneubau im Jahre 1905 liegen keine Archivalien vor.

Lediglich eine Tafel in unserem Schulgebäude weist auf einen Schulneubau 1905 hin.

Die politischen Ereignisse von 1938 bis 1945 machten auch vor unserem Schultor nicht Halt.

Herr Walter Gold, ein Zeitzeuge und ehemaliger Schüler, erinnert sich: „*Das Jahr 1938 änderte vieles in unsrem Leben, vor allem wurden wir zu Deutschen umerzogen. Hatte ich mein Halbjahreszeugnis noch von meiner Schule auf dem Czerninplatz 3 ausgestellt bekommen und war es von unserem Klassenlehrer*

Strehly unterzeichnet, so wurde das Abschlusszeugnis am 2.7.1938 von der Volksschule Blumauergasse ausgestellt und war vom Klassenlehrer Haunold unterfertigt. Was zu dieser Zeit mit meiner alten Schule geschah, weiß ich nicht mehr, aber das neue Regime war ja bestrebt, alles und jedes zu ändern und so wurde sicher auch einiges in der Czerninschule umgedreht. Was sofort geändert wurde, waren die Lehrkräfte. Jeder Lehrer, bei dem nur der geringste Verdacht bestand, dass er in seinem Stammbaum in irgendeinem Grad der Verwandtschaft jüdisches Blut hatte, wurde sofort von der Schule gewiesen und verlor seine Lehrberechtigung.“

Ein Bombentreffer hatte im März 1945 das Schulgebäude Czerninplatz 3, in dem die Mädchenhauptschule, die Volksschule für Knaben und die Volksschule für Mädchen untergebracht waren, zerstört.

Unterlagen wurden – soweit sie noch nach dem Bombentreffer vorhanden waren - von Lehrern und SchülerInnen in die neuen Schulquartiere mitgenommen.

Das erste Schuljahr 1945/46 nach Kriegende brachte für die Schüler und Lehrer große Veränderungen mit sich.

Die Knaben-Volksschule übersiedelte in die Holzhausergasse 7.

Die Mädchen-Volksschule und die Mädchen-Hauptschule hatten ihren Unterricht in der Kleinen Spertlgasse 2a.

Die Volksschule für Knaben und Mädchen unter ihrem Direktor Franz Fey hatte ab September 1956 wieder ein eigenes Schulgebäude.

Die offizielle Eröffnung der in den Jahren 1954 bis 1956 nach Plänen des Architekten Oswald Haerdtl wiedererrichteten Schule Czerninplatz 3 nahm am 26.1.1957 Bürgermeister Franz Jonas vor.

Auf Herrn Direktor Franz Fey folgte Herr Direktor Klimosch, der die Schule bis Ende 1986 leitete.

Von 1.1.1987 bis 30.11.2003 stand Frau Direktor Czucker der Volksschule vor.

Von der Musikschule der Stadt Wien, die viele Jahre an unserer Schule ihren Standort hatte, sind nur zwei Expositurklassen in unserem Schulhaus verblieben.

Seit den 80er-Jahren sind wir auch eine Besuchsschule für die StudentInnen der Pädagogischen Akademien.

Heutzutage besuchen rund 180 SchülerInnen jährlich unsere Schule, deren Leitung im September 2004 Frau Direktor Elisabeth Kauf übertragen wurde.

GOLD Walter

Geb. 29.9.1929 in Wien

„So wie es jedem 6-jährigen ergeht, musste auch ich im Sommer 1935 in Begleitung meiner Mutter zum Test in der Schule vorstellig werden, wo nach ausgiebiger Besichtigung meines Körpers durch den Schularzt und Überprüfung meiner geistigen Fähigkeiten durch die Direktion festgestellt wurde, dass ich reif für die Schule bin. Es blieb mir also nichts anderes übrig, als im Herbst die 1. Klasse der Volksschule auf dem Czerninplatz zu besuchen. Unser Quälgeist in der Klasse war Frau Lehrerin Müller, die von allen Schülern gefürchtet wurde. Die „Müller“ war eine schlanke große Person mit langem, zu einem Knoten geflochtenen, Haar und stand immer da, wie wenn sie einen Stecken geschluckt hätte. Sie war meist mit einem engen Kostüm mit langem Rock und hochgeschlossenem Kragerl bekleidet und hatte immer hohe schwarze Schnürschuhe an, die fast zu den Knien reichten. Ihre Stimme ging uns durch Mark und Bein und zu allem Überfluss hatte sie immer ein Rohrstabertl in der Hand, mit dem sie nicht nur auf die Tafel zeigte, sondern das sie auch zu unserer Erziehung benützte.“

Walter Gold, 1. Reihe, rechts

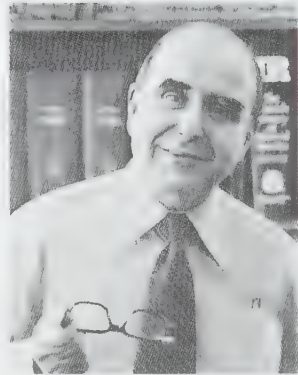


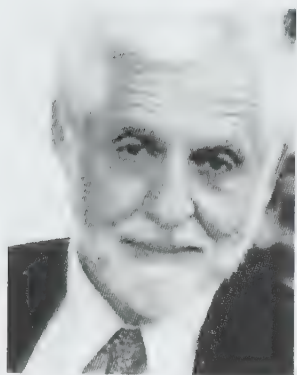
BERÜHMTGEWORDENE SCHÜLER

DDR. ALFRED BADER

Er wurde am 24. April 1924 in Wien geboren. Von 1930 – 1934 besuchte er die VS Czerninplatz 3 und anschließend das Gymnasium in der Sperlgasse. 1938 emigrierte er als 14-jähriger mit einem Kindertransport nach England. Er lebte dort in einer Gastfamilie, durfte wieder eine Schule besuchen und lernte die englische Sprache. Aufgrund der guten schulischen Leistungen wurde er im Brighton Technical College aufgenommen. Im Jahr 1945 bekam er in den USA einen Studienplatz für das Fach Chemie-Ingenieurwesen an der Queen's University in Kingston, Ontario. Das Doktoratsstudium absolvierte er an der Harvard University. 1951 gründete Bader zusammen mit einem Freund die Firma Aldrich Chemical Company. Ein weiteres wichtiges Ergebnis seiner Arbeit ist der Aufbau einer Bibliothek von Chemikalien. Neben seinen Tätigkeiten als Chemiker und Geschäftsmann hat sich Dr. Alfred Bader auch immer für Kunst und Kunstgeschichte interessiert und eine der weltweit bedeutendsten privaten Sammlungen von Arbeiten Holländischer Meister aus dem 17. Jahrhundert zusammengetragen.

Er ist Initiator von vielen Preisen und Stipendien für Kunst und Chemie. Die Royal Society of Chemistry vergibt einen Alfred Bader- und einen Josef Loschmidt-Preis. Durch die großzügige finanzielle Unterstützung von Isabel und Dr. Alfred Bader wurde der Ignaz Lieben Preis reaktiviert. Dr. Alfred Bader wurde vielfach ausgezeichnet und geehrt. Er erhielt 9 Ehrendoktorate, wurde von der Universität Wien zu ihrem Ehrenbürger ernannt, und die Gesellschaft Österreichischer Chemiker verlieh ihm auf Grund seiner Verdienste um die Chemie die Ehrenmitgliedschaft. Obwohl ihm und seiner Familie in Wien so übel mitgespielt wurde, hat Bader immer Kontakt zu Wien gehalten. Er fand hier nicht nur Geschäftspartner sondern auch gute Freunde.





DR. CARL DJERASSI

Dr. Carl Djerassi ist Romancier, Bühnenautor, schreibt Romane und Erzählungen in englischer Sprache, und er ist emeritierter Professor für Chemie an der Stanford University.

Geboren wurde er am 29.10.1923 als Sohn eines österreichisch-bulgarischen Ärzteehepaares in Wien. Er besuchte die Volksschule am Czerninplatz 3 und bis zu seiner Emigration 1938 das Gymnasium in der Sperlgasse.

Im Jahr 1938 emigrierte er mit seiner Mutter über London in die USA.

An der Universität von Wisconsin studierte er organische Chemie und promovierte 1945.

Im Jahr 1949 erfolgte ein berufliches Engagement zu Syntex S.A. in Mexiko City, wo er 1951 die „Antibaby-Pille“ erfand.

Er ist Inhaber von fünfzehn Ehrendoktoraten, Mitglied der „National Investors Hall of Fame“, der „U.S.National Academy of Arts and Science“ und Ehrenmitglied der britischen „Royal Society of Chemistry“.

Zu Wien hat er eine besondere Beziehung.

„Ich bin Wiener – kein Österreicher. Hier habe ich über Kunst gelernt, hier war ich erstmals im Theater, das prägt.“

Dr. Carl Djerassi besitzt seit kurzem die österreichische Staatsbürgerschaft.

Neben der Schriftstellerei ist Dr. Carl Djerassi auch ein leidenschaftlicher Kunstsammler.

Seine Sammlung umfasst eine große Auswahl der Werke Paul Klees und anderer zeitgenössischer Künstler.

Die Djerassi-Stiftung ist eine Künstlerkolonie in der Nähe von San Francisco.

Das „Djerassi Resident Artist Program“ fördert MalerInnen, MusikerInnen, SchriftstellerInnen in ihrer künstlerischen Weiterentwicklung.

Er lebt in London, der Toskana und in Stanford (USA).

DDR. VIKTOR FRANKL

Viktor Emil Frankl, der Begründer der Logotherapie und Existenzanalyse, wurde am 26. März 1905 im 2. Bezirk in der Czerningasse 6 geboren und wohnte dort bis 1942. Sein Vater war Staatsbeamter. Wie sein Bruder Walter und seine Schwester Stella besuchte auch er die Volksschule Czerninplatz 3, die in unmittelbarer Nähe zur Wohnung lag.

Für Psychoanalyse und Psychologie interessierte er sich bereits in seiner Schulzeit. Bereits im Alter von 15 Jahren unterhielt er einen regen Briefwechsel mit Sigmund Freud. Seine erste Publikation erschien bereits 1924 in der „Internationalen Zeitschrift für Psychoanalyse“ mit dem Titel: „Zur mimischen Begabung und Verneinung“. Er schloss sich während seines Medizinstudiums dem Kreis um Alfred Adler an. Sein Medizinstudium beendete er 1930 und zum Dr.phil. promovierte er 1949. Im Jahre 1937 eröffnete er eine Praxis für Neurologie und Psychiatrie.

Die Machtübernahme der Nationalsozialisten 1938 veränderte Frankls Leben völlig. Seine Schwester war rechtzeitig nach Australien ausgewandert. Frankl wurde 1942 mit seiner Frau und seinen Eltern ins Konzentrationslager gebracht. Er überlebte als einziger. 1946 kehrte er wieder nach Wien zurück, wo er bis 1971 Vorstand der Wiener Neurologischen Poliklinik war. Frankl wurde mit 29 Ehrendoktoraten, Professuren und einer langen Liste von Ehrungen ausgezeichnet. Seine Werke wurden in 31 Sprachen übersetzt. 1995 ernannte ihn die Stadt Wien zum Ehrenbürger. DDR: Viktor Frankl starb am 2. September 1997 in Wien.



Die Österreichische Akademie der Wissenschaften verlieh ihr 1925 den Ignaz-Lieben-Preis. Den Enrico-Fermi-Preis, die höchste Auszeichnung auf dem Gebiet der Kernphysik, erhielt sie 1966 gemeinsam mit O.Hahn und F.Strassmann. Ein Jahre vor ihrem Tod, 1967, erhielt sie das Ehrenzeichen für Wissenschaft und Kunst, die bedeutendste Auszeichnung, die österreichische Wissenschaftler verliehen bekommen. Im Laufe ihres Lebens erhielt sie noch zahlreiche Ehrendoktorate und Auszeichnungen. Seit 1992 gibt es den Lise-Meitner-Stipendien-Fonds zur Förderung der wissenschaftlichen Forschung.

Lise Meitner hat ihr ganzes Leben der Forschung und Lehre gewidmet.

Sie starb am 27. Oktober 1968 in Cambridge.

Lise Meitner (ganz links in der 2. Reihe, stehend)



ARCHITEKT DER VOLKSSCHULE CZERNINPLATZ 3



PROF. OSWALD HAERDTL

Prof. Oswald Haerdtl wurde am 17.5.1899 als Sohn des aus Nordböhmen stammenden Volksschuldirektors Josef Haerdtl und der Wiener Gastwirtstochter Leopoldine Reiterer in Wien geboren. Er besuchte die Graphische Lehr- und Versuchsanstalt, absolvierte eine Tischlerlehre und studierte zuerst bei Kolo Moser an der Kunstgewerbeschule Malerei, dann Architektur bei Oskar Strnad.

1922 bis 1939 war er vorerst

Assistent, später Atelierpartner von Josef Hoffmann. Seine Begabung für visuelle Wahrnehmung war somit mehrfach geschult.

Oswald Haerdtl war Architekt und Designer. Er beschäftigte sich nicht nur mit dem Entwurf von Bauwerken, sondern designte auch Möbel, Gläser und andere Gebrauchsgegenstände bis hin zur Zigarettenschachtel. Haerdtls Stil besticht durch leichte, spielerisch-elegante Formen und klare Linien. Auch international war er tätig, wie die Österreichpavillons auf den Weltausstellungen in Brüssel (1935) und Paris (1937) zeugen.

Von 1935 bis zu seinem Tod leitete er als Nachfolger von Strnad eine Architekturklasse an der Kunstgewerbeschule, innerhalb derer die Wiener Moderne auch in der Zeit des Nationalsozialismus weiterbestehen konnte.

In der Nachkriegszeit entwarf er zahlreiche Einfamilienhäuser und Lokale und wurde zu einem der wichtigsten Wiener Architekten der fünfziger Jahre und des Wiederaufbaues in Wien. Er gestaltete in dieser Zeit unter anderem das Bundeskanzleramt (Wiederherstellung nach Kriegsschäden), das Historische Museum der Stadt Wien, das Volksgarten-Tanzcafé sowie das Cafe Prückel.

Unsere Schule am Czerninplatz 3 entstand in den Jahren 1954 bis 1957 in der durch Kriegszerstörung entstandenen Baulücke. Sie zeigt eine ruhige, ausgewogene Fassade sowie eine sehr funktionelle, den Bedürfnissen der Kinder entsprechende Innengestaltung.

Haerdtl starb am 9. 8. 1959 in Wien.

WANDFRESKEN IN DER VOLKSSCHULE CZERNINPLATZ 3



PROF. HERBERT TASQUIL, MALER

Prof. Herbert Tasquil wurde am 23.12.1923 in Wien geboren. Seine Ausbildung als Maler erhielt er an der Akademie der bildenden Künste in Wien von 1941 bis 1945 bei Herbert Boeckl, dessen Assistent er bis zum Jahre 1952 war.

Prof. Herbert Tasquil beschäftigte sich viele Jahre mit kunsttheoretischen Arbeiten über die Probleme der figuralen Logik.

Von 1961 bis 1975 war er Lehrbeauftragter für „Theorie der Form“ an der Hochschule für angewandte Kunst in Wien. In der Zeit von 1964 bis 1971 hatte er die Leitung einer Klasse

des künstlerischen Grundstudiums inne.

Von 1971 bis 1972 leitete er eine Meisterklasse für Gestaltungslehre.

Im Jahre 1973 erfolgte die Ernennung zum Ordentlichen Hochschulprofessor, und seit 2003 ist er Ehrenmitglied der Universität für angewandte Kunst.

Er war auch Leiter der Meisterklasse für Gestaltungslehre – Bildnerische Erziehung/Lehramt.

Studienreisen führten ihn nach Italien, Deutschland und in die Schweiz.

Den Auftrag für die Wandmalereien in der Pausenhalle unserer Schule bekam er 1956.

Weitere Auftragsarbeiten waren: 1960 Mosaikfriese, Wohnanlage der Stadt Wien;

1961 Tafelbild, Zentralsparkasse der Gemeinde Wien;

1964 Keramische Wand, Kindergarten der Stadt Wien, 3. Bezirk;

1968 Steinschnitt-Relief, Schule der Stadt Wien, 22. Bezirk;

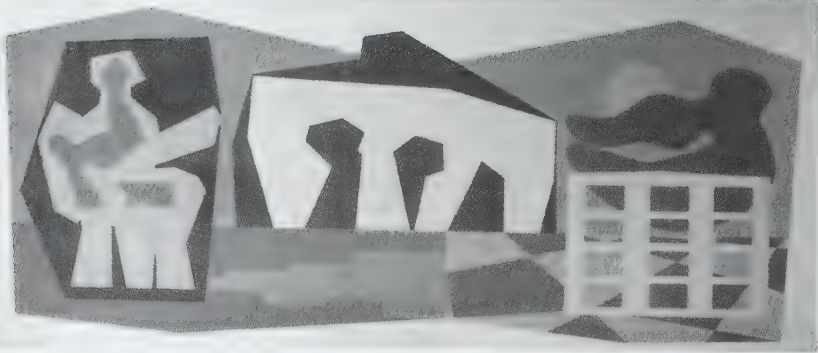
1969 Glasfenster, Stadthalle Klosterneuburg (Architekt Norbert Schlesinger);

1969 Glasfenster, Kirche von Grignano-Miramare bei Triest, Italien (Architekt Mario Zocconi).

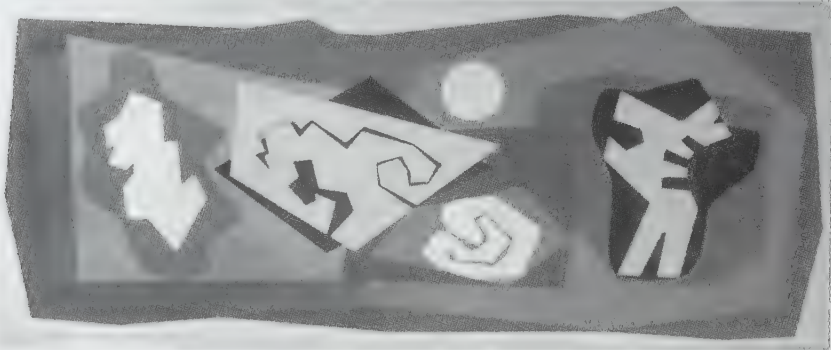
1. Preis



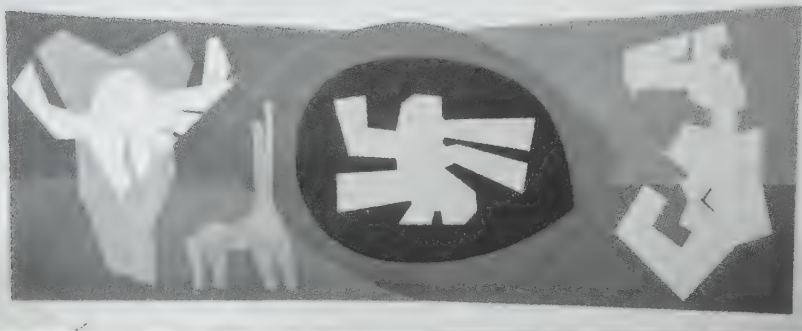
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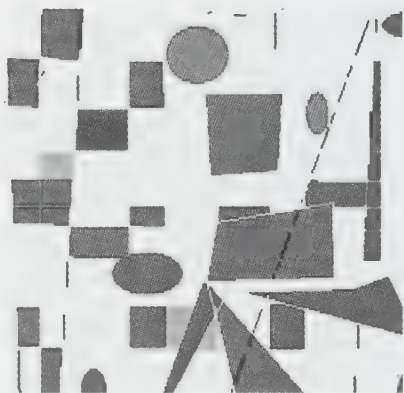


2. Stock



3. Stock

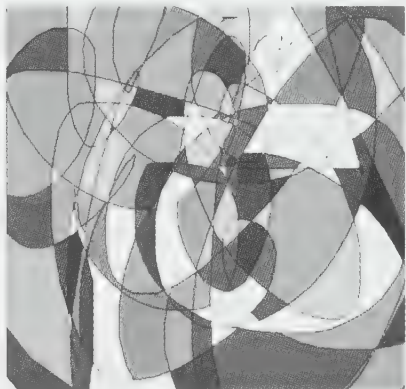




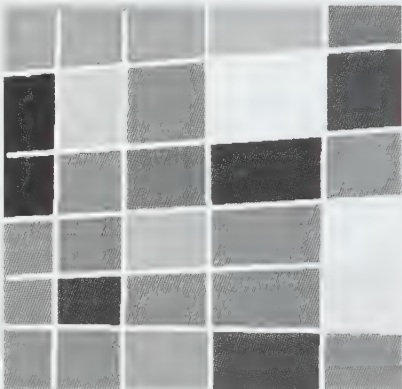
Karim



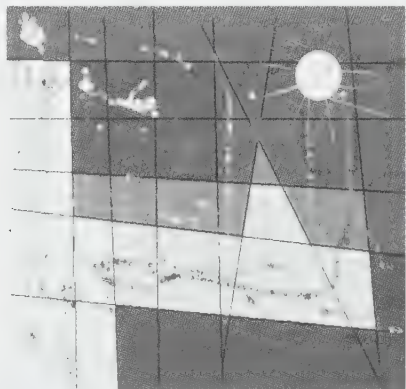
Ivana



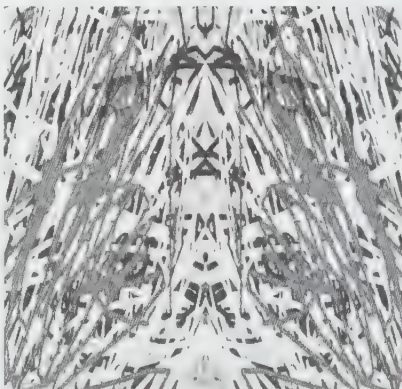
Ruana



Varol



Diana



Ivona

K. I. D. S. Kunst In Der Schule

Der große Vorteil von Computern ist, dass Geschicklichkeit in den Hintergrund und Entscheidungskraft in den Vordergrund rücken. Mit Cubase oder Photoshop kann jeder alles machen und man kann damit Dinge machen, die genauso klingen wie die aus dem Radio und genauso aussehen, wie die in den Zeitungen. Die Frage lautet also nicht mehr, ob man es machen kann oder nicht, da jeder es machen kann, wenn er nur bereit ist, sich ein paar Tage vor den Computer zu setzen, die Frage lautet vielmehr: Wofür entscheidet man sich? (Brian Eno)

Wir wissen heute, dass Kreativität eine wichtige Rolle bei der Persönlichkeitsentwicklung spielt. Kreative Kinder entfalten ihr volles Potential und sind emotional ausgeglichen.

Mit einem Computer zu arbeiten, wird für unsere Kinder Bestandteil ihres Lebens sein. Sich mit diesem Medium auch künstlerisch zu beschäftigen, ist eine Chance der Bewusstseins-erweiterung.

Ich leite vom Kulturkontakt Austria gesponserte Workshops in Volksschulen und vermittele den Schülern mit Hilfe eines einfachen Grafikprogramms Grundkenntnisse in „Malen am PC“. Bisher entstanden nicht nur Bilder und digitale Slideshows, sondern auch T-Shirts, Visiten- und Grußkarten, Masken sowie Animationen.

Die Arbeiten der letzten 2 Jahre sind zu sehen auf:

www.europa-school.de.vu

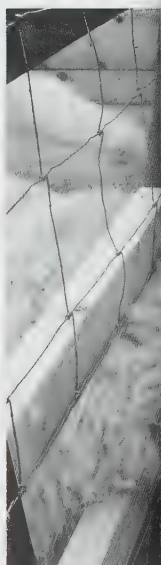
Idee, Konzept, Web & künstlerische Leitung

Y M O

Beteiligte Klassen: bereits das zweite Schuljahr: 3a und 3b mit unter anderem außerschulischem Auftritten und Ausstellungen; heuer dazugekommen: 2a

PROJEKTARBEIT

„AUF DEM BAUERNHOF“



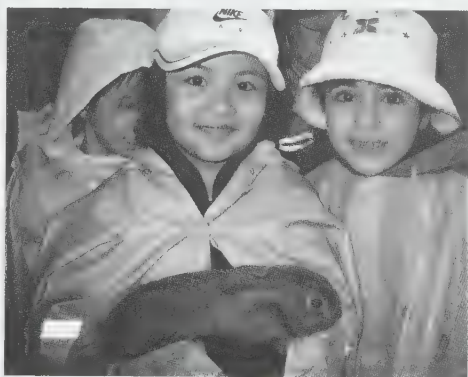
GEMEINSAMES PROJEKT DER 1.A UND 1.B

Zwei Wochen arbeiteten wir eifrig an diesem Thema. Wir sprachen über die Menschen, die auf einem Bauernhof leben und über ihre Arbeit. Wir lernten viel über Tiere und Tierfamilien.





Besonders für Kinder in der Großstadt ist es nicht leicht, Zusammenhänge zwischen der Arbeit in der Landwirtschaft und den Lebensmitteln im Supermarkt zu erkennen. Höhepunkt unserer Arbeit war der Lehrausgang zum Bauernhof auf dem Cobenzl. Die Kinder durften die Tiere (Pferde, Schafe, Schweine, Ziegen, Kühe, Hasen, Hühner ...) aus nächster Nähe sehen, manche auch streicheln und einige sogar füttern.



WIR HATTEN ALLE GROßEN SPAß.

PROJEKTARBEIT

2a



HEXEN
ZAUBERER
FABELWESEN

Im Spätherbst 2004 beschäftigte sich die 2.a zwei Wochen lang mit guten und bösen Hexen, gestaltete Zauberwälder und lernte viele Zaubersprüche. Sie hörte passende, klassische Musik, schrieb Gruselgeschichten und legte einen Hexenkräutergarten an. Be- und verzaubert wurden auch die Eltern und Lehrer bei der einstündigen Projektpräsentation.





SCHULGARTEN

In diesem Frühling war im Schulgarten und im Klassenzimmer der 2b viel los, denn bei unserem Projekt „im Schulgarten geht es rund“ haben wir zahlreiche Pflanzen gesät und eingesetzt, die nun wachsen und gedeihen. Beeindruckend war auch, wie rasch die Bohnen am Fensterbrett heranwuchsen, die wir für ein „grünes Zelt“ im Schulhof verwenden werden.

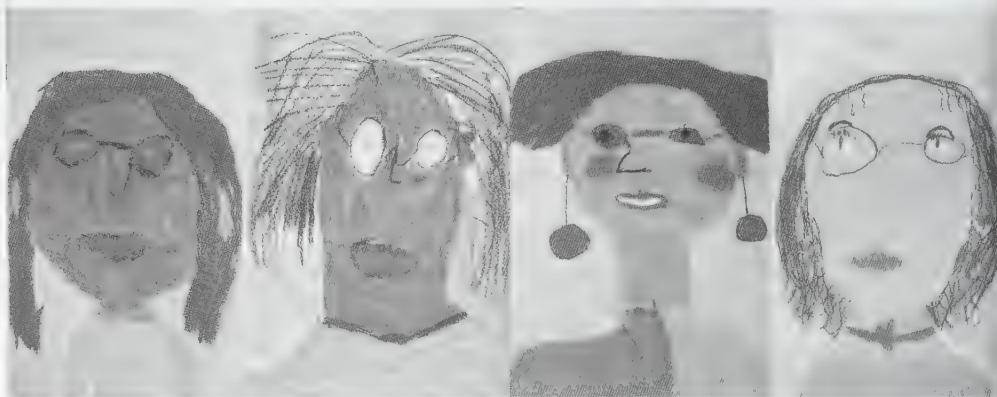
Unvergesslich bleibt uns auch die Gartenarbeit. Da staunten die Kinder über die zahlreichen Regenwürmer und andere Kleintiere. Schließlich legten wir sechs verschiedene Gemüsebeete und ein Blumenbeet an. Außerdem gestaltete jedes Kind seine eigene Projektmappe, und zusätzlich sammelten wir viele Informationen über das Gartenjahr.



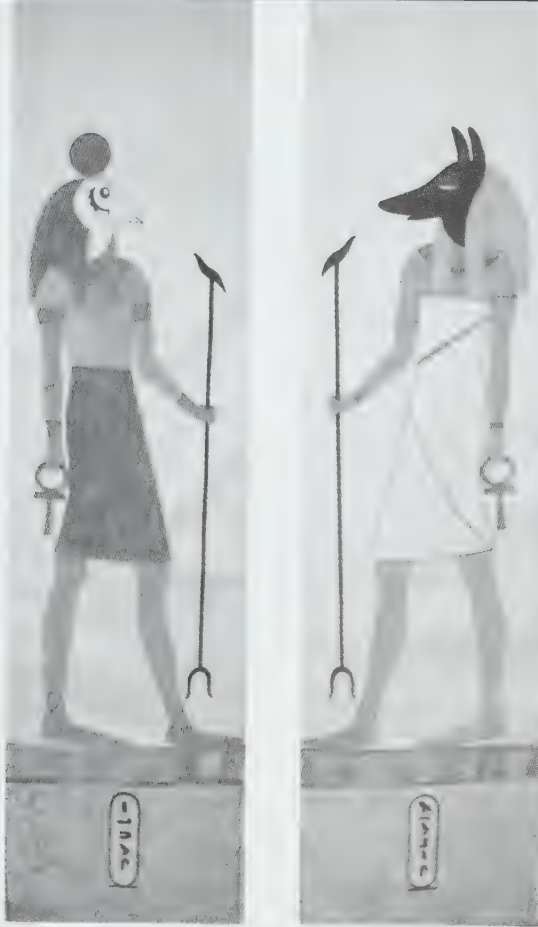
TANTE TINTENGRÜN

Deutsch/Lesen und Malen/Zeichnen

Die Erwachsenen planen für die Zukunft.
 Der Wünsche und Bedürfnisse der Kinder wird nicht gedacht.
 Die Tante Tintengrün hilft den Kindern.
 Weil aber alles, was sie ansieht grün wird, muss sie laut Verordnung eine rote Brille tragen.
 Am Ende aber ist alles gut. Kinder und Erwachsene werden gleichermaßen bedacht.



Wir haben das Buch gemeinsam gelesen und die Tante gemalt.
 Ölkreide/ Deckfarben, Schwammdruck, auf Papier, A3
 Und - herumphantasiert und uns witzige Titel ausgedacht:
 BrillenstiftundradiergummizerstörerIn
 SupergescheitrednerIn
 Nichtwissenchef
 OberspitzenrednerIn
 UhrzeigerguckerIn
 ImmerwiederschereklauerIn
 SesselruntergeberIn
 ObergurkenessermeisterIn... u.a



ÄGYPTEN

Das Land der Pharaonen

Im Jänner 2005 begab sich die Klasse 3b auf eine Zeitreise in das Land der Pharaonen.

Dabei erfuhren die Kinder viel Neues über das Land Ägypten und seine interessante Geschichte.

Sie stellten aus Gips die Maske des Tutenchamun her, schrieben in Hieroglyphen und besuchten die Ägyptische Ausstellung im Kunsthistorischen Museum.

Besonders lustig war das „Mumienwickeln“!

Den Abschluss des Projektes bildete eine Projektpräsentation für Eltern und Lehrer.



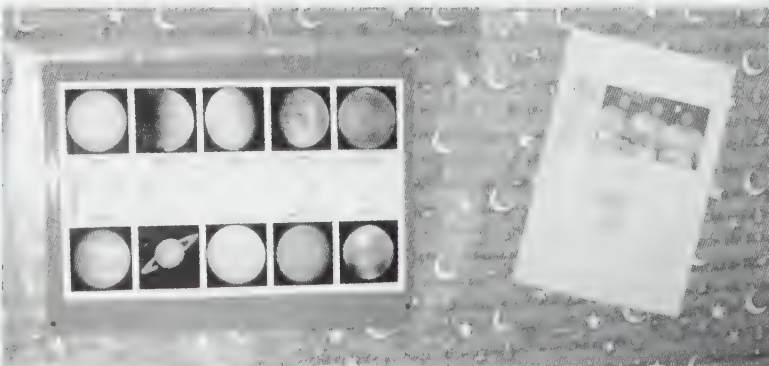
SONNE, MOND, STERNE UND PLANETEN

Im Rahmen dieses Projektes lernte die 4.a die 9 Planeten unseres Sonnensystems näher kennen.

Mit wissenschaftlicher Neugier gingen wir ans Werk: aus Büchern wurden Daten und Fakten gesucht, die anschließend auf Plakaten festgehalten wurden.

Das selbständige Anfertigen der Kostüme für das Theaterstück

„Wir fliegen durch das All“ machte großen Spaß und wird uns noch lange in Erinnerung bleiben.





„ACH, DU LIEBE ZEIT“

Unter dem Titel „Ach, du liebe Zeit“ versuchte die 4.b in einem Projekt das Thema Zeit von verschiedenen Gesichtspunkten aus zu betrachten:

Über

- Begriffe klären (Zeitdauer, Moment,)
- die Natur im Wechsel der Jahreszeiten
- besondere Ereignisse im Jahreslauf
- Ereignisse im Lebenslauf der Kinder
- zur Geschichte der Zeitmessung (Uhren früher und heute)
- Zeitabschnitte gemeinsam planen
- mein persönlicher Tagesablauf (wie lange brauche ich für bestimmte Tätigkeiten ...)
- Redewendungen mit der „Zeit“
- Missgeschicke mit der „Zeit“
- Gefühle für die Zeit bekommen
- Kann man Zeit spüren?
- Die Uhrzeit von verschiedenen Uhren ablesen können
- Die Veränderungen des eigenen Körpers im Laufe der Zeit erkennen

bis zum Malen nach Salvador Dali: „les montres molles“.

Jede/r SchülerIn erhielt dann am Ende der Projektwoche seine persönlichen Arbeitsblätter in einer Mappe gebunden.

KLASSEN
FOTOS
NAMEN

1.Reihe: v.li: Demmelbauer Patrick, Marzi Alexander, Stanculj Bojan, Kaur Navjot, Veizer Julia, Samson Michael, Mughal Umar
2.Reihe: v.li: Andjelkovic Boban, Flacher Sascha, Minkailov Akhmed, Jankovic Gordana, Ali Asmaa, Sandhu Japneet, Lazarevic Gariela
3.Reihe: v.li: Fr. Schuster Rosemarie, Fr. Dir.Kauf Elisabeth, Fr. Bogner Monika



1.Reihe: v.li: Marjanovic Manuel, Kalleitner Jakob, Legitimas Scheena, Rvay Elisabeth, Revay Elisabeth, Petrovic Danijela, Bico Angelil
2.Reihe: v.li: Jancic Clemens, Duhandzic Said, Kuran Ebubekir, Fromhold Karen, Koci Lora, Klinzing Björn-Hadi
3.Reihe: v.li: Fr.Schlegl Monika, Khajavi Sisin, Petryshyn Volodymyr, Fruhwürth Max, Gruber Johannes, Baumgartner Kira, Hasanovic Omar, Fr.Dir.Kauf Elisabeth

1.Reihe: v.li: Kindl Mario, Kobald Jessica, Unlayao Kristian, Schneeweiß Hanna, Casny Melanie, Havelka Lisa, Kastner Alexander

2.Reihe: v.li: Zagler Dominik, Pelzl Marlies, Spasic Stefan, Simic Dennys, Vasic Danijel, Marjanovic Matias, Markovic Kristijan, Novoselac Marko

3.Reihe: v.li: Fr. Lechner Andrea, Marzi Romina, Ehgartner Rosi, Shen Luise, Dieren Janusz, Böhme Tobias, Rrmoku Lorik, Fr.Dir.Kauf Elisabeth

KLASSEN

FOTOS

NAMEN



1.Reihe: v.li: Kotschig Benjamin, Kaplan Halil, Velichkova Dobrinka, Markovic Marina, Galhaup Durga, Mehic Madina, Soldat Denis

2.Reihe: v.li: Calisgan Kübra, Biskupovic Stefan, Jankovic Slobodan, Jovic Stefani, Babic Aleksandar, Stanojevic Svetozar, Minkailov Ashab, Arifaj Visar

3.Reihe: v.li: Fr.Resch Andrea, Bektas Deniz, Pemper Nikola, Burnus Patryk, Veigl David, Danijel Nikolic, Luka Pranic, Patrick Truong, Fr. Dir. Kauf Elisabeth

KLASSEN
FOTOS
NAMEN

1.Reihe: v.li: Gökce Varol, Maric Markus, Sanceda Riana, Deniz Zeynep, Sanceda Riomy, Atash Karim, Stosadinovic Bane, Mayer Gero

2.Reihe: v.li: Simsek Samet, Casny Diana, Fink Alexander, Arifaj Vjosa, Avdili Suada, Awad Nana, Eren Sewike, Flacker Clemens

3.Reihe: v.li: Fr. Schoiswohl Marianne, Löschnauer Paul, Murat Salih, Simic Ivona, Jovanovic Mirjana, Kajkic Ivana, Chen Zhou Jie, Jancik Fabian, Fr. Dir. Kauf Elisabeth



1.Reihe: v.li: Matos Ivan, Schneider Stefanie, Wöhler Magdalena, Scherer Lea, Baumgartl Johanna, Rubik Alexander, Itzlinger Jakob, Pawelka Lukas

2.Reihe: v.li: Özün Ertan, Schmid Katja, Shrief Nourihan, Hecht Caroline, Uscic Marcel, Yilmaz Kerem, Salovic Nikola, Höfferer Mattias, Onur Betül

3.Reihe: v.li: Fr. Neumaier Susanne, Cayir Hatun, Bergler Nora, Pflanzler Lina, Nanut Lena, Simic Denis, Kanyücel Fatma, Wegscheider Elisabeth, Vierlinger Julian, Fr. Kauf Elisabeth

1.Reihe: v.li: Edtinger Nina, Schilling Dana, Raza Kushbu, Juric Susanna, Ostojic Natasa, Cavir Hamil, Zeller Nikolaus

2.Reihe: v.li: Fr. Dir. Kauf Elisabeth, Radulovic Natasa, Jura Cornelia, Ehgatter Sophie, Lin Anmiao, Stevanovic Gabriela, Vucer Manuela, Petrovic Danijel

3.Reihe: v.li: Darilmaz Halime, Dedovic Maida, Simic Bianca, Mitrovic Denis, Fehringer Pascal, Hasanovic Amar, Mag.Judith Bernauer

KLASSEN

FOTOS

NAMEN



1.Reihe: v.li: Tavakovic Mirzet, Domazet Nicol, Lepuschitz Stephanie, Djordjevic Nikola, Stevanovic Anastasija, Nestorovic Dajana, Said Shaker Lava

2.Reihe: v.li: Fr. Dir. Kauf Elisabeth, Gudelj Mijo, Calisgan Nuriye, Özturgut Zeynep, Vural Hakan, Yunuz Cinar, Zaimov Gülloan, Buszolics Patrick

3.Reihe: v.li: Biskupovic Marko, Šupetic Anita, Cayir Kamil, Nikolic Cveta, Dymak Patrick, Kahraman Osman, Mahmutovic Melissa, Schneider Silvia, Pressl Gabriele

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- Universitätsbibliothek der Universität für angewandte Kunst
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- Büchereien Wien – 2. Bezirk

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UNIQA



Collector delights audience with fine art tales



Dr. Alfred Bader, author, chemist, art historian, philanthropist, lectured at the University of Toronto at Mississauga (UTM) in the Kaneff auditorium Thursday about his adventures while collecting paintings. Some of his collection, works of art mainly by Dutch masters, have been donated to Queens University with a couple recently donated to UTM.

Alfred Bader isn't one to be fooled by appearances.

Which is why he owns some of the most beautiful paintings in the history of the world.

"I love going to little auctions and looking at dirty old paintings," Bader told about 100 people Thursday in the second in the Canadian Perspectives annual lecture series at the University of Toronto at Mississauga.

Small wonder why, when your knowledge and acumen can land you works of art which other supposed experts have discarded as phonies and fakes.

Bader explained how he bought a Rembrandt at auction which had been attributed to an imitator of the same period, whose initials were prominently displayed on the work. Trusting his own instincts, he bought it nonetheless.

The founder of Aldrich Chemicals (now Sigma-Aldrich which has offices in Mississauga) knew that for a period of time at the end of the 18th century, the imitator's work was more valued than Rembrandt's. A little solvent soon removed the overpainted initials and experts confirmed the painting was by the master.

He recognized the style of Rembrandt contemporary Jan Lievens, one of his favourite painters, in a luscious landscape called *Trees* that he spotted in a sale. Unfazed by "expert" opinions that it wasn't Lievens' work, Bader bought the painting, and soon uncovered the artist's signature beneath the wooden frame.

Bader knows what he likes and he buys what he

likes. It doesn't matter if it's a charming portrait of squirrels painted by an unknown of the period of the Dutch masters, or by someone famous.

The squirrel portrait may be incongruous, but it hangs right along much more famous pictures in his Milwaukee home.

The 79-year-old gave an hour-long slide presentation filled with stories that were as stunning as the art he lovingly exhibited.

Some of his most prized pieces are works by 17th Century Dutch masters that are not yet attributed. "It is such fun to buy pictures just for their beauty," he exulted. The element of "mystery" in the eventual discovery of the identity of the painter just adds another tantalizing twist.

All but two of the 250 or so master works he has collected over 50 years are housed already, or will be housed, at Queen's University.

It is his way of repaying a kindness that changed his life.

After coming to Canada and getting a high school education, Bader tried to get into university. He was

rejected by McGill because its quota of Jews was filled. A kindly registrar at Queen's accepted the young man whose subsequent brilliant academic career eventually led to a Ph.D. from Harvard.

Bader, who ran out of copies of his book to sell at UTM, thoroughly enjoyed his latest return to Mississauga.

As audience members thanked him for his tales of collecting, he said with genuine conviction, "believe me, I've enjoyed it most of all."

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News

City stalls decision on its pot position

City councillors want to know if the grass really is greener on the other side of the fence before deciding where they stand on the decriminalization of marijuana.

A motion tabled at City council recently opposing Ottawa's plan to decriminalize the possession of small amounts of pot was referred back to staff for clarification on several points.

Council also wants to hear from Peel Regional Police Chief Noel Carney before finalizing its position on pending marijuana legislation, which would subject offenders to fines — much like those doled out for traffic violations — instead of criminal prosecution.

While supportive of the referral, Mayor Hazel McCallion said her thoughts on the federal government's move to decriminalize the drug are crystal clear.

"Decriminalization will result in more (marijuana) grow houses; that's my opinion," said McCallion, adding information brought to Peel Region council last week by high-ranking Peel drug cops has left her adamantly opposed to the dropping of criminal sanctions on

dramatically due to the potential for profit and lenient sentences dished out to those who participate in such illegal operations.

If decriminalization becomes the law of the land, said Calder, illegal pot growing operations — in which increasingly crafty crooks turn large new homes into hydroponics labs to make millions of dollars a year from the sale of marijuana — will become even more prevalent in the city.

"Illegal grow operations will expand based on the increased consumer demand," said Calder. "This isn't a problem that's going to go away; it's a very profitable business."

Ward 9 Councillor Pat Saito said City officials should be armed with all relevant information and be absolutely clear on the position of Peel police — and other law enforcement agencies — before etching their position in stone.

In addition to decriminalizing pot, a bill to be introduced later this month by Federal Justice Minister Martin Cauchon would also increase penalties for those who grow and traffic the drug.

Man in a Cap attends Queen's

The Ontario university will be showcasing its new Rembrandt painting

BY GUY DIXON

With his deeply furrowed brow, unsure expression and black shroud, the arrival of an old man in a cap is one of the most spectacular recent art events to take place at Queen's University in Kingston, Ont.

The university's Agnes Etherington Art Centre is unveiling the gift of a small painting by Rembrandt, long thought to be a portrait of his father, although historians are now undecided on that point.

Apparently, a sketch of Rembrandt's father looks somewhat like the gaunt, bearded man in the painting, but "then again, so do a lot of old men with beards," said centre director Janet Brooke.

More importantly, the *Head of an Old Man in a Cap* is only the fourth Rembrandt to be added to a Canadian museum's permanent collection and the first to come to Canada in 50 years, according to the centre's director. The National Gallery of Canada, the Art Gallery of Ontario and the Montreal Museum of Fine Arts are also among the Rembrandt club.

But unlike the other Canadian Rembrandts, the Queen's University painting is more sullen. The *Old Man* is an example of Rembrandt's exercises in painting *tronies*, the Dutch word at the time for small portraits of anonymous people, conveying the psychology of the individual.

Painted by the artist when he was in his 20s, it taps into the confusion and dejection of old age, with the figure's downward glance and the kind of subtle play of dark and light contrasts, which any reader of a textbook on European art will instantly recognize as a characteristic of Rembrandt. It's also immediately apparent that every Hollywood cinematographer who has attempted mood lighting owes a direct debt.

"If you look at the image, I think you'll agree that it really is a moving image of old age. It's not a portrait of a person. It's a portrait of old age," Brooke said.

The small 8-inch by 10-inch painting was a gift of a long-time donor, retired chemical industry magnate Alfred Bader, who has maintained a strong connection with Queen's and its art gallery, as has his wife Isabel. Currently living in Milwaukee, Wis., Bader is a Queen's alumnus who had previously come to Canada from Vienna as a Jewish teenage refugee during the Second World War. When he



Detail from *Head of an Old Man in a Cap*: a moving portrait of old age.

later applied to universities, a number of them turned him down because they had quotas on how many Jewish students they could admit. Queen's did not have a quota.

Bader went on to earn degrees in chemical engineering and history at the university and later founded what is now the chemical company Sigma-Aldrich in the States, after

which he began his long pursuit as an art collector — apparently earning a reputation as the "chemist collector" — as well as becoming a long-standing benefactor to Queen's.

"As his collection has grown and shaped over the years, he's developed a very, very, very tight focus on issues of Rembrandt and the Rembrandt school," Brooke said.

"They just speak to me," Bader said. But "there are many Dutch paintings I don't like. I don't like those peasant interiors, people smoking and drinking. I like the historical paintings and portraits, and of course Rembrandt to me was by far the greatest artist, and his students were very, very able."

Bader has donated more than 100 paintings and purchased another 20 or so for the gallery's Bader Collection of Dutch 17th-century art. Whatever is left of Bader's collection when he dies will also be given to the centre. He owns at least one other work by Rembrandt, he said.

An exhibition in Kingston based around the painting, including a number of 17th-century Dutch prints brought together to highlight the story behind the painting, opens tomorrow.

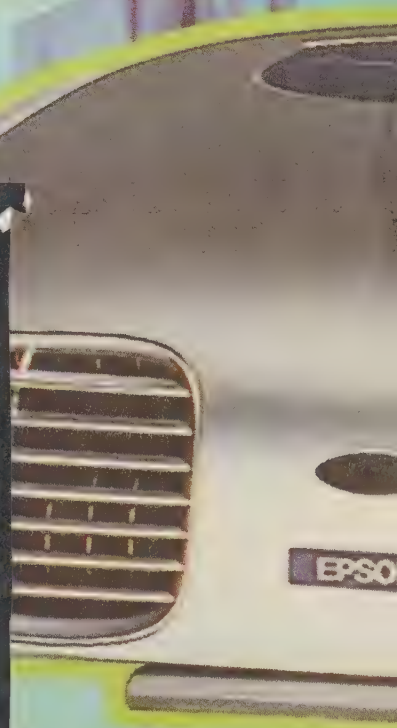


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2059

Art collector finds a home for Rembrandt

Milwaukee art maven Alfred Bader and his wife, Isabel, are in the news again.

They've donated a small but fine Rembrandt oil, "Head of an Old Man," to the Agnes Etherington Art Center on the campus of Bader's alma mater, Queen's University, in Kingston, Ontario.

Bader, 79, is an art dealer, collector and co-founder of Aldrich Chemical Co., now part of Sigma-Aldrich. Over the years, he and his wife have given Queen's University more than 100 works from their extensive holdings, plus a castle in Sussex, England, and seed money for a new art gallery.

This latest gift, an oil on panel measuring 7 1/2 by 9 1/2 inches, is believed to have been painted by Rembrandt van Rijn sometime around 1630. Janet Brooks, director of the Etherington Art Center, was quoted by the Ottawa Citizen as calling the gift "a great work of art."

Reached at his home in Sussex, Bader said the gift was the logical outcome of a long-term program of transferring ownership of his entire collection to the university. Bader said he acquired the work in 1979 for 55,000 British pounds, a sum then the equivalent of about \$100,000.

At the time, Bader said, experts had declared that the work was not an authentic Rembrandt. Since then, scholarly opinion has shifted, and the work is universally accepted as authentic, vastly increasing its value — which has been set by the Art Dealers'

Association at \$10 million.

The painting's meandering journey from Holland to London to Kingston covered thousands of miles. It is one of only four Rembrandts in Canada, and the first to join a collection there in half a century.

In his autobiography, "Adventures of a Chemist Collector," published in 1995, Bader explained how he came to acquire the oil — almost in defiance of the findings of the prestigious Rembrandt Research Project (RRP).

"The work of the RRP has had some beneficial side effects," he wrote. "One is the help that a C rating (a work not considered to be by Rembrandt) gives to buyers of fine paintings."

"In 1979, Christie's in London offered a study of Rembrandt's father, pointing out that the RRP did not accept it as a work by the master. "I was able to purchase it most reasonably, at a fraction of the price an A number would have commanded, although many competent art historians share my view that this work is an authentic Rembrandt...."

"When I thanked Professor Joshua Bryun, the senior scholar at the RRP, for his help in enabling me to acquire 'Rembrandt's Father,' he gave me a very strange look, and I really felt like giving him a great big hug. But what of the poor seller?"

It is this small but potent picture, currently titled "Head of an Old Man," that has now joined the collection of Queen's University.

Another portrait that Bader hopes is a Rembrandt, dated 1660 and also depicting an old man, carries with it a similar tale. Bader spotted it at what he terms "one of the great auction sales of Old Masters in my lifetime."

In November 1961, Bader wrote, the Erickson collection was put up for auction at Parke Bernet in New York. Among the works up for bidding were three believed to be by Rembrandt. The most important of the three, "Aristotle With a Bust of Homer," was bought by New York City's Metropolitan Museum of Art for \$2.2 million, then a record price for an Old Master.

Rembrandt or not?

"But the painting that moved me the most," Bader says in the autobiography, "was one which Jakob Rosenberg of the Fogg Museum had used as an example of the artist's sympathy with Jews...."

"Accepted by Rembrandt experts at the time, this study of an old man was expected to bring \$60,000, and in 1961 I felt I could afford that for such a superb portrait."

Bader was "staggered" to learn how much others were willing to pay. In the end, a London dealer acting for a collector in Birmingham bought the presumed Rembrandt for \$180,000.

Fortunately for Bader, the desirable but elusive likeness didn't remain in Birmingham. Some time after the Erickson sale, he recounts in the book, "members of the Rembrandt Research Project must have told the owner that they do not consider this a work by Rembrandt but by one of his students. So it was valued at only 60,000-80,000 English pounds when it was offered at Christie's (auction house) in London in April 1993."

Bader was in a quandary: Should he bid? And if so, how much? "If another collector loved it as much as I did," he writes in



Alfred Bader has donated "Head of an Old Man" to his alma mater.

his book, "it would sell for a very high price, but most works at auction are bought by dealers, who are unlikely to pay the reserve for an attributed painting."

In the end, Bader decided not to bid on the work — and that the painting went unsold, and that his offer after the auction had been accepted.

"It was less," he says, "than I had been prepared to pay in 1961, but I had missed the joy of looking at the painting for 32 years. Since then, I have spent hundreds of hours studying it in our living room and have often carried it into our bedroom for a last look before... falling to sleep."

The painting, one of just two that will not go to Queen's University, is a promised bequest to his son, Daniel. The other painting, a Rembrandt school study of Joseph and the Baker, will go to his son, David.

A home for a masterpiece

A Canadian reporter, writing in the Ottawa Citizen, suggested that Bader's collection might have gone to McGill University or the University of Toronto if either of those schools had accepted Bader as a student back in 1941, when he was a young Jewish immigrant from Austria seeking a college education.

But Bader said the gift was a result of a number of factors, particularly that he has been "working very well" with Queen's University's art center.

"The art historians are very good," he said. "It makes sense for the whole collection to go to Queen's."

What about the Milwaukee Art Museum? Couldn't his adopted hometown have used a first-class Rembrandt?

Originally, Bader said, he had planned to leave his entire collection to the art museum. "After all," he said, "I made my money in Milwaukee. I love the city of Milwaukee. My son, Daniel, works every day to help Milwaukee through the Helen Bader Foundation."

But a number of factors — all chronicled in his autobiography — caused his enthusiasm for the art museum to cool.

One involved what Bader calls in his autobiography a "total lack of interest in Old Masters" on the part of a now-departed museum director. The other, broader issue had to do with the museum's apparent lack of funds "to hire a curator of the many fine Old Master paintings it possesses."

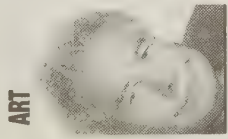
So his alma mater, to which he feels indebted because of its many kindnesses to him when he was a young refugee, provided an alternative.

In the meantime, this Johnny Appleseed of art isn't without a major Rembrandt to place internationally.

He and his associate, New York art dealer Otto Naumann, are seeking a buyer for what they say is the only Rembrandt history painting on the market, the formidable "Minerva" (1635).

If it sells, fine. If it doesn't, well, said Bader, "it's the only historical Rembrandt that will ever go on the market. I would rather have that than \$40 million!"

E-mail James Auer at jaue@journal-sentinel.com.



JAMES AUER

ART

the first to join a collection there in half a century.

In his autobiography, "Adventures of a Chemist Collector," published in 1995, Bader explained how he came to acquire the oil — almost in defiance of the findings of the prestigious Rembrandt Research Project (RRP).

"The work of the RRP has had some beneficial side effects," he wrote. "One is the help that a C rating (a work not considered to be by Rembrandt) gives to buyers of fine paintings."

"In 1979, Christie's in London offered a study of Rembrandt's father, pointing out that the RRP did not accept it as a work by the master. "I was able to purchase it most reasonably, at a fraction of the price an A number would have commanded, although many competent art historians share my view that this work is an authentic Rembrandt...."

"When I thanked Professor Joshua Bryun, the senior scholar at the RRP, for his help in enabling me to acquire 'Rembrandt's Father,' he gave me a very strange look, and I really felt like giving him a great big hug. But what of the poor seller?"

It is this small but potent picture, currently titled "Head of an Old Man," that has now joined the collection of Queen's University.

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CABIN FEVER	4:55	9:30				R
TOMB RAIDER 2	2:45	9:25				PG-13
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ART
 BY JAMES AUER

Seeing Wisconsin, one page at a time

It's raining, it's blowing, and it's chilling quickly as I write this, so I'm staying home. But that doesn't make it a day off.

The latest books about Wisconsin have piled column high, and there's no law I know of against working with your feet up.

It has long been told how after the death of Chief Oshkosh, the famed Menominee leader was buried first on his tribe's reservation but later was disinterred and reburied in the city that took his name.



DENNIS MCCANN

It was, in the eyes of Oshkosh officials, an honor: So in 1926, a coffin of human remains was dug up from the reservation, carried up Main St. in a grand parade and reburied amid much speechifying at the Chief Oshkosh statue in Menominee Park.

But was the city's offer not really honored? In the new "Oshkosh at 150," historian Michael Goc wrote that a tribal historian and Oshkosh biographer later agreed that the body brought to Oshkosh the city was not that of Oshkosh the chief.

While that would no doubt dismay those boosters who thought otherwise, Goc wrote, "Oshkosh himself would probably be happy in the knowledge that he lies buried in ground he was able to keep for his people instead of in a place he was forced to give away."

"Oshkosh at 150" (New Past Press) is Goc's sesquicentennial history of the onetime "Sawdust City." The stories include those of such heavyweight influences as

Phillips Sawyer, James

CUE

WEDNESDAY, NOVEMBER 5, 2003

E

MILWAUKEE JOURNAL SENTINEL

James Auer: Art collector finds a home for Rembrandt 2E
www.onwisconsin.com/live



FULL SNOW

'Matrix' races to re

CLIK

Photographer Tom MacDonald snapped the chic and lived to tell about it.

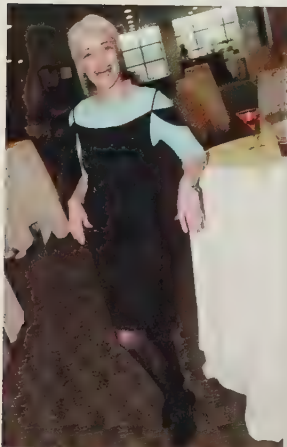
@ WAMI SHOW Potawatomi Northern lights Theater.

Stephanie Dosen of Milwaukee
Stephanie designed the lace fabric black top she wears. Her jeans are Guess; shoes from New York. Her jewelry is handmade.



Terry T. Robinson of Milwaukee

Terry dresses in a lilac suit from the House of Threads in Milwaukee. His shoes, also from the House of Threads, are by Torrence Ethel.



Mary Manion of Milwaukee

Mary wears a French cut dress from Saks Fifth Ave. Her top — and jewels — are from Three Graces on Brady Street.

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COVER STORY

Story by Judy Steininger
Photography by Doug Edmunds



Portrait
of the **Chemist** as an **Art Man**

Renowned chemist, art collector and benefactor, his story fascinates.

Multi-millionaire Alfred Bader, Ph.D. shrugs, "I haven't bought a tie since Filene's (the Boston discount store) stopped selling them for 99 cents. I do keep one in the office closet, just in case."

He rummages in the closet for a moment then emerges with a grin. "Here it is."

"It" is a white tie emblazoned with the periodic table of the elements. That tie is the key to Bader and the company he co-founded.

Bader has a lot of money. Don't be impressed; he's not. As the co-founder of Aldrich Chemical, he is still the largest individual shareholder (about 5 percent ownership) in the merged company known as Sigma-Aldrich, NASDAQ symbol SIAL, market capitalization \$3.2 billion dollars and revenues in excess of \$1.1 billion.

With operations in 33 countries and 6,500 employees (3,600 of them in the U.S.), Sigma-Aldrich bills itself as the "world's leading supplier of high quality research chemicals and products for use in life science and high technology applications."

Bader is old, born in 1924, but he is not elderly. The black hair of his youth is partially gone and turned gray; never a tall man, he's even shorter now. His academic's posture and deliberateness make it easy to picture him pattering around a lab bench checking a stopcock here, looking for a pipette there. "I was very good in the lab, but by the 1960s the business was growing so large I had to leave it."

His doctorate is in organic chemistry from Harvard University. Where did he study business? "I think I took half a course in business one time, but I don't remember it."

How Bader came to Milwaukee and founded a company listed on the benchmark NASDAQ 100 Index is a history about war, refugees, prison camps, higher education, Horatio Alger and love. But Bader isn't ready to be a history lesson, yet.

Bader is obsessed with art; he fusses over it and shows it to clients like the curator of the London National Gallery. His latest office, occupied since 1992, is in the Alfred Bader Fine Arts Gallery, a former apartment in the Astor Hotel.

Bader's office, a former bedroom, contains a huge desk stacked with papers, bookshelves, and file cabinets; the walls are covered with letters and photos from Nobel Prize winning chemists like Robert Burns Woodward and Linus Pauling. One framed certificate is his Commander of the British Empire awarded by Queen Elizabeth in October of 1997. The dollar receipt for an early patent is yellowing in a black frame. A couple of Old Masters are propped on chairs.

In the other rooms, faded damask covered sofas and chairs, tired 1950s style formal draperies, and ubiquitous worn beige carpet can't diminish the tumble of Old Masters (large and small) hung on walls, propped against chairs, each other and stashed in cubicles.

"I have some very important art here," Bader says softly and

precisely with only a hint of an accent. "Every year I sell two or three hundred paintings."

He points out one small painting from the 1500s of Christ tortured by a crown of thorns and says with just a touch of sensitive humor, "I sold that to a stock broker; it's not been a good year for him." While many pieces sell in the high six figures, Bader points out he also has paintings from \$100 and up; no one should feel intimidated to drop by.

That said, this disclaimer follows: if you're in the market for a Jackson Pollock, don't look here. His Web site (www.alfredbader.com) states, "We do not carry modern art, frankly, we don't understand it."

Since he left Sigma-Aldrich in 1992, the gallery has been Bader's full-time job. In the states and abroad he has a reputation as an Old Masters expert. He and his wife, Isabel, have been guest curators and written the introduction to catalogs for shows like the Milwaukee Art Museum's exhibit in 1989 titled "The Detective's Eye: Investigating the Old Masters." Bader frequents Europe for auctions and to practice his favorite of pastimes, rummaging old buildings looking at cobweb-coated, grime-encrusted paintings hoping to

uncover yet another lost masterpiece. His personal collection is significant, with an emphasis on Rembrandt and his students. One piece, Rembrandt's "Old Man Wearing A Cap" is currently on loan to a museum in Frankfurt, Germany.

Bader's autobiography, "Adventures of a Chemist Collector," features on its cover "The Alchemist" painted by David Ryckaert in 1648.

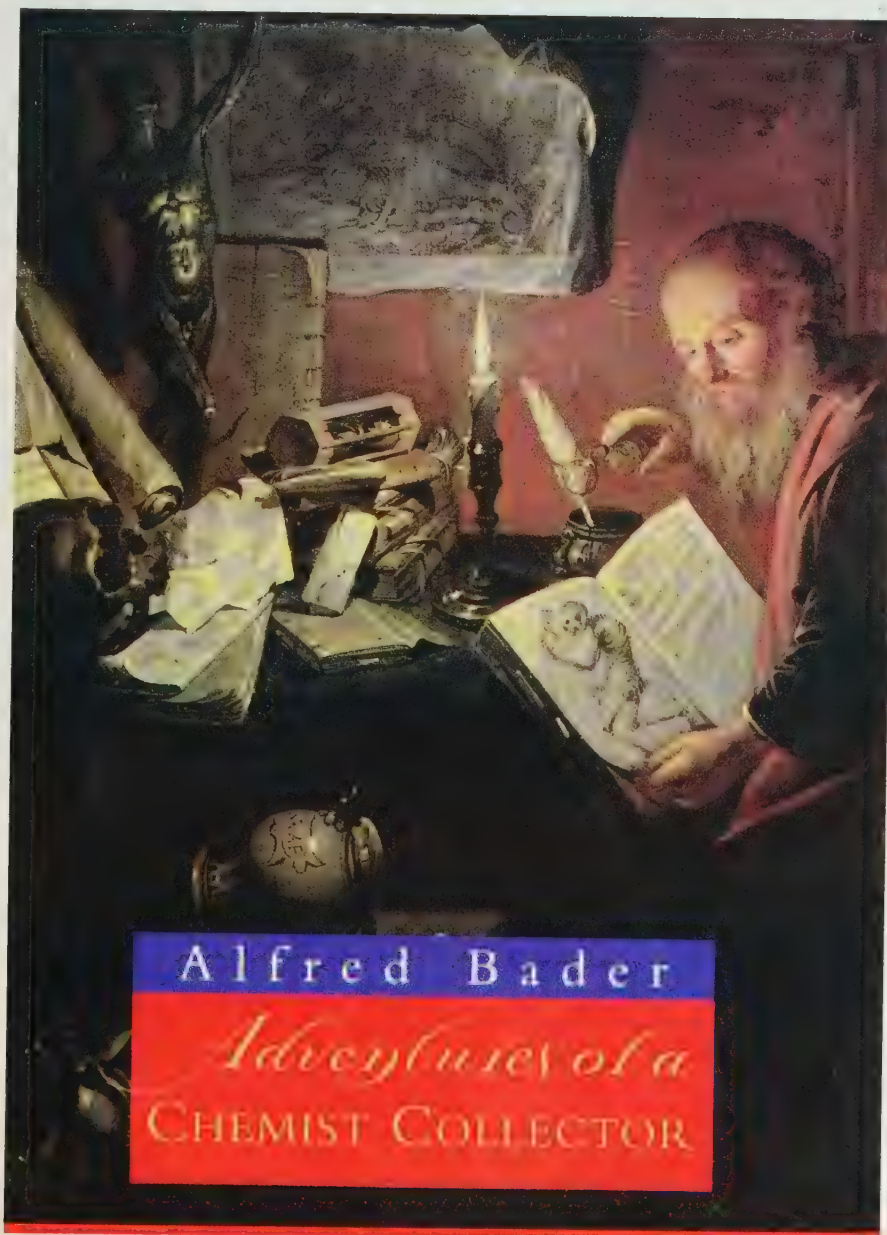
"The Alchemist" painting is symbolic of Bader, the man. An alchemist was a medieval scientist who attempted to change lead into gold. Bader has worked some alchemy in his own life and has, after some time, mobilized his fortune to do good. His childhood would not have been a predictor of wealth or happiness.

Bader was born in Vienna, Austria on April 28, 1924, to a Jewish father, Alfred Bader, and a Catholic mother, Elisabeth Serenyi. Bader's paternal grandfather, Moritz Ritter von Bader, a Viennese civil engineer, worked with Ferdinand de Lesseps to build the Suez Canal. His maternal grandparents were aristocracy: Count Johann Nepomuk Serenyi and Irma, Countess Dessewffy.

In 1912, after his mother's family tried to have her committed to an asylum rather than see her marry a Jew, Bader's parents eloped.

In 1924, two weeks after Bader was born, his father committed suicide or was murdered;

One of Bader's contributions to industry is his introduction of Old Master paintings as covers of Aldrich's chemical catalogs and annual reports.



the historical details are murky. Shortly thereafter, an Aunt Gisela whom he refers to as "Mother" adopted him; Elisabeth remained his "Mama." Bader writes and talks lovingly about both of them. He places Elisabeth in the historical context of a young woman raised to be a lady, forced to be a widow with two small children and no way to care for them, facing the approaching storm of W.W.II, the economic maelstrom in Europe at the time, and what became known as the Jewish Problem.

Living with Mother in Vienna on Praterstrasse in a house he describes as "crammed with paintings, French rococo antique furniture and carpets" plus a villa in Baden sounds like something out of the movies. It all evaporated.

From the balcony of the apartment, the little boy Bader watched parades, including Adolf Hitler's in 1938. Bad investments, rampant inflation, and war soon forced the family to sell off its possessions and live in one room. Mother, prisoner #821, died in Theresienstadt concentration camp near Prague. Mama died of a stroke in 1948.

After the Nazi rampage, Kristallnacht, in November of 1938, the British granted 10,000 visas for Jewish children; Bader was one of the lucky ones. But in 1940, at the age of 16, he and all refugees between 16 and 65 living in England were put in detention centers. Months after living in tents surrounded by barbed wire, Bader, prisoner #156, and hundreds of others were put on the ship Sobieski to be sent as POWs to camps in Canada.

And that is how Bader arrived in the New World. He was released from the Ft. Lennox prison on St. Helen's Island in the St. Lawrence River near Montreal into the care of a family. The boy who had pieced together an education in POW camps was denied entrance to McGill and the University of Toronto for lack of proper credentials. However, Queen's University, Kingston, Ontario did accept him and he began his studies, handicapped by starting halfway through the term. A B.Sc. in engineering chemistry, a B.A. in history and an M.Sc. in chemistry later, his gratitude to the university for admitting him is still being expressed in gifts: numerous works of art, a \$6 million dollar 500-seat theater donated to Victoria University to "show his love and admiration for his wife Isabel" and \$10 million to purchase and maintain a 140-room, 15th century castle in Sussex, England, home of the Astronomer Royal. Read and weep, McGill and Toronto.

From Queens, he was off to Harvard University where he earned an M.A. and Ph.D. in Chemistry.

He came to Milwaukee in 1950, as a chemist with Pittsburgh Plate

Glass (PPG). Some of Bader's early work produced patents worth millions of dollars. PPG eventually left the city, but by then Bader and Jack Eisendrath had started a company selling research chemicals. "We incorporated on Aug. 17, 1951, each putting in \$250. We tossed up (a coin) for the name; I lost the toss. Jack was engaged to a charming girl, Betty Aldrich, and the company was named the Aldrich Chemical Company."

Bader is candid about his personal life in his autobiography. Milwaukeeans are familiar with his first wife Helen, in large part through the Helen Bader Foundation, a very generous benefactress to the city and throughout the world. Bader and Helen have two sons, Daniel, the director of the foundation which grants on average \$10 million a year, and David, an architect living in Pennsylvania.

He has five grandchildren.

Bader and Helen were divorced in 1981; she died in 1986.

After the divorce, Bader married Isabel Overton, a Canadian living in England whom he had known decades earlier.

Of all my jobs
giving away money
is the hardest.




Isabel and he are inseparable: traveling, writing art catalogs, and translating German articles into English. Along with their modest East Side home, they retain the small house in England where she used to live.

In his gallery at the Astor, Bader is content. From this control central he gives away millions of dollars a year, deals in art, corresponds with scientists and friends around the world, and plans his next art buying adventure, accompanied by Isabel, of course. "Of all my jobs giving away money is, the hardest. Every year Isabel and I sit down

at tax time and figure out our income, then we give away half of it. I like to give to the American Joint Distribution Committee, a Jewish group that helps people all over the world. Right now I'm helping them help the Romas or gypsies in Eastern Europe. I think the Quakers are wonderful people and I help with their work in Africa. One of Isabel's ancestors started the Salvation Army and every year I live I add a thousand dollars to my contribution to them."

He muses on his unusual life: "In the beginning I was too frugal;" or "The key to business is always treat your people, customers and suppliers well," and "Politically, I am a Socialist at heart, but I know it doesn't work — people need the money incentive."

What does the future hold? "I love what I do and as long as the good Lord gives me strength and my wonderful wife Isabel, I will keep doing it." 



Gift: 'I am a Jew. ... I couldn't get in'

Continued from page A1

"McGill wouldn't accept me. I am a Jew. They had a quota and the quota was full when I applied there on Nov. 3, 1941. Even though I had passed McGill's senior matriculation exam, and passed it very well, I couldn't get in," Mr. Bader said.

McGill wasn't the only top Canadian school to say no to the talented student.

"The University of Toronto turned me down as well," Mr. Bader said. "Queen's took me in and treated me so wonderfully well. It was the first time in my life I was treated as an equal. If Queen's hadn't admitted me, where would I have gone? What would I have done?"

The painting he has donated was painted by Rembrandt van Rijn around 1630. It is one of only four paintings in Canada by the acclaimed Dutch artist, and the first to be acquired by a Canadian museum in 48 years.

"The Rembrandt is just one brick in the wall," Mr. Bader said. "I am leaving Queen's my whole collection. I have given them so far 120 paintings, many of which are very good indeed."



Queen's University is getting a valuable painting by Rembrandt that might otherwise have gone to Montreal if the donor, Alfred Bader, above left, had not been refused admission to McGill University because he is Jewish. The painting, *Head of an Old Man in a Cap*, is estimated to be worth millions of dollars.

Janet Brooke, director of the Agnes Etherington Art Centre at Queen's University, says the Rembrandt is "a fantastic gift, an extraordinary little tiny panel, about 20 by 24 centimetres, painted with such bravura.

"The artist's connection to the subject is so empathetic, you have a sense of the subject's character. It is a great work of art that enriches the national patrimony."

The painting was originally identified as being the work of one of Rembrandt's students. But Mr. Bader, certain the work was painted by Rembrandt, bought it at auction for about \$200,000 in 1979.

Recent scholarship confirmed his hunch.

No one will say how much the painting is worth, but a Rembrandt self-portrait, painted in 1634 and considered an inferior work, sold at auction this year for \$15.6 million; other works by Rembrandt have recently sold

for more than \$30 million.

Had things worked out differently, and had he been able to get into McGill, Mr. Bader said: "My collection would have gone to McGill, certainly."

Mr. Bader and his wife will unveil *Head of an Old Man in a Cap* on Sunday. It will be featured in an exhibition titled *Gift of Genius: A Rembrandt for Kingston*, which will run until Jan. 18.

Mr. Bader obtained his degree in engineering chemistry in 1945 and a second degree in history in 1946. He went on to Harvard University for his doctorate and moved to the United States in 1950.

He then made a fortune in chemicals and assembled an outstanding collection of Dutch art. He's been a generous benefactor to his alma mater. Ten years ago he bought a castle in Sussex, England, that he donated to Queen's.

The Montreal Gazette

Social Phobia is a real condition that cannot be attributed to personal weakness. The anxiety or panic experienced in social phobia may be mild to severe, but it is not a sign of weakness or a sign of restriction.

**Anxiety Disorders
Association of Ontario**

Bloc bid to get PM to quit puts Liberals at risk

Motion for Chrétien to leave after Nov. 4 'confidence vote'

BY ANNE DAWSON
AND SEAN GORDON

A Bloc Québécois motion calling on Prime Minister Jean Chrétien to resign after Paul Martin officially wins the Liberal leadership contest Nov. 14 will be treated as a vote of confidence, meaning the Liberal government will fall if Grit MPs join the opposition and vote in favour.

Bloc Québécois leader Gilles Duceppe will introduce the motion for debate today, and while the Canadian Alliance and the Conservatives say they will support it, it is unclear how many Liberals, many of whom have called on Mr. Chrétien to leave before his planned February retirement date, will join them.

"Mr. Chrétien is not the one taking the decisions. The decisions are taken in the back room by Paul Martin. He should be in the House answering questions. We want him to debate with us ... and to clarify his position where he stands on many issues," said Mr. Duceppe.

Liberal House leader Don Boudria said the Bloc motion is a ploy to defeat the government. He said he does not believe his Liberal colleagues will support it.

"To want the resignation of the prime minister, in my view, makes this a non-confidence motion. Especially since it comes from the opposition. If the opposition is asking the House to no longer have confidence in the government, even if it's in the process of congratulating another Liberal government ... it's an expression of non-confidence in the government," said Mr. Boudria.

"This motion has as its goal to defeat the government. It would be completely outra-

about whether I'm using Oil of Olay," he joked. "I've always felt waiting until February ... is a little long in the tooth," said Mr. McTeague.

Alliance leader Stephen Harper said although the motion is not binding, if it were to pass, Mr. Chrétien would be compelled to leave.

"I have been critical of the long goodbye ... and the slow-motion coup. He probably should have left office a long time ago, but he's out of excuses once the new Liberal leader is officially elected," said Mr. Harper.

"The spirit (of the motion) is that if a majority of the House passes this motion, the prime minister should comply. We all expect the prime minister will try and get around this ... by proroguing."

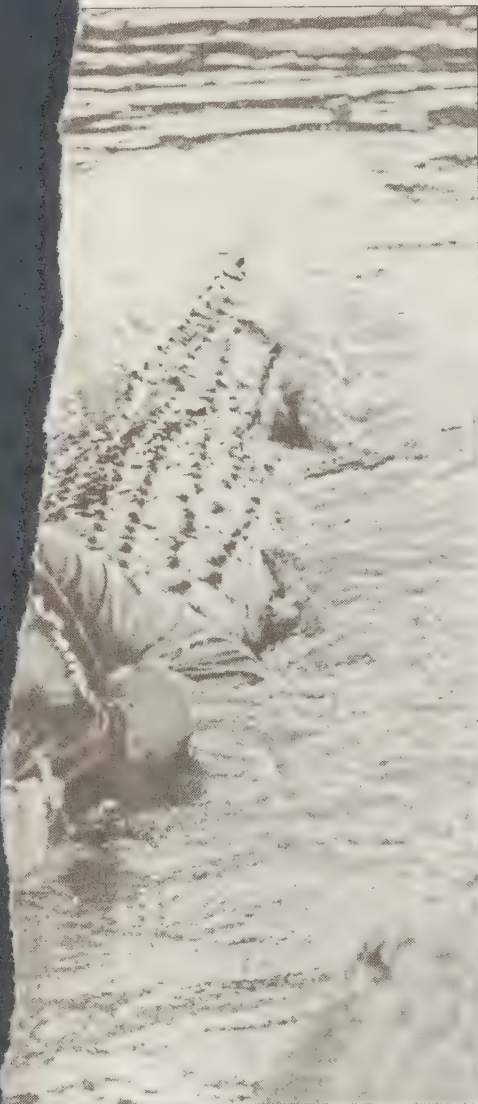
Tory leader Peter MacKay said he told Mr. Duceppe earlier this week he would support him. "We feel the country's agenda has very much been hijacked and sidelined by the Liberal party's internal machinations over the change in leadership, and to that end I think it would be in the broader and better interests of Canada to have this transition take place quickly," said Mr. MacKay.

But NDP leader Jack Layton said his party has no intention of voting in favour of anything that helps put Mr. Martin to work as prime minister any sooner than need be.

"I'm going to be running against Paul Martin. The last thing I want is for him to come to power sooner so that he can begin to implement the cuts that he's talking about. So we will be opposing that motion," said Mr. Layton.

"It's not to say we're in favour of Mr. Chrétien. We're running against Liberals, all Liberals."

Meanwhile, Bank of C



Million Dollar Man, which aired on ABC from

the Bionic Man



REUTERS

will work with
will write and

new powers to
might recall
the show,
1-78:

Todd Phillips, who has directed hit comedies *Old School*, *Road Trip* and the upcoming *Starsky and Hutch* starring Ben Stiller, Owen Wilson and Snoop Dog, has signed on to write and direct the flick for Dimension Films.

"The teaming of Jim and Todd is the perfect creative combination to launch the *Six Million Dollar Man* franchise," Dimension co-chairman Bob Weinstein said in a Yahoo! news release. "Todd is a director with proven instincts and Jim is a superstar."

Before he goes bionic, Mr. Carrey still has some work to finish up. You can expect to soon see him in theatres in *Eternal Sunshine* and *Spotless Mind*. He's also working on a few other projects, including a remake of the 1977 comedy *Fun*

The Gazette

MONTREAL | THURSDAY, OCTOBER 23, 2003 | QUEBEC'S OLDEST DAILY SINCE 1778 | SPORTS FINAL

McGill's lost treasure

QUEEN'S GETS ART

Donor was victim of Jewish quota system that limited access to Montreal campus

ALAN HUSTAK
THE GAZETTE

Queen's University in Kingston, Ont., is getting a valuable painting by Rembrandt that might otherwise have come to Montreal if the donor, Alfred Bader, had not been refused admission to McGill University in 1941 because he is a Jew.

The painting, estimated to be worth millions of dollars, is the latest bequest to Queen's from Milwaukee philanthropist Bader, 80, and his second wife, Isabel.

"The Rembrandt is just one brick in the wall," Bader said. "I am leaving Queen's my whole collection. I have given them so far 120 paintings, many of which are very good indeed."

Bader, 80, was born in Vienna and at age 14 was one of the Jewish kindergartners children shipped out of the country to escape the Nazis during the Second World War.

He arrived in Montreal when he was 17, and for the next seven years considered the city his home.

His latest gift to Queen's, he says, is another payment of the continuing debt of gratitude he owes the university.

"McGill wouldn't accept me. I am a Jew," Bader said in a telephone interview.

"They had a quota and the quota was full when I applied there on Monday Nov. 3, 1941. Even though I had passed McGill's senior matriculation exam, and passed it very well, I couldn't get in."

Please see REMBRANDT, Page A8
See also had quotas, Page A8



Rembrandt's Head of an Old Man in a Cap, valued in the millions, is one of 120 paintings Milwaukee philanthropist Alfred Bader and wife Isabel have given the Kingston, Ont., university — so far. "The Rembrandt is just one brick in the wall," Bader says. "I am leaving Queen's my whole collection."

COURTESY OF QUEEN'S UNIVERSITY'S AGNES EBERHARTING ART CENTRE

Canada's three other Rembrandts



The Montreal Museum of Art's 'The Milkmaid' by Rembrandt, painted in 1657. It was a gift to the museum by Mrs. C. H. Macdonald Patterson. The portrait was painted about 1665.



Rembrandt's Portrait of a Lady with a cap, painted in 1665, is in the Art Gallery of Ontario in Toronto. It was given to the gallery by Frank Wolf in 1959.



Rembrandt's Portrait of a Lady with a cap, painted in 1665, is in the Art Gallery of Ontario in Toronto. It was given to the gallery by Frank Wolf in 1959.

Rembrandt | A great work of art that enriches the national patrimony

CONTINUED FROM A1

"The University of Toronto turned me down as well," Bader said. "Queen's took me in and treated me so wonderfully well. It was the first time in my life I was treated as an equal. If Queen's hadn't admitted me, where would I have gone? What would I have done?"

Bader obtained his degree in engineering chemistry from Queen's in 1945 and a second degree in history in 1946. He went on to Harvard University for his doctorate and moved to the United States permanently in 1950.

Over the years, he made a fortune in chemicals and has assembled an outstanding collection of Dutch art. Bader has been a generous benefactor to his Canadian alma mater. Ten years ago, he bought a castle in Sussex, England, he donated to

Head of an Old Man in a Cap is to be unveiled Sunday at the Eberharting Art Centre, Queen's University. It will be featured in an exhibition titled Gift of Genius: A Rembrandt for Kingston, which will run until Jan. 16.

Queen's.

His latest gift, titled Head of an Old Man in a Cap, was painted about 1650. It is one of only four paintings in Canada by Rembrandt van Rijn.

Janet Brooke, director of the Agnes Eberharting Art Centre at Queen's, said the Rembrandt is "a fantastic gift, an extraordinary little tiny panel, about 20 by 24 centimetres, painted with such bravura. The artist's connection to the subject is so empas-

thetic, you have a sense of the subject's character. It is a great work of art that enriches the national patrimony."

The painting was originally identified as the work of one of Rembrandt's students. But Bader, certain the work was painted by the master, bought it at auction for about \$200,000 in 1979. His bunch was confirmed.

No one will say how much the painting is worth, but a Rembrandt self-portrait, painted in 1634 and considered an inferior work, sold at auction this year for \$15 million. Other works recently sold for more than \$3 million.

Had there been different and he was able to get into McGill, Bader said "my collection would have come to McGill certainly."

ALAN HUSTAK FOR THE GAZETTE

ALAN HUSTAK FOR THE GAZETTE

ahustak@thegazette.ca; news@thegazette.ca

All our universities had unwritten quotas for Jews, historians say

It's difficult to find concrete evidence today of restrictive admissions, archivists find

ALAN HUSTAK
THE GAZETTE

Most Canadian universities desisted against Jews in the 1930s and '40s to varying degrees, not just McGill or the University of Toronto, but all of them. The system of quotas restricted the number of Jews to be admitted to each faculty was never officially stated, but it was understood.

"The quota system limited the number of Jews who could be admitted was widely known to exist," Wolff said — but it is hard to find any concrete evidence on the subject now," James Brown, director of the Canadian Jewish Congress told The Gazette. "Universities didn't need to write down the policy, it was just understood. Ironically, English-language universities had their faculty of a quota system in their facult-

ties than did the French language universities."

In fact, even Alfred Bader, a Milwaukee philanthropist who made his fortune in chemicals, concedes he might not have been able to get into Queen's, in Kingston, Ont., had it not been for his well-connected mentor in Montreal, Martin Wolff.

In his autobiography, Adventures of a Chemist Collector, Bader writes he was accepted at Queen's because Wolff was a friend of the registrar. "Wolff wrote to the registrar and a civil engineering friend, Professor Low, and I was accepted. I was

free man. I had been welcomed into a Canadian family and had been accepted by a prestigious Canadian university. I was determined to do my best."

At the time Kingston had an active Jewish community. Queen's was a bit more liberal than other institutions in the country and was slightly more receptive to Jewish students than Montreal or Toronto.

One authority on the subject, Queen's University history professor Gerald Tulchinsky, says McGill's dean of arts in the 1930s, Dr. Mackay, a philosopher and lawyer, expressed the view

that "Jewish people are of no use to us in this country" and restricted Jewish enrollment in his faculty to 20 per cent.

Mackay also required Jews to have high school averages of 75 per cent, compared with 60 per cent for gentiles, before they would even be considered for admission to McGill.

By 1939, the student enrolment of Jews in McGill's medicine and arts faculties was held to about 12 per cent, and in law to 15 per cent. Tulchinsky writes in Branching Out: The Transformation of the Canadian Jewish Community published in 1999.

The prejudice wasn't only against Jews; women, Italians, eastern Europeans and Mennonites were also branded as "non-preferred" and discouraged from attending Canadian universities, no matter what their academic standing.

The attitude was widespread until 1950, when Prime Minister John Diefenbaker introduced his Canadian Bill of Rights and legislated an end to discrimination. Most authorities concur that the quota system disappeared in the late 1960s.

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Spending has been going up each year since mid-'90s

CHERYL CORNACCHIA
THE GAZETTE

Yves Robitaille and Suzanne Plouffe started getting ready for Halloween in August, and they estimate 800 hours have been devoted this month alone to decorating their Pincoort house.

With the help of 30 friends and family members, they have transformed their garage into a Frankenstein laboratory and their backyard into a cemetery for the living and dead. Last weekend, they put a banquet table on their front lawn.

Last year, 7,000 children screamed and shivered their way through Robitaille and Plouffe's haunted house, and the Pincoort family — Livi, Anne, 17, and Maxim, 14, also participate — want to celebrate the same way this year.

Their friends and family members — dressed as Jason, Freddy, Dracula, the grim reaper, Medusa and an assortment of other monsters, ghouls and witches — are expected here on Saturday night for a party.

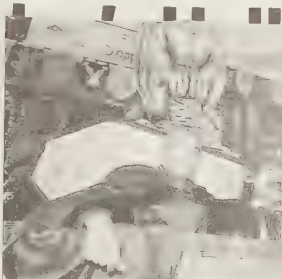
After that, they open the doors to the neighborhood every evening until Halloween is over. Last year, they raised \$12,000 for the Children's Wish Foundation.

If you somehow missed it, Halloween has become a cultural phenomenon second only to Christmas, surpassing Thanksgiving, Easter, Valentine's Day and all other holidays when it comes to retail sales generated.

Blame it on the dollar store, an economy that makes people want to score up good times, or Martha Stewart herself, who got us decorating in the first place. The days of a solitary jack-o'-lantern on the front stoop are over.

People no longer wear a white sheet or dress up like hobos. Today, Halloween means elaborate costumes that are worn at home and at the office and a round of festivities that rivals the Christmas season.

Halloween spending has



Yves Robitaille dons his Dracula costume to sit in a coffin by his Pincoort home. Last year, more than 7,000 children screamed and shivered their way through Robitaille's haunted house.

It's called Ste. Anne des Plaines, and each year the town of 13,000 northeast of Montreal does Halloween like no other in Quebec.

Everyone decks their halls with cobwebs and then takes part in the Festival de Halloween, a ghoulish, 10-day extravaganza that's not for the faint-hearted.

been going up each year since the mid-'90s, and last week the Retail Council of Canada predicted even more monstrous Halloween sales this year. We're expected to spend a record \$600 million, up from \$700 million in 2000.

Diane Brisebois, president of the council, said Halloween is now second only to Christmas in spending and on a par with back-to-school time.

Citing various retail industry sources, she said an estimated 85 per cent of Canadians now decorate their homes for the holiday and 23 per cent their offices.

This year, with Halloween falling next week on a Friday, she said, consumers could spend more than \$2 a million at clothing rental/costume stores;

Last year, more than 200,000 visitors made their way to Ste. Anne des Plaines, about 25 kilometres west of the city — for the event.

This year's celebration, the ninth edition, will include a soccer's house, a haunted barn, a pumpkin pavilion, a mysterious castle and a spooky railway station with a pumpkin-coloured train for the little ones.

\$7.6 million at stationery stores; \$6.7 million at discount stores; and \$39 million at miscellaneous and specialty stores — then there's candy.

Last year, according to the council's sources, Canadians spent \$205 million on Halloween sweets — up 6 per cent from 2001 — and sales are expected to rise again this year.

"It just keeps growing and growing," said Kim Bouché, who has owned L'Occasion, a costume rental shop in Dorval for the past 18 years.

In addition to the usual rentals for Halloween costume parties, she said, people who work in restaurants, bars, fitness clubs and other service jobs now come in to rent costumes to wear on the job. They have fun wearing them

It all kicks off tomorrow at 7 p.m. and runs until Sunday, Oct. 2, with events all day in the under-10's.

Activities start every day at 10 a.m. and close at 8 p.m. Monday through Thursday, at 10 p.m. Friday, 11 a.m. Saturday and 12 p.m. Sunday. For more information, check out the Web site: www.halloween.ca

on the job, she said, while other employees in more structured workplaces are organizing Halloween office parties so they don't miss out.

She said 20 men and women from one Westland company were at a Halloween costume party group of five from the office of the wanted sales staff, and crew and a local travel agency came in for medieval costumes.

Raymond Choinard, spokesman for the Royal Bank of Canada, said 250 of his employees will be dressing up in Halloween costumes this year for the 40th anniversary celebration, which takes place at Place Ville in Montreal.

"Halloween is not just for the people but big people," said Steve Lalonde, the manager of a St. Laurent construction

Stabbing victim was a prostitute, police reveal

A Montreal police officer escorts two women from an apartment building on Thompson Blvd. in St. Laurent, where a fire killed one man early yesterday and left his teenage son severely burned.

Blaze in apartment kills man, injures son

St. Laurent tenants driven from their beds; about a dozen left homeless by fire

One man died and a 14-year-old boy was severely burned in a fire that ravaged an apartment block in St. Laurent early yesterday.

Flames swept through the second floor of a building on Thompson Blvd. about 1:30 a.m. Operations chief Richard Liebmann said about 100 firefighters responded to the alarm.

One badly burned man, 47, was found to have suffered cardiac arrest and was pronounced dead, Liebmann said. The man — teenage son was

PHIL CARPENTER THE GAZETTE

was taken to Sacre Coeur Hospital and was listed in critical condition last night.

The 30 apartments were evacuated, sending about 100 residents into the street. Twelve people were left homeless.

Witnesses also reported seeing a man jump to safety from the fourth-floor balcony.

The building alarm went off once a heat detector was activated, but by then there was too much smoke and "it's difficult to survive," Liebmann said.

SIHARATHA BANERJEE THE GAZETTE

For the last six months, the city's latest homicide victim had been working as a prostitute in the Hochelaga-Maisonneuve district, police say.

Veronique Lalonde, 21, was found slain in a vacant Notre Dame St. E. lot on Monday.

Homicide investigators made her identity public yesterday in the hope witnesses who might have seen her in the 24 hours from Sunday to Monday will come forward.

Lalonde, the city's 34th homicide victim of the year, was stabbed multiple times in the chest, an autopsy revealed.

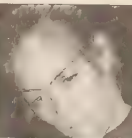
She was found partially nude in the middle of the empty lot. An investigator working on the case said her body had been there for a day, maybe less.

Lalonde was a known prostitute and had a drug problem, police said.

Police haven't found anyone who witnessed the crime. A homeless man who had set up a tent in the same vacant lot did not see or hear anything and is not considered an important witness.

Although it has not been confirmed, investigators believe Lalonde was killed in the lot. The area is known to be frequented by prostitutes.

A man walking his dog Monday about 1:40 p.m. made the



MONTRÉAL POLICE Veronique Lalonde, whose body was found in woods on Notre Dame St. E.

discovery in the wooded lot on Notre Dame between Dickson and Ste. Catherine St. E.

Pedestrian traffic is light in the area, but police are hoping someone might remember seeing Lalonde, an investigator said yesterday.

The manager of a nearby fast-food restaurant said this week plenty of prostitutes try to hitch rides at Via St., by Ontario and Ste. Catherine St.

There were 36 homicides during the corresponding period in Montreal last year.

Anyone with information can contact Montreal police anonymously via the Info-Crime telephone line at (514) 393-1133.

sbannerjee@the gazette.canwest.com

United by an enemy



BILL BROWNSTEIN
ON BOSTON

"As much as Montrealers love the Yankees

that was evil in baseball, and for that matter, the world, emanated from those cursed Yankees.

In fact, we became more obsessed by hating the Yankees as they kept winning more World Series than loving the Red Sox, who hadn't won since, it seemed, the Boer War. As a result, many Montrealers also became fans of the Milwaukee Braves and Brooklyn Dodgers — simply because they couldn't root for the Yankees in the World Series.

The young man seemed more



Bader lectures CHF on the rocky road to success

HURRICANE ISABEL DIDN'T PREVENT Aldrich Chemical founder Alfred Bader from giving the 2003 Ulyot Public Affairs Lecture in Philadelphia at the Chemical Heritage Foundation (CHF). Though the bad weather cut attendance to

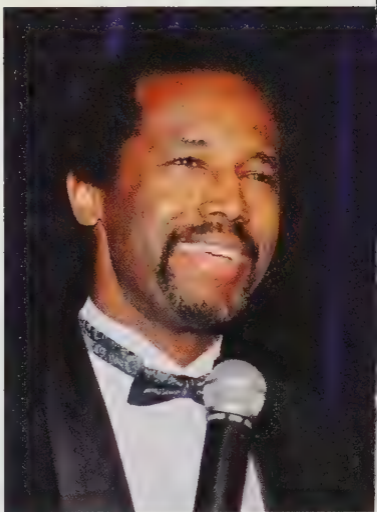


PHOTO BY STUART WATSON

about 100, half of what had been expected, Bader—shown here (left) with his wife, Isabel, and 1997 Public Affairs Lecturer and retired Merck CEO P. Roy Vagelos—regaled the audience with the story of the “rocky road to success” for the chemical supplier known since the 1970s as Sigma-Aldrich.

CHF President Arnold Thackray introduced Bader and “the real Isabel,” whom he complimented as both lovelier and much better tempered than the storm then brewing outside. As the real Isabel projected images for the audience on an overhead screen, Bader described such artifacts as his first advertisement: It appeared in the C&EN issue of June 1, 1953, and cost \$29.

While working toward his Ph.D. at Harvard in 1949, Bader said, Eastman Kodak—then the main source of research compounds—was unable to fill an order he sent. The disappointment led him to reason he could be “a chemist’s chemist” and supply building blocks and reagents to the research community. Bader had many successes and some setbacks, including his ejection from Sigma-Aldrich in 1992. He is again welcomed back at the company he helped make a \$1.2 billion success today.



ALL SMILES Benjamin S. Carson Sr. is the keynote speaker for the evening. He is joined by Gerard Lecoeur, C&EN's Madeleine

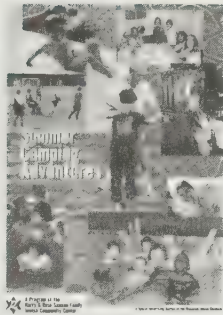


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Bader Foundation to fund local outreach initiatives

JFS, JCC, MJF to partner with national outreach organization

By Leon Cohen
of The Chronicle staff

Welcoming the stranger is a central Jewish teaching. It's so important that it is repeated more than 30 times in the Bible, said Rabbi Kerry M. Olitzky, Ph.D., executive director of the New York-based Jewish Outreach Institute.

But we usually think of the principle as applying to total outsiders. What if the stranger is an unaffiliated Jew, or a non-Jew married to a Jew? Is the community welcoming then?

Olitzky and his organization seek to help it become more so. He was in Milwaukee recently for the launching of two new outreach programs to be run by two of this community's major Jewish organizations: Jewish Family Services and the Harry & Rose Samson Family Jewish Community Center. Both programs are being funded by a grant from the Helen Bader Foundation.

JFS will create a "healing center," which will be not a physical place but rather "an umbrella for services and programs" that "add the spiritual component" to physical and mental health issues, according to JFS executive vice president Elliot Lubar.

The JCC will create a broad outreach

effort to unaffiliated and intermarried families, to "find these people, build bridges and ... open doors to the Jewish community," said Jay Roth, JCC executive vice president.

Both of these efforts will be created in consultation with JOI and with help in coordination and disseminating information to the community from the Milwaukee Jewish Federation, which encouraged the initiatives.

"The federation's strategic renewal plan had as one of its priorities outreach to unaffiliated and interfaith families," said Betty Lieberman, the federation's director of planning and strategic services. "We're happy that two agencies are expanding their work in this area because we think it is important to the community. We're anxious to have people feel at home in federation activities and in the larger Jewish community."

This past spring, the Helen Bader Foundation's Jewish Life and Learning program area



Jay Roth



Betty Lieberman



Elliot Lubar



Marge Eiseman

also in the planning stages. "How we do it, the tone, all need to be thought through," said Roth.

He said Eiseman will "be working as part of a team with the [Harold and Terry Nash JCC] Parenting Center staff and our Jewish educator to define the kind of programs and then determine how we're going to implement them. We're also in the process of establishing a committee, hopefully with inter-

faith centers for a more or a syna-., Lubar be gate-ervices, or yoga a heal-agogue,

Seniors

Continued from page 1

seeing changes in the types of services that the senior population wanted to have available to them."

The population here is much healthier and more active; "at 70 they look like 55 used to," said Taxman. They are not so interested in eating a big noon meal. They also live more in the North Shore suburbs — Taxman said the "center of the population" is Silver Spring Dr. — and they find coming downtown to the JHCC, where the Senior Center has been meeting, to be inconvenient.

So, within the next few months — Roth said a possible date is April 1 — the Senior Center will move north, meeting at Congregation Beth Israel three days a week and at the JCC's Karl Campus building on other days. Eventually, the entire program will move to the JCC once the Karl Campus is renovated.

Moreover, the JCC is "trying to define a model of adult services that would appeal to a broader cross-section of adults within the Jewish community," a group that includes "empty-nesters' and older," said Roth.

So the JCC is visiting sites in Chicago, meeting with a consultant from the Jewish Community Centers Association, assembling an advisory group and a program committee to "evaluate and determine the kinds of activities that this group would find interesting, stimulating and attractive," said Roth.

The JCC brought its ideas to MJF's Older Adult Services Panel, whose members "are very well educated as to the older adult population and the changes in the demographics," said Taxman. And panel members "felt it was critical for the JCC to be allowed to make this move and respond to what [its staff members] were hearing from the community."

According to Betty Lieberman, MJF director of planning and strategic services, "this is probably one of the best examples of agencies working with our community allocations process to develop a plan for the best use of communi-

ty resources," she said.

Lieberman added that the federation has provided funds for start up and renovations required at CBI for the program, and that they are a reallocation of funds previously provided to the Senior Center at the downtown site.

In addition, the kosher meal program has been reorganized. Not only will it stay at the JHCC and remain the only one of the county's 28 meal sites serving kosher food, but that organization also has "assumed the responsibility for programming at this site as well," according to JHCC president Mina Tepper.

As of Jan. 2, the program was renamed the Lakeside Senior Enrichment Program. While Taxman said the primary motivation for participants, many of whom live in that neighborhood, is the meal, the county's mandate for all the meal sites requires that additional programming be provided as well.

Tepper said that JHCC is "using a team approach in providing a variety of programming" before and after the meals. She said these programs comprise about 50 percent participation activities, 25 percent "lecture and learning" and 25 percent entertainment — although some of the offerings cross categories, like the ever-popular ballroom dancing lessons.

Tepper said the JHCC is also publicizing the meal and programming offerings at the site through monthly mailings to "a large mailing list" of possible participants and weekly flyers distributed to people attending.

The federation is also providing funds for start up and marketing of the program and will continue to fund 30 cents for every meal served, which is the additional cost of providing kosher meals above the money provided by Milwaukee County.

Tepper added that transportation to the site from within Milwaukee County is available, paid for by the county.

For more information about these programs, call the JCC, 414-964-4444, and the JHCC, 414-276-2627.



Mina Tepper



PROMISES KEPT ... Two years ago I made some very specific promises to you — promises to eliminate the corruption in County government. I've kept those promises, but that is just the beginning.

IT'S A NEW DAY... Despite the progress we've made, we still have work to do. I'm currently working to reduce the number of political appointees and to improve the ethics code. We must also continue to hold the line on property taxes.

I ask for your vote on February 17.

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Bader *Continued from page 1*

made a grant of \$75,000 for each of three years (total \$225,000) for these efforts.

Of this, one-third will go to the JOI for consultation, and one-third each to JFS and the JCC for the specific programs, according to Tobey Libber, program officer for Jewish Life and Learning at the Bader Foundation.

"The reason why [funding these efforts] became an important opportunity for the Helen Bader Foundation is because of the potential for service to two of our largest and most effective Jewish communal agencies in areas that they would not otherwise be able to do," said Libber.

And the foundation, he added,

"is eager to support new projects that will benefit the Jewish community of Milwaukee."

At both agencies, the specific content of the programs will be designed in consultation with JOI, said Lubar and Roth. Moreover, there will likely be opportunities for collaboration between the programs, they agreed.

JFS has hired Michael Lubar to coordinate the healing center, and Marge Eiseman will staff the JCC's program.

Lubar said that many Jewish family service agencies have begun offering healing centers as part of their pool of services because, he said, "there is a feeling" that "we have not paid enough attention to the integration of spirituality and emotion" in physical health and mental health issues, he said.

A Jewish healing center "makes

use of Jewish tradition and the community to achieve spiritual wholeness [or] offer comfort and perspective in the face of illness, pain or loss," said Lubar.

Exactly how Milwaukee's JFS will offer this is in the planning stages. Coordinator Lubar, who has a doctorate in psychology and himself has muscular dystrophy, said, "Our hope is to start out slowly with a few programs and then build." Early efforts could include visitation programs for the homebound, support groups for the bereaved and for caregivers, and creation of a Web site, Lubar said.

A side benefit from such centers is that unaffiliated and interfaith families often find them a more comfortable Jewish spiritual or communal environment than a synagogue or other institution, Lubar said. Moreover, they can be gateways to other community services, for example to a meditation or yoga class offered by a JCC, or to a healing service offered by a synagogue, he said.

The JCC's outreach program is

also in the planning stages. "How we do it, the tone, all need to be thought through," said Roth.

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Marge Eiseman



Tobey Libber

'Street ministry' for Jews? JOI says it must be done

One problem with much of the Jewish community is that it "treats the minority of Jews as if they were the majority," said Rabbi Kerry M. Olitzky, Ph.D., executive director of the New York-based Jewish Outreach Institute.

According to many studies of the American Jewish population, the largest denomination of American Jews is not Orthodoxy, Reform, Conservative or Reconstructionism. It is the "movement" of the unaffiliated, unconnected and uninterested, which Olitzky said numbers between 50 and 60 percent of the U.S. Jewish community.

And even of those who are affiliated, connected and interested, an estimated only 20 percent are in the community's "core" — i.e., those deeply involved in Jewish community activities, he said. The remaining 80 percent orbit the core; yet the community designs programs aimed mostly at the core, treating its members as though they were the majority of Jews, said Olitzky.

So how can the community reach the loosely connected and unconnected?

Two weeks ago, Olitzky came to Milwaukee with JOI program director Ruth Decalo. During meetings

with community leaders, he outlined his organization's approach to these issues and helped mark the launch of two new, JOI-advised outreach programs (see accompanying story).

The basic idea, Olitzky said, is that instead of waiting for Jews to come to the community, the community must go to them. Indeed, that is how the JOI defines outreach itself: as "going to where the people are" physically and psychologically.

Moreover, the organization calls upon and seeks to help Jewish communities and institutions do this through advising such practices as "street ministry" or "public space Judaism" — i.e., contacting Jews in the non-Jewish places they go, from shopping malls to grocery stores to nightclubs — and pointing out ways to "lower barriers" to entering the community.

And the upshot, he said, is that "if outreach works, everybody in the community benefits," Olitzky said.

Leon Cohen



Rabbi Kerry M. Olitzky

Seniors

Continued from page 1

seeing changes in the types of services that the senior population wanted to have available to them."

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Marci Taxman



Mina Tepper



SCOTT WALKER
COUNTY EXECUTIVE

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TORAH PORTION

Jethro, Moses worked at their evolving relationship

By Rabbi Shari Shamah

The first person we encounter in this week's portion is Jethro, or Yitro, which is also the portion's name. Within the first verse, we are given a description of his identity: priest of Midian and Moses' father-in-law (Exodus 18:1).

This detail helps us surmise that one of his more important characteristics is his relationship to Moses; his claim to fame is his daughter's spouse. How many in-laws do you know that would include mention of their son-in-law as one of two personal traits about themselves? Does this tell us something about Jethro's relationship with Moses?

Rashi, the great medieval biblical commentator, offers a clue. He says that Jethro prided himself on his relationship to Moses, i.e., "I, the father-in-law of the king."

However, we have learned earlier that Moses hinged his greatness on Jethro. After Moses received his mission from God at the burning bush, Exodus 4:18 says: "And Moses went and returned to Jethro, his father-in-law, and said to him: 'Let me go back to my kinsmen in Egypt and see how they are faring.'

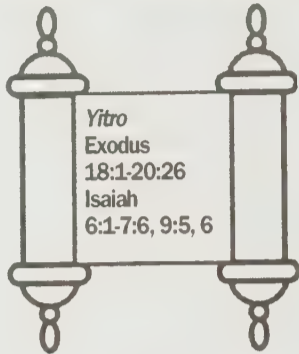
And Jethro said to Moses, 'Go in peace.'" It appears as though these two men had an unusually close relationship of mutual trust and admiration.

The Torah further elaborates on their connection (18:7): "And Moses went out towards his father-in-law, and prostrated himself and kissed him; and they asked each other of their welfare; and they came into the tent." The two men were genuinely pleased to be reunited.

Rashi again looks into their reunion and wonders: Who bowed to whom? The Torah uses the Hebrew phrase for "man to his fellow man." Since Moses often has "man" used to describe him, Rashi proposes that it must be Moses who bowed to Jethro. A certain amount of respect is accorded to his father-in-law.

The most important tenants of our faith, the Ten Commandments, also contained in this portion, underscore the notion of respect for parents, or in this case an in-law.

For well we know the fifth commandment: "Honor your father and your mother, that you may long endure on the land that the Lord your God is assigning to you"



(20:12). In fact, in the "Etz Chaim Torah Commentary," we learn that "the Torah explicitly requires 'respect' only in relation to God and to parents."

The Torah emphasizes "honoring" your father and mother; yet, it doesn't say "love" your father and mother. The two require different emotional connections.

While in the deepest recesses of our souls we hope that one both "loves" and "honors" a parent, the wording in the Torah helps us understand that not all relationships between parents and children, or, in other cases, between "in-laws" and children are ideal.

Just as Moses and Jethro have a

relationship that develops into a two-sided one throughout the Book of Exodus, so too must we allow for an evolving relationship throughout our lives between parents and children. Relationships require much hard work.

Later Jewish commentary helps demonstrate this. In "Sefer Chasidim," a 12th-13th century work by Rabbi Judah the Pious, we learn, "If your parents are always quarreling with your wife, and you know that your wife is in the right, you should not rebuke your wife in order to placate your parents."

Honor and respect are essential; mutual admiration and love are traits for which we must work. Jethro's description as the father-in-law of Moses suddenly holds more weight.

Perhaps the inclusion of this important detail alerts us to the hard work, dedication and devotion that he had in developing a relationship with his daughter and her husband. And when they embraced and kissed, we imagine that it represented a foundation of respect that in turn led to years of hard work.

Rabbi Shari Shamah is associate rabbi at Congregation Shalom.

Becker seeks re-election to Nicolet school board

Gail Becker is running for re-election to the Nicolet School Board against Mark Hopkins and Mark Majeski in the Feb. 17 primary election.



Gail Becker

Currently president of the board and a member of the Fox Point-Bayside School Board, Becker is a certified public accountant and a former adjunct instructor at Cardinal Stritch University.

She has served as a member of the State of Wisconsin Joint Legislative Council's Special Committee on the School Calendar and is a member of the state's Department of Agriculture, Trade and Consumer Protection's School Integrated Pest Management Advisory Committee.

A member of Congregation Emanu-El B'ne Jeshurun, Becker has also been involved with various local organizations.

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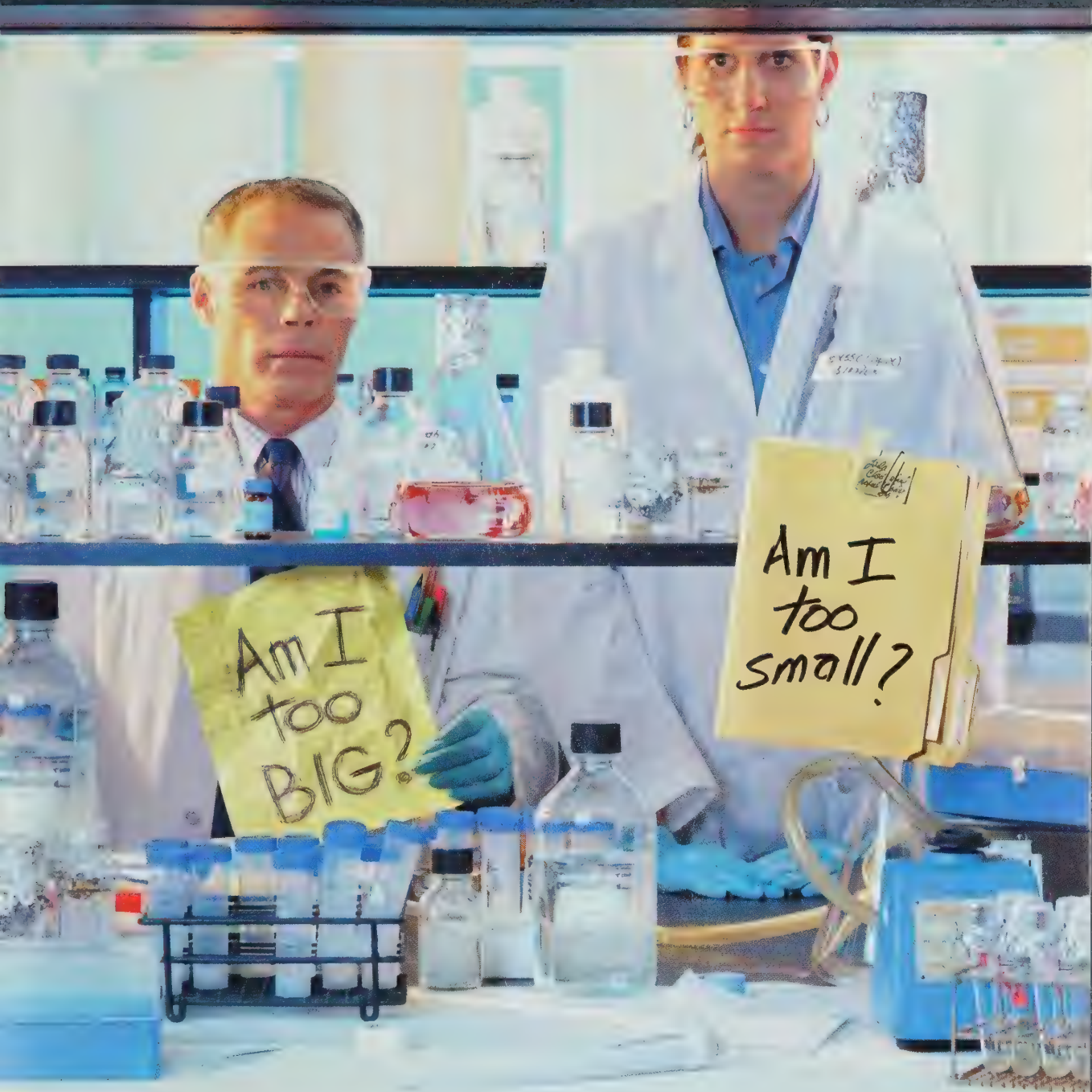
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QUOTE OF THE WEEK

"One thing in our business that I am absolutely sure about is that what we think is going to happen won't."

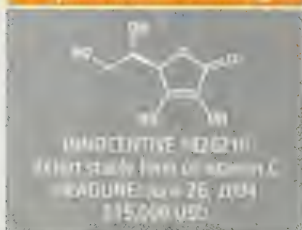
SIMON UPFILL-BROWN, business director, Dow Haltermann Custom Processing **PAGE 20**

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Pursuing Scientific Excellence

IS U.S. SCIENCE LOSING ITS COMPETITIVE edge? The *New York Times* addressed this question a few weeks ago in a long, page-one article by veteran science correspondent William J. Broad. Drawing from a number of sources, Broad concluded that many nations, particularly in Western Europe and Asia, are catching up with and in some cases even surpassing the U.S. in various measures of scientific and technological accomplishment. The U.S. no longer dominates the world as it once did in the number of scientific papers published, patents awarded, or Ph.D.s conferred.

C&EN has been covering these trends for many years. In this week's issue, Editor-at-Large Michael Heylin looks in some depth at one component of this question, the nation of origin of scientific papers over the past 15 years (see page 38). He finds that, while the long-standing scientific dominance of the U.S. persists, other areas of the world are closing the gap.

Heylin analyzed data on scientific publishing from the National Science Foundation, Chemical Abstracts Service, and the American Chemical Society's journal publishing operations. For all three data sets, a paper is assigned to a nation by where the work was done, not by the nationality of the scientist or scientists who performed it.

While the numbers from NSF and CAS differ in absolute terms, they reveal similar patterns of relative growth. These are among the findings Heylin turned up:

■ Growth in U.S. scientific publication has been flat in recent years, despite increases in research funding and personnel.

■ The U.S.'s share of scientific papers, according to NSF, fell from 38.1% of the total in 1988 to 30.9% in 2001, with the share from Western Europe rising from 30.9% to 35.3% and the share from Asia up from 11.1% to 17.5% for the same period; CAS data show a similar trend.

■ The U.S. share of papers published in ACS journals fell from 64% of the total in 1988 to 43% in 2001 and 40% in 2003.

As measured by CAS, the total number of scientific papers climbed from 390,000 in 1988 to 607,000 in 2001. The U.S. accounted for 33,000, or about 15%, of the increase. Strikingly, the increase for China was from 13,700 papers in 1988 to 59,300 in 2001, 21% of the increase. This gain

vaulted China from seventh to third in the world ranking.

There is much to ponder in the numbers unearthed by Heylin. It would be unseemly to suggest that increasing scientific and technological sophistication in nations around the world is somehow a negative development. Far from it. Increasing the store of scientific knowledge is one of humanity's loftiest pursuits, and no nation has a particular claim on it.

The numbers, coupled with a variety of developments reported in the pages of C&EN and conversations I have had with chemists and business leaders, give me pause, however. There can be no question that U.S. scientific and technological prowess has been a major component in the nation's economic growth through the 20th century. As the U.S. surrenders its dominant position in science to other nations, it runs the real risk of undermining its economic future as well.

China is a particularly interesting case. China's commitment to advancing science and technology is clear from the information developed by Heylin and many other indicators. China's leaders clearly believe that vigorous R&D efforts are key to the nation's economic development, and the leaders are pouring resources into advanced laboratories and science education.

We recently reported that Rohm and Haas will build a major research and technical center in Shanghai. When the center is fully occupied, it will employ about 225. Other chemical companies also have plans to open R&D centers in China. Part of their motivation is clearly that China is where the scientific talent is. This point is also made in a profile of WuXi PharmaTech, a contract research firm in Shanghai that is doing work for several multinational drug companies (see page 24).

The bottom line here isn't new. Excellence in science is critical to the nation's future, and as a nation, we must redouble our commitment to maintaining that excellence. Unfortunately, that is easier to state than to carry out.

Thanks for reading.

Rudy M. Baum

Editor-in-chief

Views expressed on this page are those of the author and not necessarily those of ACS

Many paths to faculty success

IN REFERENCE TO PAMELA S. ZURER'S ARTICLE "Initiative Targets Faculty Recruiting," ACS's new Academic Employment Initiative (AEI) inaugural event missed the mark (C&EN, April 19, page 45). AEI claims an effort to try to "broaden the recruitment process and make it more inclusive," yet the panelists at this inaugural event were a fairly homogeneous group, representing high "pedigree" and research-active institutions. Multiple times throughout the panel session, it was conveyed that one's "pedigree" is the key to landing an academic position.

As a member of the audience, I felt disheartened, realizing that I did not have the "pedigree" required to be successful. Yet there I sat, considering myself to have a "successful" academic position at a liberal arts college, where teaching is the emphasis. I looked around the room, wondering how many prospective faculty members there were in the audience who did not do research at a top 10 university. How did they feel about their job prospects?

The AEI inaugural event clearly sent the wrong message to prospective faculty members. There are numerous opportunities in academia for people who did not receive their Ph.D. at a top 10 school. Additionally, a "successful" faculty position does not necessarily mean a research-active environment. Even people with "pedigree" sometimes prefer a position at a teaching institution.

I look forward to a more balanced view at the next AEI event.

HELEN M. BOYLAN
New Wilmington, Pa.

Japan's island experiment

THE EDITOR'S PAGE "Lessons of Leaves" reminds us that plants are indeed the sole renewable resources and provide all the living organisms on this planet with material and energy (C&EN, May 3, page 3). In order to sustain human civilization for generations to come, we must minimize the use of nonrenewable resources for both material and energy. Would it ever be possible for a society to live off the renewable resources alone?

Well, let me outline such a society which indeed did just that. It was Japan during the Edo period (about 1600-1868). Japan

was closed to the outside world; no substantial amount of material and energy was exchanged with the outside world. It experimented, unwittingly, with a truly self-contained society. Throughout the period, the population was more or less constant, at about 30 million, about one-quarter of the present population. The population density, about 200 per sq. mile, was still much higher than that of today's U.S. (75 per sq. mile).

Without the import of food, material, or energy resources, Japan sustained its population. The society was preindustrial, and hence living conditions were much lower than today's standard. However, the level of culture was quite high, with flourishing art, theater, and academics, including mathematics. The number of books published was estimated to be the highest among all the nations at the time. The literacy level was quite high; primary education was widely available. Not only did the Japanese sustain the society, they improved their environment during this period. Soil was made more fertile and productive, rivers and lakes were made cleaner, and more forest was created.

How did they do it? Here is a summary of some prominent points:

- Peace prevailed; no waste of material and energy was necessary.
- Only truly renewable resources were used, and sparingly (that is, at a rate less than the natural renewal rate). For example, paper was made only from annually grown twigs of certain specific trees, and recycled.
- Human and animal waste was converted to fertilizer. (No synthetic fertilizer, of course, was known anywhere.) These resources were actually bought and sold.
- Virtually everything else was recycled and used as much as possible. For example, ash from burned timber (an energy source) was bought by a commercial enterprise, and useful chemical substances such as potassium carbonate were extracted and sold as fertilizer and for other uses. By the way, no significant amount of fossil fuel was used during this period.
- All artifacts, including those made from nonrenewable resources, were repaired over and over again and reused. (Some nonrenewable resources used were minerals for iron, copper, and other metals.)

I am not trying to advocate that we should return to such a preindustrial society, but I think that we can learn something from such an experience about the human spirit.

EI-ICHIRO OCHIAI
Huntingdon, Pa.

Early research initiatives

IT WAS INTERESTING READING THE ARTICLE on the expansion and improvement of undergraduate research as discussed at several ACS meetings (C&EN, May 3, page 33). I am pleased to note that, back in 1990, the Gordon Research Conferences, under the directorship of Alexander Cruickshank, took two major steps to stimulate this very activity. Our first action was to study the effectiveness of undergraduate science education and research, after which we began the series of Science Education Conferences in a number of different scientific fields.

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At the same time, we ran TARP, our Teaching & Research Program. This was designed to attract both undergraduate science faculty members and students to the Gordon Research Conferences. That drew so many new applicants that the registration form has been changed to note if the conference attendee is from an undergraduate institution rather than from the "usual" groups that dominated the attendance for so many years.

This was one of the first steps to initiate the activity that C&EN has covered now for several years, so virtually everyone is now very impressed.

RICHARD W. ZUEHLKE
Wilmot, N.H.

IP illuminated

ALL AREAS OF SCIENCE AND TECHNOLOGY experience conflicting claims of invention and priority; these claims intertwine financial and scientific interests and reflect clashes of personality. Nanotechnology, because of its perceived potential, has perhaps more than its share of these contentions, which are

aggravated by a lack of consensus on nomenclature. "Nanotech IP" may have tried, diplomatically, to avoid these issues, but it was not entirely successful (C&EN, April 12, page 17). One important issue concerns the core matter of invention of various types of carbon nanotubes (or "buckytubes").

When the article describes the intellectual property situation in carbon nanotubes—a matter that is related in both intellectual and legal ways to the matter of priority in invention—it is clear from the context that what are being discussed are what would be more fully described as "single-wall carbon nanotubes." On this subject, the article correctly states that both NEC and IBM control significant intellectual property concerning this class of carbon nanotubes. The article is incorrect in tracing NEC's position to Sumio Iijima's 1991 paper [*Nature*, 354, 56 (1991)]. In fact, single-wall carbon nanotubes were discovered simultaneously by the NEC and IBM groups, but not until 1993 [*Nature*, 363, 603 and 605 (1993)].

The exact substance of Iijima's 1991 "discovery" is central to assigning priority in

the overall field of carbon nanotubes. What Iijima described in 1991 were multiwall carbon nanotubes. In fact, multiwall nanotubes had a long literature and patent history prior to the 1991 paper by Iijima. Relevant papers and patents which describe multiwall tubes include the following: *J. Cryst. Growth*, 32, 35 (1976), and U.S. Patent 4,663,230, filed Dec. 6, 1984. Multiwall carbon nanotubes of the type described in Iijima's 1991 paper were, in fact, even in commercial use at the time of that paper. A recent, well-informed, and balanced article by W. de Heer [*MRS Bull.*, 29, 281 (2004)] appropriately credits Iijima's 1991 paper with awakening scientific interest in carbon nanotubes, but also correctly concludes that multiwall tubes had clearly been described, and their importance recognized, more than a decade previously.

ROBERT HOCH
Cambridge, Mass.

THE APRIL 12 ISSUE OF C&EN PUT THE next big thing—nanotech—on the cover. In addition to being a part of the title of the story, the word "IP" (in-

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lectual property) showed up around 30 times in the article. To me—an IP professor—the word sounded just like the meaning of “patent” in the article. In other words, “IP” could have been utilized interchangeably with “patent.”

However, we should be aware that IP is generally viewed as comprising four separate types of property rights: the big three (patents, trademarks, and copyrights) and trade secrets.

These four rights are different in nature, although sometimes they overlap. A patent conveys to its owner the right to prevent others from making, using, selling, offering for sale, or importing the patented invention. A trademark is a word, symbol, or combination thereof that is used to identify the source, albeit a possibly anonymous source, of goods. A copyright conveys to its owner the right to prevent others from copying, selling, performing, displaying, or making derivative versions of a work of authorship. Trade secrets consist of any valuable information that gives its owner a competitive advantage.

When dealing with technology, the IP

issue should be mainly narrowed down to patents and trade secrets. Only computer software might overlap copyrights, patents, and trade secrets.

SHYH-JEN WANG
Taipei, Taiwan

Global call to arms

KUDOS TO JURGEN H. EXNER FOR HIS comment “Global Climate Change and Citizen Chemists” (C&EN, March 29, page 45). He asks us to learn the issues, talk to others about them, write to our newspapers urging the government to invest in enhanced energy efficiency and conservation, save energy in our homes and factories, and choose fuel-efficient cars. In the long term, he says, the debate will be settled through science; we must embrace technologies that help us mitigate the potential negative effects of climate change.

These are all good things, but they will not happen automatically; we must demonstrate our support of them—long, loud, and often. Exner renders a real service in calling for individuals to exercise the rights

and duties of citizens. Maybe then the issue will be settled by science. What we should fear most is that it will be settled by inaction, which is really all it takes for the status quo to prevail.

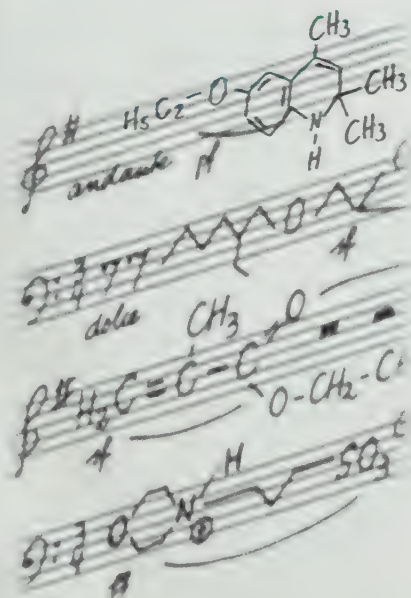
Exner’s most telling call may be to “embrace technologies that can help us to mitigate the potential negative aspects of climate change.” The scientific community today seems to be fixed on the reduction of CO₂ emissions as the only path to control the CO₂ level in the atmosphere, a very significant element of global climate change. Stabilization has been approached as a removal problem, resulting in very low cost methane and concentrated carbon forms suitable for segregation to achieve stability. This technology has been published over a number of years; only techniques already in use and well understood are required.

There may be other approaches to the control problem that are left out of consideration because of this seeming bias, and Exner exhorts us not to neglect them. Let us hope that his urging succeeds.

H. A. HARTUNG
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NEWS OF THE WEEK

JUNE 14, 2004 - EDITED BY WILLIAM G. SCHULZ & STEPHEN TRZASKA

BIOTECH INDUSTRY

BIOTECH FACES ITS PAST AND FUTURE

Annual conference focuses on persistent and emerging challenges

BILLED AS A KIND OF HOME-coming, the Biotechnology Industry Organization's 2004 exposition and conference convened last week in San Francisco, the reputed birthplace of biotechnology and one of the most diverse biotech industry hubs in the world.

This year's event, with more than 16,000 people in attendance, had an air of nostalgia, with a farewell address by departing BIO President Carl B. Feldbaum and presentations by prominent figures associated with key breakthroughs over the past two decades. Talk show journalist Charlie Rose hosted an opening session panel consisting of founders of pioneer biotech companies who assessed the progress made by the industry



Feldbaum

over the past 20 years and offered a prognosis for the future.

"It's gone faster than I would have ever dreamed, and it's taken more money than I ever dreamed," said Thomas J. Perkins, the found-

ing chairman of Genentech. Chiron cofounder William J. Rutter pointed out that increasingly sophisticated techniques are guiding researchers toward more curative biotech medicines; however, severe obstacles exist to developing these medicines at a reasonable cost and within a reasonable time frame.

Regulatory bureaucracy and the high level of uncertainty regarding success for expensive drug development efforts will have a chilling effect, Rutter said. Leroy Hood, president and cofounder of the Institute for Systems Biology, added that the rise of personalized medicines will intensify the need for regulatory streamlining and reductions in the cost of drug development.

Emerging issues such as bioterrorism and biotech drugs and foods that combat obesity figured prominently in conference sessions and on the exhibit floor. Former FDA commissioner David A. Kessler, now dean of the School of Medicine and vice chancellor for medical affairs at the University of California, San Francisco, told attendees at a Sunday brunch conference that obesity is a root cause of debilitating and deadly diseases including diabetes, arthritis, gallstones, and several forms of cancer. "We won't give patients much help if we try to fix each spoke of the wheel and do nothing to fix the hub," Kessler said.

In the exhibit hall, the Russian pavilion highlighted advances

made by the U.S. State Department's Office of Proliferation Threat Reduction and various Russian scientific organizations in redirecting one-time nuclear, chemical, and biological weapons facilities in the former Soviet Union to pharmaceutical and other applications. The program recently turned to antibiotechnology, with Russia's State Research Cen-



AP PHOTO/MARCIO JOSE SANCHEZ

ter of Virology & Biotechnology taking the lead on converting biological weapons operations into biodefense vaccine programs.

Meanwhile, Kevin Cox, vice president of biotechnology at Avecia, said his company expects to hear by August on its bid to supply the U.S. government with 25 million dosages of an anthrax vaccine it has been developing as part of an existing contract with the government. Cox said that Avecia, which is competing against VaxGen on the anthrax vaccine contract, is also developing a plague vaccine.

A sizable antibiotech demonstration on Tuesday, organized by a San Francisco group called Reclaim the Commons, served as a reminder that the industry still faces strong opposition on issues such as genetically modified foods and stem cell research. The group estimated that 500 protestors faced at least double that number of police officers. Some 150 protestors were arrested. —RICK MULLIN

STREETS OF SAN FRANCISCO
BIO 2004 attendees passed through a boisterous anti-industry demonstration on June 8.

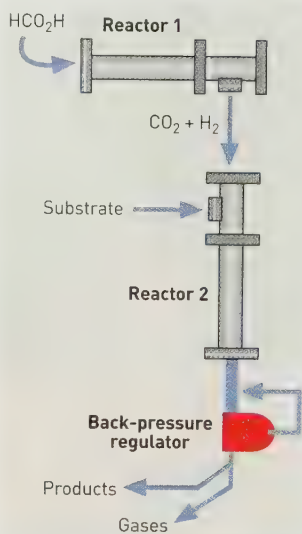
NEWS OF THE WEEK

SUPERCRITICAL CHEMISTRY

HYDROGENATION WITHOUT GASES

Hydrogen and supercritical fluids are formed in situ from liquid precursors

GASLESS PROCESS H_2/CO_2 mixture generated in reactor 1 hydrogenates substrates such as cyclohexene or 1-octene in reactor 2.



BY SIMULTANEOUSLY GENERATING both hydrogen and supercritical carbon dioxide, a new continuous hydrogenation process avoids the problems of handling gases under pressure.

Developed by chemists at the University of Nottingham, in England, the gasless laboratory technology relies on the decomposition of liquid formic acid, HCO_2H , over a heated platinum or palladium catalyst at 450 °C in a miniature reactor. The resulting H_2 and supercritical CO_2 are mixed with the material to be hydrogenated, then passed over a noble-metal catalyst in a second reactor.

"The gasless equipment is simple to use and eliminates the need for high-pressure gas cylinders," says chemistry professor Martyn Poliakoff, who developed the

process with postdoc Jason R. Hyde [*Chem. Commun.*, published online May 27, <http://www.rsc.org/is/journals/current/chemcomm/ccadvarts.html>].

Decomposition of HCO_2H yields H_2 and CO_2 in a 1:1 ratio. Feeding liquid ethyl formate, $HCO_2C_2H_5$, into the first reactor, where it decomposes to CO_2 and ethane, can lower the H_2 concentration. The parallel decomposition of HCO_2H and $HCO_2C_2H_5$ allows control of the H_2 concentration in the supercritical CO_2/C_2H_6 mixture.

Decomposition of $HCO_2C_2H_5$ in the absence of HCO_2H opens up possibilities for carrying out other supercritical fluid reactions. Hyde and Poliakoff have demonstrated, for example, that the equipment can be used for acid-catalyzed Friedel-Craft alkylations.

The Nottingham team members have been collaborating with HEL, a company based in Hertfordshire, England, that produces research-scale automated equipment, to develop the technology. HEL will launch a commercial version of the equipment next month.

"Our gasless technology unit eliminates the need to store, meter, and control gases," says HEL Managing Director Jasbir Singh. "The unit contains the electronics, the pumps, the pressure and temperature controls, and even an embedded computer with pre-loaded software."

The equipment can be used to automatically vary the process parameters for hydrogenations, polymerizations, and for other processes, he points out.

David J. Cole-Hamilton, a chemistry professor at the University of St. Andrews, in Scotland, and an expert on supercritical chemistry, believes the technology provides an attractive new route into supercritical reactions.

"Although industry has learned to handle pressurized gases, they represent a considerable hazard," he says. "Any method for reducing their inventory holds significant safety advantages. The *Chemical Communications* paper presents an elegant method for doing this."

Problems still need to be overcome, however. For example, HCO_2H decomposition leads to the generation of small quantities of carbon monoxide and water. If this decomposition is not controlled, "the concentration of CO in the gases generated will rise," the authors note. "Currently, we are investigating how the presence of CO in the H_2/CO_2 mixture can be exploited for gasless supercritical hydroformylation." —MICHAEL FREEMANTLE

CONFLICTS OF INTEREST

FDA Examines Its Ethical Standards

A recent FDA review to assess compliance with the agency's ethical standards shows that "the aggressive disclosure and review process designed to prevent conflicts of interest is working well," says Acting FDA Commissioner Lester M. Crawford.

Following a House Energy & Commerce subcommittee hearing in May that

raised questions about conflict of interest at FDA, the agency undertook a review of its employees' adherence to conflict-of-interest regulations. Crawford announced the results of that review on June 4. The conclusions are based on more than 1,800 submissions from agency employees of their outside activities.

After the hearing in May, FDA began to

tighten its conflict-of-interest regulations. It required that each agency director personally review all employee requests for outside consulting activities. Now, the agency is expanding the number of employees that must file declarations of financial holdings and conducting an annual review of outside activities.

"These are good first steps, especially if the requests for outside activities will be accessible to the public," says Jeffrey Delviscio of the Center for Science in the Public Interest. —BETTE HILEMAN

NEWS OF THE WEEK

BIOCHEMISTRY

ASTHMA NEXUS

Researchers pinpoint human chitinase as new target for asthma therapy

EVER SINCE HUMAN CHITINASE was discovered in the 1990s, its presence has been somewhat of an enigma. Chitinase breaks down chitin—the stuff of insect exoskeletons and parasite cell walls. Yet mammals themselves make no chitin.

Now, researchers at Yale University and McGill University, in Quebec, have discovered that one human chitinase (acidic mammalian chitinase) is a key player in the acute inflammation pathway of asthma [*Science*, 304, 1678 (2004)].

The group, led by Jack A. Elias at Yale, first recognized a strong similarity between the classic antiparasitic response of prokaryotes and simple eukaryotes and the exaggerated inflammation re-

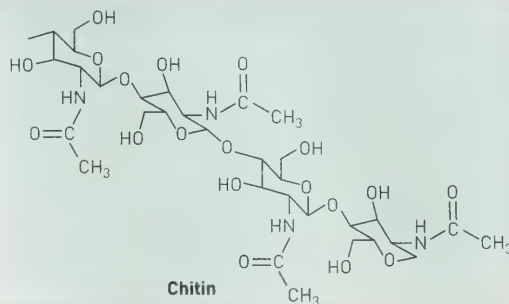
action in humans (called the Th2 response) that leads to asthma.

Because chitinase breaks down chitin in parasite cell walls, it is highly involved in the antiparasitic reaction, “so we thought chitinase might also be upregulated in human asthma,” says Qutayba Hamid, a specialist in asthma at McGill.

The group induced a Th2 response in mice and, indeed, saw levels of acidic mammalian chitinase rise. They also compared lung tissues of human asthma sufferers with normal patients. Only asthma patients had high levels of chitinase in their epithelial and macrophage cells.

Further, one of the symptoms of acute asthma is airway acidification, and acidic mammalian

chitinase functions best at pH 2.3. Elias' group suspects that current steroid therapy works partly because it raises the pH of the



airways. More generally, they say, any drug that hampers the activity of acidic mammalian chitinase will likely lead to milder inflammation in asthma sufferers.

The fact that some asthma attacks are triggered by exposure to house dust mites (and thus their chitin) may also be related to chitinase activity, Hamid says. But experiments haven't looked at that yet. —LOUISA DALTON

PHARMACEUTICALS

NOVARTIS TO ACQUIRE SABEX HOLDINGS

The \$565 million purchase will enlarge Swiss firm's stake in generic drugs

NOVARTIS HAS SIGNED A DEFINITIVE agreement to acquire privately held Sabex Holdings, a 23-year-old Canadian maker of generic pharmaceuticals, for \$565 million.

The acquisition of Sabex, based in Boucherville, Quebec, will add \$90 million in sales to Novartis' generic drug unit, Sandoz, which had sales of \$2.9 billion in 2003.

Sabex offers a range of copycat drugs produced at FDA-approved facilities that include injectables, suppositories, ophthalmic medicines, and other products cover-

ing more than 80 molecules. It received approval to sell eight new products over the past year and has 50 more under development.

Unlike other ethical drugmakers, Novartis has aggressively pursued growth in generic drug markets. In 2002, Novartis bought the Slovenian generic drugmaker Lek for nearly \$900 million. At the time, Lek had almost \$400 million in sales. The Sabex purchase will make Sandoz the leading injectable generics manufacturer in Canada and the sixth-largest Canadian generics maker.

Sandoz CEO Christian Seiwald explains that the firm paid a premium for Sabex because it “provides Sandoz with a leadership position in injectable generics in Canada and a platform to build a generic injectables business globally, particularly in the rapidly growing U.S. market.”

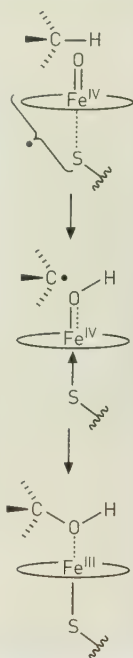
The U.S. market for injectable medicines losing patent protection is set to double from \$7 billion to \$14 billion between 2002 and 2010, Sandoz says. Sabex has expanded sales to U.S. customers and increased manufacturing capacity since 2002, when private equity firm Round Table Healthcare Partners purchased a majority interest in the company.

But Sabex's value is not just as a channel into the U.S. injectables market. Sandoz says it expects the Sabex sales force to help increase sales of its existing portfolio of solid-dosage drugs in Canada. —MARC REISCH



NEWS OF THE WEEK

COURTESY OF MARK HESTEN



IRON WILL The cysteine that binds the heme iron in P450s allows these enzymes to oxidize inert substrates.

BIOINORGANIC CHEMISTRY

PUTTING THE OH WHERE IT BELONGS

Study shows how P450s hydroxylate hydrocarbons but not themselves

ONLY A HANDFUL OF HEME proteins—for example, the medically important family of cytochrome P450 enzymes that metabolize drugs in the body—are capable of attaching hydroxyl groups to inert hydrocarbon substrates. A new X-ray absorption study of a model member of this protein class hints at what allows these enzymes to create reactive iron intermediates that can perform this demanding chemistry without destroying themselves.

The active sites of cytochrome P450s contain a heme cofactor whose iron center is coordinated to the protein via a cysteine thiolate. During catalysis, these enzymes are thought to use dioxygen to generate an Fe(IV)=O radical species. This highly reactive ferryl radical species is thought to abstract hydrogen from the hydrocarbon substrate,

forming a protonated ferryl that then hydroxylates the substrate.

Somehow, this highly reactive ferryl radical species performs hydroxylations without oxidizing the surrounding enzyme. "That's a remarkable feat," says Michael T. Green, an assistant professor of chemistry at Pennsylvania State University. He collaborated with chemists Harry B. Gray of California Institute of Technology and John H. Dawson of the University of South Carolina to try to figure out what allows a P450 to hydroxylate hydrocarbons without destroying itself.

Since it has proven impossible to trap and study these ferryl radical

species in P450 enzymes, Green's team turned to chloroperoxidase—a closely related fungal enzyme with an identical active site—as a model system. Using X-ray absorption spectroscopy to estimate bond lengths, they show that chloroperoxidase uses a catalytic intermediate just like the protonated high-valent Fe=O species thought to participate in P450 catalysis [*Science*, 304, 1653 (2004)].

This unexpected observation "gives us an indication of how P450 enzymes manage to hydroxylate their substrates," Green says. He suggests that the way the heme iron is tethered to the P450 enzyme is key: Most heme enzymes use a histidine to coordinate iron. But P450s' cysteine thiolate linkage do-



PHOTO BY SUELLEN HOPFER

Green

ates electron density to the ferryl group, making the oxo moiety more basic and ensuring that the species is protonated at pH values lower than 8.2, his team finds.

"This is a key contribution to the ongoing debate about the mechanism of P450," says chemistry professor James M. Mayer of the University of Washington, Seattle. His early studies of synthetic model systems indicate that the reactivity of ferryl species depends on both their redox potential and the ease with which their reduced forms can be protonated.

So because the electron-donating thiolate linkage makes it easier to protonate the ferryl species, P450s can rely on ferryl radicals whose redox potentials are lower than what would normally be required to hydroxylate inert hydrocarbon substrates, Green says. "Such species, while capable of hydroxylating normally inert saturated hydrocarbons, are less likely to oxidize the enzyme itself," he adds.—AMANDA YARNELL

NANOTECHNOLOGY

Nantero To Move Nanotubes Into Computer Chips

Nantero, a nanotechnology start-up firm, is working with the semiconductor manufacturer LSI Logic to incorporate carbon nanotubes into high-end computer chips. If these chips go commercial next year as expected, they will represent one of the first uses of carbon nanotubes outside of the product reinforcement realm.

Nantero was cofounded in 2001 by chemists Thomas Rueckes and Brent M. Segal and businessman Greg Schmergel to commercialize nanotechnology discovered by Rueckes while he was a research fellow at Harvard University. The firm has since raised more than \$15 million in venture-capital financing.

The company seeks to replace several existing forms of computer memory with one universal chip in which single-wall nanotubes are

strung over an electrode. Applying an electric field to one of the nanotubes causes it to dip down and hit an electrode, completing a circuit and creating the zeros and ones with which digital memory is formed.

LSI intends to use the technology in memory chips that it will make at its Gresham, Ore., facility. Because such chips maintain data when power is turned off, they could enable "instant-on" computers, Nantero says. They could also replace conventional memory in devices such as cell phones and digital cameras.

Schmergel says Nantero will obtain its nanotubes from one of the "couple dozen" companies that already manufacture the materials, which are now used mostly for the purpose of reinforcing plastic products such as tennis rackets and automotive parts.—MICHAEL MCCOY

NEWS OF THE WEEK

CHEMICAL WEAPONS

LAB TESTS CONFIRM SARIN IN IRAQI SHELL

Sophisticated analyses uphold tests fingering nerve agent in roadside bomb

CONFIRMATORY LAB TESTS have verified that the contents of a roadside bomb that exploded in Baghdad last month was the nerve agent sarin. Also known as GB, sarin is a potent cholinesterase inhibitor and bears the chemical name *O*-isopropyl methylphosphonofluoridate.

Initial field tests using an improved version of the Army's Chemical Agent Monitor (CAM) and M8 detector paper indicated the presence of sarin in the 155-mm artillery shell that was rigged as a bomb. M8 alerts mil-

itary personnel to the presence of a chemical agent. The more sophisticated portable CAM distinguishes among nerve and mustard agents but is notorious for yielding false positives.

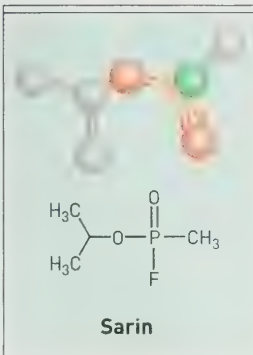
A U.S. official who asked not to be identified tells C&EN that follow-up lab analyses performed by the Iraq Survey Group confirmed the presence of "sarin and a major degradation product, diisopropyl methylphosphonate."

Liquid samples from the partially exploded shell were analyzed using gas chromatography/mass

spectrometry and Fourier transform infrared spectroscopy, this official says. The lab report does not discuss sarin's purity or concentration, the official says.

Days after the explosion, U.S. military spokesman Brig. Gen. Mark Kimmitt described the artillery shell as predating the 1991 Persian Gulf War and binary in design. Iraq admitted to having an R&D program to create a sarin binary shell but claimed not to have deployed such a munition. In a binary system, sarin is formed when methylphosphonyl difluoride, or DF, and isopropanol mix after the artillery shell is fired.

Jonathan B. Tucker, a senior researcher in the Washington, D.C., office of the Monterey Institute of International Studies, says if the shell was of binary design, the precursor chemicals didn't mix well. Its detonation caused only minor symptoms of sarin exposure in two soldiers.—LOIS EMBER



BIOENGINEERING

GENE MACHINE TRUMPS SYNTHESIS

Metabolic engineering improves path to compounds that kill parasitic worms

IN ANOTHER DEMONSTRATION of the power of metabolic engineering, researchers have developed a fungus that produces derivatives of a bioactive natural product that cannot be made efficiently using chemical synthesis.

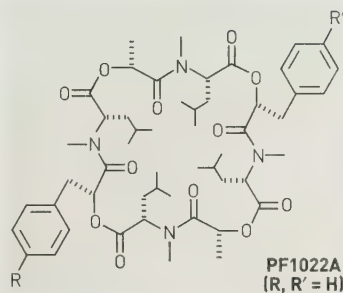
The natural product is the cyclooctadepsipeptide PF1022A. It consists of four residues of *N*-methyl-L-leucine alternating with two residues each of *D*-lactate and *D*-phenyllactate. Its potent activity against nematodes makes it a strong candidate to replace existing agents, to which resistance is increasing. Studies have shown that derivatives of PF1022A in which the para positions of the benzene

units are substituted with amino or nitro groups are even more potent against parasitic worms than the original natural product.

Chemical methods to introduce substituents at the benzenes' para positions are low yielding and inefficient for industrial-scale production. For this reason, Koji Yanai and coworkers at Meiji Seika Kaisha, in Kanagawa, Japan, turned to metabolic engineering. By modifying a filamentous fungus' biosynthetic pathway to PF1022A, they have been able to carry out para-position-specific substitutions by fermentation [*Nature Biotechnol.*, published online June 6, [Page.taf?file=/nbt/journal/vaop/ncurrent/abs/nbt978.html\].](http://www.nature.com/cgi-taf/Dyna</p></div><div data-bbox=)

The Japanese team replaced the phenylpyruvate pathway in *Rosellinia* sp. PF1022 with the *p*-amino-phenylpyruvate pathway from *Streptomyces venezuelae*. The phenylpyruvate pathway leads to *D*-phenyllactate. With the switch, the modified fungus produces *p*-amino-*D*-phenyllactate, as well as *p*-nitro-*D*-phenyllactate. The authors suggest that the latter is formed through the oxidation of amino groups to nitro groups, possibly mediated by a monooxygenase.

The route has two advantages, the authors say. It allows exquisitely position-specific substitution of the benzene rings. And it is far less hazardous and more environmentally friendly than chemical routes.—MAUREEN ROUHI



WORM BUSTERS
Derivatives with R, R' = NO₂ or NH₂ are more potent.



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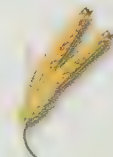
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GRUPE SNPE

CONCENTRATES

New top team is in at SNPE

French specialty chemicals and explosives producer SNPE has appointed a new chairman and CEO, Jacques Zyss, and a new executive vice president for chemicals, Michel Nicolas. Nicolas took up his post on June 3, replacing Bernard Fontana; Zyss must be approved at the next meeting of the French Council of Ministers. Nicolas oversees the company's four chemical units: Isochem fine chemicals, peptides, chemical specialties, and Bergerac nail polishes. SNPE has been seeking a joint-venture partner for Isochem for some time as part of a strategy of becoming a more global fine chemicals player. A recent press report put the firm in discussions with Solvay, but an SNPE spokesman counters that the company is in talks with several companies. Isochem has also been suggested as a merger partner for Rhodia, creating one of the national champions being encouraged by the French government.

Honeywell in bulletproof fiber project

Add Honeywell to the list of bullet-resistant fiber makers who are investing in production increases to meet U.S. military and security needs. The firm says it will spend \$20 million to boost output of its Spectra high-density polyethylene fiber at its Richmond, Va., plant by the second quarter of 2005. Earlier this month, DuPont said it would spend \$70 million to increase Kevlar *p*-aramid fiber output by 2006, and last month, DSM opened its first Dyneema high-density-polyethylene fiber line in the U.S. Nance K. Dicciani, CEO of Honeywell Specialty Materials, says the firm has invested more than \$25 million in Spectra fiber research and production in the past three years. In a recent C&EN interview (C&EN, March 22, page 13), she said sales of Spectra-based composites for bullet-resistant vests, helmets, and airplane cockpit doors are growing at more than 15% annually. The latest production increase will be devoted to military applications, she says.



HONEYWELL PHOTO

Symyx drug unit is now Ilypsa

Symyx Therapeutics, which applies high-throughput techniques to biopharmaceutical discovery, has changed its name to Ilypsa. The company has also appointed Scott M. Rocklage to be executive chairman. Rocklage is a partner in 5AM Ventures and the chairman of Cubist Pharmaceuticals. Additionally, Ilypsa, which had been working out of Symyx Technologies' facilities, is moving to its own 21,000-sq-ft space in Santa Clara, Calif. Investors in Ilypsa include the Sprout Group, Symyx Technologies, and 5AM Ventures.

Huntsman mulls more polyethylene

Huntsman Polymers hopes to begin construction by the end of this year on a 400,000-metric-ton-per-year low-density polyethylene plant at its ethylene complex in Wilton, England. Vice President Monte Edlund says the shutdown of ethylene derivatives units around the U.K. in the coming

years will free up significant quantities of ethylene. "We think the best use of the ethylene is to construct an LDPE plant," he says, adding that LDPE garners a price premium compared with other kinds of polyethylene. To help finance the investment, Huntsman intends to add \$100 million to an existing \$1.2 billion loan. The plant is slated to go onstream in 2007.

Great Lakes sells U.K. plant to Shott

Great Lakes Chemical has sold its Holywell, Wales, fine chemicals plant to Ian Shott Development for an undisclosed sum. Ian Shott, a veteran of fine chemicals firms such as Lonza and Rhodia, formed his own company last year. In April, his company acquired the Scottish engineering company WH Promotion. Shott says the Holywell business, which recently received an \$8 million investment, will capitalize on experience in nonnatural amino acid technologies and asymmetric synthesis. He also plans



GREAT LAKES CHEMICAL PHOTO

GOOD DEAL The sale of Great Lakes Chemical's Holywell facility includes these new labs.

to boost its contract research business. For Great Lakes, the sale represents an exit from the fine chemicals business; Great Lakes sold its Widnes, England, plant to Pentagon Chemicals in December.

Dow licenses drug patents ...

Dow Chemical has licensed patents from Epicyte Pharmaceutical related to the expression of antibodies in plants. The deal replaces an earlier development agreement between the two firms that ended when Epicyte was acquired last month. Dow's Dowpharma and Dow AgroSciences units are both pursuing the production of therapeutic proteins in plants. Earlier this year, Dowpharma formed a collaboration with Nobex for plant-based production of a peptide being developed as an appetite suppressant. Separately, Dow is moving its biopharmaceutical process development capabilities from Stony Brook, N.Y., to San Diego, Calif., home of its corporate biotechnology R&D center.

... and signs vaccine pact

Dow AgroSciences has signed a cooperative agreement with USDA's Arthropod-Borne Animal Disease Research Laboratory in Laramie, Wyo., to develop a plant-made vaccine to protect horses against West Nile virus. Transmitted by mosquitoes, the virus is fatal to about one-third of infected horses. Dow brings its expertise in plant-made vaccines to the collaboration, and USDA has specialized labs for vaccine development.

More sucralose is under way

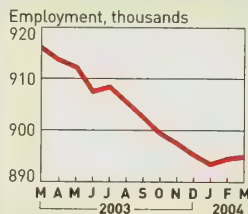
Tate & Lyle will begin a "significant" expansion of its sucralose sweetener facility in McIntosh, Ala., investing some \$30 million in the plant by January 2006. According to Tate

CONCENTRATES

& Lyle, the project will meet growing demand "across all categories," including new mid-calorie carbonated beverages containing the sweetener. Sucralose's developer, Johnson & Johnson's McNeil Nutritionals unit, sold the Alabama plant to Tate & Lyle in February. As part of the deal, McNeil granted Tate & Lyle worldwide marketing to food and beverage manufacturers, while retaining retail and food-service business marketing.

Employment inches upward

U.S. chemical employment increased in March from February, but only by 200 workers to 894,800, according to sea-



sonally adjusted data from the Labor Department. The March total was still down 21,400 from the same month in 2003. The number of production workers increased by 400 from February, to 520,200; however, this was 8,400 fewer than in March of last year.

Akzo develops new paint

Akzo Nobel's Copenhagen and Malmo, Sweden, R&D labs have developed a water-based exterior wood coating that contains 65% solids. A typical waterborne paint contains 35% solids. The increased solids content in the new Tinova VX paint means that it has minimal volatile organic compound content, well below new stringent

regulations set by the European Commission to go into effect in 2007, Akzo says. Distinctive small-polymer molecules ensure good penetration into wood, the firm adds.

Contract firms strike deals

Three fine chemicals companies have reached contract-manufacturing agreements with drug industry partners. In the small-molecule realm, Lonza will produce Isotechnika's trans-ISA247, an immunosuppressant, for use in upcoming clinical trials. In biopharmaceuticals, Biovitrum will manufacture Maxygen's improved form of interferon β , a multiple sclerosis drug, for Phase I and II clinical trials. And also in biopharma, Akzo Nobel's Diosynth unit will make clinical quantities of a therapeutic monoclonal antibody for Human Genome Sciences.

Abbott, Icos in drug pacts

Two antibody development deals were struck last week. In one, Abbott Laboratories will gain access to Protein Design Labs' technology for antibody humanization. Abbott is already a comarketer with MedImmune of the respiratory disease drug Synagis, a humanized antibody that was developed with PDL technology. Separately, Icos has licensed five monoclonal antibody candidates from Raven Biotechnologies. Abbott and Icos will make undisclosed payments to their partners.

Kemira and Tetra eye sale

Tetra Technologies has offered to acquire Kemira's calcium chloride business. Kemira

expects to complete an evaluation of the offer later this summer. The deal would include calcium chloride production in Finland and Sweden and a 50% share of a joint venture in liquid calcium chloride with Akzo Nobel in the Netherlands. Tetra, based in The Woodlands, Texas, calls itself the worldwide leader in calcium chloride production.

Sumitomo ups materials for electronics

Sumitomo will double capacity at its liquid-crystal polymers plant in Ehime, Japan, to 6,000 metric tons per year. The move is to prepare for an expected increase in demand for liquid-crystal polymer components such as the bobbins in the backlights of LCD televisions. As a first step, Sumitomo will increase capacity to 4,500 metric tons in the spring of 2005. In Ehime, Sumitomo is also building a new R&D lab fo-

cused on the development of optical films. Separately, Sumitomo will sell its plant making *o*-cresol novolac epoxy resin for semiconductor encapsulation to Taiwan's Changchun Plastics.

Rohm and Haas, Clariant open Asian plants

Rohm and Haas has inaugurated its largest Asian electronic materials facility and support center in Dongguan, China. Employing 200 people, the facility will manufacture Rohm and Haas's circuit-board materials and support the firm's packaging and finishing technologies businesses. The center will provide technical assistance to the sales force and test new applications for the company's products. Meanwhile, in Hsinchu, Taiwan, Clariant has inaugurated a new photoresist plant that will serve the liquid-crystal display market. The plant has capacity for 240 metric tons per year.

BUSINESS ROUNDUP

- **Air Liquide plans to invest** \$22 million to add 600 tons per day of nitrogen capacity at its Strathmoor facility near Edmonton, Alberta. The new capacity will meet growing demand for the gas, used in the extraction of methane from coal beds.
- **ProSkelia of Paris and Strakan of Galashiels, Scotland,** will combine in a 50-50 merger. The new drug company, focused on skeletal biology and steroid chemistry, will be headquartered in Galashiels, with R&D in Paris.
- **Oxford BioMedica will acquire** several patent families from Chiron's gene therapy patent portfolio for an undisclosed

amount. In a separate agreement, Chiron has made an equity investment in Oxford BioMedica of just over \$100,000.

■ **Australia's pSivida is the first company to start trading** on London's International Market Service facility, which allows trading in firms from markets outside the U.K. pSivida is developing a nanostructured porous silicon used for biomedical applications.

■ **Kalypsys, a 2001 spin-off** from the Novartis Research Foundation, will supply high-throughput compound screening and other technologies to the new NIH Chemical Genomics Center. The deal is worth as much as \$30 million to Kalypsys.

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RECALIBRATING CONTRACT FIRMS

Speed, agility, and know-how rule in the capricious world of nonpharma custom processing

RICK MULLIN, C&EN NORTHEAST BUREAU

THE NONPHARMACEUTICAL contract manufacturing sector has, like its drug-targeting counterpart, fallen on hard times. The economy, energy prices, Asian competition, and the shrinking market for agricultural chemicals in recent years have led to consolidation and a refocusing as companies pursue growth markets such as specialty polymers.

Custom processing of industrial chemicals is a diverse field. It includes small, independent firms such as Dixie Chemical and KMCO, as well as the contract manufacturing units of large, diversified chemical companies such as Dow Chemical, Degussa, and Clariant. Many have operations in major chemical centers such as Houston, while others operate in more remote areas like Galena, Kan.

They all, however, operate in the same economic environment as the customer base they share. For the past three years, that environment has been harsh.

"We are glad that 2003 is in the history books," says Philip A. Johnson, senior vice president and general manager of Dixie, which operates in Pasadena, Texas. Although sales were up more than 6% last year, Johnson says natural gas prices and raw material costs erased this gain from the bottom line. The firm is optimistic about continued growth in revenue this year, and has launched an efficiency campaign to mitigate the rising costs, he says.

Meanwhile, Houston-based KMCO saw a solid recovery in 2003 following unusually tough times beginning in 2001. Richard T. McDill, regional manager of

custom processing, credits improvement in the economy and a general movement of the chemical industry out of its slump. KMCO invested in two large reactors last year.

Similar stories can be heard across the sector. Although the timing may differ from company to company, producers uniformly speak of good indications for improvement following a surprisingly severe downturn in business over the past three years. Consolidation, reorganization, and



SHAPING UP Contract firms are consolidating operations and pushing for efficiency gains.

efficiency improvement measures—as well as some investment in capacity expansion—are under way to maximize profitability going forward.

"We didn't meet our targets for growth last year," says Simon Upfill-Brown, business director of Dow Haltermann Custom Processing, Dow's nonpharma contract business. "We were targeting 8% growth, but we achieved only 2%. You can say we were too optimistic. This year, we are targeting 5 to 6% growth."

Upfill-Brown says energy prices, the economy, and Asia factored into last year's performance, but the fate of a handful of important contracts also figured heavily. "We've had one or two projects in the last year in which we were expecting higher volumes and, for whatever reason, it didn't happen."

That phenomenon, according to Edward E. Greene, Dow Haltermann's commercial director, can have a big impact. "It's a project-driven business. The difference between 2% and 8% growth may come down to a couple of projects you thought you would land but you didn't."

TIMING AND SPEED are crucial in nonpharma contract work, Greene explains.

"A lot has to come together for our customers ultimately to sell a product that we would make for them," he says. "And the speed with which things develop is very much different than with pharmaceutical work. You have to go from initial trials to 20 million lb in 90 days." Repeat business is also important, he says. It is best for the contractor if customers have several projects in the pipeline, so that there is work coming up behind anything that drops off.

Upfill-Brown says this requires maximum flexibility and broad technological expertise. "We are thought of as a distillation company, because that's our roots," he says of his business, the core of which Dow acquired in 2001 as part of its purchase of Ascot Chemical. "But over 50% of the work we do has some sort of reaction component."

During the past two years, Dow Haltermann has consolidated operations, closing down its phosgene joint venture with SNPE and dismantling the plant. Assets that had been interspersed with Dow's fuel additives business in Houston were consolidated into one area of the facility.

Producers uniformly speak of good indications for improvement following a surprisingly severe downturn in business over the past three years.

Like many players in the field, Dow is separating pharma and nonpharma custom manufacturing assets. In January, the firm disbanded its custom and fine chemicals division, moving Dow Haltermann into specialty chemicals and Dowpharma into its Dow Ventures group.

Upfill-Brown says he is optimistic about business this year, noting an uptick in large-scale production in Houston and in Antwerp, Belgium, the firm's other large-volume production facility. "We have very rigorous pipeline management, and we are optimistic that a number of things in the pipeline will come through."

At Ruetgers Organics, the nonpharma contract unit of Ruetgers AG, speed and flexibility are highly prized. The company's competence in these areas has recently been put to the test, according to John Wetzel, director of fine chemicals.

As part of a project to cut capacity by 50%, Ruetgers consolidated operations this year at a 20-year-old plant in Augusta, Ga. In doing so, the firm closed its 47-year-old manufacturing operations in State College, Pa., transferring equipment and ongoing projects to the Augusta site, which

was originally built to produce 2-chloropyridine but was converted to contract work in the 1980s.

"The downcycle of the business certainly figured into the decision to shut down the State College plant," Wetzel says. "We now have a plant in Augusta running at better than 85% capacity."

Wetzel says the company is hoping to limit its exposure to swings in the agchem market by growing other parts of the business, such as high-tech and specialty polymers. In recent years, he says, agricultural chemicals have accounted for as much as 85% of the company's business. They are now down to about 50%.

One of the company's key strengths, Wetzel says, is process development. The firm has landed several contracts because of its ability to design and build processes that cut time and cost out of production or that eliminate dangerous solvents, he says. A key component of Ruetger's processing toolbox is phase-transfer catalysis, Wetzel says. This year, the company added new high-pressure and high-temperature reaction capability with equipment that can handle up



DOW HALTERMANN PHOTO

OVERVIEW Dow Haltermann sees an uptick at its large-scale processing operations, which include a plant in Antwerp, Belgium.

to 3,000 gal at a pressure as high as 600 psi.

Last year, the division introduced its first catalog product, polyphosphazene, a temperature-resistant, flexible material with aerospace and military applications. Ruetgers developed the product in partnership with Pennsylvania State University, according to Wetzel.

Georg Weichselbaumer, general man-

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ager of Clariant's nonpharma custom synthesis unit in Germany, says contract business has been stagnant if not declining in recent years. But things are picking up. And despite the fact that Clariant, like Ruetgers, is working to decrease its dependence on agricultural chemicals, part of the uptick is in agchem, Weichselbaumer says.

Still, agchem is a difficult business to rely on. "There are only three innovators left in Germany," he says, "Syngenta, Bayer, and BASF." Customers are also beginning to "in-source," according to Weichselbaumer. And while business is up this year—part of the "good news" is an outbreak of Asian rust fungus in South America—pricing is under constant pressure.

DEGUSSA PHOTO



Korell

RUETGERS ORGANICS PHOTO



Wetzel

DOW HALTERMANN PHOTO



Upfill-Brown

Cooperation is extremely important in nonpharmaceutical contract manufacturing, Weichselbaumer says. "Agchem is an especially cost-driven business. There is a huge effort on the part of the customer and supplier to jointly identify the potential for savings. Pharmaceutical customers are more focused on regulatory issues, and don't work as closely on the cost factor of the final molecule."

DEGUSSA ESTABLISHED separate businesses for pharma and nonpharma contract work last year. According to Michael Korell, business development manager for the company's new Building Blocks business unit, the move can be viewed in the context

"but you also have to be selective. You have to decide which technologies make sense from an economic perspective. Not every technology that looks attractive from a scientific perspective will be suitable because of the costs associated with it."

Korell says Degussa focuses on areas where technological strength is matched with back integration and secure raw materials supply. These include malonates, cyanoacetates, orthoesters, cyanamids, and downstream derivatives.

Agricultural chemicals make up a small part of the Building Blocks portfolio, and Korell does not expect significant growth. Major markets are polymers and polymer additives for adhesives and coatings, textile chemicals, and flavor and fragrance ingredients. Electronic chemicals are also a growing part of the portfolio. "But the growth push is in materials—polymers and modification of polymers," Korell says. "That is where most of the growth in the industrial market will be in the future."

Degussa's Building Blocks division manufactures in Germany, the U.K., Spain, Belgium, and the U.S. Although Exclusive Synthesis shuttered a plant in Germany over the past year, Korell says Building Blocks has not had to close any facilities. There is, however, a steady process of consolidation within the plants, whereby the company evaluates the relative benefits of filling idle capacity or shutting it down and pushing for efficiency improvements to accommodate new work.

Korell says results fell below expectations in 2003, largely because of energy and related raw materials costs. On the other hand, the recent slump has had a positive effect because of its impact on customers. "There is steady business from companies that are having a tough time getting the funding to start new [manufacturing] projects," he says. "Some of the projects we are currently discussing with people are driven by the intention to consolidate and shut down facilities, to hold tight, or by the lack of funds for investment in new capabilities."

Ultimately, sources agree that the business of contract manufacturing is fraught with this kind of contradiction. Although fortunes are to some extent tied to the economy, project management and sheer chance can pull business in the opposite direction. "One thing in our business that I am absolutely sure about is that what we think is going to happen won't," Dow Haltermann's Upfill-Brown says. "Then something else comes through. That's very much the nature of the business. You have to be extremely flexible." ■

Clariant has also downsized, closing a facility in Rock Hill, S.C., and mothballing operations in Elgin, S.C. The company also consolidated its plants in Griesheim, Germany. Overall, Clariant cut staff in this area by 200 in 2003, a 20% reduction.

All of this has taken place as Clariant took on the task of integrating the contract manufacturing assets of British fine chemicals producer BTP, most of which are in the pharmaceutical arena. Clariant's custom synthesis business currently consists of three units—pharmaceutical, nonpharma custom synthesis, and specialty fine chemicals.

Weichselbaumer says the company contemplated setting up an operation in China as a means of competing against low-cost Asian suppliers. "We decided we were too late to establish something new there," he says. "There is enough steel in the ground in China."

Instead, India is Clariant's primary front line in dealing with Asia, and the company is planning to nearly double the size of its plant in Roha. Although the Indian plant is run to Clariant standards, Weichselbaumer acknowledges that customers concerned with "intellectual property, reliability, and cooperation" tend to prefer to work with the firm in the U.S. and Germany.

of integrating Hüls, SKW Trostberg, and Laporte—all major acquisitions of the past four years, each with a contract manufacturing component. But ultimately, he says, splitting pharma and nonpharma contract work was a conscious decision on the part of Degussa to break up two businesses that had been managed as one.

In November, the firm announced the formation of the \$1 billion nonpharma Building Blocks unit and a pharmaceutical contract chemical division half the size called Exclusive Synthesis & Catalysts. The new structure will allow the nonpharma group to concentrate on a business operation that is ultimately quite different from pharma contract work, Korell says.

"There are very few pharmaceutical products that reach a scale of 1,000 tons or more. This is not uncommon in the industrial field," he says. Speed to commercialization is also a major difference—drug products can take six to eight years to reach the market, while in the industrial area many products are commercialized in two to three years. "As a supplier to the industrial market, you have to be able to keep up with the pace of your customers," Korell says.

Agility must be matched with comprehensive reaction expertise, Korell adds,


degussa.

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A CHINESE BASE FOR DRUG RESEARCH

Contract research company launched by Ge Li in 2001 already employs more than 200 scientists

THE PAST THREE YEARS HAVE been a dizzying ride for Ge Li, the founder of Shanghai-based WuXi PharmaTech.

Li, 37, started the contract research company in 2001 when he returned home to China after 12 years of living in the U.S. He tripled his sales in the 2002-03 fiscal year and expects sales to double again this year. Within a year or two, Li will be employing 500 scientists. U.S. competitors that had earlier expressed doubts about PharmaTech's capabilities are now trying to cooperate with the firm, he says.

PharmaTech's rented labs in Shanghai's Waigaoqiao Free Trade Zone are like an R&D mall of the world's most famous drug companies. One room handles projects for Sumitomo Chemical, another room takes care of Merck & Co. projects, and scientists in the next room work for another major pharma company. In one conference hall, a researcher from Eli Lilly is giving a seminar. Most researchers are wearing safety glasses, a rare sight in China, and the hallways are fitted with emergency showers.

It's early in PharmaTech's fourth year of operation, and the firm is completing

PharmaTech to import instruments and spare parts tax-free, saving the company about \$1.5 million. Lab chemicals imported from abroad take only about a week to reach PharmaTech, he adds, so waiting for missing materials does not unduly disrupt research projects.

About two hours away, at the opposite end of Shanghai, PharmaTech has invested another \$6 million in a current Good Manufacturing Practices-certified plant that will provide active pharmaceutical ingredients in kilogram or ton quantities for customers who want to initiate toxicology studies or clinical trials on samples generated by PharmaTech. The Shanghai firm is thus moving downstream from contract research and the provision of milligrams or grams of samples. For zoning reasons, the plant had to be located in a different part of the enormous city.

Li initially formed PharmaTech to provide contract research services to Chinese companies. In 1999, while the head of research at Pharmacopeia, he had gone to China to establish a research joint venture. The venture was never set up, but Li saw an opportunity to create China's first pharmaceutical contract research organization.

He formed PharmaTech with three other partners: Xiaozhong Liu, a mathematician and physicist who is now executive vice president; Tao Lin, who is in charge of internal operations; and Zhaohui Zhang, who handles domestic marketing. As if foreign drug companies had been long awaiting the opportunity to farm out some of their work to China, it was immediate-

ly easier to sign up foreign customers than Chinese ones, Li says.

Li says one reason PharmaTech has been so successful is its customer focus. He says the firm's employees routinely stay at work until 10 or 11 PM to communicate with overseas customers during their office hours. He maintains it's not a problem that most of his company's employees are more fluent in Chinese than English. "Communication and language are different things. You can communicate well even if you don't master the language perfectly," he says.

PharmaTech has designed a tracking system that allows customers to follow the

progress of their projects, much like Federal Express users can log onto the company's website to see where their package is. "Two days before a project is due, the system automatically sends a reminder to the researcher involved," Li says. "And if he or she misses the deadline, the system notifies his or her boss."

One would think it difficult for PharmaTech to secure quality talent in China. The students who are ad-

mitted to the science departments of the top Chinese universities are a small elite of superbright people, but they tend to move abroad after graduation.

Li argues that there is not much difference in quality between the graduates who leave China and those who stay. Some remain for personal reasons, not because no foreign university wants them, he says. Moreover, he adds, a firm like PharmaTech provides an incentive for bright people to stay in or return to China. For example, Shuhui Chen, who holds a Ph.D. from Yale and is now PharmaTech's chief scientific officer, was a senior research scientist at Eli Lilly in the U.S. before returning to China. For all practical purposes, Li says, the talent pool in China is "unlimited."

Once he employs 500 scientists, or about 700 total employees, Li says he'll slow down the company's growth for a while, more because he wants to catch his breath than because he lacks resources. His success has attracted the attention of international investment banks who are trying to convince him to take their money.

Pharmaceutical research can be an immensely complex area, but Li's business concept is simple. In pharmaceutical contract research, he says, "high quality at low cost will win out." —JEAN-FRANÇOIS TREMBLAY



Li

PHOTOS BY JEAN-FRANÇOIS TREMBLAY



GIVE ME MORE At this Shanghai plant, WuXi PharmaTech will soon start making larger quantities of the chemicals it produces in gram quantities in its labs.

construction of its own premises, also in Waigaoqiao. PharmaTech has invested \$12 million in the free trade zone, with \$5 million going into imported instrumentation. Li says that being in the zone allows

CONCENTRATES

Senate weighs in on stem cells

Fifty-eight senators have signed a letter to President George W. Bush calling for an expansion of the federal policy that limits the funding for human embryonic stem cell research. The letter, which is similar to the one sent to the President in late April by members of the House (C&EN, May 3, page 22), illustrates the bipartisan congressional support for changing the current policy that strictly limits the number of stem cell lines available for federally funded research. "Scientists have told us that since the policy went into effect more than two years ago, we have learned that the embryonic stem cell lines eligible for federal funding will not be suitable to effectively promote this research," the senators wrote. The letter also notes the senators' willingness to work with the President to modify the stem cell policy. "We should not close the door on a form of scientific research—nuclear transplantation—that has the potential of curing millions of debilitating and life-threatening diseases," said Sen. Orrin G. Hatch (R-Utah), one of the cosponsors of the letter.



Hatch

drug development pipeline: the identification of useful biological targets," explained National Human Genome Research Institute Director Francis S. Collins. In support of the research network, NIH plans to establish a repository to acquire, maintain, and distribute a collection of up to 1 million chemical compounds. To that end, the center plans to screen more than 100,000 small-molecule compounds in its first year. High-throughput screening is expected to begin later this year.

Senate votes to ease DOE tank waste cleanups

Radioactive sludge remaining in 51 large tanks along the Savannah River at the Department of Energy's Savannah River Site need no longer be treated as high-level radioactive waste due to provisions in the Senate fiscal 2005 Defense Authorization funding bill. Under a federal law written in 1982 and a district court decision reached last year, the sludge was to be handled the same way as liquid high-level radioactive waste in the tanks, which must be pumped from the tanks, treated, and eventually shipped to an underground repository. The new provisions, however, allow DOE to leave the sludge in the tanks and cover it with grout, saving the department billions of dollars and decades

of time for the cleanup. The provisions were sponsored by South Carolina Republican Sen. Lindsey O. Graham but opposed by Sen. Ernest F. Hollings (D-S.C.). Sen. Maria Cantwell (D-Wash.) led efforts to remove the provisions, fearing that they would eventually be expanded to include tank sludge at DOE's Hanford Site. Her amendment lost on a close vote. Cantwell and environmental and community groups believe grout will not contain the radioactive waste in the aging steel tanks. DOE officials say that, because of the amendment, some \$350 million in funds would be freed for cleanups at Savannah, Hanford, and Idaho, which all have radioactive waste tanks. The department had argued that the new provisions were needed before cleanup efforts could continue; community groups and some in Congress said DOE's actions were a threat. The funding bill is expected to clear the full Senate this week but must go to conference with the House, whose version of the bill has no such provisions.

U.S. to halve nuclear weapons reserves

The U.S. stockpile of reserve nuclear weapons will be cut in half, the National Nuclear Security Administration (NNSA) announced last week. The announcement follows one made by President George W. Bush in 2001 where he said the U.S. would cut the number of operationally deployed nuclear warheads to some 1,700 to 2,200 warheads by 2012, a reduction of about two-thirds from the nation's deployed, operational warheads. However, Bush's announcement was unclear as to whether these warheads would be held in reserve or actually be removed from use and dismantled. With the recent NNSA statement, about half of approximately 4,400 weapons that Bush planned to take from operational service will be dismantled.

FDA issues warning on domperidone

FDA is warning women not to use the unapproved drug domperidone to increase their milk production. According to several case studies, the drug caused arrhythmia, cardiac arrest, and sudden death in some patients receiving the intravenous form of the drug. It is approved only for gastric distress in some countries, but not for enhancing lactation. In the U.S., it has not been approved for any use. Women are purchasing the drug from compounding pharmacies and from foreign sources over the Internet, according to FDA. Domperidone, which is excreted in breast milk, is touted on several websites as safe and effective for milk production because the compound may increase the secretion of prolactin, a hormone that is needed for lactation. FDA also issued six warning let-

ters to compounding pharmacies that sell domperidone and to firms that supply the drug for use in compounding.

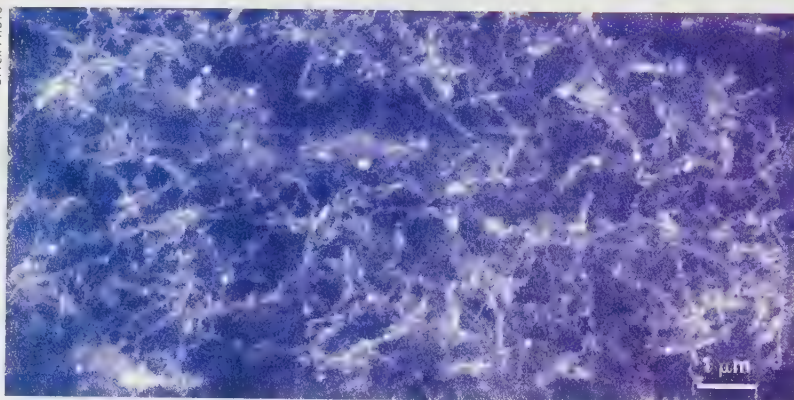
NIH launches new Chemical Genomics Center

As part of its Roadmap for Medical Research, NIH announced the establishment of the Chemical Genomics Center last week. The center is the first step of an initiative to set up a national network of centers that will produce chemical tools for use in biological research and drug development. The purpose of the center is to give "academic and government researchers a chance to contribute in a much more vigorous way to the earliest stages of the



Collins

ZYVEK PHOTO



TO MARKET ZyveX is using its Kentera technology to bridge functional groups onto nanotubes, which can then be dispersed onto a host. This field-emission surface scanning electron microscope image shows a polyurethane thin-film composite loaded at 2.5 weight % with Kentera. The carbon nanotubes appear as white fibers retained in the matrix.

PAVING THE WAY FOR NANOTECH

Institute of Medicine roundtable hosts forum to assess field, find ways to avoid misconceptions

SUSAN R. MORRISSEY, C&EN WASHINGTON

NANOTECHNOLOGY HAS BEEN billed as the next great technological revolution—sometimes referred to as the “second Industrial Revolution.” It holds great promise in a number of areas, including medicine, energy, and materials science. But as the science advances and applications begin to emerge, researchers and policymakers fear that unintended health and environmental implications and a backlash of negative public opinion will stop the field in its tracks.

To guard against such a backlash, a push is under way to make sure that, as the science moves forward, issues related to the environmental and safety implications and the ethical concerns of nanotechnology also are studied. This latter group of studies was the topic of discussion at an Institute of Medicine workshop held in Washington, D.C., on May 27. Sponsored by IOM’s Roundtable on Environmental Health Sciences, Research & Medicine, the meeting assessed the current state of research on nanotech implications.

“There are a number of uncertainties related to nanotechnology, but we’ve faced uncertainties before with emerging technologies,” roundtable Chairman Paul G.

Rogers, partner at Hogan & Hartson LLP, said at the opening of the workshop. He noted that the science community needs to make the science understandable so that informed policy decisions can be reached. To do this, communication will be key.

“It’s important to get the public involved up front,” said Kenneth Olden, director of the National Institute of Environmental Health Sciences at the National Institutes of Health. “We should anticipate that not every nanomaterial that is made will be benign” and be on guard to prevent harmful materials from being released into the public, he noted.

The public must have access to the facts so that they can educate themselves, Olden said. Otherwise, he added, they will not accept the resulting technological advances and will miss out on their benefits.

With the federal investment in nanotechnology at nearly \$1 billion per year, the nascent field is maturing and moving from the laboratory to the marketplace, where it is predicted to have a revolutionary impact. Nanotechnology is already being used to make products that include sunscreens, tennis balls, stain-resistant fabrics, and electroconductive coatings.

Currently, the estimated total amount of

nanoparticles in commerce is a few thousand tons, reported Vicki L. Colvin, associate chemistry professor and executive director of the Center for Biological & Environmental Nanotechnology at Rice University. This is not a significant amount of material, but as future concepts such as high-tech battle suits (C&EN, Aug. 11, 2003, page 28) become realities, the quantity will grow, she explained.

“We are at an optimal time to study these problems,” Colvin pointed out. “We are at the birth of a new market. We can shape this area with knowledge as it develops.”

PERHAPS THE BIGGEST challenge in trying to shape the emerging market and inform the public is the limited data on the toxicity and bioavailability of engineered nanoparticles, Olden said. For the available environmental and health data to increase, a better toxicity screening process needs to be in place. “Toxicology assessments will be expensive and daunting unless we can develop new strategies to identify toxicity on a large scale, not on a single material as is now done,” he said.

The small number of publications evaluating the toxicity of engineered nanoparticles is evidence of the difficulty in screening these materials. According to Colvin, only 50 peer-reviewed research papers on environmental and health effects of engineered nanoparticles have been published. The situation is better for naturally occurring nanoparticles, where Colvin noted that there are about 500 publications. By far, the most work in this area has been on incidental nanoparticles such as ultrafine soot and carbon black—for which there are more than 10,000 peer-reviewed publications.

The large number of papers on incidental nanoparticles came from industry studies looking at manufacturing by-products, Colvin explained. These nanoparticles have a high concentration in the environment and typically have a complex

“We should anticipate that not every nanomaterial that is made will be benign.”

composition, an ill-defined surface chemistry, and a diameter less than 100 nm.

In contrast, engineered nanoparticles are relatively new and are not yet present in the environment in high quantities. These particles also differ from incidental nanoparticles in that they are typically

traditional paradigm of evaluating particles' health risks. "The current paradigm says that health effects associated with inhalation exposure to particles are related to the mass of the material depositing in the lung," said Andrew D. Maynard, senior service fellow at the National Institute for Occupational Safety & Health.

When it comes to nanoparticles, however, the factors that contribute to the health risks include surface area, surface chemistry, and size-deposition probability and translocation, Maynard said. "But these factors do not include particle mass," he pointed out. This observation illustrates the need for a change in philosophy when dealing with nanoparticles, he said.

Another unique aspect of nanoparticles is their behavior, Colvin noted. Studies have shown that nanoparticles cannot be assumed to behave like a bulk material or a single molecule of the same composition, she explained. She also dis-

cussed three important lessons of nanoparticles' behavior that she has learned from the emerging data on fullerenes.

First, the physical size of nanoparticles is not constant, as they tend to form colloidal aggregates. Another point is that the surface of the nanoparticle influences its properties, and derivatizing the surface can significantly alter the toxicity. Finally, the properties of the nanoparticle will change as its surface interacts with the environment.

THESE OBSERVATIONS illustrate how hard it can be to determine the toxicity of nanoparticles. Based on the limited published data, the relative toxicity of engineered nanoparticles is worrisome, said John M. Balbus, director of the Environmental Health Program at Environmental Defense—a nonprofit, environmental activist organization.

For example, Balbus noted that the data available on fullerenes show that the particles are translocated to the brain, cause membrane lipid peroxidation, and prevent bacterial growth in an aqueous aquarium environment (C&EN, April 5, page 14). In



Colvin

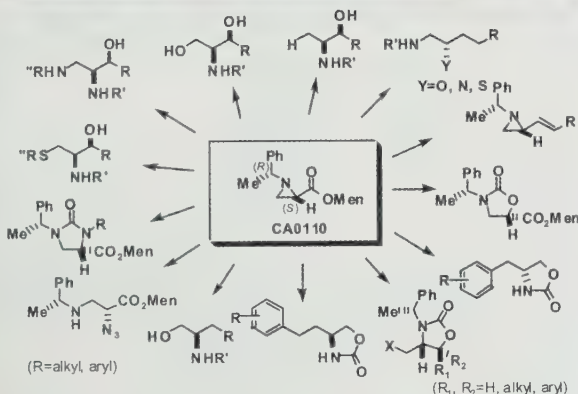


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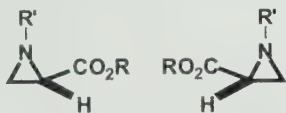
very pure in composition, have a controlled surface chemistry, and are much smaller in diameter.

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TARGETING TUMORS

Nanomedicine Moves Beyond The Bench

Although most of the scientific talks at a recent Institute of Medicine forum on implications of nanotechnology were devoted to precautionary tales of nanotech's negative impact on human health, University of Michigan environmental health professor Martin A. Philbert gave attendees a glimpse of how nanomedicine could transform cancer diagnosis and treatment.

Philbert has been developing a range of biological nanosensors called PEBBLEs (probes encapsulated by biologically localized embedding) in collaboration with University of Michigan chemistry professor Raoul Kopelman (C&EN, Jan. 29, 2001, page 31). PEBBLEs are nanoprobe made

of sensing molecules trapped in a chemically inert matrix. They can be used to monitor various chemicals inside living cells without doing any damage.

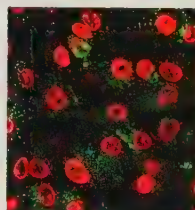
The researchers are currently trying to make more sophisticated PEBBLEs that go beyond sensing applications. The idea, Philbert says, is to make one PEBBLE that can

image a tumor and then, in a slightly different mode, kill that tumor as noninvasively as possible.

"The concept is simple, but the implementation is very difficult," Philbert tells C&EN. Creating PEBBLEs that can safely perform such varied tasks, he says, is like

a battle between physics, chemistry, materials science, and biology: "In order to get a very good medical therapy, you have to conquer each of those domains and have them work together."

Despite the technical challenge, the researchers have already seen some promising in vivo results using PEBBLEs to treat certain types of brain tumors in rats. They hope to publish the work within the next few months.—BETHANY HALFORD



COURTESY OF R. SCHNEIDER

CHANGING COLORS

PEBBLEs made with a ruthenium-based chelate kill rat glioma cells by generating singlet oxygen upon excitation with light. Dead cells appear red; living cells appear green.

addition, he added, carbon nanotubes that have been placed directly into the tracheas of rats have been found to cause the animals to suffocate (C&EN, April 28, 2003, page 30). Thus far, scientific studies do not

paint a reassuring picture of the environmental and health safety of these engineered nanoparticles, he said.

Many more questions must be answered before the toxicity can be confidently de-

termined, Balbus noted. "What we don't know far exceeds what we do know," he said. In light of this, he questioned whether current Environmental Protection Agency regulations under the Toxic Substances

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Control Act (TSCA) are sufficient to handle the developing use of engineered nanoparticles.

Under TSCA, engineered nanoparticles are not viewed as new compounds unless they have a unique composition. For example, TiO₂ nanoparticles are handled the same way with respect to regulation as bulk TiO₂, even though the two forms have different properties. This situation shows that new regulations need to be developed, Balbus said.

A model that could be used to regulate these novel materials is the one used by the European Commission, Balbus pointed out. The commission uses an algorithm that gives nonsoluble particles a higher risk assessment priority because these particles have the potential to bioaccumulate. Although the success of this proactive stance has yet to be demonstrated because it is still being implemented, it is an option worth considering, he explained.

Another model is to work within the existing regulatory framework until a new framework can be developed. This is what is happening in Canada, said Paul Glover, director general of the Safe Environments

Program at Health Canada. He noted that Canada is using horizontal management to address this problem, an approach where all the players—government, industry, and researchers—work together not as individual departments and agencies but as a multidisciplinary team.

The U.S. is also taking steps to develop an effective framework for dealing with nanotechnology, noted E. Clayton Teague, director of the National Nanotechnology Coordination Office at the National Nanotechnology Initiative. NNI—which provides a long-term R&D focus for nanotechnology and coordinates the relevant federal agencies in this area (C&EN, April 19, page 30)—is funding research into the environmental and health implications of nanotechnology. About 11% of NNI's funding is being used to study applications and implications in this area, he said.

Teague also said the federal agencies are

working together as part of the National Environmental & Health Implications working group to develop standards such as best practices and a common nomenclature for the emerging field.



Balbus



Teague

PHOTOS BY SUSAN MORRISSEY

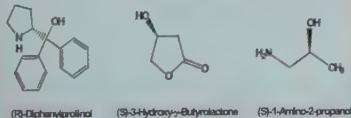
"The train has yet to leave the station," Maynard told the audience. "We have the opportunity to work hand-in-hand with people in industry" to ensure that regulations and policies are developed that allow the public to get the maximum benefits of nanotechnology. ■

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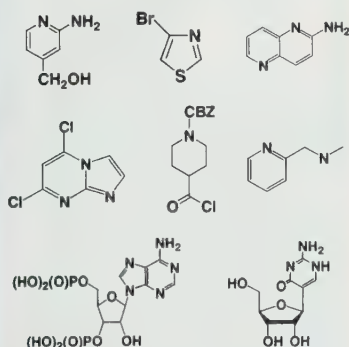
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CONCENTRATES

New complex turns H₂O into O₂

Chemists have created a ruthenium complex that catalyzes the conversion of water to molecular oxygen—a reaction performed by plants and of great interest for developing renewable energy sources [*J. Am. Chem. Soc.*, published online June 5, <http://dx.doi.org/10.1021/ja0486824>]. Researchers have sought to model this natural oxidation, which occurs via a manganese tetramer, but few examples exist. Now, a team led by Antoni Llobet, chemistry professor at the University of Girona, in Spain, has synthesized a promising compound containing two ruthenium atoms (shown, pink = ruthenium, red = oxygen, purple = nitrogen, and gray = carbon). The new complex turns H₂O into molecular O₂ at a much faster rate than other recently reported ruthenium-containing, water-oxidizing species. Those compounds contain rotating Ru–O–Ru groups, whereas the new complex, which does not, forms strategically oriented Ru=O groups, which likely help increase the complex's activity.



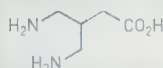
Small-molecule protein labeling with less labor

A general and efficient method for site-specifically labeling proteins with small synthetic molecules that's compatible with high-throughput protein microarray preparation and enzymatic screening has been developed by Christopher T. Walsh, Jun Yin, and coworkers at Harvard Medical School. Currently available methods for specific labeling of a target protein in a complex mixture of cellular proteins require attaching a bulky peptide tag to one end of the target protein. The tag directs the small-molecule label to the target protein. But these tags are bulky (200–400 amino acids) and don't work with all target proteins, Walsh says. Instead, his team tags the target protein with an 80-amino-acid component of a nonribosomal peptide synthetase. This tag can be enzymatically labeled with a small molecule such as biotin via a phosphopantetheinyl tether [*J. Am. Chem. Soc.*, published

online June 4, <http://dx.doi.org/10.1021/ja047749k>]. Biotin-labeled target proteins prepared this way can be directly immobilized on a streptavidin-coated surface for high-throughput enzymatic screening, the researchers say.

Diamino acids in meteorite

For the first time, diamino acids have been discovered in a meteorite. Using gas chromatography and mass spectrometry, a team led by Uwe J. Meierhenrich of the University of Bremen, in Germany, has identified seven diamino acids—including D- and L-2,3-diaminopropanoic acid, D- and L-2,4-diaminobutanoic acid, 3,3'-diaminoisobutanoic acid, 2,3-diaminobutanoic acid, and 4,4'-diaminoisopentanoic acid (shown)—in the Murchison chondritic meteorite [*Proc. Natl. Acad. Sci. USA*, 101, 9182 (2004)]. Previously, researchers found monoamino acids in the Murchison meteorite. Amino



acids arriving on Earth through similar avenues are thought to have triggered life's beginnings. Diamino acids may also have played a role in the development of life on Earth. They are the backbone of peptide nucleic acid materials thought to have preceded both RNA and DNA in early life. This new work suggests that diamino acids had extraterrestrial origins and may have arrived on Earth via meteorites during prebiotic times.

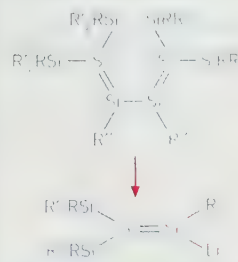
Proteins that harvest light tapped for electronics

The remarkable light-harvesting ability of photosynthetic protein complexes in plants and certain bacteria can make the scientists who create photovoltaic devices turn green with envy. But using the complexes as photon-harvesting components in solid-state electronics has proven difficult: They aren't stable enough for practical use when removed from their native biological environments. Now, a group led by MIT electrical engineering professor Marc Baldo and Shuguang Zhang has developed a technique for integrating the light-harvesting complexes from *Rhodobacter sphaeroides* and spinach's photosystem I into solid-state electronics [*Nano Lett.*, 4, 1079 (2004)]. Using surfactant peptides, the team was able to stabilize the complexes so that their functionality wasn't diminished when incorporated into solid-state electronics. The researchers report that depositing an amorphous organic semiconductor between the photosynthetic complexes and the top metal contact was also crucial to successful integration. The technique pre-

serves the complex's light-harvesting power for at least three weeks.

Silicon analogs of vinyl lithium

An unexpected stable silicon analog of a vinyl lithium compound has been isolated and characterized by chemistry professor Akira Sekiguchi and colleagues at the University of Tsukuba, in Japan [*Organometallics*, 23, 3088 (2004)]. The researchers prepared the sp²-type silyllithium by reaction of a tetrasil-1,3-butadiene with *tert*-butyllithium (shown). The crystal structure of the diene reveals a twisted silicon back-



R = methyl, R' = *tert*-butyl, R'' = trimethylphenyl

bone, which opens the compound up to attack by reducing agents, the researchers report. The silyllithium is formed by cleavage of the central Si–Si bond of the diene. It retains the sp² bonding and geometry of the parent molecule, and the lithium atom is solvated with tetrahydrofuran molecules. The silyllithium is expected to be an important reagent to synthesize disilene compounds, the researchers note, which in turn could be used to prepare silicon-based polymers. Another silyllithium, with triisopropylphenyl substituents, has also just been reported by postdoctoral researcher David Scheschkewitz of ETH Zurich [*Angew. Chem. Int. Ed.*, 43, 2965 (2004)].

SE PHOTO



TRIO AT TRINITY John Hegarty (from left), provost of Trinity College, Dublin; Harney; and Harris view ultra-high vacuum scanning tunneling microscope at opening of SFI Trinity Nanoscience Laboratory.

INTERNATIONAL

IRELAND INVESTS IN HIGH-IMPACT SCIENCE

Foundation promotes world-class research of strategic economic value to country

MICHAEL FREEMANTLE, C&EN LONDON

IRELAND IS IN THE PROCESS OF MAKING the largest investment in scientific research in its history. Central to this investment—more than \$775 million over six years—is Science Foundation Ireland (SFI).

The foundation was set up by the Irish government in 2000 as part of its National Development Plan 2000–06 to support globally competitive scientific and engineering research in strategic areas that advance the country's technological and economic success and reputation.

"In essence, Ireland has embarked on what amounts to a new direction in industrial policy," notes Mary Harney, deputy prime minister and minister for enterprise, trade, and employment. "This policy aims to generate clusters of world-class technology-based companies, both Irish- and foreign-owned, that work in new knowledge areas in collaboration with universi-

ty researchers. Together, they will advance scientific knowledge, commercialize research output, create high-level jobs, and build an entrepreneurial environment in which new technology-based businesses will prosper."

According to SFI Director General William C. Harris, one of the major aims of the foundation is to make Ireland attractive for science.

"Our fundamental desire is to make Ireland a place that's not only friendly to scientists, but also science-friendly," he says. "We have put together programs for centers, individual scientists, visiting scholars, conferences, and workshops—a small portfolio of programs that has begun to transform the research landscape in Ireland."

SFI's initial investment programs are geared to research that underpins biotechnology, as well as information and communications technology (ICT).

"We selected these fields because Ireland has a huge industrial presence in biotechnology and ICT sectors," Harris says. "If we didn't provide an intellectual foundation for these activities, the country might have a difficult time retaining a lot of these companies in the future."

Harney notes that 1,000 companies in the ICT sector, nine of the top 10 pharmaceutical companies, and 13 of the top 20 medical device companies have bases in Ireland. The total includes 630 software companies; 175 engineering companies; and 170 pharmaceutical, medical products, and chemical companies.

SFI is, to a large extent, modeled on the U.S. National Science Foundation, observes Harris, a chemist who worked for 20 years at NSF and, during that time, led the NSF Mathematical & Physical Sciences Directorate for five years.

"We're adapting the NSF model to what works and makes sense in Ireland," Harris says. "NSF was set up and run by scientists and engineers to set priorities and to be a highly competitive system. It's open, transparent, and flexible, and it adapts and changes over time."

SINCE 2001, SFI has made investment commitments of more than \$384 million to support more than 750 scientists carrying out research that aims to foster industrial development in the country.

The investment includes end-of-year (2003) funding awards of \$82.8 million, announced in January of this year, for several new research professorships; two new SFI Centres for Science, Engineering & Technology (CSETs); and other programs.

SFI funding is awarded only after a rigorous review process led by international experts. For the CSET awards, experts in science as well as government and industry leaders participate in the review. They assess the application's level of research quality, collaboration, intellectual breadth, flexibility in responding to new research opportunities, and integration of research and education.

CSETs are campus-industry research

"Our fundamental desire is to make Ireland a place that's not only friendly to scientists, but also science-friendly."

partnerships that link scientists, engineers, and industry. The centers normally receive awards ranging from \$1.2 million to \$7.2 million per year for up to 10 years. Industry partners add a minimum of 20% to SFI's support for each award in the form of funding, personnel, or equipment.

"All SFI CSETs have been established to create highly competitive academic research teams linking academia and industry as part of the foundation's effort to create and sustain a lasting indigenous research base that produces ideas, products, and jobs based on knowledge and innovation," Harris says. "Ireland's future depends on exploiting ideas and the creativity of talented researchers here."


Three existing centers focus on digital enterprise research, human proteomics, and alimentary pharmabiotics, and are located, respectively, at the National University of Ireland, Galway; the Royal College of Surgeons in Ireland, Dublin; and University College, Cork (UCC).

One of the new CSETs, to be known as the Regenerative Medicine Institute (REMEDI), will be established at the National University of Ireland, Galway, which has been awarded \$18 million of SFI funding for the project. The center will investigate and develop techniques for the repair of tissues and organs. Medtronic Vascular, Galway, is a major industry partner.


The other recent CSET award is funding of \$12 million for the Centre for Research on Adaptive Nanostructures & Nanodevices (CRANN) at Trinity College, Dublin (TCD). UCC and University College, Dublin, are partners in the project. CRANN's principal industry partner is Intel Ireland. TCD will also receive just over \$13.2 million of SFI funding for a new, specialized nanoscience research laboratory to be built on the college campus in the center of Dublin.

The CRANN laboratory will meet the environmental and vibration standards required for cutting-edge nanoscience research.

"The building, which is currently at the planning stage, will house nanoscience laboratories that will provide 150 scientists, technicians, and graduate students with the facilities needed to explore the nanoworld," explains John B. Pethica, director of the CRANN project. "The building will have ultrastable environments in the basement with vibration, temperature, and humidity control for our scanning-probe microscopes; clean rooms with equipment to engrave or assemble the smallest molecular structures; and specialist laboratories for nanoscale mechan-



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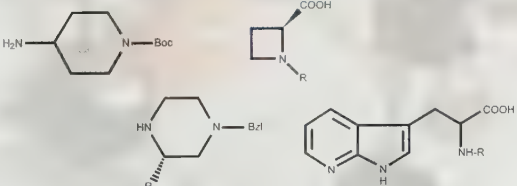
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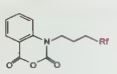
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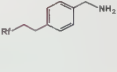
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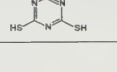


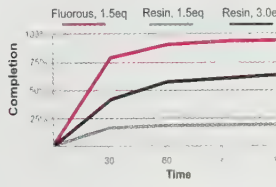
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


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
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
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
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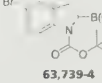
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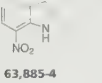
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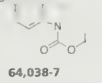
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Pethica points out that “crann” is the Gaelic word for “tree.” The new center is expected to bear fruit from four main branches, each representing a key area of nanoscience.

A nanoscale contacts branch will investigate various aspects of the transport of electrons at the contacts between nanoscale objects. “The influence of nanocontacts on semiconductor device fabrication and performance is particularly important for the electronics industry,” Pethica notes. “Any nanoscale object is significantly changed by contact with another object, and there is credible evidence that the contacts may control its function.”

An interdisciplinary group working in CRANN’s membrane-fluid interface branch will investigate transport across cell membranes, membrane-surface adhesion, and membrane fusion.

The third branch is concerned with pattern formation. The CRANN team will

SFI also operates a variety of other funding programs. Its investigator program, for example, provides grants for researchers in Ireland of up to \$300,000 per year for up to four years, with higher awards for exceptional researchers. The grants fund research equipment and materials and salaries for support staff.

One of the recipients is Damien W. M. Arrigan, a senior research scientist in the transducers group at the National Microelectronics Research Centre (NMRC), UCC. He has a four-year SFI investigator award of almost \$1.2 million for research on interfacial processes for future bioelectroanalytical sensing.

“As chemists, we are extremely lucky that our research can underpin both biotechnology and ICT, and hence there is great opportunity for the funding of chemical research within Ireland,” he says. “Chemists can contribute enormously to the future technologies that the Irish government has decided will be important in the development of our knowledge-based economy.”

investigator awards provides opportunities for researchers to assemble teams of post-doc and graduate researchers to work together on a given topic.

“My SFI investigator award allowed me to quickly expand my group to double its pre-SFI size,” he explains. “It also means that instead of writing many proposals and managing the resultant numerous grants, we can now focus on a smaller number of grants and concentrate on research without the hassle of nearly continuous report writing, which is a feature of some other grant agencies.”

Harris points out that SFI offers some of the largest grants for research of any government funding agency in the world. SFI fellow awards, for example, range up to \$1.2 million per year for up to five years. The awards support senior, distinguished scientists in Ireland who carry out research in biotechnology- or ICT-related fields.

SFI’s fellows-research professorships program, on the other hand, aims to attract outstanding scientists from abroad to academic institutions in Ireland.

One of them is John J. Boland, who was a chemistry professor at the University of North Carolina, Chapel Hill, before he moved to TCD as an SFI fellow and research professor in 2002. He has a five-year SFI award of just over \$9.3 million to carry out research on nanometer-scale aspects of silicon-process technologies.

“Although I’m an SFI research professor with funding for five years, Trinity has also secured my position here with a chair professorship,” he explains.

“OUR RESEARCH focuses on understanding nanoscale processing and materials properties for advanced device applications, including the development of new protocols for assembling, fabricating, and testing nanometer-scale device structures,” Boland says.

“We have, for example, been looking at halogen etching and, in particular, whether there are fundamental limitations on how smooth you can etch silicon,” he continues. “We have shown that the halogens used to etch silicon cause roughening to occur, and this is driven by steric crowding on the surface.”

In recent work, Boland’s group showed that even when the surface is sparingly covered with halogen atoms, roughening cannot be avoided because of the existence of a driving force that makes the atoms cluster together [*Phys. Rev. Lett.*, 92, 096103 (2004)]. The driving force is a “fundamentally new” type of interaction that lowers the surface energy of the silicon sur-

PHOTO BY MICHAEL FREEMANTLE



BRANCHING OUT Trinity College campus will be the site of the Centre for Research on Adaptive Nanostructures & Nanodevices.

carry out research on the self-assembly of chemical building blocks into nanostructured arrays and nanodevices.

Finally, a branch on spin currents will examine how spin-polarized currents in nanoscale structures can be manipulated for device design. “Conventional electronics ignores the spin of the electron—the property which makes each one a tiny magnet,” Pethica notes. “First-generation spin electronics has been based on magnetoresistors. The next generation will be built on multiterminal devices, and perhaps exploit magnetooptics to generate novel technology.”

Arrigan is particularly interested in the electrochemical behavior of molecules at liquid-liquid interfaces and how this behavior can be manipulated into strategies for chemical analysis.

“This behavior might be usefully exploited in future analytical systems or biosensors with biotechnological applications and could even result in new biotech start-up companies,” he continues. “There are numerous opportunities for other scientists working in the analytical area to benefit from this funding source.”

He observes that the size of the SFI in-

face, according to Boland. Even at low surface concentrations, attraction between bare silicon atoms on the surface drives the halogen atoms to form patches. The attraction results in surface roughening, making it impossible to maintain an atomically flat surface under etching conditions.

"We have now developed an instrument that can measure the stress resulting from

fluence of functionalization and interconnectivity, and the transport through the networks that results.

"We are looking at electrical contact formation with individual molecules," he continues. "We want to find out how the probe contact influences the states in the molecule and what implications this has for molecular electronics."

Boland is one of five SFI-funded principal investigators at the SFI Trinity Nanoscience Laboratory that was opened at TCD by Harney in January 2003. The laboratory comprises five investigative teams, each led by a principal investigator.

Equipment and facilities already in operation at the lab include a dual-beam focused ion beam/electron beam tool, an ultrahigh vacuum scanning tunneling microscope operating at very

low temperatures, a molecular beam epitaxy system for preparing and characterizing pure iron oxide films a few nanometers thick in ultrahigh vacuum, a sputtering system for making metallic multilayers and spin valves, an atomic force microscope for examining biological systems in situ, and a microfabrication clean room facility.

"The 54 people currently employed in the laboratory, including 20 graduate students, belong to the physics and chemistry departments at Trinity," notes Trinity physics professor Michael Coey, whose five-year SFI award of almost \$8.4 million

was approved in 2001. His team is investigating the conception and implementation of nanoscale spin electronics.

"The laboratory is home to a young community of 19 nationalities coming together from diverse backgrounds to create an environment of rich research potential," he observes. "Forty percent of this vibrant staff are Irish."

Principal investigator Igor V. Shvets was based, like his colleague Coey, at the Trinity physics department when his five-year SFI award of more than \$8.6 million was approved in 2001. Shvets, who obtained his Ph.D. at Moscow Institute of Physics & Technology, and coworkers are studying the surfaces and interfaces of magnetic oxides on the nanometer and atomic scale and are also looking at the development of the heterojunctions of these materials for information storage applications.

"IN PARTICULAR, we strive to understand the structural properties emerging at their interfaces and surfaces during spin-electronic events, which are at the nano level," he notes. "If we can demonstrate the relevance of this large class of materials to spin electronics, it could be of value to the whole of information technologies."

Physicist Suzi Jarvis, who previously carried out research at the Nanotechnology Research Institute, in Tsukuba, Japan, received a five-year SFI award of more than \$4.4 million in 2002. She leads a team that is investigating the function of nanoscale complex systems.

"We want to understand, manipulate, and use the function of molecules on the

PHOTOS BY MICHAEL FREEMANTLE



Pethica



Boland

these interactions," Boland says. "We can also use the instrument to look at the atom-scale features that result, and by applying an external stress, it is possible to control key surface chemical reactions."

The group is also interested in interconnects in nanodevices and particularly in the properties and performance of wires.

"Using a specialized atomic force microscope developed using SFI funding, we can now measure the stress-strain curves of wires with unprecedented levels of control," Boland says. "We also determine the electrical properties of the wires, the in-



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nanometer scale to help construct the foundations on which both nanotechnology and biotechnology will be built," she explains. "We hope to have an impact on medical and technological advances and help develop new biocompatible materials, diagnostic methods, and drug delivery."

"In essence, Ireland has embarked on what amounts to a new direction in industrial policy."

The fifth principal investigator at the SFI Trinity Nanoscience Laboratory is Pethica, who was previously professor of materials science at Oxford University, in England. He has a five-year SFI award of almost \$8.4 million.

"I came in 2001 following the first round of SFI awards," he says. "I was given quite a large grant to work on nanomechanics and atomistic mechanics."

In the 1980s, Pethica led a team that invented and developed atomic force microscopy and the technique of nano-indentation. "With this technique, we use an AFM tip to create a small dent in the surface of a material in order to measure

the plastic and elastic properties of the material," he says. "The technique is particularly useful for coatings. We can use it to characterize thin films, for example."

All five investigative teams and the equipment at the SFI Trinity Nanoscience Laboratory will migrate to the new

CRANN building when it opens. The building is expected to be completed in December 2005.

SFI also actively supports international collaboration in biotech and ICT research. For example, in January SFI announced funding for the first group of collaborative research projects to be awarded under its \$1.2 million Ireland-China Research Collaboration Fund Agreement.

"The goal of this agreement is to build links between Irish academic research leaders and their Chinese counterparts with a view to encouraging and sustaining research excellence in fields of investigation that are vital to both

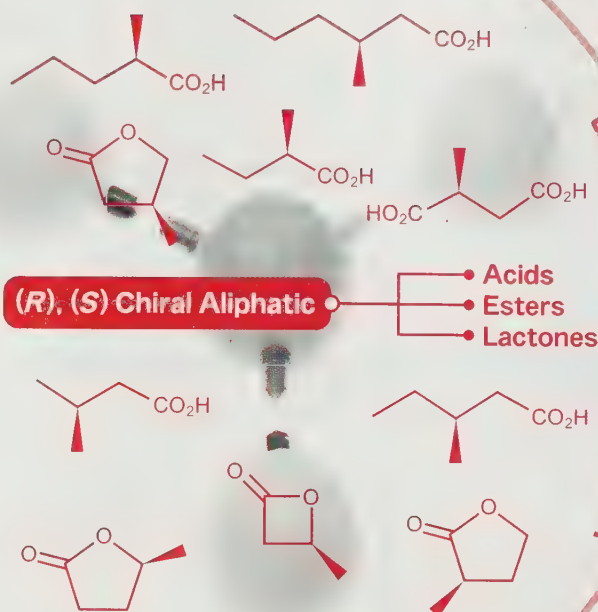
China and Ireland," Harris comments.

And last month, the Materials Research Institute at Northwestern University, Evanston, Ill., announced that it has embarked on a collaborative research project on fundamental photonics with an SFI-funded group at NMRC in Cork. NSF is providing the U.S. funding for the project.

The two teams aim to jointly develop new ultra-high-speed optical devices for information technology applications. The project will also jointly develop dynamic Web-based courses in nanophotonics for precollege and first-year undergraduate students. Exchanges of graduate students, postdocs, and faculty will take place in both directions. In addition, science teachers and undergraduate students will have the opportunity to perform summer research internships under the mentorship of senior researchers on both campuses.

SFI operates a number of other funding programs. Its Walton Visitor Awards scheme, for example, aims to bring international researchers to Ireland for periods of up to one year. The grants usually total \$240,000 per year and cover salary, laboratory, and moving expenses. The scheme

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is named after Irish-born Ernest T. S. Walton (1903–95), a professor at TCD who won the Nobel Prize in Physics in 1951 for pioneering work on the transmutation of atomic nuclei by artificially accelerated atomic particles.

In another development, announced last month, SFI revealed funding approval for 120 research proposals under the Basic Research Grants Programme. The program, which is now administered by SFI, was previously administered by Enterprise Ireland, a government agency responsible for the development of Irish industry. The fund aims to provide support for new researchers or researchers who have returned after a career or parental leave break to establish their research careers and for researchers to build on their existing basic research programs. SFI's contribution to the program in 2004 is \$9 million.

The foundation also offers grants for workshops and conferences sponsored by or involving Irish scientists and research bodies that reach an international audience. In recent months, SFI has announced a couple of initiatives aimed at

encouraging young people to pursue careers in science in Ireland.

AN INITIATIVE known as Science Teacher Assistant Research (STAR) will invest up to \$600,000 to enable more than 50 second-level teachers each year to conduct research in Irish research laboratories over a period of three summers. The STAR initiative, which was unveiled in March, "will greatly enrich the teaching of science in second-level schools and underlines the government's continued commitment to increased promotion of awareness of science among young people and the general public," Harney comments.

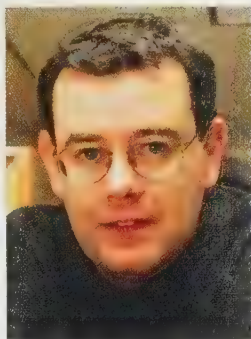
And last month, Ireland's president, Mary McAleese, announced the President of Ireland Young Researcher Award program, which will help young investigators from Ireland and around the world to develop their research careers in Ireland. Each awardee will receive funding

of up to \$1.44 million from SFI over a five-year period. Awardees will be selected by an international panel of experts.

Harris says that he expects a diverse group of nominees for the award and adds that SFI will especially encourage women nominees for the competition.

"The President of Ireland Young Researcher Award will enable SFI to identify the most promising members of the next generation of engineers, scientists, and mathematicians beginning their careers in fields that are critical to Ireland's economic and social prosperity," Harris remarks. "In building and sustaining this pool of talent here in Ireland, we have the prospect of highly productive research careers being started and sustained here, and

investing in these young researchers will be of benefit to both themselves and the research institutions where they will be based." ■



Arrigan

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SCIENTIFIC PUBLISHING

SCIENCE IS BECOMING TRULY WORLDWIDE

Bulk of growth in scientific papers is in Europe and Asia; U.S. posts far more modest gains

MICHAEL HEYLIN, C&EN WASHINGTON

TO THE EXTENT THAT THE NUMBER of articles published annually in the scientific literature is a reasonably meaningful—if not strictly quantitative—measure of trends in the practice of science, the profile of scientific activity worldwide has changed dramatically over the past 15 years or so.

On a nation-by-nation basis, the long-

standing scientific dominance of the U.S. persists. But analysis of the source of published papers by nation indicates that other areas of the world are closing the gap.

Since the late 1980s, growth in the number of scientific papers published by scientists working in the U.S. has been spotty and limited. Since the mid 1990s, there has been no growth at all. Meanwhile, the

output of articles from Western European nations, combined, has surged past the U.S. total. And there have been really big absolute gains for Asia.

The U.S. accounted for only about 15% of the worldwide increase in the number of scientific papers between 1988 and 2001. Over this period, the U.S.'s share of articles declined in all of the natural sciences as well as in engineering and mathematics.

These are some of the major trends that can be confirmed and at least semiquantified by examination of National Science Foundation (NSF) and Chemical Abstracts Service (CAS) data on the output of scientific and technical papers. Analysis of the genesis of the papers published in ACS's own journals also shows a large increase in the non-U.S. contribution: It rose from 36% of the total in 1988 to 57% in 2001 and 60% in 2003.

DATA SOURCES. NSF data come from the foundation's latest and recently published biennial review, *Science and Engineering Indicators 2004*.

Most of the data concern the 1988 to 2001 period. They cover papers published in a steadily expanding set of the world's most influential scientific and technical journals—4,460 in 1988 and 5,262 in 2001—tracked by the Institute for Scientific Information's Science Citation Index and the Social Sciences Citation Index. The data were compiled by CHI Research, an intellectual property consulting firm based in Haddon Heights, N.J.

Data are presented on nine major disciplines. Included is chemistry, which is defined narrowly as the classic subdisciplines of analytical, applied, general, inorganic, nuclear, organic, physical, and polymer chemistry.

CAS data are based on the monitoring of a larger range of journals: about 8,000 in 1988 and about 9,000 currently. Again, coverage is very widespread.

The data from ACS's own journals have to be interpreted with care. They come from a program that has grown from 19 journals in 1988 to 31 today. Hence, the combined total of articles published in them largely reflects this expansion of coverage.

For all of these three data sets, a paper is assigned to a nation where the work was done and not by the nationality of the scientist or scientists who performed it.

THE BROAD TRENDS. In some cases, the corresponding totals and subtotals for papers from the NSF and CAS counts differ quite substantially in absolute terms. How-

SCIENCE AND TECHNOLOGY PAPERS

U.S. is still dominant, but growth is slow

THOUSANDS OF PAPERS BY NSF COUNT	1988	% OF TOTAL	2001	% OF TOTAL	1988-2001 GROWTH	% GROWTH
WORLD TOTAL	466.4	100.0%	649.8	100.0%	183.4	39%
U.S.	177.7	38.1	200.9	30.9	23.2	13
Non-U.S.	288.8	61.9	448.9	69.1	160.2	55
Non-U.S./non-U.S.S.R.	257.1	55.1	428.8	66.0	171.7	67
AUSTRALIA	9.9	2.1	14.8	2.3	4.9	49
CANADA	21.4	4.6	22.6	3.5	1.2	6
WESTERN EUROPE	143.9	30.9	229.2	35.3	85.3	59
France	21.4	4.6	31.3	4.8	9.9	46
Germany	29.3	6.3	43.6	6.7	14.3	49
Italy	11.2	2.4	22.3	3.4	11.1	99
Netherlands	8.6	1.8	12.6	1.9	4.0	47
Spain	5.4	1.2	15.5	2.4	10.1	87
Sweden	7.6	1.6	10.3	1.6	2.7	36
Switzerland	5.3	1.1	8.1	1.3	2.8	53
U.K.	36.5	7.8	47.7	7.3	11.2	31
EASTERN EUROPE						
Poland	4.0	0.9	5.7	0.9	1.7	41
Russia	—	—	15.8	2.4	—	—
U.S.S.R.	31.6	6.8	20.1 ^a	3.1	-11.5	-36
ASIA	51.7	11.1	113.6	17.5	61.9	22
China	4.6	1.0	21.0	3.2	16.4	354
India	8.9	1.9	11.1	1.7	2.2	25
Japan	34.4	7.4	57.4	8.8	23.0	67
South Korea	0.8	0.2	11.0	1.7	10.3	1,332
Taiwan	1.4	0.3	8.1	1.2	6.7	472
LATIN AMERICA						
Brazil	1.8	0.4	7.2	1.1	5.4	308

NOTE: These data include papers on psychology, social science, health sciences, and professional fields. ^aTotals for former Soviet republics are Armenia, 152; Azerbaijan, 68; Belarus, 528; Estonia, 339; Georgia, 110; Kazakhstan, 116; Latvia, 157; Lithuania, 272; Moldova, 77; Russia, 15,846; Ukraine, 2,256; and Uzbekistan, 204. **SOURCE:** National Science Foundation, *Science and Engineering Indicators 2004*

PAPERS ABSTRACTED BY CAS

Spectacular growth in Asia pushes it ahead of the U.S.

THOUSANDS OF PAPERS ABSTRACTED BY CAS	1988	% OF TOTAL	2001	% OF TOTAL	1988-2001 GROWTH	% GROWTH
WORLD TOTAL	389.7	100.0%	606.7	100.0%	217.0	56%
U.S.	106.7	27.4	139.3	23.0	32.6	31
Non-U.S.	283.0	72.6	467.4	77.0	184.4	65
Non-U.S./non-U.S.S.R.	232.5	59.7	429.8	70.9	197.3	85
AUSTRALIA	5.0	1.3	8.7	1.4	3.6	72
CANADA	12.1	3.1	14.7	2.4	2.5	19
WESTERN EUROPE						
France	16.8	4.3	24.7	4.1	7.9	47
Germany	29.2	7.5	42.3	7.0	13.1	45
Italy	9.3	2.4	17.8	2.9	8.5	92
Netherlands	5.7	1.5	8.6	1.4	2.9	50
Poland	6.8	1.7	9.6	1.6	2.7	40
Spain	5.4	1.4	12.3	2.1	6.9	127
Sweden	4.7	1.2	7.2	1.2	2.6	55
Switzerland	4.1	1.1	7.2	1.2	3.0	73
U.K.	21.8	5.6	30.3	5.0	8.5	39
EASTERN EUROPE						
Russia	—	—	26.7	4.4	—	—
U.S.S.R.	50.6	13.0	37.6 ^a	6.2	-13.0	-26
ASIA						
China	13.7	3.5	59.3	9.8	45.6	333
India	12.0	3.1	15.1	2.5	3.1	26
Japan	44.6	11.5	79.2	13.1	34.6	77
South Korea	2.2	0.6	12.6	2.1	10.4	591
Taiwan	1.4	0.4	6.0	1.0	4.6	330
LATIN AMERICAN						
Brazil	1.5	0.4	7.5	1.2	6.0	395

^a Totals for former Soviet republics are Armenia, 371; Belarus, 1,433; Estonia, 333; Georgia, 374; Kazakhstan, 611; Kyrgyzstan, 55; Latvia, 371; Lithuania, 564; Moldova, 149; Russia, 26,747; Tajikistan, 25; Turkmenistan, 6; Ukraine, 5,875; and Uzbekistan, 662. **SOURCE:** Chemical Abstracts Service

U.S. SCIENCE PAPERS BY TOPIC

Several disciplines show declines since 1995

THOUSANDS OF PAPERS BY NSF COUNT	1988	1991	1993	1995	1997	1999	2001
All topics	150.4	165.1	168.8	173.6	167.3	168.9	171.1
Clinical medicine	55.0	59.5	61.3	63.4	62.7	63.2	63.7
Biomedical research	27.5	31.2	33.1	35.0	33.7	33.4	34.0
Biology	12.9	13.9	12.7	12.7	12.0	11.3	12.5
Chemistry	13.2	14.7	15.1	14.9	14.4	14.5	14.3
Physics	18.0	20.5	19.6	19.7	18.0	18.1	17.7
Earth/space science	8.1	9.1	9.8	10.9	10.5	11.2	11.3
Engineering/technology	11.8	12.8	13.3	13.8	12.9	13.6	13.9
Mathematics	3.9	3.4	3.5	3.2	3.1	3.6	3.7

SOURCE: National Science Foundation, *Science and Engineering Indicators 2004*

ever, they reveal similar patterns of relative growth around the world.

For instance, they both trace a flattening of U.S. scientific publication, which, according to NSF, held at between 196,000 and 203,000 papers annually between 1992 and 2001. CAS puts the U.S.

total as peaking at 160,000 in 1996, followed by a dip and partial recovery to 151,000 by last year.

NSF is puzzled by this apparent disconnect between a stagnant output of papers in this country in recent years and increasing real R&D expenditures and

research personnel. The foundation will explore such issues as whether the lack of growth is real or an artifact of the indicators used. The issue of what happened to scientific publishing in the 1990s will also be looked into. The foundation says it will reveal its findings in *Science and Engineering Indicators 2006* as well as in special reports.

The overall NSF data, which also include the social and behavioral sciences, indicate a gain of 184,000—from 466,000 to 650,000—in the worldwide total of papers between 1988 and 2001. The U.S. accounted for 23,000, or a little under 13%, of this gain, moving up from 178,000 to 201,000, with almost all of this gain coming before 1992.

The CAS world total grew from 390,000 papers in 1988 to 607,000 in 2001. This was a gain of 217,000. The U.S. accounted for 33,000, or about 15%, of this increase—from just under 107,000 to just over 139,000.

Both NSF and CAS indicate a sharp decline in the number of papers from the republics of the former Soviet Union from 1988 to 2001—a drop of 13,000, or 26%, according to CAS and of 11,500, or 36%, by NSF's count.

This all means that the vast majority of the growth in papers over this period was in non-U.S./non-former Soviet Union areas of the world. According to NSF, this gain was 172,000, or 67%, from 257,000 to 429,000. The CAS count puts it at 197,000, or an even higher 85%, from 233,000 to 430,000.

According to NSF, the U.S.'s share of scientific papers fell from 38.1% of the worldwide total in 1988 to 30.9% in 2001. Over the same period, Western Europe's share rose from 30.9% to 35.3% while Asia's slice went up from 11.1% to 17.5%. The 1988 to 2001 gains of 85,000 papers for Western Europe and of 62,000 for Asia were both far larger than the 23,000 uptick for the U.S.

Both NSF and CAS reveal particularly strong percentage growth for Italy and Spain, as well as for China, Taiwan, South Korea, and Brazil.

Traditionally, CAS has pegged the U.S.'s share of papers lower than has NSF: at 27.4% in 1988 and 23.0% in 2001.

The biggest change in the CAS count has been in the total for the Asian Big Five—China, India, Japan, Taiwan, and South Korea—with a jump from a combined 19.0% of the worldwide total in 1988 to 28.4% in 2001.

The most spectacular absolute boost has been for China, with a gain, accord-

SCIENCE & TECHNOLOGY

TRENDS IN CAS ABSTRACTS

Less than a quarter of abstracted articles are now from U.S. sources

THOUSANDS OF CAS ABSTRACTS	WORLD	U.S.	NON-U.S.	% NON-U.S.
1982	381.3	103.4	277.9	72.9%
1983	371.4	100.4	271.0	73.0
1984	380.7	103.0	277.7	72.9
1985	380.1	102.6	277.5	73.0
1986	384.1	106.5	277.7	72.3
1987	386.5	107.6	278.8	72.2
1988	389.7	106.7	283.0	72.6
1989	397.2	110.9	286.7	72.2
1990	394.9	110.0	284.9	72.2
1991	453.6	132.3	321.4	70.9
1992	430.3	117.8	312.4	72.6
1993	448.7	126.2	322.5	71.9
1994	542.5	158.2	384.3	70.8
1995	563.0	152.2	410.8	73.0
1996	579.2	160.3	418.9	72.3
1997	585.5	151.6	434.0	74.1
1998	559.0	136.6	422.4	75.6
1999	591.1	141.3	449.8	76.1
2000	573.5	136.3	437.1	76.2
2001	606.7	139.3	467.4	77.0
2002	630.5	150.5	479.9	76.1
2003	646.9	150.9	496.0	76.7

SOURCE: Chemical Abstracts Service

BREAKDOWN OF PAPERS IN ACS JOURNALS

Over the past 20 years, the non-U.S. share is up

PAPERS IN ACS JOURNALS	WORLD	U.S.	NON-U.S.	% NON-U.S.
1980	8,248	6,006	2,242	27.2%
1981	8,707	5,941	2,766	31.8
1982	9,043	6,304	2,739	30.3
1983	8,946	6,033	2,913	32.6
1984	9,928	6,546	3,382	34
1985	10,174	6,604	3,570	35.1
1986	10,492	6,825	3,667	35
1987	10,288	6,633	3,655	35.5
1988	10,875	6,926	3,949	36.3
1989	11,473	7,308	4,165	36.3
1990	12,351	7,729	4,622	37.4
1991	13,670	8,326	5,344	39.1
1992	14,432	8,407	6,025	41.8
1993	15,067	8,710	6,357	42.2
1994	15,750	8,600	7,150	45.4
1995	16,541	8,555	7,986	48.3
1996	18,503	9,192	9,311	50.3
1997	18,691	8,497	10,194	54.5
1998	19,254	8,737	10,517	54.6
1999	19,730	8,809	10,921	55.4
2000	20,915	9,005	11,910	56.9
2001	21,138	9,051	12,087	57.2
2002	22,511	9,306	13,205	58.7
2003	24,222	9,738	14,484	59.8

SOURCE: ACS Journal Publishing Group

PAPERS PUBLISHED IN ACS JOURNALS

Their number almost doubled between 1988 and 2001

PAPERS IN ACS JOURNALS	1988	% OF TOTAL	2001	% OF TOTAL	1988-2001 GROWTH	% GROWTH
WORLD TOTAL	10,875	100.0%	21,138	100.0%	10,263	94%
U.S.	6,926	63.7	9,051	42.8	2,125	31
Non-U.S.	3,949	36.3	12,087	57.2	8,138	206
AUSTRALIA	165	1.5	280	1.3	115	70
CANADA	590	5.4	869	4.1	278	47
WESTERN EUROPE						
France	376	3.5	930	4.4	554	147
Germany	363 ^a	3.3	1,203	5.7	840	231
Italy	253	2.3	630	3.0	377	149
Netherlands	133	1.2	339	1.6	206	155
Poland	18	0.2	113	0.5	95	528
Spain	120	1.1	790	3.7	670	558
Sweden	119	1.1	293	1.4	174	146
Switzerland	111	1.0	251	1.2	140	126
U.K.	229	2.1	915	4.3	686	300
ASIA						
China	45	0.4	454	2.2	409	909
India	111	1.0	307	1.5	196	177
Japan	821	7.6	2,062	9.8	1,241	151
Taiwan	40 ^b	0.4	327	1.6	287	718
South Korea	22	0.2	346	0.5	324	1,472
LATIN AMERICA						
Brazil	16 ^b	0.2	96	0.5	80	500

a West Germany only. b Data for 1989. SOURCE: ACS Journals Publishing Group

ing to CAS, of from 13,700 papers in 1988 to 59,300 in 2001. This 45,600 gain was larger than the 32,600 gain for the U.S. over the same time period. It boosted China from seventh to third on the world ranking.

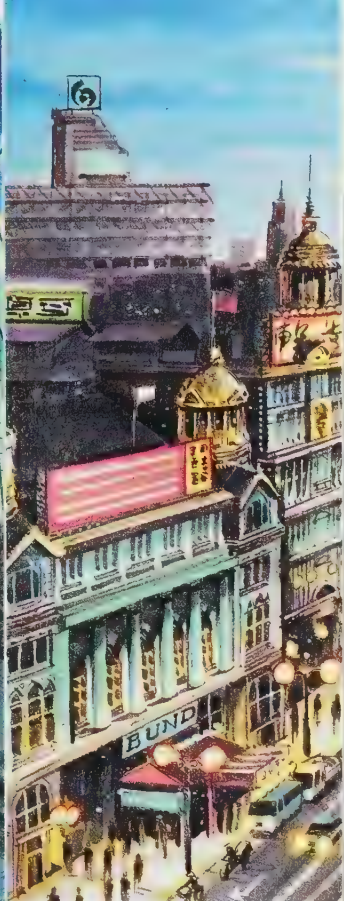
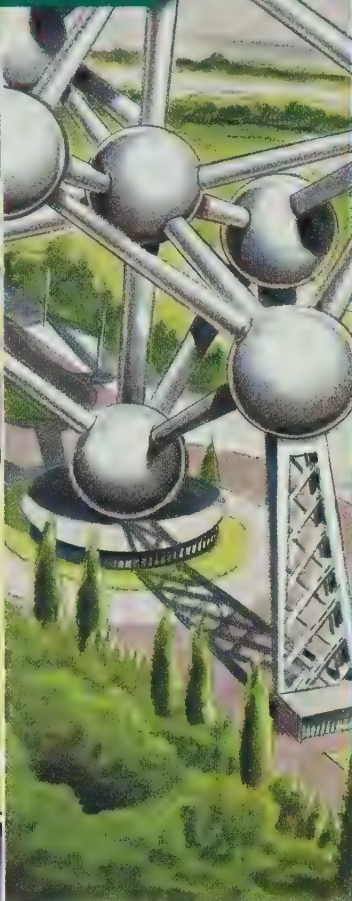
Japan overtook the former Soviet republics to claim the second ranking by 2001 with 79,200 papers, up from 44,600 in 1988. And South Korea had the highest percentage growth of more than 500%—from 2,175 in 1988 and 12,575 in 2001.

All of these trends primarily reflect what is happening in academic science. According to NSF, 73.6% of papers worldwide were from academia in 2001. The range was from 92.8% for mathematics to 65.5% for engineering/technology, with chemistry at 75.8%.

CHEMISTRY. The NSF count for classic chemistry indicates an increase in papers worldwide of from 57,400 in 1988 to 77,300 in 2001. Only 1,100 of this 19,900 gain was accounted for the U.S., which went from 13,200 to 14,300 over the period, with a peak of 15,100 in 1991.

U.S. physics did even worse. Worldwide, the number of papers rose from 62,000 in 1988 to 87,100 in 2001, while the U.S.

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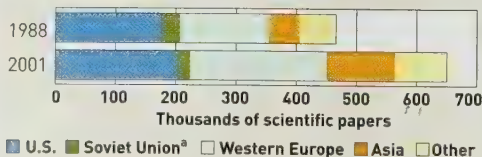
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GLOBALIZATION OF SCIENCE

Asia and Europe account for 80% of growth in scientific papers



NOTE: Data include papers in the social and behavioral sciences. ^aTotal for republics of the former Soviet Union. SOURCE: National Science Foundation, *Science and Engineering Indicators 2004*

TRENDS IN NSF ARTICLE COUNT

U.S. total has been stagnant since 1992

THOUSANDS OF PAPERS BY NSF COUNT	THOUSANDS OF PAPERS			%
	WORLD	U.S.	NON-U.S.	
1988	466.4	177.9	288.6	61.9%
1989	497.1	187.2	309.9	62.3
1990	508.8	191.6	317.2	62.4
1991	515.5	194.0	321.5	62.4
1992	547.6	198.9	348.8	63.7
1993	540.5	197.4	343.1	63.5
1994	567.2	199.8	367.4	64.8
1995	580.8	202.9	377.9	65.1
1996	593.6	201.8	391.8	66.0
1997	594.5	197.5	396.9	66.8
1998	617.8	197.9	419.9	68.0
1999	632.1	198.5	433.5	68.6
2000	632.8	196.2	436.6	69.0
2001	649.8	200.9	448.9	69.1

NOTE: These data include papers in the social and behavioral sciences. SOURCE: National Science Foundation, *Science and Engineering Indicators 2004*

contribution dipped from 18,000, or 29%, to 17,400, or 20%.

ACS journals have enjoyed a healthy increase in the total number of articles they publish: from 10,900 in 1988 to 21,100 in 2001 and 24,200 in 2003. This more than doubling reflects both the expansion of the number of ACS journals as well as the worldwide growth in chemical papers, as indicated by the NSF data.

The ACS journal data, however, show the same trends in geographic distribution as NSF's data do. Contributions to ACS journals from the major European countries increased from 16% in 1988 to 26% in 2001 and from Asia from 10% to 16%.

In 1988, chemistry papers were 12.3% of the scientific papers published worldwide, according to NSF. By 2001, this was down to 11.9%. Of the U.S. papers, chemistry claimed a substantially lower 7.4% in 1988 and 7.1% in 2001.

In Asia, chemistry held on to a larger

share, 18.2% of papers in both 1988 and 2001. Western Europe fell between: 13.1% of its 1988 papers and 11.5% of its 2001 papers were in chemistry.

Among the major paper producers in 2001, the highest percentages of chemistry papers were 26.7% for Poland, 26.3% for China, 25.5% for India, and 18.5% for Spain. On the lower end of the scale, along with the U.S., were the U.K., Sweden, the Netherlands, Australia, and Canada, all in the 7-8% range.

BY DISCIPLINE. Of the science disciplines that were identified by NSF, earth/space science showed the largest percentage gain in the number of papers published worldwide between 1988 and 2001, 83%. Physics came in second at 40%, and chemistry and clinical medicine tied for third at 35%. Biology had the smallest increase, 26%. The overall gain for all disciplines was 41%.

Gains for the U.S. were far smaller, with

PAPERS BY DISCIPLINE

Decline in U.S. share is across the board

THOUSANDS OF PAPERS BY NSF COUNT	1998	2001	1988-2001 GROWTH % GROWTH	
All disciplines except social sciences				
World	422.2	593.3	171.1	41%
U.S.	150.4	170.8	20.4	14
% U.S.	36%	29%		
Clinical medicine				
World	136.7	184.5	47.8	35
U.S.	55.0	63.7	8.7	16
% U.S.	41%	35%		
Biomedical research				
World	70.9	92.3	21.4	30
U.S.	27.5	34.0	6.5	24
% U.S.	39%	37%		
Biology				
World	35.0	44.2	9.2	26
U.S.	12.9	12.5	-0.4	-3
% U.S.	37%	28%		
Chemistry				
World	57.4	77.3	19.9	35
U.S.	13.2	14.3	1.1	8
% U.S.	23%	19%		
Physics				
World	62.0	87.1	25.1	40
U.S.	18.0	17.4	-0.6	-3
% U.S.	29%	20%		
Earth/space science				
World	19.1	35.1	16.0	83
U.S.	8.1	11.3	3.2	40
% U.S.	42%	32%		
Engineering/technology				
World	31.3	58.5	27.2	87
U.S.	11.8	13.9	2.1	18
% U.S.	38%	24%		
Mathematics				
World	9.8	14.3	4.5	46
U.S.	3.9	3.7	-0.2	-5

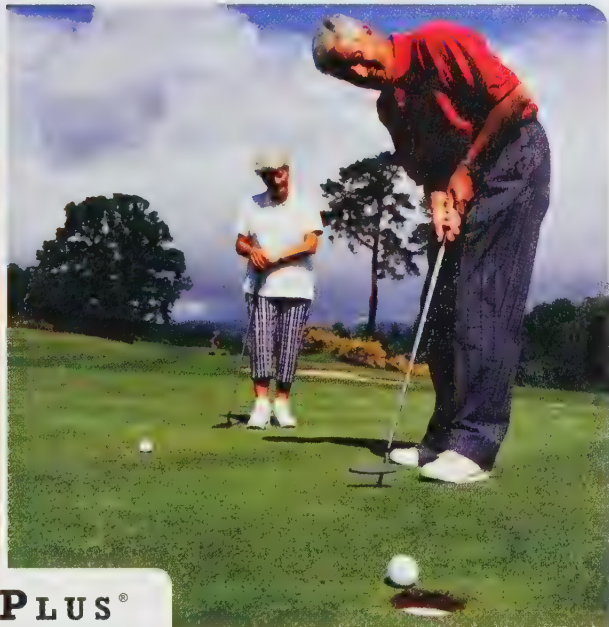
SOURCE: National Science Foundation, *Science and Engineering Indicators 2004*

an overall 14% increase. Chemistry came in at 8%, and both biology and physics had decreases of 3%.

ANALYSIS. The output of scientific papers is just one quantitative parameter that yields an indirect measure of scientific activity and of trends in its national origin and subject matter. The issuance of patents and the commitment of funding, resources, and people power are among others.

All such indicators should be handled with an appreciation that any discontinuities in the way they are measured or outside factors that transcend them can render them less than precise and definitive measures of what is really happening in science.

Be that as it may, the data on scientific publication unambiguously suggest a leveling of science activity in the U.S.—if at a still relatively very high level—while activity in the rest of the world, except the former Soviet republics, continues to grow apace. ■



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FLUORINE PERSISTS

Polyfluorinated alcohols shown to be key source of bioaccumulating perfluorocarboxylic acids

STEPHEN K. RITTER, C&EN WASHINGTON

BY NOW, IT'S NO SURPRISE THAT many synthetic chemicals are ubiquitous in the environment and are detectable in human blood and urine. But determining how specific chemicals end up in the environment and if they pose any serious environmental or human health risks is still far from a straightforward process.

One example is perfluorooctanoic acid (PFOA) and its homologs. The ammonium salt of PFOA, ammonium perfluorooctanoate, is used in small quantities as a surfactant to aid industrial production of widely used fluoropolymers, primarily polytetrafluoroethylene and polyvinylidene fluoride. The chemical inertness of these compounds makes them useful for a variety of consumer and industrial products, but this property also means the compounds are persistent and can bioaccumulate.

Although PFOA and its salts have low volatility and are not normally present in final manufactured products, PFOA has been detected in the blood of humans and animals worldwide, even in remote areas in the Canadian Arctic. The Environmental Protection Agency has been working to gather information from companies that produce or use PFOA or its salts to deter-

mine how these compounds have become so widespread and if they have sufficient toxicity to pose any health risk.

Following several years of intensive study, a research team led by chemistry professor Scott A. Mabury of the University of Toronto and research scientist Timothy J. Wallington of Ford Motor Co. has now pieced together a set of atmospheric degradation

pathways to show that the real culprit is not PFOA, but likely polyfluorinated alcohols that convert to PFOA or other carboxylic acids in the environment [*Environ. Sci. Technol.*, 38, 3316 (2004)].

pathways to show that the real culprit is not PFOA, but likely polyfluorinated alcohols that convert to PFOA or other carboxylic acids in the environment [*Environ. Sci. Technol.*, 38, 3316 (2004)].

The alcohols are part of a group of compounds known as telomers, short-chain fluorinated compounds built up from tetrafluoroethylene using a telomerization synthesis. Fluorotelomer alcohols (FTOHs) include $\text{CF}_3(\text{CF}_2)_n\text{CF}_2\text{CH}_2\text{CH}_2\text{OH}$, for example, where $n = 2, 4, \text{ or } 6$. These com-

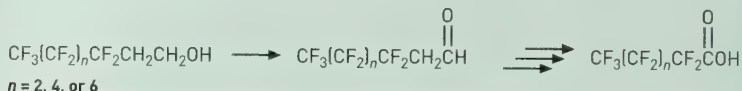
ounds are known from lab studies to degrade to carboxylic acids. The alcohols are produced on a much larger scale than PFOA—some 10 million lb per year worldwide—and are used primarily as protective coatings for carpeting, fabrics, and paper. “From a chemical and toxicological standpoint, and ultimately from a regulatory standpoint, the intermediates have much interest for their reactivity and potential biological effects,” Mabury says. The alcohols may leach from the polymeric materials during manufacture or use, he adds. “Fixing the problem could be as simple as making production processes more efficient or ensuring residual material is removed from the products when they are manufactured.”

EPA's concern over long-chain perfluorocarbons dates back a few years. In late 1999, EPA began to take a closer look at perfluorooctyl sulfonate (PFOS) when the agency obtained data that the compound was persistent, unexpectedly toxic, and bioaccumulative. The only U.S. maker of PFOS was 3M, which used the compound in its Scotchgard brand of stain-resistant coatings.

In May 2000, 3M announced that it would voluntarily phase out PFOS pro-

CHAIN OF EVENTS

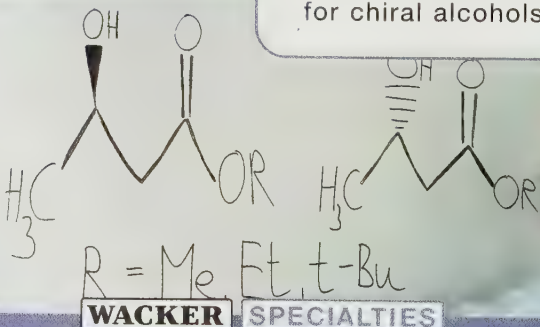
Perfluorocarboxylic acids are atmospheric degradation products of fluorotelomer alcohols



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“From a chemical and toxicological standpoint, and ultimately from a regulatory standpoint, the intermediates have much interest for their reactivity and potential biological effects,” Mabury says. The alcohols may leach from the polymeric materials during manufacture or use, he adds. “Fixing the problem could be as simple as making production processes more efficient or ensuring residual material is removed from the products when they are manufactured.”

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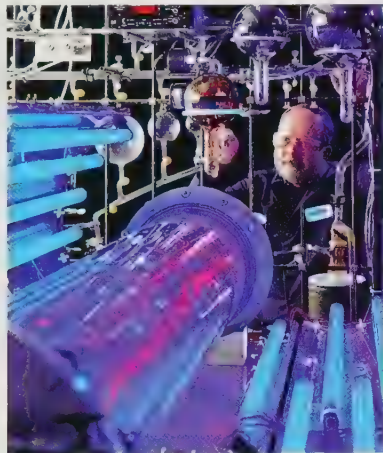
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ON THE TRAIL Ford research scientist Michael D. Hurley poses with a smog chamber used to study the atmospheric degradation of fluorotelomer alcohols.

duction based on data that showed the highest concentrations found in animals in the wild were approaching a level that caused adverse effects in lab animals. EPA then issued regulations to limit future manufacturing or import of PFOS.

As a follow-up, EPA expanded its investigation of perfluorinated chemicals to include PFOA and telomers. In April 2003, following input from manufacturers, EPA released a preliminary risk assessment for PFOA and its salts, citing a concern that these compounds are accumulating in the environment and that there is uncertainty over their toxicity (C&EN, June 16, 2003, page 24).

Mabury first thought about FTOHs as a possible link a few years ago following studies his lab conducted for 3M on PFOS, he says. "We hypothesized that the reason for high concentrations of these compounds in animals, such as polar bears at the top of the food chain in remote regions, is that there had to be an atmospheric component," he says.

To prove this, Mabury and coworkers had to determine the physical properties of PFOA, FTOHs, and related compounds. This required synthesis of many compounds that were not commercially available or could not be obtained from manufacturers, he notes. The researchers measured vapor pressures of FTOHs to show that they are volatile enough to transport into the atmosphere. Mabury's group had to show that the compounds could be found in the atmosphere, and that their lifetimes there—about 20 days for the C₁₀ alcohol—are long enough for them to be transported to re-

mote areas. The researchers followed up with monitoring studies to show that PFOA was in water and in the blood of polar bears, fish, and other animals.

COLLECTIVELY, the studies reported in more than a dozen papers during the past couple of years provided hints as to how PFOA and other perfluorinated carboxylic acids might be formed from the alcohols, Mabury notes. The last step was to determine the degradation pathway from FTOHs to the carboxylic acids, which is the subject of the current *ES&T* paper.

Mabury, Wallington, and coworkers carried out a series of smog chamber studies in which they oxidized FTOHs using chlorine or hydroxyl radicals under UV light. The radicals set off a chain of reactions that convert the alcohols first into an aldehyde intermediate, followed by various acyl peroxy and peroxy species, other aldehydes, and acid fluorides. Ultimately, one part of the reaction sequence leads to formation of the carboxylic acids. The various compounds were analyzed by gas chromatography/mass spectrometry, liquid chromatography/tandem mass spectrom-

etry, and ¹⁹F nuclear magnetic resonance spectroscopy. Mabury is now convinced that all long-chain perfluoroalkyl compounds with reactive terminal functional groups will ultimately end up as carboxylic acids in the environment.

Further work needs to be done to help pin down point sources for the alcohols and to look at related compounds, such as perfluoroalkyl sulfonamido alcohols, Mabury notes. "We would like to eventually give regulators and industry the information they need to allow the chemistry to be optimized so that these fascinating and highly important materials can continue to be used," Mabury concludes.

For now, EPA continues to work with companies that produce or use PFOA and telomers to identify possible points of release of the compounds to the environment during consumer use or end-of-life processing, such as incineration. EPA's full risk assessment on PFOA is expected to be available for public review next fall. Following evaluation by an EPA advisory committee, a determination will be made to seek voluntary or regulatory control of these compounds, if deemed appropriate. ■

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CHIRAL CHEMISTRY HOTBED In this production unit in Kaisten, Switzerland, the agrochemical company Syngenta operates what is currently the largest-scale catalytic enantioselective hydrogenation plant in the world.

CHIRAL CHEMISTRY

Traditional methods thrive because numerous hurdles, including tough luck, slow down the commercialization of catalytic processes

A. MAUREEN ROUHI, C&EN WASHINGTON

DESPITE THE UNRELENTING PACE OF RESEARCH IN CATALYTIC asymmetric chemistry, relatively few catalytic enantioselective processes are currently operated on a commercial scale. Until more bio- and chemocatalytic chiral routes are developed that are robust and cost-effective for large-scale production, the bulk of optically pure compounds will have to be prepared through traditional

chemistry, including conventional syntheses based on chiral substrates or stoichiometric chiral induction and separations, such as chromatographic resolutions.

A survey by Frost & Sullivan estimates that in 2002, of the \$7 billion in revenues worldwide from chiral products, 55% was generated by traditional technologies (chiral pool and separation), 35% by chemocatalysis, and 10% by biocatalysis. The survey projects that by 2005, worldwide revenues of \$9.5 billion would be realized not much differently: 49% by chiral pool

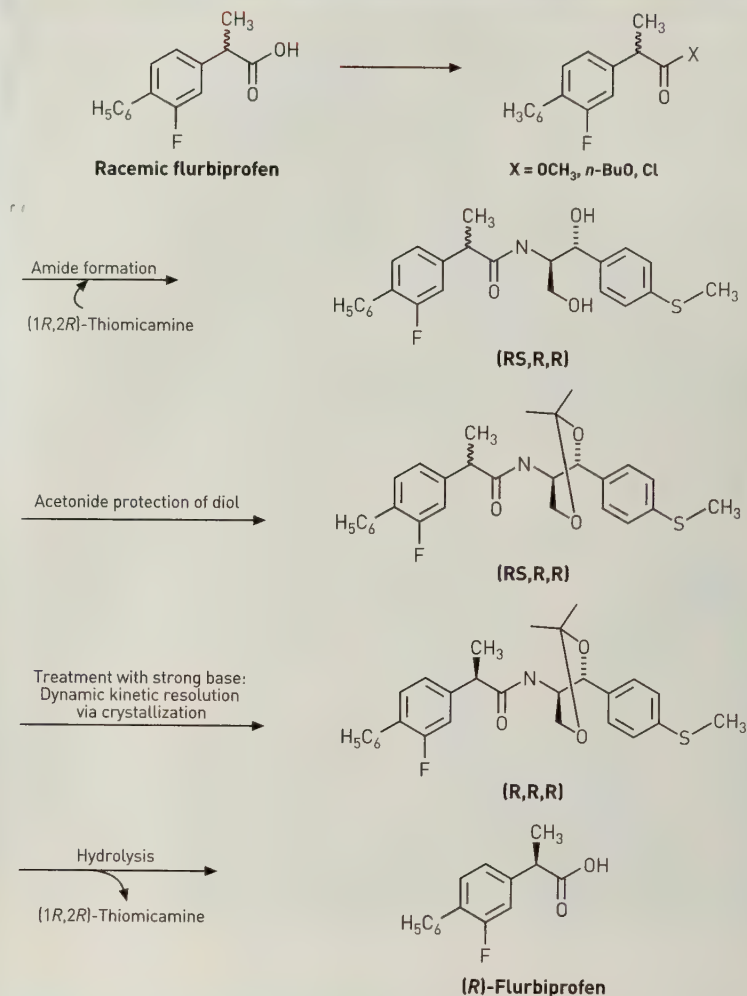
and separation, 36% by chemocatalysis, and 15% by biocatalysis.

Demand for enantiopure chiral compounds continues to rise, primarily for use in pharmaceuticals but also in three other sectors: flavor and aroma chemicals, agricultural chemicals, and specialty materials. Demand from the drug industry is fueled by regulations governing chiral active pharmaceutical ingredients (APIs) and the recognition that enantiomers of a chiral compound could have dramatically different biological activities. Whereas chiral APIs previously were usually formulated as racemates, the preference now is for single enantiomers. Furthermore, the switch from a racemic to a single-enantiomer API is key to managing the life cycle, as well as improving the efficacy, of racemic drugs (C&EN, May 5, 2003, page 56). Such switches also contribute to the demand for optically pure compounds.

GLOBAL SALES of single-enantiomer compounds are expected to reach \$8.57 billion by the end of 2004 and \$14.94 billion by the end of 2009, growing annually by 11.4%, according to the Frost & Sullivan survey. By 2009, the share of the market realized through traditional technology would drop to 41%. The share of chemocatalysis would rise to 36% and the share of biocatalysis, to 22%, the same survey shows.

Meanwhile, in journals surveyed by Chemical Abstracts Service, the number of papers per year that are related to chiral technologies has tripled from just over 1,300 in 1994 to more than 4,400 in 2003, for a total of more than 24,000 chiral-technology-related papers published in the past 10 years. An overwhelming majority (72%) are about stereoselective or asymmetric syntheses.

Yet when Hans-Ulrich Blaser, chief technology officer of Solvias, a Basel, Switzerland-based chemical company serving the life sciences industry, surveyed the literature three years ago for catalytic enantioselective processes, he found only 16 practiced on a commercial scale [*Appl. Catal. A: Gen.*, 221, 119 (2001)]. Blaser's survey did not include commercial biocatalytic processes. More chemocatalytic processes may exist that he is not aware of, he says, because most companies do not publicize processes used in actual production. But clearly, the gap between R&D output and commercial application is wide.



DYNAMIC KINETIC RESOLUTION In this Zamboni route, resolution is initiated when an acidic benzylic hydrogen is abstracted by a strong base in methanol. When the carbanion is reprotonated, the desired R,R,R isomer crystallizes whereas the unwanted isomer does not.

Research in academia is focused on molecule building at the bench scale, comments Enrico Polastro, vice president and senior industry specialist at Arthur D. Little Benelux, in Brussels. "What is easy to achieve in a flask might be extremely challenging in a reactor, given the heat- and mass-transfer considerations."

Many factors contribute to the slow development of commercial-scale catalytic asymmetric processes. But the bottom line is cost. At the end of the day, the customer does not care what technology produces

the required material. And to win business, suppliers must offer optically pure products at the most competitive price.

At the economic level, some observers believe that a major damper to the practice of catalytic asymmetric chemistry is that most catalysts are not in the public domain. Many technologies are proprietary, exclusively available only to particular companies. When people consider using them, their first thought is not how wonderful the chemistry is but how much it will cost and how the price will be negotiated, ob-

"Catalyst selection is not just science, but also art. You need intuition, some luck, some feeling."

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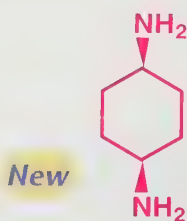
In view of Carl's acting abilities, director Francis P. searches his pockets for his hypertension tablets. They have a special coating, formulated by Degussa that helps to dispense the correct dosage of the medicine continuously. So, even if Carl needs 24 takes, Francis' blood pressure will remain constant even if his temper doesn't.

Catarine A. properly anticipates a passionate love scene with Brad L. and brushes her teeth thoroughly with a toothpaste containing an additive formulated by Degussa to give her kissing sweet breath. What Catarine doesn't realize is that Brad L. will be replaced by a double.

"I know my rights, man!" – After flubbing this line for the sixteenth time, perhaps the villainous Carl N. deserves the beating his character's about to receive. Carl should consider taking a product with lecithin made by Degussa to help strengthen his powers of concentration.

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serves Mukund S. Chorghade, president of the consulting company Chorghade Enterprises, Natick, Mass., and chief scientific officer of D&O Pharmachem, an intermediates and fine chemicals supplier based in Paramus, N.J. Complex negotiations turn off customers and prompt efforts to develop alternative methods, he adds.

The situation has sparked a technological race that has produced a plethora of proprietary catalysts. Many of these catalysts are now available in research quantities from Strem Chemicals, Newburyport, Mass.; for example, ClMeOBIPHEP (Bayer Chemicals); CatAXium and CatASium families (Degussa AG); MonoPhos (DSM Pharmaceutical Products); Josiphos, Walphos, Mandyphos, and Rhophos (Solvias); and Synphos (Synkem).

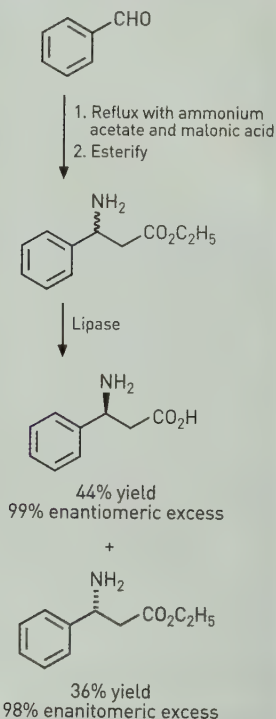
Companies develop their own catalysts to get around other companies' patents, says David Ager, competence manager for homogeneous catalysis at DSM. Very often, new catalysts are not any better than those already existing, but they give their inventors freedom to practice chemistries that previously were off-limits, he adds.

THE COST OF using patented chiral technology can be prohibitive, Polastro points out. And the right price can be hard to figure out. Assigning a value to a specific technology in the overall context of a final product being developed is not an exact science. Suppliers and customers will not discuss how they calculate these costs.

In the view of Ronald Brandt, interim chief executive officer of the chiral catalyst developer Chiral Quest, Monmouth Junction, N.J., the task is easier for customers, because they set the price at which their molecule must be produced, whereas technology providers must work within the pricing already existing in the market. What's clear is that companies like Chiral Quest can't survive by only selling catalysts, unless those are very highly priced. For this reason, Brandt says, Chiral Quest, like other technology providers, offers multiple pricing options: Customers can buy a high-priced catalyst, pay royalties, or arrange anything in between.

At the strategic level, customers have traditionally regarded as unacceptable reliance on technology over which they have no control or that is available from only one source. This attitude may be changing as technology providers demonstrate flexibility: Multiple sourcing can be arranged by sublicensing either to the customer or to a third party, says Michel Spagnol, vice president for strategic and technical marketing at Rhodia Pharma Solutions, Cran-

SIZABLE Dowpharma's route has made tons of β -phenylalanines



bury, N.J. The need for multiple sourcing also can be satisfied by production at multiple sites of a sole supplier, he adds.

At the practical level from the technology developer's point of view, commercialization of catalytic asymmetric methods is tricky. For one thing, catalysis is still viewed as a high-risk step in fine chemicals production. "People in production units usually prefer noncatalytic reactions," Blaser says. "They have more experience with stoichiometric reactions, which are usually easier to control and more robust."

The bigger problem is the still highly empirical nature of catalyst selection. When presented with a new molecule, no one can tell what catalyst is right simply from the target structure. That's because the understanding of reactions and catalytic mechanisms is far from complete. Analogies work, however, and scientists with a lot of experience in asymmetric catalysis are fairly successful in narrowing the field. "Catalyst selection is not just science, but also art. You need intuition, some luck, some feeling," Blaser says.

The availability of substrates is also key. Sometimes synthesizing the appropriate substrate is more problematic than running the catalytic reaction itself, Ager says.

Likewise critical is the availability of catalyst. A good catalyst is useless if one can't get it in commercial quantities.

Many things can go wrong in process development, Polastro adds. Even very low levels of impurities can poison the system. The economics — of temperature control, mass transfer, agitation, solvent and catalyst recovery, among others — may not be favorable. Or the process may be so fragile that minor variations in operating parameters lead to significant changes in yield or quality.

Time is another factor. Especially for products in development, the time to develop a catalytic asymmetric process may not meet the need to get materials out rapidly for testing. The window of opportunity is wider for established or mature products, for which developing a catalytic asymmetric step in the synthetic route could vastly improve production economics.

FINALLY, good luck counts. In many cases, commercially viable catalytic chiral processes do not make it to prime time because the projects they support don't survive. When a product is not approved, a

CHIRAL BLOCKBUSTERS

In nine of top 10 drugs, the active ingredients are chiral

BRAND	GLOBAL 2003 SALES (\$ BILLIONS)	ACTIVE INGREDIENT(S)	FORM OF ACTIVE INGREDIENT(S)	THERAPEUTIC EFFECT
Lipitor	\$10.3	Atorvastatin	Single enantiomer	Lipid-lowering agent
Zocor	6.1	Simvastatin	Single enantiomer	Lipid-lowering agent
Zyprexa	4.8	Olanzapine	Achiral	Psychotropic agent
Norvasc	4.5	Amlodipine	Racemate	Calcium channel blocker
Procrit	4.0	Epoetin α	Protein	Stimulant of blood cell production
Prevacid	4.0	Lansoprazole	Racemate	Inhibitor of gastric acid secretions
Nexium	3.8	Esomeprazole	Single enantiomer	Inhibitor of gastric acid secretions
Plavix	3.7	Clopidogrel	Single enantiomer	Inhibitor of platelet aggregation
Advair	3.7	Salmeterol	Racemate	β_2 -adrenergic bronchodilator
		Fluticasone	Single enantiomer	Anti-inflammatory agent
Zolof	3.4	Sertraline	Single enantiomer	Selective serotonin reuptake inhibitor
TOTAL	\$48.3			

NOTE: Sales figures from IMS Health.

candidate does poorly in trials, or a promising lead is dropped, chiral chemistries that are ready to go are mothballed overnight.

Ironically, it is usually under these circumstances that many successful process development stories are made public. For example, Avecia, based in Manchester, England, developed a commercial process

to enantioselectively reduce *m*-nitroacetophenone to (*S*)-1-(3-nitrophenyl)ethanol. Everything was in place, ready to go to a 1,000-L scale, when the project died, according to John Blacker, technical manager for process technology.

The asymmetric synthesis was developed to achieve better economics for a syn-

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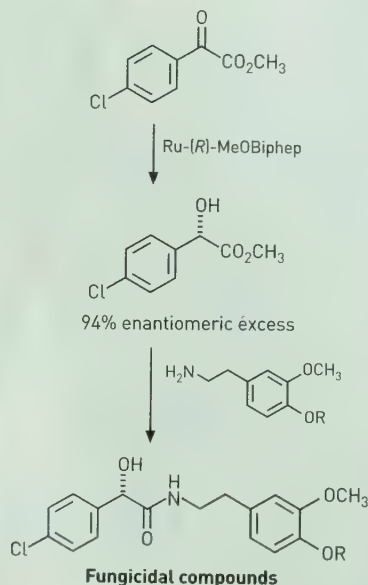
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thetic route in which the chiral alcohol is a key intermediate. With Avecia's proprietary transfer-hydrogenation catalyst CATHy, the conversion could be achieved in greater than 95% yield and greater than 95% enantiomeric excess with less than 0.1 mol % of catalyst; 25 kg of substrate could be converted in four hours in a 100-kg reactor. Because the chiral alcohol is an early intermediate, 95% enantiomeric excess is sufficient, Blacker says. "It's not worth spending a long time trying to get a perfect reaction at this point."

THE CHEMISTRY involves enantioselective transfer of hydrogen from formic acid to the substrate. The aromatic nitro group is highly reducible and would have been attacked by other catalysts, Blacker points out. "This reaction gives a good example of the selectivity you can get with a catalyst."

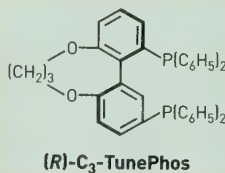
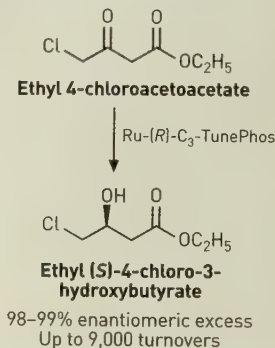
Another recent example of a potentially commercially feasible but aborted catalytic asymmetric chemical process comes from a project Solvias carried out for the agrochemical company Syngenta, based in Basel. Syngenta required a route to a chiral mandelamide with fungicidal activity. After evaluating three enantioselective methods, Solvias prepared kilogram quantities of the material through reduction of methyl (4-chlorophenyl)glyoxalate with a

PROMISING
Solvias-developed route could be optimized for commercial use



NOTE: Scale-up experiments indicate that turnover numbers of up to 4,000 and turnover frequencies of up to 210 per hour are feasible for the catalytic step. Recrystallization of the free acid raises optical purity to more than 99%.

GREAT EXPECTATIONS
Chiral Quest joins race to make high-demand compound



ruthenium-(*R*)-MeOBIPHEP catalyst. The product, methyl (*S*)-4-chloromandelate, could be prepared in up to 94% enantiomeric excess. The free acid could be recrystallized to more than 99% enantiomeric excess. Reaction with the appropriate amine yields the required mandelamide.

The process is far from optimized, but the efficiency achieved gives strong reason to believe that it would be feasible technically and economically, Blaser says. Syngenta lost interest in the compound class, however, and Solvias did no further work. But it is not uncommon that compounds that have been dropped are picked up again, he adds. If and when this project comes up again, the catalytic asymmetric chemistry might finally be developed to its full potential.

According to Polastro, the method of choice at present for industrial-scale application still is traditional resolution. Others disagree, on the basis that the cost of resolution rapidly escalates with scale-up.

However, recent advances in separations are making large-scale resolutions more cost-effective, Chorghade says. He notes that in some cases, simulated-moving-bed technology (SMB) is cost-effective on a commercial scale.

SMB is a form of multicolumn continuous chromatography. Six to eight columns are run in series. Feed

enters specific columns at particular times, material moves out from one column into the next, and fractions are collected in separate evaporators. The system operates in continuous mode with solvent recycling. The equipment is commercially available from companies such as Novasep. Depending on the size of columns, separations can range in scale from grams to tons. The technology is used to make the APIs for two approved single-enantiomer drugs, escitalopram and sertraline.

SMB is a winner at Aerojet Fine Chemicals, according to Aslam A. Malik, vice president for technology and business development. Whereas the past few years have been rough for custom chemical companies, "our sales have doubled over the past three years," he tells C&EN. The success is due to the value Aerojet can offer because of SMB, he says. In one exclusive-synthesis example that he mentions without specifics because of confidentiality agreements, use of SMB reduced six steps of chemistry required in a process to two. "That cut cost way down," he says.

The biggest advantage of SMB is rapid development. Recalling recent work, Malik says a process developed on a 50-mm-diameter-column unit to everyone's satisfaction in October 2003 was operating in a 200-mm-diameter-column unit by December. "In a few months, we went from a few kilograms to 250 kg. But as far as the engineers were concerned, we could have gone all the way to metric-ton quantities. Because SMB is a physical separation, once it works, it works at any scale," he says.

The biggest disadvantage is the high cost of acquiring the technology. Malik says the bill can reach \$15 million by the time a facility is up and running. Strong justifications must be made for that kind of spending. According to Malik, one of the most convincing arguments was that SMB simultaneously involves engineering and chemistry expertise, which Aerojet developed through the company's long history in the defense business.

To illustrate the economics of SMB, Geoffrey B. Cox, vice president and general manager for separation solutions at Chiral Technologies, Exton, Pa., prepared a case study for C&EN on the commercial-scale synthesis of enantiopure miconazole from a racemic intermediate.

Miconazole is an antifungal agent used to treat skin diseases. For topical applications, a single-enantiomer formulation may not be needed. However, miconazole may be considered for oral treatment of other diseases, including tuberculosis. Should a new oral-route use be found, the drug will

likely have to be formulated as a single enantiomer. Furthermore, structurally related antifungal agents are taken orally, and some of those are produced as single enantiomers.

Chromatographic experiments were conducted to determine the appropriate chiral stationary phase and mobile phase for separating the enantiomers of the racemic intermediate, Cox explains. The data then were used in computer simulations to optimize operating conditions for separation at a scale of 15 metric tons per year. The process was run on a small-scale SMB unit to confirm results.

The process was valued on the basis of the costs of raw material and other material and personnel inputs, as well as costs related to the outsourcing of an SMB operation. The valuation also embodied four key assumptions: Yield will be 96%. Product will be 99% enantiopure. The undesired enantiomer cannot be racemized. And the separation will directly yield material of the required enantiopurity.

According to the calculations, the additional cost to make one enantiomer of miconazole at 99% enantiomeric excess would be \$121 per kg. This is the extra cost

over the procedure that yields racemic product. The amount includes the cost of SMB operation (\$95 per kg) and of the raw material that is discarded at the end (\$26 per kg).

To put that extra cost in context, Cox estimates that the chemical step to convert

the raw material to an appropriate substrate and identifying effective, as well as usable, chemical catalysts or biocatalysts.

What happens to the unwanted enantiomer also depends on the economics. Reracemizing and feeding the racemate back into the process is ideal but not al-

“An enzyme that gives greater than 99.5% enantiomeric excess in one step directly from the solution is hard to beat.”

the intermediate to miconazole costs around \$200 per kg. In this case, it will be more expensive to run the fairly straightforward chemical reaction than to separate the enantiomers.

ALTERNATIVE ROUTES beginning with the racemic raw material will likely be more costly or more time-consuming to develop, Cox says. Crystallization might be tricky because the stereogenic center does not have a group that can readily undergo acid-base chemistry. Catalytic asymmetric chemistry will necessitate converting

ways practical. In the miconazole case, the raw material costs \$32 per kg. It is unlikely that reracemizing would be less costly in this example, Cox explains.

People should not forget that the goal of chiral technologies—enantiopure product—also may be achieved with chemistry that already exists, notes David R. Dodds, founder of Dodds & Associates LLC, Manlius, N.Y., a consulting service for biotechnology and chemical companies. Process chemists seek the most robust, most productive, and least expensive synthetic route and aim to find it as fast as possible. Any re-



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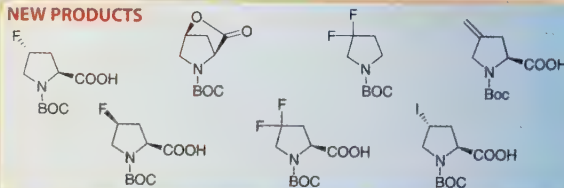
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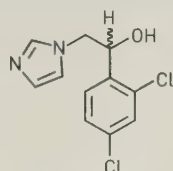
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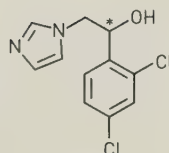


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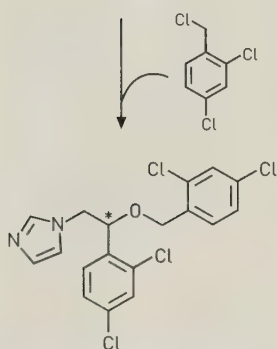


Racemate

Simulated-moving-bed chromatography



R or S



Single-enantiomer miconazole

THE PRICE IS RIGHT Chiral Technologies estimates that in a commercial route to single-enantiomer miconazole that incorporates resolution by simulated-moving-bed chromatography, the separation step, at about \$95 per kg, will cost less than half the chemical conversion step, at about \$200 per kg.

action that can help reach this goal is useful. It is the overall process cost that will dictate which reactions will be used. And that cost covers not only reagents but also waste streams, utilities, equipment use, unit operations, and downstream requirements. Thus, it may be more commercially attractive to replace an elegant but expensive single reaction with several more mundane ones that have a lower total cost, he says. Such a situation is likely to arise when an asymmetric step requires an expensive chiral catalyst or chiral auxiliary.

The power of conventional chemistry is reflected by routes developed by companies such as Zambon, based in Milan, Italy. An example provided by Livius Cotarca,

R&D manager for fine chemicals, is the separation of (*R*)-flurbiprofen from flurbiprofen, a racemic nonsteroidal anti-inflammatory agent. (*R*)-Flurbiprofen is being studied for the treatment of Alzheimer's disease and various cancers. Zambon's patented process has been scaled up to kilogram production. It requires no catalysts. The resolving agent is (*R,R*)-thiomcamine, an advanced intermediate in Zambon's route to thiamphenicol.

Another example of the clever use of

stoichiometric chemistry is the practical synthesis of L-ribose by HanChem, a company based in Daejeon, Korea. Interest in L-sugars is high for therapeutic and cosmetic applications, says Myung Joon Seo, the company's vice president for custom manufacturing. Demand for L-ribose is several metric tons per year, and prices range from \$700 to \$1,000 per kg, he adds.

HanChem prepares L-ribose through a piperidine-induced, one-pot inversion of 2,3,5,6-di-*O*-isopropylidene-D-mannono-

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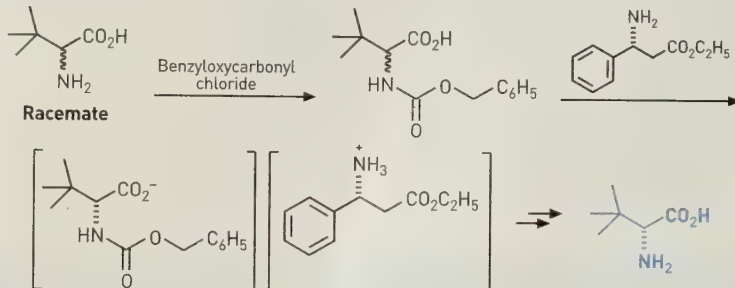
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FILLING A GAP

With the help of β -amino ester, Degussa prepares D-*tert*-leucine at kilogram scale



1,4-lactone [*Tetrahedron Lett.*, **44**, 3051 (2003)]. The reaction has been run at a scale of 5 kg. Seo hopes that the process will be competitive with the best so far, an enzymatic route from D-glucose. It would be competitive if HanChem can find a low-cost supplier of D-mannose. The price of D-mannose has increased since HanChem began the development work, he says.

Still, the consensus is that catalytic asymmetric routes are the most desirable. When C&EN asked several companies about their best commercial or commercially viable chiral chemistry, most offered catalytic asymmetric chemistries.

For the intermediates division of BASF, Ludwigshafen, Germany, the best story so far is (*S*)-methoxyisopropylamine, according to Henning Althoefer, manager for new business development. The compound is an intermediate for the single-enantiomer active ingredient of the herbicide Outlook, a chiral-switch product. Frontier, another BASF herbicide, contains the racemic active ingredient.

A DEDICATED PLANT in BASF's facilities in Geismar, La., produces (*S*)-methoxyisopropylamine at a scale of several thousand metric tons per year, Althoefer says. Production is based on enzymatic acylation of a racemic amine by a proprietary ester. Only one enantiomer is acylated to an amide, which can be readily separated from the unreacted amine. The same principle is used to make BASF's ChiPros chiral amines in Ludwigshafen. Usually, Althoefer points out, the unwanted enantiomers are racemized and fed back into the process.

Similarly, Dowpharma uses biocatalytic resolution using a lipase to prepare enantiomerically pure β -amino acids. Its lipase technology was developed in the late 1990s at Chirotech Technology Ltd., Cambridge, England, which is now a subsidiary of Dow Chemical.

Karen E. Holt, technology leader for biocatalysis at Dowpharma, says that in previous resolutions of racemic β -amino acids the amine is protected—that is, the substrate is derivatized both at the carboxyl group (as an ester) and the amino group (as an amide). She and others showed that protecting the amino group is unnecessary and that the resolution can be achieved in fewer steps than had been tried before [*Tetrahedron Lett.*, **41**, 2679 (2000)]. This route to 99% enantiopure β -phenylalanines has been performed at metric-ton scale at Dowpharma, she says.

Ian C. Lennon, technology leader for chemocatalysis at Dowpharma, points out that Chirotech chemists examined producing β -amino acids by catalytic asymmetric hydrogenation of carbon-carbon double bonds in unsaturated substrates. But given the state of that technology in the late 1990s, they concluded that such a route

would be more complex, with more stages and steps, and would produce more waste even though the key step is asymmetric.

The complexity is due partly to the mixture of E and Z isomers produced in the synthesis of the required substrates. Most catalysts effectively hydrogenate the E isomer in high enantiomeric excess, and not the Z isomer. But the Z isomer is formed in greater amounts because it is more thermodynamically stable. In this scenario, the overall yield of enantioselective hydrogenation would be inferior compared with biocatalytic resolution.

Chiral Quest recently has offered one solution to this problem in the form of the rhodium-TangPhos catalyst. According to Xumu Zhang, a chemistry professor at Pennsylvania State University and the company's founder and chief technology offi-

cer, this catalyst is indifferent to the geometric-isomer form of the substrate. In reactions run at mild enough conditions, rhodium-TangPhos hydrogenates E and Z isomers in 98–99% enantiomeric excess. Because of the high electron-donating ability of TangPhos, turnovers of up to 10,000 can be achieved, he claims. The company is now scaling up production of the catalyst to kilogram quantities in anticipation of demand.

β -Amino acids are so important—and the lipase route to them so general—that many companies are trying to commercialize the chemistry. β -Amino acids are intermediates for various drugs being developed, and demand ranges from several hundred kilograms to a few metric tons per compound, according to Karlheinz Drauz, Degussa's vice president for technology and R&D management.

Like Dowpharma's, Degussa's route begins with racemic β -amino acids prepared through one-pot synthesis. The amino acids are then esterified with a Degussa proprietary ester. A commercially available lipase selectively hydrolyzes only the (*S*)-esters, releasing (*S*)- β -amino acids. The free acid precipitates directly from the reaction in greater than 99.5% enantiomeric excess and a chemical purity of 99%. Drauz says Degussa has conducted several multi-hundred-kilogram campaigns for various β -amino acids,

such as β -phenylalanines, and is preparing for even larger campaigns for the near future.

Before adopting the biocatalytic route to β -amino acids, Degussa also tried catalytic enantioselective hydrogenation of α,β -unsaturated enamides, but it proved inferior. With Degussa's rhodium-MalPhos catalyst, only 95% enantiopurity could be achieved. At least one recrystallization would be needed to raise the enantiopurity to that required for pharmaceutical applications. Furthermore, the route yields a derivatized β -amino acid. Releasing the amino acid requires another chemical step and additional workup. "An enzyme that gives greater than 99.5% enantiomeric excess in one step directly from the solution is hard to beat," Drauz says.

Degussa is developing methods to racemize the undesired enantiomers while also seeking potential uses for them. It turns out that (*R*)- β -amino acid esters are excellent resolution agents. According to Drauz, in late March, Degussa revealed that it has successfully used ethyl (*R*)-3-amino-3-phenylpropionate in a process to resolve

"It's never the whole story in publications. It's so much more complex."

racemic *tert*-leucine for kilogram-scale production of *D-tert*-leucine. This compound previously could not be accessed through biocatalytic means, he says. Now a chemical resolution is available.

"*D-tert*-Leucine is a missing link in the chiral map," Drauz says. Many asymmetric ligands, catalysts, and chiral auxiliaries are based on *tert*-leucine, but only those incorporating *L-tert*-leucine could be made easily. Now the complementary compounds based on *D-tert*-leucine can be prepared "on a roughly similar cost basis," he explains. "This is a great result for all asymmetric reactions based on *tert*-leucine." Furthermore, a demand exists for *D-tert*-leucine as a building block for new drug candidates. It also is needed in the synthesis of the enantiomers of drug candidates containing *L-tert*-leucine, which must also be evaluated during drug development.

Biocatalysis also has been successfully applied to commercial production of single-enantiomer 3-hydroxybutyrate from

prochiral ketones. One particular compound, ethyl (*S*)-4-chloro-3-hydroxybutyrate (ECHB), is an intermediate in the synthesis of cholesterol-lowering drugs

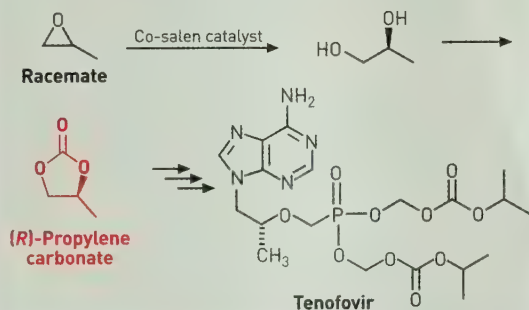
production capability for ECHB is more than 100 metric tons per year by whole-cell biocatalysis. Significant improvements to the process have been made since C&EN reported on it five years ago (C&EN, July 19, 1999, page 65).

The key step is asymmetric hydrogenation of the carbonyl group of ethyl 4-chloroacetoacetate (ECAA) by a biocatalyst. That catalyst is a carbonyl reductase originally isolated from *Kluyveromyces aestuarii* and then expressed in *Escherichia coli*. ECAA is prepared chemically from diketene, a core raw material at Daicel.

The hydrogen source is reduced nicotinamide adenine dinucleotide (NADH). Previously it was regenerated through a glucose dehydrogenase system that converts glucose to gluconic acid. Because of environmental concerns regarding the large amount of gluconic acid formed in the waste stream, Daicel switched to a formate dehydrogenase system, which converts

ACE IN THE HOLE

Using hydrolytic kinetic resolution, Rhodia prepares tons of chiral intermediate per year



such as Lipitor (atorvastatin) and Crestor (rosuvastatin). Sales of Lipitor alone reached \$10.3 billion in 2003. Many companies are vying to supply the chiral side-chains in these compounds.

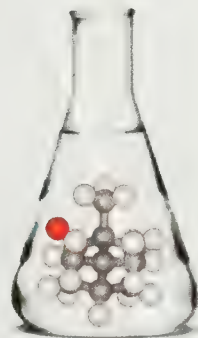
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formic acid to carbon dioxide, according to John R. Peterson, chief executive officer of Thesis Chemistry LLC, Mentor, Ohio, which is the marketing representative of Daicel in North America.

A stable and active formate dehydrogenase was isolated from *Mycobacterium vaccae*, and its productivity was improved by site-specific mutation. The variant now in commercial use furnishes ECHB with greater than 99% enantiopurity at a rate of 49.9 g/L, much more productive than the wild-type enzyme (19.0 g/L) and even better than the optimized glucose dehydrogenase (45.6 g/L).

Other targeted, site-specific mutations of the formate dehydrogenase have led to two other benefits: increased tolerance to ECAA and better performance in an organic solvent. According to Peterson, ECAA is toxic to whole cells bearing the wild-type enzyme, which is usually shut down by organic solvents as well. In this case, fewer cells are dying from ECAA, and the enzyme actually works better in organic solvents.

Competition to come up with better ways to make ECHB is intense. Dowpharma teamed up with the San Diego-based biocatalysis company Diversa to develop a route that is likely based on nitrilases (C&EN, Feb. 18, 2002, page 86; Oct. 7, 2002, page 8). "The team is not in a position to comment at this time," a Dowpharma spokesperson says in response to C&EN's request for an update on the project's status.

Chiral Quest has joined in with its ruthenium-*C*₃TunePhos catalyst for asymmetric hydrogenation of ECAA. Zhang estimates that as little as 1 kg of this catalyst can produce up to 9 metric tons of 98 to 99% enantiopure ECHB from ECAA. And according to Brandt, Chiral Quest is supplying kilogram amounts of the catalyst to a client for commercial production of ECHB.

Wacker Specialties, Munich, Germany, is also targeting single-enantiomer 3-hydroxybutyrates as part of its mission to be "the number one chiral alcohol producer based on ketones," according to Hans Pommerening, director for organic fine chemicals. The company is a major producer of diketene, from which prochiral acetoacetates are readily made.

To compare the economics of various options for making 3-hydroxybutyrates, Wacker analyzed two routes it operates to make (*R*)-3-hydroxybutyrate esters: biocatalytic reduction with an isolated enzyme and catalytic asymmetric hydrogenation with ruthenium and a proprietary diphosphine ligand. On the basis of published literature, the company concluded

that biocatalytic reduction by whole-cell fermentation is an inferior route, according to Pommerening.

Wacker's isolated-enzyme biocatalytic route is based on an alcohol dehydrogenase from *Lactobacillus brevis*. The commercial application of this enzyme was developed by and is proprietary to Jülich Fine Chemicals (JFC). This company, based in Jülich, Germany, is one of Wacker's collaborators in developing enzymatic processes for fine chemicals. Wacker claims that the process yields 100% enantiopure product in 97% yield. It has been run at hundreds-of-kilograms scale. Wacker estimates that this route can produce commercial quantities of (*R*)-3-hydroxybutyrates at less than \$100 per kg.

By comparison, the chemocatalytic route using Wacker's proprietary ligand yields 98% enantiopure product in up to 95% yield. This route also has been run at hundreds-of-kilograms scale. Wacker estimates that the cost to produce (*R*)-3-hydroxybutyrates from this route will be 10 to 15% lower than by biocatalysis.

Both routes use standard equipment. The biocatalytic route has an edge with regard to safety and health issues. It runs at ambient pressure and temperature, whereas the chemocatalytic route requires 100 °C temperatures and means for handling

hydrogen, as well as a toxic solvent, methanol. On the other hand, the chemocatalytic route produces less than 100 g of organic waste per kg of product, compared with 2 L of waste per kg of product for the biocatalytic route.

THE BIGGEST DIFFERENCE is that throughput for the chemocatalytic route is three to four times higher than for biocatalysis. To achieve the high enantiomeric excess of the biocatalytic route, the process must run with dilute solutions. That means lower throughput rates, Pommerening explains. Both routes are poised for operation at multiton scale, he adds. The customer's requirement for purity and price will dictate which route to take.

The biocatalytic route yields chiral alcohols of exceptionally high quality, says Thomas Maier, senior marketing manager at Wacker. For this reason, he says, Wacker is collaborating with JFC, as well as Prokaria, a Reykjavik company that discovers enzymes from Iceland's biodiversity pool, to develop processes for other specific chiral alcohols.

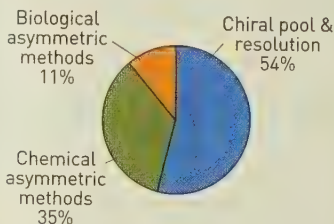
At Bayer Chemicals, 3-hydroxyesters, including 3-hydroxybutyrates, are produced with enantiopurities of more than 99% in ton quantities per year by way of catalytic asymmetric hydrogenation of 3-ketoesters through Bayer's ruthenium-ClMeO-BIPHEP catalyst, according to Ulrich Scholz, laboratory head for catalysis. At the request of a customer, Bayer has used the chemistry to prepare enantiopure (*S,S*)-pentan-2,4-diol from acetylacetone. Bayer prepared several kilograms of the enantiomer with greater than 99% enantiomeric excess and greater than 98% diastereomeric excess. Interestingly, the customer specializes in biocatalysis and has a biocatalytic route to the *R,R* enantiomer, Scholz says. "They were looking for a way to have both enantiomers in their portfolio."

For Rhodia Pharma Solutions, the best chiral chemistry success so far is hydrolytic kinetic resolution (HKR) of racemic terminal epoxides, according to Spagnol. The technology was invented by Harvard University chemistry professor Eric N. Jacobsen and is licensed exclusively to Rhodia. The process produces tens of tons of single enantiomers of epichlorohydrin per year. An extremely versatile building block, epichlorohydrin provides access to a diverse range of intermediates of interest to the pharmaceutical industry.

Rhodia also applies HKR to racemic propylene oxide, a commodity chemical, to prepare single-enantiomer propylene glycol. (*R*)-Propylene glycol is easily convert-

MISMATCH

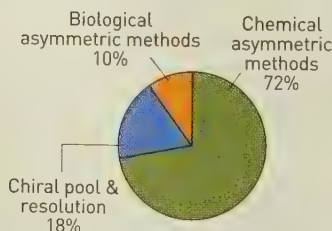
Technology use in 2003 ...



Estimated revenues worldwide = \$7.74 billion

SOURCE: Frost & Sullivan

... does not reflect R&D output



Journal citations for 1994-2003 = 24,107

SOURCE: Chemical Abstracts Service

ed to (*R*)-propylene carbonate, an intermediate in the synthesis of the AIDS drug tenofovir (Viread), from Gilead Sciences. This intermediate, produced in multiton quantities per year, is Rhodia's second largest product based on HKR technology, Spagnol says.

Using a cobalt-salen catalyst, the Jacobsen hydrolytic kinetic resolution hydrolyzes only one enantiomer of a racemic epoxide to the corresponding diol. Because the diol and the unreacted epoxide differ greatly in their physical properties, they are readily separated. The process typically yields single-enantiomer epoxides in greater than 99% enantiomeric excess.

That HKR consistently achieves excellent enantioselectivities was a major factor in its adoption by Rhodia, Spagnol says. With improvements on the original invention, including development of a second-generation catalyst, the process now uses less than 1 kg of catalyst to make 1 metric ton of product, Spagnol claims. The technology is so commanding that Rhodia is now the largest producer of single-enantiomer epichlorohydrins and (*R*)-propylene carbonate, he adds.

Hard work and luck both contributed to Rhodia's success with HKR. According to Spagnol, from the time of licensing, it took at least four years of intense effort and investment to develop the technology to its current state. Meanwhile, demand for products derived from HKR has been increasing. With customers insisting on high-quality but low-cost supplies, the process had to be made extremely efficient.

AN ALTERNATIVE ROUTE to single-enantiomer chiral epoxides is asymmetric epoxidation of olefins. At DSM, hopes are high for the reaction developed by chemistry professor Yian Shi at Colorado State University, Fort Collins. Called the Shi epoxidation, the reaction is catalyzed by a fructose-derived ketone and transforms trans alkenes that do not have to bear an allylic group to single-enantiomer epoxides with enantiomeric excesses usually greater than 95%.

Pharmaceutical applications of the reaction have been licensed exclusively to DSM. According to DSM's Ager, DSM has used the original methodology, in which the oxidant is potassium peroxomonosulfate (Oxone), to make around 100 kg of a

custom-synthesis product for a pharmaceutical customer.

The substrate scope is broad, including trisubstituted olefins and olefins bearing a wide range of functional groups. But until recently, the Shi epoxidation was ineffective for cis olefins and terminal olefins. In 2002, the reaction was extended to these substrates through a catalyst that is a glucose-derived nitrogen analog of the fructose-derived ketone in the original invention.

The Shi epoxidation complements the chemistry developed by chemistry Nobel Laureate K. Barry Sharpless. The Sharpless epoxidation, which has been licensed to PPG Fine Chemicals, is catalyzed by a titanium-tartrate complex and requires allylic alcohol substrates. "In many cases, newer technologies have proven to be more cost-effective than the Sharpless epoxidation," according to PPG's website.

At Bayer Chemicals, meanwhile, Arne Gerlach, laboratory head for specialty chemicals, has spent part of the past three years developing the asymmetric epoxidation reaction called the Juliá-Colonna oxidation. Here the substrate is an enone; the product is a chiral epoxy ketone; the oxidant is hy-

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drogen peroxide; and the chiral catalyst is poly-L-leucine, which can be recycled.

Gerlach says the substrate scope of this reaction is limited to substituted enones. On the other hand, the reaction is atom economical and requires mild reaction conditions, an inexpensive oxidant, and a recyclable catalyst. These advantages were attractive enough to invest in its development, Gerlach says.

According to Gerlach, the original reaction was not practical. Throughput was low, and workup was complicated. An industrially viable process now patented by Bayer Chemicals involves a simpler workup and a phase-transfer cocatalyst, which was not part of the original invention. A reliable synthesis of poly-L-leucine also has been established.

In the Bayer process, the enone substrate is dissolved in an organic phase, such as toluene. Hydrogen peroxide and an inorganic base, to generate peroxide anion, are in an aqueous phase. Poly-L-leucine, which is not soluble in water or organic solvent, constitutes a third phase. The phase-transfer cocatalyst—tetrabutylammonium bromide—escorts the peroxide to the organic phase. This innovation cut the reaction time from more than 90 minutes to seven minutes in experiments with 75 mg of a chalcone substrate.

In the organic phase, the peroxide delivers an oxygen atom to the substrate. It is

believed that the substrate is bound to poly-L-leucine through the carbonyl of the enone so that only one face of the olefin double bond is available to accept it. The mixture is stirred at 700–800 rpm to ensure efficient mixing of the three phases. After the reaction, the catalyst is filtered out, the liquid phases are separated, and the product is concentrated from the organic phase.

Practiced on 100 g of the same chalcone substrate, Bayer's epoxidation protocol converts 75% of the starting material to an

tons per year, the largest-scale enantioselective catalysis at present produces the penultimate intermediate in the synthetic route to (S)-metolachlor. This compound is the active ingredient of Dual Gold, a broad-spectrum herbicide against grass weeds. The predecessor of Dual Gold is Dual, with racemic metolachlor as the active ingredient. Dual came to the market in 1976.

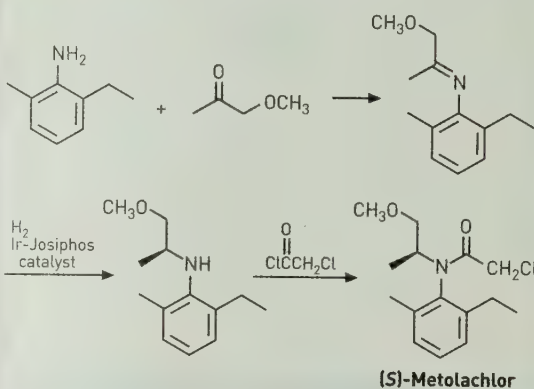
Metolachlor has two elements of chirality: a chiral axis and a stereogenic center. The active ingredient in Dual therefore consists of four stereoisomers. In 1982, it was established that the biological activity resides only in the two S diastereomers. That knowledge spurred the search for a commercially viable chiral switch.

The chiral switch is based on catalytic enantioselective hydrogenation of an imine. The reaction was developed in what was then the central research laboratories of Ciba-Geigy, in Basel, by chemists led by Blaser, Hans-Peter Jalett, Benoit Pugin, and Felix Spindler. One key to the success is the catalyst discovered as the work progressed—iridium complexed to a ferrocenyl diphosphine ligand now well known as Josiphos.

The iridium-Josiphos catalyst delivers both satisfactory enantiomeric excess and an amazing turnover number of more than 1 million. That and the relatively mild reaction conditions—hydrogen pressure of 80 bar and a reaction temperature of 50

INDUSTRIAL FEAT

Catalytic asymmetric hydrogenation is key in route to herbicide ingredient



epoxy ketone with 95.5% enantiopurity. Recrystallization raises the enantiopurity to more than 99%. "We have now set the stage to produce multikilogram quantities with this technology," Gerlach says.

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CALENDAR

Events Of Interest

June 18, Tetrahedron Symposium 2004. New York City. Information at <http://www.tetrahedron-symposium.elsevier.com/index.htm>.

June 20–25, Gordon Research Conference on Stereochemistry. Newport, R.I. Information at <http://www.grc.uri.edu/programs/2004/stereo.htm>.

June 23–24, ChemSpec Europe 2004. Amsterdam, the Netherlands. Information at <http://www.dmgworldmedia.com>.

July 11–14, 16th International Symposium on Chirality. New York City. Contact Janet Cunningham, phone (301) 668-6001; fax (301) 668-4312; e-mail: janetbarr@aol.com.

July 11–16, Gordon Research Conference on Biocatalysis. Meriden, N.H. Information at <http://www.grc.uri.edu/programs/2004/biocat.htm>.

July 12–16, 10th Belgian Organic Synthesis Symposium. Louvain-La-Neuve, Belgium. Information at <http://www.boss10.be>.

July 13–16, 10th International Conference on Organic Process Research & Development. Vancouver, British Columbia. Contact Scientific Update, 011 44 14 3587 3062; e-mail: sciup@scientificupdate.co.uk.

July 18–23, Gordon Research Conference on Organic Reactions & Processes. Bristol, R.I. Information at <http://www.grc.uri.edu/programs/2004/orgreact.htm>.

July 25–30, Gordon Research Conference on Natural Products. Tilton, N.H. Information at <http://www.grc.uri.edu/programs/2004/natprod.htm>.

Sept. 23–24, 7th International Symposium on Laboratory Automation in Process Development. Contact Scientific Update.

Oct. 4–5, Chiral USA 2004. Boston. Contact Scientific Update.

Oct. 6–7, Outsource USA 2004. Boston. Contact Scientific Update.

Oct. 17–20, SPICA 2004, International Symposium on Preparative & Industrial Chromatography & Allied Techniques. Aachen, Germany. Information at <http://events.dechema.de/spica.html>.

Nov. 1–4, 6th International Conference on the Scale-up of Chemical Processes 2004. Dublin. Contact Scientific Update.

Dec. 7–9, CPhI Worldwide 2004. Brussels. Information at <http://www.cphi.com>.

Jan. 17–20, 2005, Informex 2005. Las Vegas. Information at <http://www.informex.org>.

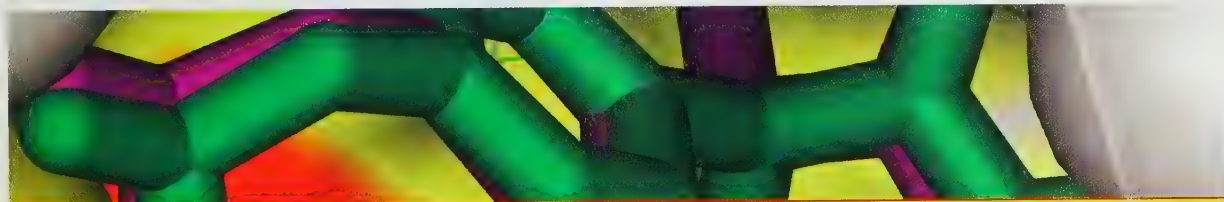
^oC—yield a highly efficient, cost-competitive process.

The story of (S)-metolachlor has been told, most recently in a chapter of the book "Asymmetric Catalysis on Industrial Scale: Challenges, Approaches, and Solutions," edited by Blaser and Elke Schmidt (Wiley, 2004). This account gives the impression that development proceeded as if accord-

ing to a well-planned blueprint. "It's never the whole story in publications," says Blaser. "It's so much more complex."

Earlier, in a much more nuanced report [*Adv. Synth. Catal.*, 344, 17 (2002)], Blaser aptly called the 13-year (1981–94) effort an odyssey and compared the quest for the right catalyst with navigating a labyrinth. When the search began, al-

most nothing was known about enantioselective reduction of imines, catalytic asymmetric hydrogenations that could provide guidance were few, and the number of ligands to choose from was limited. But even now, with more ligands, more screening capabilities, and more people with hands-on experience, finding the right catalyst is still the key, Blaser



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says. Optimizing and scaling up are routine by comparison.

Lack of rapid analytical techniques was also a handicap at the early stages. Enantiomeric excesses were measured from optical rotations or by nuclear magnetic resonance spectrometry. Chromatographic methods were not developed until later. "Good analytics are crucial with any project," Blaser says. "If they are not reliable or are slower than the throughput of screening systems, they are useless."

Initially, progress was slow as hypotheses about routes and catalysts failed. Nevertheless, the research continued because Blaser and his team were trusted by and had the strong backing of the company. At one point, management suspended the project as it considered whether another compound altogether should be developed to replace metolachlor. When finally it was decided to stick with the chiral switch, the project sped up with the full force of Ciba-Geigy's organizational expertise and institutional know-how. "You must have somebody who

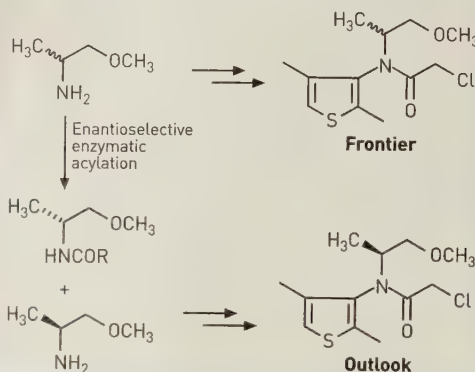
says, "This problem is important, and we want to solve it," Blaser tells C&EN. "That was the situation at Ciba-Geigy's agrochemical division. It was their most impor-

tant product, it eventually came off patent, and they needed a replacement." Having a champion and years of development time are rare in the current climate in which speed to market is everything. The window of opportunity is narrow, and success will be elusive without certain elements in place, Blaser says. These elements include a suitable library of ligands, auxiliaries, and metal precursors; access to rapid screening of catalytic systems; access to very good analytical equipment; and highly experienced specialists. The last is especially key, given that so many catalysts are being invented but their inventors do not always have experience with process development. Licensed catalysts are not worth much until somebody applies them to scale, he adds.

The full potential of enantioselective catalysis is far from realized. As process chemists acquire more experience with catalytic systems, as researchers gain better understanding of enantioselective reactions and mechanisms, and as optically pure products progress through pipelines and eventually to markets, so will the promise of the catalytic chiral technology incrementally be fulfilled. ■

ENABLING

Biocatalysis assisted BASF in chiral switch of a commercial herbicide



tant product, it eventually came off patent, and they needed a replacement."

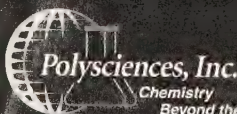
Having a champion and years of development time are rare in the current climate

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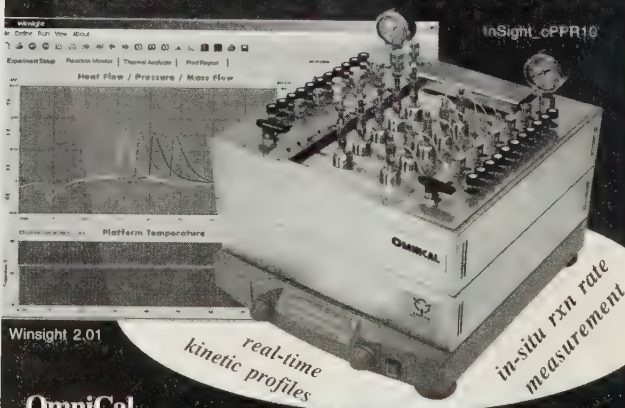
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CHEMISTRY LEADERS MEET IN TOKYO

Officers of six major international chemical societies have common problems, work together

THE CHEMICAL SOCIETY OF JAPAN (CSJ) last month hosted the fourth Major Chemical Societies Meeting in Tokyo. Also called C6, the meeting was attended by presidents and officers of six major chemical societies: those of France, Germany, Japan, the Netherlands, the U.K., and the U.S. Participants met to discuss important issues affecting chemistry, chemical technology, and the chemical community.

American Chemical Society participants were Charles P. Casey, president; James D. Burke, board chair; Madeleine Jacobs, executive director and chief executive officer; and David L. Schutt, chief strategy officer and director of external affairs.

"All societies are experiencing similar challenges," says Jacobs, who supplied notes and background information to C&EN for this article. "Across cultures, across the globe," Jacobs says, "there are great opportunities to address our common concerns."

The idea of having these conferences was first proposed in 1998 by Mary L. Good, who was then chair of the ACS Committee on International Activities. This year's meeting started with a keynote lecture delivered by CSJ President Makoto Misono. He noted that chemistry and chemical technology have contributed to the welfare of humanity by changing and evolving over the years. He pointed out

that chemical societies will continue to be attractive by being ahead of these changes.

After the keynote, participants started to tackle five broad topics that had been preselected for discussion. Each topic was chaired by a different chemical society.

Casey launched a discussion on "Breadth of Chemistry" by noting the challenge of finding ways to incorporate people working at the interfaces of chemistry and other sciences. Participants agreed that chemistry as a discipline has grown to cover a wide range of research areas and incorporates interfaces with other areas of science such as biology and nanotechnology. There was agreement that it is incumbent upon the chemical societies in the C6 countries to respond to changes in chemistry and to attempt to redefine the field in terms of interdisciplinary sciences.

In this discussion, it became apparent that each C6 society is having difficulty attracting members. This difficulty is, in part, attributed to the proliferation of niche societies. Attendees agreed that smaller societies could be provided with autonomy within the larger societies. Casey believes that ACS has not been as fast to incorporate new areas as it needs to be.

A session on "Career Development & Accreditation of Chemists" was chaired by David Giachardi, CEO of the U.K.'s Royal Society of Chemistry. In this session, the roles of chemical societies were discussed as they relate to three life stages of chemists: university education, early career, and mid-to-late career. The societies differed in their opinions on the necessity of professional certification of chemists and on accreditation of chemistry departments.

There are systems in some of the C6 countries to accredit individual chemists. All of the societies, however, have programs in place to help their members grow

professionally, including short courses, employment services, and mentoring. They differ in their accreditation practices.

A session on "Primary & Secondary Education" was chaired by Rietje van Dam-Mieras, president of the Royal Netherlands Chemical Society. In the session, all participants affirmed the importance of primary and secondary education, but they noted that scientific societies are limited in what they can achieve in influencing national education systems. But they believe that use of electronic media is particularly important and that chemical societies can serve as clearinghouses for effective curriculum material.

"International Relations" was the topic chaired by Henning Hopf, president of the German Chemical Society. C6 societies agreed that international cooperation and exchange are of central importance. In-



REPRESENTATIVES (From left) Hopf, president, German Chemical Society; Casey, president, ACS; Misono, president, Chemical Society of Japan; Lattes, president, French Chemical Society; van Dam-Mieras, president, Royal Netherlands Chemical Society; and Giachardi, chief executive officer, Royal Society of Chemistry.

creasing international student exchange and leveraging the resources on the Internet for information were seen by all as highly desirable. Attendees also agreed that industry and government agencies should be approached to provide funding for these projects.

Armand Lattes, president of the French Chemical Society (SFC), chaired a session on "Collaboration with Developing Countries." In this session, society representatives agreed that it is important to accelerate cooperation with developing countries while taking into account environmental concerns related to sustainable development. Highlights of the discussion included the importance of education and training of students in their home countries.

An official statement from the meeting and other materials are available at <http://www.cen-online.org>. The next C6 meeting will be held in Paris in 2007 on the occasion of SFC's 150th anniversary.—LINDA RABER



KANPAI! Chemical Society of Japan Executive Director and Secretary General Teruto Ohta (left) and Casey exchange festive toasts at the farewell dinner of the C6 chemical societies meeting.

NESACS Exchange Program On A Roll

THE YOUNGER CHEMISTS COMMITTEES of the ACS Northeastern Section (NESACS) and the German Chemical Society just completed their fourth annual student exchange program. "The exchange, which was held this year in Boston, typically involves 12 mostly graduate students," says NESACS member Michael E. Strem, president of Strem Chemicals.

PHOTO BY R. BRIDGET HINTER



EXCHANGE Ulrike Helmstedt, a Ph.D. student at the University of Leipzig, describes her poster to an interested onlooker.

Strem, who has been involved in all the section's exchanges, tells C&EN that the program began in 2001 when a German contingent traveled to Boston for a week-long program. In 2002 and 2003 (the Year of Chemistry in Germany), groups of students from NESACS traveled to Germany visiting Cologne, Aachen, Munich, and Dresden. The highlight of each trip to Germany was the Euroregionale Research Conference in which the NESACS group participated.

In addition to taking in a Red Sox home baseball game, this year's group members toured the Harvard University and Massachusetts Institute of Technology chemistry departments and visited the research facilities of Pfizer in Groton, Conn., where they also participated in a seminar on drug discovery. The group members also visited Boston's Museum of Fine Arts for a lecture by its chief chemist.

The first career fair for the Northeastern Section was also part of this year's exchange. Participating companies included Amgen, AstraZeneca, Bayer, Cubist Pharmaceuticals, DAAD (German Academic

Exchange Service), Degussa, Engelhard, Genzyme, ImmunoGen, Kforce, Novartis Institutes for Biomedical Research, Pharm-Eco, Strem Chemicals, and Wyeth. During the morning, ACS Career Services hosted a résumé/interview workshop, and in the afternoon the participants visited the company booths.

The last day was the highlight, as the 6th Annual Northeast Student Chemistry Research Conference (NSCRC) was held. This conference featured the research of undergraduates, graduate students, and postdocs. Awards were given for the best posters and the best oral presentation.

Charles P. Casey, ACS president, delivered the welcoming address at NSCRC as well as the closing remarks at the banquet that evening. Stephen J. Lippard, chair of the MIT department of chemistry, gave the keynote address, "New Fluorescent Sensors To Study Biochemical Zinc and Nitric Oxide and To Monitor Mercury in the Environment."

In Casey's note afterward, he expressed his appreciation for being invited to attend the events and his hope that

other local sections would try to have similar programs. "There is value in both the cultural and science exchanges and the career development for students as well," he said.—LINDA RABER

Casey Addresses Delaware Legislature

ON APRIL 27, ACS PRESIDENT CHARLES P. Casey addressed the Delaware State Senate on behalf of ACS and the Delaware Section. He spoke briefly, making three specific recommendations to the state so that it can remain a center of high technology and good jobs.

"First, you need to provide a workforce for high technology. And that means investment in K-12 education and everything beyond that," he said. "Second, it means investment in research universities. The research universities are often the center of new technological development that leads to spin-off companies and new jobs in the state.

"Third, you need to provide an environment attractive to scientists and high-technology companies. And what would attract them? It's going to be good schools in the K-12 area. It's going to be a clean environment. It's going to be a vibrant arts and music community. And it's going to be a community that welcomes diversity."

Casey also noted that colleges and universities play an important role as technology partners. "The Delaware Biotechnology Institute at the University of Delaware and the Delaware Technology Park are good examples of collaboration across disciplinary research and education," he said. "We hope you will continue to build in these efforts to boost Delaware's standing in current and emerging areas including biotechnology, nanotechnology, and energy technology."—LINDA RABER

PORTLAND SECTION JUDGES INTEL SCIENCE FAIR WINNERS

Each year, ACS local sections select chemistry prizewinners in the Intel International Science Fair. This year, the science fair was held in Portland, Ore., and judges from the Portland Section reviewed projects and awarded a number of prizes. Front row, left to right, are Ivan S. Bushmarinov, Russia, 1st-place winner; Arun Thottumkara, Illinois, 2nd place; Michael Klenov, Russia, 3rd place; and Sharat Ganapati, Oregon, and Thomas Chen, Washington (team), 4th place. Back row, left to right, are Nicolas Hamel, Portland Section education chair, and honorable mention winners Brian Sparling, Florida; Carrie McDonough, Ohio; Ayaka Iwami, Japan; and Di Zhen Ye, Pennsylvania.



Two Receive Iota Sigma Pi Awards

IOTA SIGMA PI, THE NATIONAL HONOR society for women in chemistry, has selected two chemists to receive annual awards.

Carolyn R. Bertozzi, professor of chemistry and molecular biology at the University of California, Berkeley, is the 2004 recipient of the Agnes Fay Morgan Research Award. This annual award is given to a woman under age 40 for research achievement in chemistry or biochemistry.



Bertozzi attended Harvard University as an undergraduate and earned an A.B. in chemistry in 1988. She moved to UC Berkeley to pursue a Ph.D. in chemistry, which she received in 1993, working with Mark Bednarski on the synthesis and biological activity of C-glycosides.

Bertozzi joined the UC Berkeley faculty in 1996. Her research focuses on profiling changes in cell surface glycosylation associated with cancer, inflammation, and bacterial infection and exploiting this information to develop diagnostic and therapeutic approaches. Bertozzi is a member of several scientific advisory boards of biotechnology and pharmaceutical companies and is a cofounder of Thios Pharmaceuticals.

Rose Ann Clark, associate professor of chemistry at Saint Francis University, Loretto, Pa., will receive the 2004 Iota Sigma Pi Centennial Award for Excellence in Teaching. This award is given for excellence in teaching chemistry, biochemistry, or a chemistry-related field at an undergraduate institution that does not offer a graduate program in that field.

Clark received a B.S. in chemistry at the University of North Carolina, Wilmington, and a Ph.D. in analytical chemistry from North Carolina State University under the direction of Edmond F. Bowden. After spending two years as a postdoc at Pennsylvania State University with Andrew G. Ewing, she joined the chemistry department at Saint Francis to focus on undergraduate education and research.

She has been instrumental in the trans-



formation of the chemistry department, which has undergone complete curriculum revisions with addition of concentrations in forensic chemistry and biochemistry and a neuroscience minor. Not only is the curriculum changing, but the method of teaching has also changed. Clark adopted new active-learning textbooks to further encourage active learning in general chemistry classes and helped to redesign the ways labs are taught by incorporating cooperative learning at all levels.

Her success at making research an effective teaching tool for undergraduates is reflected in the progress of students she has mentored. Undergraduates conducting research with Clark have presented a large number of papers at conferences locally, regionally, and nationally.

Madeleine Jacobs Honored For Executive Excellence

ON JUNE 17, THE COMMERCIAL DEVELOPMENT & Marketing Association and the Chemical Heritage Foundation will present their 2004 Award for Executive Excellence to Madeleine Jacobs, ACS executive director and CEO. The award is given annually to an individual who has made an outstanding contribution in the field of commercial development and marketing in the chemical and allied industries. With extensive experience at several major scientific organizations, Jacobs consistently demonstrated strategic thinking, innovation, and effective communication on issues critical to the chemical community during her previous position as editor-in-chief of *Chemical & Engineering News*, and she has made an important contribution by serving as an ambassador for the chemical sciences, CDMA says.



Gordon Amidon To Receive Volwiler Award

THE AMERICAN ASSOCIATION OF Colleges of Pharmacy (AACCP) Board of Directors has selected **Gordon L. Amidon**, Charles R. Walgreen Jr. Professor of Pharmacy at the University of

Michigan College of Pharmacy, as the recipient of the 2004 AACCP Volwiler Research Achievement Award. Amidon was selected to receive the association's premier research award, given since 1977 to recognize outstanding research conducted by a pharmaceutical scientist and educator,



based on his research productivity and exceptional sustained service to the pharmaceutical sciences as a whole.

Sponsored by Abbott Laboratories in memory of its former president and research director, Ernest H. Volwiler, the award consists of a \$12,500 stipend, a specially struck gold medal, and an inscribed plaque. Amidon is the 28th recipient of the award and will be honored on July 11 at AACCP's annual meeting in Salt Lake City, Utah.

Amidon has distinguished himself in the areas of solubility-permeability, intestinal absorption mechanisms, biopharmaceutics, and molecular drug targeting with prodrugs. Of particular note is his work on oral drug absorption that established the fundamental basis for a set of regulatory standards, widely recognized as the Biopharmaceutics Classification System. BCS is an innovative approach to regulating the bioequivalence of pharmaceutical dosage forms, and its influence is enormous because it affects the globalization of the pharmaceutical industry.

Amidon is the editor of the journal *Molecular Pharmaceutics*, published by ACS.

Degussa Honors Benjamin List For Achievements In Chiral Chemistry

DEGUSSA EXCLUSIVE SYNTHESIS & Catalysts will present the first Degussa Award for Chirality in Chemistry to Benjamin List of the Max Planck Institute for Coal Research, Mülheim an der Ruhr, Germany. The Degussa Award for Chirality in Chemistry is given for innovative research in amino acids performed by a chemist under 40. The award of about \$6,000 (5,000 euros) will be presented to List at the 2004 Chiral Europe conference being held in Mainz, Germany, this week, where he will also deliver the prize lecture.

"Degussa places a strong emphasis on

innovation and recognizes the achievements of young researchers in academia," says Peter Nagler, president of Degussa Exclusive Synthesis & Catalysts. "Once we developed the concept for this award, we asked an independent, international jury of distinguished organic chemists to nominate a candidate. List stood out for his pioneering work in amino catalysis."

List studied at the Free University, Berlin, and received his Ph.D. from the University of Frankfurt. He then moved to Scripps Research Institute, where he became assistant professor in 1999. In 2003, he returned to Germany as an associate professor at Max Planck Institute.

List is a pioneer in amino-catalyzed asymmetric synthesis, using natural amino acids such as proline as simple enzyme mimics. The advantages of this method over transition-metal-catalyzed asymmetric reactions are that no precious metals or complex ligands are required and the reaction can be run to recover the amino acid catalyst for reuse.



List

Chemical Computing Excellence Awards

THE CHEMICAL COMPUTING GROUP (CCG) and the ACS Division of Computers in Chemistry (COMP) presented the latest winners of the CCG Excellence Awards at the 227th ACS national meeting in Anaheim, Calif.

The CCG Excellence Awards are intended to encourage graduate student participation and interaction among computational chemists in COMP activities at ACS national meetings. Winners are selected according to the high quality and relevance of their research, as well as the caliber of supporting materials. The winners received a one-year software license for the most recent version of MOE, the Molecular Operating Environment, in addition to reimbursement for travel expenses to Anaheim.

Winners and their projects are the following:

Andreas Bender — "Similarity Searching Using Atom Environments, Information-Gain-Based Feature Selection, and the Naïve Bayesian Classifier," University of Cambridge.

Xiaolin Cheng — "Molecular Dynamics

Simulations of 8-Oxoguanine: A Mismatch DNA," State University of New York, Stony Brook.

Wei (David) Deng — "Predicting Protein-Ligand Binding Affinities Using Transferable Atom-Equivalent Techniques and Machine-Learning Methods," Rensselaer Polytechnic Institute.

Asif Ladiwala — "Prediction of Protein Affinity in Hydrophobic Interaction Chromatography Using Quantitative Structure-Retention Relationship Models," Rensselaer Polytechnic Institute.

Anne E. Loccisano — "Development of New CHARMM Force-Field Parameters for Novel DNA Binding Agents," Duquesne University.

Asim Okur — "Multiple Pathways in β -Hairpin Folding and Unfolding Simulations," State University of New York, Stony Brook.

Alexander Perryman — "HIV-1 Protease Molecular Dynamics of a Wild-Type and of the V82F/I84V Mutant: Possible Contributions to Drug Resistance and a Potential New Target Site for Drugs," Howard Hughes Medical Institute and University of California, San Diego.

Sarah A. Mueller Stein — "Influence of Steric Congestion on the Dynamics and Geometry of DNA," Duquesne University.

Jessica Swanson — "Revisiting Free Energy Calculations: One Step Closer to Rigorous Scoring Functions and One Step beyond MM/PBSA," University of California, Berkeley.

Ivan Tubert-Brohman — "Improved Semiempirical Methods: Parameterization of PDDG/PM3 for Sulfur," Yale University.

Joel Miller Is 2003 Utah Awardee

ON JUNE 2, JOEL S. MILLER, CHEMISTRY professor at the University of Utah, received the Utah Award from the ACS Central Utah and Salt Lake Sections. The annual award is for outstanding achievement in chemistry in Utah. Miller's research group seeks to develop, understand, and exploit materials exhibiting the technologically important property of bulk ferromagnetism as well as to understand unusual carbon-carbon bonding. His group designed and synthesized the first organic magnet as well as



the first organic magnet that works above room temperature.

HIST Citations For Chemical Breakthroughs

THE ACS DIVISION OF HISTORY OF CHEMISTRY (HIST) is initiating a new award program: HIST Citations for Chemical Breakthroughs. Beginning in 2005, these citations will recognize breakthrough publications and patents worldwide in the field of chemistry. Plaques, to be placed in the hallways outside the office or laboratory where the breakthroughs were achieved, will be presented annually to the departments and institutions at which these breakthroughs occurred.

"We believe that identifying and celebrating chemical successes are important to the continued prosperity of chemistry worldwide. We envision that our colleagues and friends, seeing these plaques, will feel pride and inspiration in being a contributor to the sciences," says Jeffrey Seeman, HIST chair-elect. He says the selection process will involve open solicitation of nominations from the chemical community. An awards committee composed of eminent scientists and historians of science will provide careful screening of the nominees and selection of each year's awardees. For additional information, contact Seeman at HIST_CCB@yahoo.com.

North Jersey Honors Chemistry Educator

RICHARD MENDELSON, A PROFESSOR of biophysical chemistry at Rutgers, the State University of New Jersey, has won the 2004 Sr. Marian Jose Smith Excellence in Chemical Education Award from ACS's North Jersey Section.

The prize, awarded biennially since 1993 and funded by Hoffmann-La Roche, recognizes an educator in the North Jersey Section area who has inspired students to pursue and succeed in careers in chemistry. Mendelson received the prize on the recommendation of several of his former students, who credited his enthusiasm and interest in the lab with inspiring them to enter the chemistry world.

Mendelson received his bachelor's degree from McGill University and a Ph.D. in 1972 from Massachusetts Institute of Technology. He joined the faculty of Rutgers in 1976. ■



ALFRED BADER HONORED AT QUEEN'S UNIVERSITY

Celebration commemorates 80th birthday and explores close relationship with the school

THE LONG STORY OF CHEMIST, philanthropist, and art collector Alfred R. Bader's life has intersected many times with the tragedies and triumphs of the 20th century. There have been twists and turns, and he remembers all the dates associated with them. Festivities held at Queen's University, Kingston, Ontario, on May 12 have made that date a happier one for Bader.

Born in Vienna of Jewish parents, Bader was sent to England in 1938 at the age of 14, one of more than 10,000 children who were saved from the Nazi genocide. A year later, Bader was deported from England and sent to Canada. On May 12, 1940, he was interned in a prisoner-of-war camp in Canada as an enemy alien. On May 12, 2004, he was honored by Queen's University—his alma mater—the university that Bader says “saved” him.

The celebration held at Queen's last month was officially a commemoration of Bader's 80th birthday (which was actually April 28), but it encompassed much more. There were birthday cards and gifts and a cake, of course, and Bader and his wife, Isabel, were obviously delighted with the festivities. The university even renamed Queen's Crescent—the street on

which the chemistry department building sits—Bader Lane.

The festivities also provided an opportunity to explore the close and precious relationship that Bader has had with Queen's University for more than 60 years. Bader told an audience of chemistry faculty, graduate students, and summer undergraduate students, “Queen's saved me a year of my life, and I have been thanking them ever since.”

He explained that a year and a half after he was imprisoned in Canada, he was released from custody and was “frantic to get into college.” He was a superior student and had excellent qualifications, so he applied to the University of Toronto and McGill University. Bader recalled that these universities were not willing to accept him because they had already enrolled their quota of Jews, who he says were considered undesirable students.

Queen's University, however, accepted Bader as a student with open arms and treated him well, awarding him bachelor's degrees in 1945 in engineering chemistry and in 1946 in history and then a master's

KEEPSAKES Delighted, Bader shows off an upcoming cover of the *Canadian Journal of Chemistry* and a bound book of birthday wishes from luminaries in chemistry.

degree in chemistry in 1947. Bader went on to receive M.A. and Ph.D. degrees in chemistry from Harvard University in 1949 and 1950, respectively.

Bader is well known in chemistry as the one of the founders of Aldrich Chemical Co., now Sigma-Aldrich—the world's largest supplier of research chemicals. Bader was primarily responsible for turning this small start-up company into a billion-dollar enterprise. And this success has made Bader a wealthy man, who is, for his part, a generous man.

Bader is equally well known in the art world as a preeminent collector—particularly of 17th-century Dutch paintings. He is also a philanthropist whose gifts have benefited many institutions, notably those in the areas of chemistry, education, and Jewish interests.

Queen's University in particular has benefitted a great deal from Bader's generosity, which has included many gifts, from endowed professorships to priceless paintings to a castle in England. On this visit, he presented the university's department of art and the Agnes Etherington Art Center with a painting: “Portrait of a Man Holding a Skull” by Michael Sweerts (1618–64). The art department, in turn, held a standing-room-only discussion on three paintings from the center's Bader Collection.



ings from the center's Bader Collection.

A chemistry symposium in Bader's honor was organized by Queen's chemistry department head David M. Wardlaw and Victor Snieckus, the Alfred Bader Chair in Organic Chemistry. Speakers at the symposium were Nobel Laureate K. Barry Sharpless of Scripps Research Institute and

DONATION Alfred and Isabel Bader donated this painting, “Portrait of a Man Holding a Skull,” by Michael Sweerts (1618–64), to Queen's University.

Gilbert Stork, emeritus professor of chemistry at Columbia University.

At the symposium, Sharpless praised chemical entrepreneur Bader as “the enabler of organic chemists across the board.” He then proceeded to give an interesting lecture on, among other things, water. “I

am increasingly excited by water," Sharpless said, noting that "life is just one of the games water can play."

Sharpless argued that humans are so enchanted by complexity that they frequently don't look to simple solutions to synthetic problems. He urged chemists to appreciate simplicity—for example, water as a solvent in synthesis. He then gave a few examples of syntheses that work exceedingly well in aqueous solution.

In his remarks, Stork lovingly detailed various approaches to the total synthesis of morphine.

Stork finds the structure of the molecule enticing, and he is not alone. He said there have been 22 total syntheses of morphine in the chemical literature since 1952. During a question-and-answer session after the talks, Bader's eyes lit up as he asked his longtime friend Stork why he was so interested in this particular synthesis—"it had been done so many times before." Stork noted that the molecule had been imprinted on his subconscious for more than 50 years. "You may as well ask, 'Why paint a picture of a mother and child?'" he added.

After the talks, Snieckus presented Bader with two keepsakes. One was a bound book with individual birthday greetings from nearly 100 members of the chemistry community. He also gave Bader a mock-up of an upcoming cover of an issue of the *Canadian Journal of Chemistry* that will honor Bader with a special issue in 2005.

Bader was joyful, telling the audience how happy these events had made him, and thanking everyone at Queen's. He then introduced his wife to the audience, thanking her, his partner in all endeavors, to great applause.—LINDA RABER

Business

ADHESIVES RESEARCH

Glen Rock, Pa.

Mary Gallagher is the new global vice president of quality and compliance. She will continue to be based in the Limerick, Ireland, facility. She started at the company in 1998 as quality and regulatory affairs manager for Adhesives Research Ireland. Gallagher earned a B.S. in science from University College Galway, in Ireland.

Gregory Young has been promoted to director of quality and compliance at the Glen Rock facility. He has been with Adhesives Research since 1997, most recent-

ly as medical/pharmaceutical operations manager. He received a B.A. in biology and chemistry from Skidmore College, Saratoga Springs, N.Y., and an M.S. in biomedical engineering from Fairleigh Dickinson University, Teaneck, N.J.

BASF CORP.

Mount Olive, N.J.

Florian H. Geissler is the new director of technical engineering services at the Geismar, La., manufacturing site. He joined BASF in 1989 and served in engineering and operations positions at BASF's Freeport, Texas, site. Geissler moved to Geismar in 1998 as technical engineering services manager for the urethanes intermediates plants. Since 2002, he has been project director at Geismar. He received a B.S. in chemical engineering from the University of Oklahoma, Norman.

Benjamin J. Kaufman has started as business manager for fuel additives in the performance chemicals business. He joined BASF in 2003 from Chevron/Texaco, where he had held management positions in fuel and lubricant additive research since 1987. Kaufman earned a bachelor's degree from Montclair State University, in New Jersey; an M.B.A. from Western Connecticut State University, in Danbury; and a doctorate in organic chemistry from Purdue University.

Michael J. Killian has been appointed product manager for fuel additives in the performance chemicals business. A BASF employee since 1995, Killian has worked as a development engineer at three different facilities and as an application development engineer for the intermediates business. He holds a bachelor's degree in chemical engineering from Drexel University, Philadelphia.

DEGUSSA CORP.

Parsippany, N.J.

Stacey McMahon, who has 25 years' experience at the company, has been appointed director of sales and marketing for the active oxygens business line in the NAFTA region. Since starting at Degussa's former metal group, McMahon has held marketing and management positions. She was most recently director of marketing for peroxygen chemicals.



George Rightmyer has been named vice president of sales for the building blocks unit. During his more than 17 years with Degussa, he has held various sales and management positions in the peroxygen chemicals unit. Before coming to Degussa, Rightmyer worked for LCP Chemical & Plastics.

ROHM AND HAAS

Philadelphia

Yi Hyon Paik has been named president of microelectronic technologies within the electronic materials business. He will move to Marlborough, Mass., from Tokyo, where he was president of the company's electronic materials operation in Asia. Paik was elected a vice president in 2002 and continues to hold that position. He earned a B.S. and an M.S. in chemistry from Seoul National University, in South Korea, and a Ph.D. in chemistry from the University of Pittsburgh.

Stephen J. Robinson has been named business unit director for architectural and functional coatings. In 1999, Robinson became a vice president of the company and president of Shipley Microelectronics (now microelectronic technologies within the electronic materials business). He will continue his role as a vice president. Robinson holds a B.S. in chemical engineering from the University of Leeds, in England.

OTHER COMPANIES

Jussi Holopainen has been appointed president and CEO of Pharmatary Oy, Oulu, Finland. His previous positions include managing director for ICI Pharma/ICI and GlaxoWellcome in Finland and senior executive for ICI Pharmaceuticals/Zeneca in the U.K. and Mexico. Holopainen has a B.S. in pharmacy from the University of Kuopio, in Finland, and an M.S. in economics from Vaasa Business School, in Finland.

Todd Johnson has been appointed manager of sales and business development at Cambrex, East Rutherford, N.J. His previous positions include vice president of pharmaceutical business development at ABC Laboratories and senior director of development at MetaPhore Pharmaceuticals. Johnson holds a Ph.D. in chemistry from Indiana University.

This section is compiled by Deanna Miller. Announcements of promotions and new hires may be sent to d_miller@acs.org.

Obituaries

Frederick A. Bettelheim, distinguished university research professor of chemistry at Adelphi University, Garden City, N.Y., and a guest scientist at the National Eye Institute of the National Institutes of Health, died of a heart attack on Feb. 17. He was 80.

A native of Győr, Hungary, Bettelheim fought in the resistance in Nazi-occupied Hungary during World War II. He came to the U.S. in the early 1950s and received a B.S. in biochemistry from Cornell University in 1952. He went on to earn an M.S. in food science in 1954 and a Ph.D. in physical chemistry in 1956, both at the University of California, Davis.

Bettelheim was hired as an assistant professor of chemistry at Adelphi in 1957, reaching full professor in 1963. He served as chair of the chemistry department from 1985 to 1991. He retired from teaching in 1993 but continued to serve as a research professor.

Bettelheim's early research centered on carbohydrates and glycoproteins, including investigations of potato texture, birefringence of polyethylene, physical models of hyaluronic acid, and light scattering of mucins and unsaturated polyesters. He later turned to eye research, concentrating on light-scattering patterns of vitreous humor and low-angle laser scattering of cornea and macromolecular superstructures of the lens.

During his career, he was a member of numerous national scientific advisory panels and ad hoc study sections. He also served as a visiting professor at Uppsala University, in Sweden, in 1965; the Weizmann Institute, in Israel, in 1973; and the University of Florida in 1981. He was a Fulbright Lecturer at Weizmann in 1984.

Bettelheim was coauthor of "Introduction to General, Organic, and Biochemistry," a market-leading textbook for nursing students used at more than 200 universities. He was working on revisions for the eighth edition at the time of his death.

Bettelheim was an avid tennis and racquetball player, a pianist, a lover of classical music and opera, and a gourmet cook. He is survived by his wife, Vera, and a son. Joined ACS in 1957; emeritus member.

Alfred E. Brown, retired director of scientific affairs for Celanese Corp., died on March 12 at the age of 87.

Born in Elizabeth, N.J., Brown earned a bachelor's degree in chemistry from Rutgers University in 1938. He went on to earn a Ph.D. in organic chemistry from Ohio State University in 1942.

While still in school, Brown joined a wartime research project at the U.S. Department of Agriculture Eastern Regional Research Center, in Pennsylvania. He stayed with the project until 1944, when he left to work for the Office of Scientific Research & Development in Washington, D.C. In 1945, he took a position as a research associate with Harris Research Laboratories, working his way up to vice president in 1954.

In 1956, Harris Labs was acquired by the Gillette Co. and renamed the Gillette Research Institute. Brown stayed on to become president of Gillette Research in 1960. He left in 1966 to serve as president of Celanese Research Co., Summit, N.J. In 1975, he became director of scientific affairs for Celanese Corp.

During his career, Brown contributed to research on chemical, fiber, textile, and resin products. His major accomplishments dealt with keratin chemistry, including the application of wool and hair chemistry to textiles and cosmetics.

In recognition of his work, Brown was made a member of numerous professional associations, including the American Association for the Advancement of Science, the National Academy of Engineering, Phi Beta Kappa, and Sigma Xi. He served on the editorial board of *Science* from 1970 to 1974, and on the editorial board of *C&EN* from 1972 to 1974.

After retiring in 1981, Brown continued to serve as a consultant to various scientific organizations, including Celanese, Case Institute of Technology, the National Academy of Sciences, and the National Science Foundation. For ACS, Brown served on the Committee on Chemistry & Public Policy from 1982 to 1985. He had previously served as president of the ACS Washington section in 1963.

Brown is survived by his wife, Sylvia; two daughters; and two grandsons. Joined ACS in 1940; emeritus member.

Irma Tuck-Weiss, professor emerita of biochemistry at New York University (NYU) College of Dentistry and former head of admissions, died on Feb. 19 at the age of 90.

A native of New York, Tuck-Weiss was the 13th woman in the U.S. to receive a Ph.D. in biochemistry. After earning her degree at NYU with a specialty in terpene chemistry in 1942, she became a

faculty member at the NYU dentistry school, where she taught for more than 50 years.

After retiring in 1978, Tuck-Weiss took the position of director of admissions for a five-year term.

Tuck-Weiss is survived by her husband, Louis; a daughter; and a son. Joined ACS in 1934; emeritus member.

Wayne E. (Sonny) Wentworth, retired professor of chemistry at the University of Houston, died on March 10 at the age of 73.

Born in Rochester, Minn., Wentworth attended Rochester Junior College from 1948 to 1950, then completed a bachelor's degree in chemistry at St. Olaf College, Northfield, Minn., in 1952. He received a Ph.D. in analytical-physical chemistry at Florida State University in 1957.

Wentworth accepted a position in 1956 as a mathematical analyst with RCA Service Co. at Patrick Air Force Base, Fla. Three years later, he left to join the University of Houston as an assistant professor, reaching full professor in 1969. He retired in 2000 but continued to do research and present short courses on the electron capture detector in conjunction with Valco Instruments, Houston.

During his career, Wentworth published more than 125 papers, wrote three textbooks, and received numerous patents. His hypothesis that the response of an electron capture detector is related to the equilibrium constant and hence to the electron affinity of a molecule led to the first determination of these quantities in 1960. Subsequent research on the temperature dependence of electron capture detectors led to the determination of the electron affinities of many aromatic hydrocarbons and other organic molecules.

In his last days, Wentworth contributed to a hypothesis statement submitted to the *Journal of Physical Chemistry A*. Following a major stroke in February, coworkers read the manuscript of the hypothesis to Wentworth, who couldn't speak and instead nodded in agreement or shook his head when he wanted changes.

Wentworth is survived by his wife, Elise; two sons; one daughter; and three grandchildren. He was preceded in death by one son. Joined ACS in 1957.

Obituaries are written by Victoria Gilman. Obituary notices may be sent by e-mail to v.gilman@acs.org and should include detailed educational and professional history.

Advertising Rate Information

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Positions open—placement bureaus, industrial positions, pharmaceutical positions, and academic positions. Situations wanted—members, nonmembers, student and national affiliates, retired members.

Issuance: Published weekly, issued every Monday. Mailed Friday preceding date of issue.

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POSITIONS OPEN

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SENIOR PROJECT/PROCESS ENGINEER

King Industries, Inc. has been a pioneer in the development, manufacturing, and marketing of specialty chemical products for use in the coatings and lubricant industries for over six decades. We currently have an opening in our Engineering Department for an individual with a BS in Chemical Engineering with 10+ years experience in process design and project engineering for chemical companies in a plant environment. Specific responsibilities will include: Preparing equipment design and layouts, process and utility piping runs for new and revised manufacturing systems; estimating equipment and total job costs, as well as purchases of special equipment and auxiliaries; managing construction and installation activities; writing process operation manuals and conduct process hazard analysis (PHA); assisting in system start-up and commissioning. We offer an excellent salary, company-paid benefit package and an opportunity for professional growth. If you are interested in becoming a valued member of our team, please forward your resume to the **Director of Human Resources at: Fax: 203-855-6606, E-mail: mhorne@kingindustries.com**. Mail to: **King Industries, Inc., P.O. Box 588, Norwalk, CT 06852**.



THE NEWSMAGAZINE OF THE CHEMICAL WORLD

Quality Jobs, Quality Chemists

INDUSTRIAL POSITIONS



WALT DISNEY Imagineering

Walt Disney Imagineering is the master planning, creative development, design, engineering, production, project management and research and development arm of The Walt Disney Company. Its talented corps of Imagineers is responsible for the creation—from concept initiation through installation—of all Disney resorts, theme parks and attractions, real estate developments, regional entertainment venues and new media projects. We are recruiting for a Senior Technical Staff—Materials Engineer based in our Glendale, California offices. The primary responsibilities of the position are:

- Manage forensic investigations across Walt Disney Parks & Resorts for materials issues
- Develop new solutions as identified by analysis or business unit request
- Develop and maintain programs to support the needs in all areas
- Maintain awareness of materials development and performance of vendor community
- Interface with environmental/regulatory groups

Areas of focus:

- Facility structural systems
- Building envelope materials and design
- Elastomeric materials, from skins to wheels
- Architectural finishes, especially paints and coatings

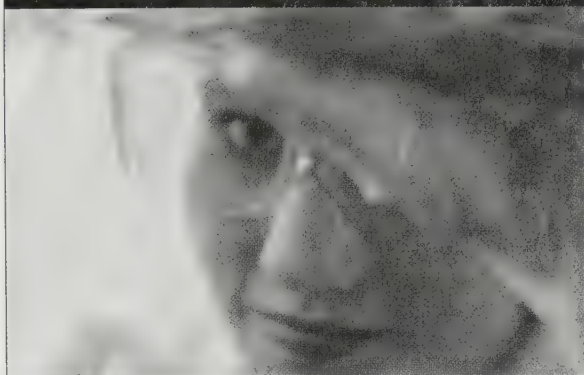
The position requirements are:

- Extensive experience in at least one of the above areas of focus, and an understanding of all
- MS or PhD in Materials Science or Engineering and 8 to 12 years of industrial work experience
- Strong interpersonal and written skills
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Medicinal Chemistry

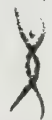
Staff Scientist - Candidates must possess a PhD in synthetic organic chemistry with a solid publication track record. Postdoctoral and 4+ years of industrial research experience in a pharmaceutical setting is required. A firm grasp of synthetic organic chemistry and a commitment to discovery in chemistry and biology is essential. Experience as a key project contributor/Project Leader and junior staff supervision a plus.

Scientist/Senior Scientist - Candidates must possess a PhD in synthetic organic chemistry with a solid publication track record. Postdoctoral research experience in a pharmaceutical setting is preferred. A firm grasp of synthetic organic chemistry and a commitment to discovery in chemistry and biology is essential.

Associate Scientists/Sr. Associate Scientists - Candidates must possess a B.S./M.S. in a qualified organic chemistry program, with 2-6 years experience, preference given to candidates with industrial experience in a pharmaceutical setting. Strong skills in analytical techniques (e.g., HPLC, MS, and NMR) and in the review of relevant scientific literature is necessary.

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This is an opportunity to assist in the bioanalytical aspects of our drug metabolism profiling efforts. We'll rely on you to perform high throughput analysis of crude biosamples across multiple drug discovery projects, as well as work closely with the Drug Metabolism Group to evaluate new chemical entities. Requirements include:

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Job No. 4720-03B

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- Significant experience in NMR methods development
- Proven ability to work effectively in a multidisciplinary research environment
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GOVERNMENT POSITIONS

POSTDOCTORAL OPPORTUNITY MICRO CHROMATOGRAPHY

Nanoscience and Biophysics Research group at Lawrence Livermore National Laboratory (LLNL) is seeking candidates for a postdoctoral position available immediately. Qualified applicant will work on the development of micro chromatography columns based on arrays of carbon nanotubes. Candidates should have a recent Ph.D. in engineering, chemistry, physics, materials science or a related field. Experience in as many of the following disciplines is a plus: "lab-on-a-chip", micro- and nano- fabrication, carbon nanotube synthesis, chromatographic separations both in liquid and gas phase. Our highly interdisciplinary group consists of staff scientists, postdocs and graduate students in fields ranging from chemistry and biophysics to mechanical engineering. Starting salary for this position is \$5,300/month.

LLNL offers a challenging environment and a competitive salary/benefits package. To view and apply for this job, go to <http://jobs.llnl.gov>, Advanced Search feature and enter **AJCE6E4CH** as the source code. LLNL is operated by the University of California for the Department of Energy. We are proud to be an equal opportunity employer with a commitment to workforce diversity.

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ACADEMIC POSITIONS

THE DEPARTMENT OF CHEMISTRY AT PRINCETON UNIVERSITY has an immediate opening for a PhD bioinorganic chemist for environmental research <http://www.princeton.edu/~catalase>. Send resume and three letters of reference by July 30, 2004 to: **Ms. Lynn Mendenko, Department of Chemistry, Princeton University, Princeton, NJ 08544-1009**. Princeton University is an EOE/AA employer. For information about applying to Princeton and how to self-identify, please link to <http://web.princeton.edu/dof/ApplicantsInfo.htm>.

POSTDOCTORAL POSITION, in synthesis of hydrogels for ophthalmic applications, is available immediately at the VA Medical Center and Washington University in St. Louis, MO. The ideal candidate would have demonstrated expertise in ATRP, nanoparticles, and have excellent communication skills. Send CV, your career goals, and three references to: **Dr. N. Ravi M.D., Ph.D. Department of Ophthalmology, Campus Box 8096, 660 Euclid Ave, St. Louis, MO 63110; e-mail ravi@vision.wustl.edu**

ACADEMIC POSITIONS

POSTDOCTORAL POSITION in the area of oxygen activation by transition metal complexes is available in the Catalysis Group at the Ames Laboratory (US DOE), Iowa State University. PhD in chemistry required. Must have experience in kinetics and mechanisms, inorganic synthesis, air- and moisture-free work, and use of standard instrumentation. Experience with stopped-flow and laser-flash photolysis a plus, but not a prerequisite. Please send a resume/summary of research experience, list of publications, and list of references to **Dr. Andreja Bakac, Ames Laboratory, 29 Spedding Hall, Iowa State University, Ames, IA 50011**, or apply by email at bakac@ameslab.gov. Please see our web sites at <http://www.external.ameslab.gov/pbchem/MP%20research.htm> and <http://www.iprt.iastate.edu/ccat/green.html>. An EEO/AA employer.

TROY UNIVERSITY invites applications for a tenure-track analytical chemistry position for Fall, 2004. A Ph.D. is required. Teaching assignments include general chemistry, analytical and instrumental chemistry, and labs. Supervision of undergraduate research is encouraged. Send curriculum vitae, copies of transcripts, statement of teaching philosophy, research interests, and three letters of reference to **Human Resources, Troy University, Troy, AL 36082**. Screening will begin June 14. Troy is an AA/EEO employer and encourages applications from individuals with disabilities, females, African Americans and other minorities. Visit our website at www.troyst.edu/humanresources/jobs.htm

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The Chemistry Department seeks applicants for a lecturer to teach general chemistry. Initial appointment is for one year with possibility for renewal. A Ph.D. in Chemistry or Chemistry Education and a defined interest in teaching introductory chemistry courses are essential. Interested applicants should send curriculum vitae, the contact information for three references, and a statement of teaching philosophy to **Dr. Melanie M. Cooper (cmelani@clemson.edu) Department of Chemistry, Clemson University, Clemson, SC 29634-0973**. Review of applications will begin immediately and applications received by June 21 will be assured full consideration. Clemson University is an equal opportunity, affirmative action employer.

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EOE

ACADEMIC POSITIONS

NMR SPECTROSCOPIST, MANAGER OF MAGNETIC RESONANCE INSTRUMENTATION DEPARTMENT OF CHEMISTRY YALE UNIVERSITY

The Department of Chemistry at Yale University invites applications for manager of magnetic resonance instrumentation. The position involves oversight and management of magnetic resonance instrumentation within the Chemical Instrumentation Center, particularly NMR instruments. Other duties involve providing instruction to graduate students and postdoctoral researchers in the use of NMR spectrometers, especially in the execution of 2-D NMR experiments. It also involves maintenance of magnetic resonance spectrometers, associated computer systems, and other instruments within the Center. The primary responsibilities are associated with seven high field NMR and two EPR spectrometers. Training at the level of a PhD in chemistry or related field, MS in chemistry and three years relevant experience, or equivalent combination of education/experience is required. Training in the theory and practice of NMR spectroscopy and practical experience operating and maintaining instruments and associated computers and software is desired. Relevant experience in the application of 2-D methods in NMR and practical experience in maintaining instrumentation is preferred. A detailed job description is available at <http://www.yale.edu/jobs/>, keyword CEDB20540. Please apply online referencing Source Code EACEN20540 at www.yale.edu/jobs/ and submit a cover letter, resume, and three confidential letters of recommendation. Please be sure that all correspondence references Source Code EACEN20540. Yale University is an Affirmative Action/Equal Employment Opportunity Employer.

POSTDOCTORAL POSITION BIO-ORGANIC CHEMISTRY

A postdoctoral position is available in synthetic organic chemistry at Wake Forest University in the laboratory of Dr. S. Bruce King involving the synthesis and evaluation of new organic materials as nitroxyl (HNO) donors. Applicants must be familiar with modern organic synthetic, chromatographic, and spectroscopic methods. Interested candidates should apply online at www.wfu.edu/hr/careers. EOE/AA

ACADEMIC POSITIONS

RESEARCH CHEMIST

The Naval Research Laboratory seeks a Ph.D. Synthetic/Polymer Chemist to conduct basic and applied research involving high-temperature polymers (elastomers) and organometallic-containing compounds as precursors to metal nanoparticle compositions. Research experience and modern characterization techniques involving carborane, silicon/siloxane, acetylene, and organometallic compounds/polymers are required. The applicant selected must have a Ph.D. or equivalent experience and be able to obtain a secret security clearance. This is a fulltime entry level NRL staff position. Submit resume, transcripts, three letters of reference and statement of research interest to: **Search Committee, Code 6120, Naval Research Laboratory, 4555 Overlook Ave SW, Washington, DC 20375.** NRL is an Equal Opportunity Employer.

LECTURERS IN CHEMISTRY AND BIOCHEMISTRY: The Department of Chemistry & Biochemistry at Southern Illinois University Carbondale seeks to hire one or more individuals to teach introductory/general chemistry and/or undergraduate courses in organic or physical chemistry. Applicants must hold an M.S. or Ph.D. degree in any area of chemistry. Several appointments at full or part time levels may be available for the academic year 2004-2005, beginning August 16, 2004. Reappointment is possible. Faculty planning a sabbatical are also welcome to apply. A letter of application, CV, statement of teaching philosophy, and at least two letters of recommendation should be submitted to **Search Committee, Department of Chemistry & Biochemistry, Southern Illinois University, Carbondale, IL 62901-4409.** Review of applications will begin June 30, 2004 and continue until positions are filled. *SIUC is an affirmative action/equal opportunity employer that strives to enhance its ability to develop a diverse faculty and staff and to increase its potential to serve a diverse student population. All applicants are welcomed and encouraged and will receive consideration.*

ACADEMIC POSITIONS

ACADEMIC POSITION IN ORGANIC CHEMISTRY AT THE UNIVERSITY OF CYPRUS

The Department of Chemistry of the University of Cyprus invites applications for a position in Synthetic Organic Chemistry at the rank of Lecturer or Assistant Professor. A PhD in Synthetic Organic Chemistry from a recognized University and knowledge of the Greek language are required. Applications should include six copies of the full CV and summary of previous work and proposed research plans, and reprints of three most representative publications. Applications and three letters of recommendation should be sent by Monday, 30th August 2004, at the **Registrar, University of Cyprus, POB 20537, 1678 Nicosia, Cyprus, tel. 357 22892054, fax 357 22892005.** More information at tel. 357 22892780, e-mail: elenarst@ucy.ac.cy, web: www.ucy.ac.cy/~chemweb/.

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ORGANIC

SYNTHETIC ORGANIC CHEMIST, PH.D. Postdoctoral, 14 yrs. in industry. Process development/improvements and plant troubleshooting. Synthesis of dyestuff, pigment and pharmaceutical intermediates, analgesic drugs, quats, heterocyclic compounds and specialties. Strong in problem solving. Seeking R&D position anywhere. Will relocate. (231) 719-1486.

ORGANIC CHEMIST, PH.D. Seeking teaching position for Organic Chemistry to undergraduate and graduate students, and process R&D position. Experience with organic synthesis ionic liquids. Will relocate. Phone: (216) 226-5538. E-mail: mts@abcintinc.com.

MATERIALS ORGANIC/POLYMER CHEMIST, PH.D. Synthesis of specialty chemicals and high-tech polymers. Specialization in carbon nanotubes and fullerenes chemical modifications, and nanocomposites. Seeks R&D Position (mokader.1@juno.com) (520) 743-0056.

ORGANOMETALLIC CHEMIST, PH.D. Seeking teaching position for organometallic chemistry to graduate or under graduate students. Published three books and many reviews on organometallic chemistry, e.g. "Applications of Organometallic Compounds" by Wiley, two "Chemical Reviews". E-mail: vyq02326@nifty.ne.jp.

POLYMER

R&D CHEMIST, MS 15+ years in adhesives/coatings/sealants. UV curing free radical/cationic; thermal curing epoxy/silicone; dual component methacrylate/epoxy; for electronics/electrical/engineering. Concept to commercialization. Open to salary/relocation. fermion1@juno.com. Box 400-A-5

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BENCH CHEMIST/RESEARCH POSITION Seeking full time/part time bench chemist research position in University/Industry/Govt. Authored new ideas in my book, "Chemistry of Stabilized Negative Charge And Its Applications". 30 plus years experience in Environmental/Polymer Fields. M.S. in Chemistry, Ph.D. Courses/Research completed. Excellent health. RKSingal@aol.com or 792-247-9224.

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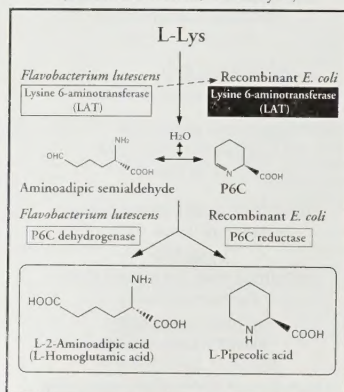
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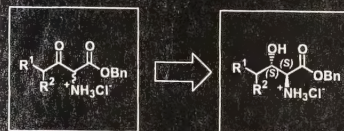
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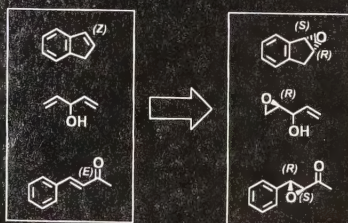


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NEWSSCRIPTS

Cracker Jack comes back

THE NEW YORK YANKEES BASEBALL team has countermanded its decision to stop selling Cracker Jack during ball games at Yankee Stadium (C&EN, May 31, page 48). Corey Kilgannon reports in the June 3 *New York Times* that the Yankees' chief operating officer, Lonnie Trospe, said, "The fans have spoken."

Frito-Lay, which owns Cracker Jack, had started to package the caramel popcorn-peanut snack in paper bags instead of boxes, but still with a prize inside. Bags, it is said, tend to break and don't sell as well as boxes, so the Yankees opted out, until the fans sounded off.

Reporter Kilgannon spoke with Kate Raffo, 18, a college student, who said: "It's good to see them [Cracker Jack] back. I'm glad the Yankees listened to the fans." Frito-Lay sells Cracker Jack to every major league baseball team but the Montreal Expos and the Toronto Blue Jays.

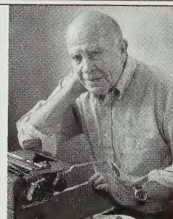
Meanwhile, from Marvin F. Preiser of Middletown, N.Y., comes word that "Take Me Out to the Ball Game," the song long associated with Cracker Jack, was written by Albert Von Tilzer, "the younger brother of the talented songwriter and publisher Harry Von Tilzer." Preiser says Albert never went to a baseball game until 20 years after he wrote the song.

Railroad gauges arise again

A. B. DI CYAN HAS CHIMED IN FROM CHICAGO on the railroad gauge discussion (C&EN, April 26, page 64) by sending a copy of a letter to the editor that appeared in the May issue of *ChiMe*, the monthly newsletter of Chicago Area Mensa. Di Cyan personally took no stand on the matter.

Anyway, the Mensa letter is signed by Matt Crawford. He writes in part that attributing the origin of the U.S. standard railroad gauge (4 feet, 8.5 inches) to the needs of the war chariots of ancient Imperial Rome is incorrect. The myth, Crawford writes, has been traced to a letter in a 1948 issue of *True, the Man's Magazine* and has been "rebutted to no avail many times since."

The Roman Republic, Crawford goes on, was founded at least a century after the introduction of larger, stronger horses



BY K. M. REESE

shot down the chariot as an instrument of war. "Rome never used the chariot for war or commerce," he writes, "and the ceremonial and circus uses may have never reached Britain, the alleged link to railroads."

Roads were deliberately rutted in Roman times, Crawford

says, but not for the sake of horse-drawn vehicles. The intended beneficiaries instead were hand-drawn carts, which otherwise would have tended to roll down the rain-shedding crowns of the roads.

Another problem with a car name

REMARKS ON INAPPROPRIATE NAMES FOR automobiles (C&EN, May 17, page 48) prompted James M. Fresco to send from Montreal an article from the spring issue of *Touring* (Canadian Automobile Association, Quebec). The title is "Lost in Translation?" The author is Eric Lefrançois.

The article opens with an excerpt from a Canadian guide to trade that begins, "A word can have a different meaning in other cultures." Lefrançois then says that General Motors of Canada decided to name a new sedan—this spring's successor to the Buick Regal—La Crosse. The expression has several meanings, it turns out, one of them not very nice. A GM executive who prefers to remain anonymous, Lefrançois reports, said, "The connotation of the word in Quebec completely escaped us!" The car will be renamed Allure in Canada.

Mouth device fights obesity

SCIENTIFIC INTAKE, ATLANTA, HAS INTRODUCED a device that fits into the mouth and compels the fittee to take smaller bites of food and so fend off obesity. Star Lawrence reported the advance on May 25 in *WebMD Medical News*.

The DDS System costs nearly \$500. It is intended to be custom-designed by a dentist to fit the roof of the client's mouth.

The principle of the device is that, based on normal bites, the brain needs 15 to 20 minutes to tell the stomach that it's full and to stop eating. Says Lawrence, "Fast eaters can do a lot of caloric damage before putting down the fork."



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