

Alfred Baker

Articles

[Articles about Baker]

1971-1976

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—Journal Photo

Camera catches members of the Milwaukee Repertory theater company rehearsing for the season's opener, "The Skin of Our Teeth." The Thornton Wilder play begins a five week run Oct. 11 under the direction of Tunc Yalman.

Hands

good measure of sprightly ornamentation. It is thoroughly pleasant listening throughout.

Leonard Pennario is, of course, a very good pianist, but not, to judge from his recorded output, one to challenge the summit. Capitol uses him for light classical works, or those so familiar to the public that they are im-



—AP Photo

daughter Joely Kim on "adora" in London.

Affair Redgraves

awfully likely girl. A bit lumpy."

"But she always had this fantastic talent for mimicry," Lady Redgrave added.

"Of course I'm very proud of them all. We respect each other."

Japanese Violinists

FOR many years leaders and followers of American symphony orchestras have been worrying about a shortage of capable string players. Musicians from Europe, especially Russia, cannot be imported as readily as in the past; and too few American youngsters are willing to spend the long time and effort to gain competence on the violin or cello.

But now a solution seems to be near. Good players are expected to arrive, in the coming seasons, from Japan and other lands in that part of the world.

In the last few decades Japan, Korea and their neighbors have taken up western symphonic music with zeal and aptitude. Many thousands of oriental children are studying the occidental string instruments; orchestras over there are becoming proficient, even by American standards.

That development can be credited, in large part, to a Japanese educator of genius, Shinichi Suzuki, who is now 72 and active throughout the world. His specialty is teaching the violin to little children, even as young as 3. Since the end of World War II about 15,000 Japanese children, and thousands in other nations, have studied by his method.

The method is now being introduced to Milwaukee by Barbara Fraser, a violinist of the Milwaukee symphony orchestra (and formerly of the great Concertgebouw orchestra of Amsterdam), who teaches at the Wisconsin College-Conservatory.

Taught by Master

Last June Miss Fraser spent two weeks of intensive

The World of Art

Rembrandt and Era in Oshkosh Exhibit

'Dutch Art of the 1600s' Presents 60 Works
in Rare Event at Paine Art Center

By DONALD KEY
Journal Art Editor

A RARE and richly representative exhibition, "Dutch Art of the 1600s," will open Wednesday at the Paine art center in Oshkosh. The center has assembled 60 paintings, including one by the great old master himself, and others by his students and colleagues overshadowed by the Rembrandt image but not always inferior in expressing their times.

In recent years the Paine center, directed by Richard Gregg, has organized several exhibitions of surprising importance and impact for a relatively small midwest community. This one exceeds the others.

Museums and private collectors today are reluctant to lend 300 year old master-

works, even to major museums, because of the dangers involved in moving them. For this reason alone the show is rare. Its content, which so well represents the style of a great era of painting, is remarkably extensive.

Seventeen of the paintings are from the Milwaukee collection of Dr. and Mrs. Alfred Bader. Dr. Bader, a connoisseur of Dutch and Flemish painting, has assisted the center in organizing the show and has written a comprehensive introduction for the catalog.

All the paintings in the

show from his collection have been acquired in the last year. Among them are an unusual biblical scene, "Tobias Healing His Father," by Paulus Lesire, who was known primarily for portraiture; "Joseph Explaining the Baker's Dream," a literary picture of convincing character, attributed to Carol Fabritius (a student of Rembrandt), and "Portrait of a Girl," a softly toned and warmly tempered painting from the school of Rembrandt.

Rembrandt Etchings

The exhibition is strongest in portraits. Most of them are formal in pose and character, as expected in commissioned work. "Portrait of a Girl" is an exception.

Rembrandt is represented by one painting and eight graphics.

The oil, "Christus," is a harmonic blending of a pensive face, mature and compassionate but not sentimental. Like most of his masterful canvases, the picture seems to have an inner glow, a painted light that gives a living luster to subjects.

Several etchings by Rembrandt also are based on religious themes; some are strongly atmospheric landscapes. A "Head of a Man in a Fur Coat Crying Out" is in the mode of Dutch genre which flourished in the 17th century. It was led by Franz Hals and Jan Steen and their schools, and was close to the lyrically lighted paintings of Vermeer of Delft, whose work was not recognized until later.

The popular motif of peasants merrymaking, often with laughs and jeers and lots of beers, and with young girl waitresses pinched and pretending to pout, is represented by several canvases and numerous prints. Among them are "Dance at the Inn" and "Fiddler at the Hurdy Gurdy," both by Adrian Van Ostade, "Violin Player at the Tavern" by Cornelis Dusart, "The Street Musicians" by Jacob Ochtervelt and "Self Portrait with Skull" by Michiel Sweerts.

Other Masters

Paintings by long recognized masters, in addition to Rembrandt, include "Soldier Family" by Pieter de Hooch, "Landscape" by Jan Van Goyen, "Self Portrait" by Ferdinand Bol, "Young Lady with Still Life" by Gerard (or Gesina) ter Borch, "Village Musicians" by David Teniers II and "Portrait of Peter Breughel" by Anthony Van Dyck. Other masters are represented by graphics.

A pair of portraits (man and wife) in oil by Govaert Flink, donated to the Milwaukee Art Center by Dr. Bader, are loaned by the center for this show.

In his introduction, Bader said, "Collecting is plagued



"Portrait of a Girl" is a 21 by 14 inch oil on panel of the school of Rembrandt in the show opening Wednesday at the Paine Art Center, Oshkosh. It is from the Milwaukee collection of Dr. and Mrs. Alfred Bader.

today — as it probably always has been — by the fetish for names. A signed and certain, but third rate, work of a well known master will often bring more than a great painting of uncertain authorship . . ."

This is verified by the high quality paintings of lesser known artists in this show.

It covers an amazing era of art. A great tradition in Dutch painting was established by an academy in Haarlem, the early commercial and cultural center of Holland. In 1572 the city was attacked by Spanish forces that expected to take it in a week. Instead, women fought along with men, half starving on diets that included cats, dogs, rats and hides of horses, before finally giving up six months later. The city was ravaged. Yet in the following century, Dutch culture rebounded in one of its greatest advances.

The show continues through Oct. 30. Viewers over 13 years of age are welcome. Gallery hours are 2 to 5 p.m. and 7 to 9 p.m. Tuesdays, Wednesdays, Thursdays and Fridays; 2 to 5 p.m. Saturdays; 1 to 5 p.m. Sundays; closed Mondays.

An opening reception will be held from 7 to 10 p.m. Wednesday. The consul general of the Netherlands from Chicago will attend.



THE

CHESAPEAKE CHEMIST

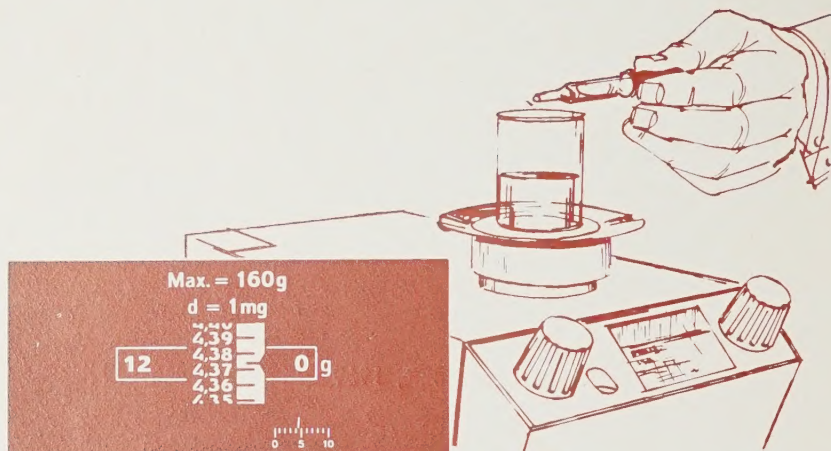
MARYLAND SECTION
AMERICAN CHEMICAL SOCIETY

VOL. XXV

NOVEMBER, 1969

NUMBER 8





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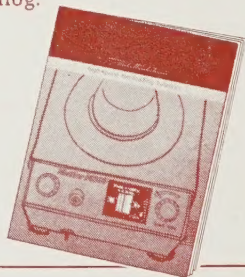
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*Dr. Harold Delaney was elected Chairman for 1969. However, since Dr. Delaney has now left the Maryland area Dr. Cogliano, who was Chairman-elect, assumes the position of Chairman of the Maryland Section. He will remain Chairman through 1970.

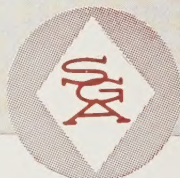
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NOVEMBER MEETING

LADIES NIGHT



HAZEL BISHOP

DATE:

WEDNESDAY, NOVEMBER 19, 1969

PLACE:

Eudowood Gardens Lecture Room,
Eudowood Plaza, Joppa Road near
Goucher Boulevard.

SPEAKERS AND TOPICS:

5:30 P.M. Dr. Alfred Bader, Aldrich
Chemical Company, Inc. "Chemistry
and Art"

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small, original works to the meeting
for examination and discussion in-
formally after the meeting.

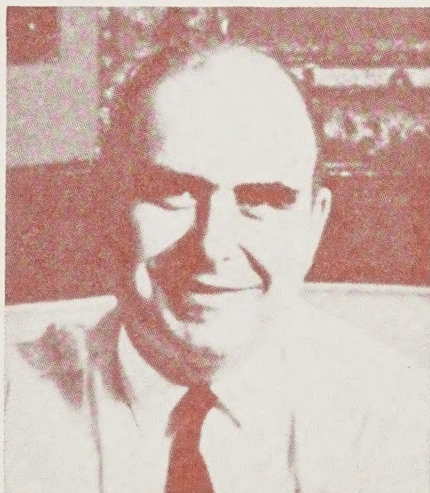
8:30 P.M. Hazel Bishop, Evans and
Company, "The Common Denominator
of the Laboratory and the Markets"

SOCIAL HOUR:

There will be a social hour after the
meeting. Refreshments will be served.

COCKTAILS AND DINNER:

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with Mr. Allen Bednarczyk, McCor-
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3155, 666-3156 no later than November
17. It is not necessary to be a member
of the American Chemical Society to
attend the dinner or the talks, and
the talks may be attended without at-
tending the dinner. You are invited to
bring your wife and friends to both
the dinner and the meeting.



DR. ALFRED R. BADER

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ACS AWARDS

The *Chemical and Engineering News* issue of September 15, 1969 announced the winners of ACS awards for 1970. Last spring a series of articles was published in the *Chesapeake Chemist* describing the procedures for selecting the recipients of the ACS awards. All members of the ACS are encouraged to submit nominations for the awards. A description of some of the individual awards is given in this article.

Roger Adams Award in Organic Chemistry.

Purpose. To recognize and encourage outstanding contributions to research in organic chemistry.

Nature. The award consists of a gold medal, a sterling silver replica of the medal, and \$10,000. The award will be presented biennially. The recipient shall deliver a lecture at the Biennial National Organic Chemistry Symposium of the American Chemical Society at which time the award will be presented. His travel expenses to the Symposium will be paid.

Establishment and Support. The award was established in 1959 by Organic Syntheses, Inc. and Organic Reactions, Inc., and is sponsored by those organizations and the Division of Organic Chemistry of the American Chemical Society. The first award was made in 1959.

Rules of Eligibility. The award shall be granted to an individual without regard to nationality for outstanding contributions to research in organic chemistry.

ACS Award in Analytical Chemistry sponsored by Fisher Scientific Company.

Purpose. To recognize and encourage outstanding contributions to the science of analytical chemistry, pure or applied, carried out in the United States or Canada.

Nature. The award consists of \$2,000 and an etching. The traveling expenses of the recipient incidental to the conferring of the award are paid.

Establishment and Support. The award was established in 1947 by the

Fisher Scientific Company.

Rules of Eligibility. A nominee must be a resident of the United States or Canada and must have made an outstanding contribution to analytical chemistry. Special consideration will be given to the independence of thought and the originality shown, or to the importance of the work when applied to public welfare, economics, or the needs and desires of humanity.

The 1970 recipient of this award will be Charles V. Banks, Professor of Chemistry at Iowa State University.

ACS Award in Biological Chemistry Sponsored by Eli Lilly and Company.

Purpose. To stimulate fundamental research in biological chemistry (excepting therefrom immunology, clinical investigations, pharmacology, and experimental therapeutics) by young chemists working in the United States.

Nature. The award consists of \$1,000 and a bronze medal. The traveling expenses incidental to the conferring of the award are paid.

Establishment and Support. The award was established in 1934 and has been supported since that time by Eli Lilly and Company.

Rules of Eligibility. A nominee must be a citizen of the United States who shall not have passed his 36th birthday on April 30 of the year in which the award is presented and have accomplished outstanding research in biological chemistry of unusual merit for an individual on the threshold of his career. Special consideration shall be given to the independence of thought and the originality shown. At the time of the nomination, the nominee must be actively engaged in the line of research for which the award is made. This award will not be voted to any person who previously has received another award sponsored by Eli Lilly and Company granted for the same technical accomplishment.

The 1970 recipient of this award will be Lubert Stryer, Professor of Molecular Biophysics and Biochemistry at Yale University.

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NOMINATIONS FOR SECTION OFFICERS

Prior to the talk at 8:30 P.M. the election will be held for officers, councilors, and members-at-large to serve in 1970. The Nominating Committee with James F. Salmon S.J. as Chairman

Chairman-elect
 Secretary
 Treasurer
 Councilors
 Alternate Councilors
 Members-at-large

has presented the following slate of candidates. However, additional nominations may be received from the floor with the condition that any candidate must have given consent to such nomination.

Richard Kokes
 Herbert S. Aaron
 John I. Stevens
 Thomas C. Simmons
 George Braude
 Melvin P. Miller
 John L. Straughn
 Frederick S. Lee
 Theodor C. Berenthien
 Ernest F. Silversmith
 Edward J. Poziomek
 Joseph A. Scarlett

NOTES FROM THE EDITOR

Are you receiving your *Chesapeake Chemist* in adequate time before the monthly meeting? If not, the main fault may lie with your local post office. We on the editorial staff try to deliver the magazine to the main post office in Baltimore no later than the first of each month. However, the last two issues were delayed for reasons beyond our control but were delivered at the post office at least twelve days before the meeting. We know that the magazine was actually delivered in such places as Columbia, Cockeysville, zone 1 in Baltimore City within a few days after mailing. Of financial necessity the *Chesapeake Chemist* is mailed third class, and since this is low priority mail it may be delayed at your local post office. Perhaps a note or call to your local postmaster will expedite delivery. In any case, we urge you to consult the meeting calendar published in September in order that you determine your interest in a particular topic. If your *Chesapeake Chemist* is delayed, information on the meeting may be obtained by calling the Editor, Dr. James Leslie, at 955-7616 or 730-5761.

The *Chesapeake Chemist* is produced, with minor exceptions, by a staff who donate their time to its publication. We are desperately in need of assistance. Since we have little time to go 'scouting' for material for publication in the magazine, we are dependent on ACS news services and section members for publishable material. Unfortunately, the contribution by section members has dropped close to zero, and so we are appealing to you members for support by submitting suitable items for publication.

EARLY DECEMBER MEETING DATE

The December meeting will be held on the second Wednesday *i.e.* on December 10 instead of the usual third Wednesday of the month. Dr. Andrew G. DeRocco of the University of Maryland will discuss "How Hard are Liquid Crystals" at 5:30 P.M., and at 8:30 P.M. Dr. Richard W. Hamming of the Bell Telephone Laboratories will discuss "You and Your Research".



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HAZEL BISHOP

"After all, I am a woman. If you are an organic chemist and a woman, cosmetics attract you. Finding the answer to a problem like lipstick that smears is a game, a challenge—it's fun" said Hazel Bishop a year after her laboratory brought out the first new lipstick formula in forty years.

Hazel Bishop was born in Hoboken, New Jersey over fifty-five years ago, which it difficult to believe of this lively, blue-eyed chemist. She followed a pre-medical course at Barnard College and received a B.A. in chemistry in 1929. When the stock market crash occurred Miss Bishop gave up her hopes of being a doctor and went to work as a chemical technician at Columbia University, as well as being a night student in biochemistry there. After working with a dermatologist and with the Standard Oil Company of New Jersey she worked for Socony-Vacuum Oil Co. as an analyst on oil products. When the plant was cut to a forty-hour week Miss Bishop had time to work on her hobby of improving lipstick in the kitchen of her apartment. Three hundred and nine experiments later she found the solution to a feminine problem—a long-staying lipstick that did not smear. The product she developed was finally marketed in 1950 by Hazel Bishop, Inc. About ten years ago Miss Bishop sold the company that retains the lady chemist's famous name. She still experiments in cosmetics and other areas of chemistry in her kitchen laboratory. She has recently become affiliated with a New York brokerage house, a reflection of the interest in diverse fields of business she inherited from her father.

PETROLEUM RESEARCH FUND REPORT FOR 1968

The "13th Annual Report on Research Under Sponsorship of the Petroleum Research Fund Administered by the American Chemical Society" is now available from Robert E. Henze, Director, Research Grants and Fellowships Division, American Chemical Society, 1155 Sixteenth St., N.W., Washington, D. C.

THE COMMON DENOMINATOR OF THE LABORATORY AND THE MARKETS

A chemist, in my opinion, is one who has been trained to observe, to imagine and then to apply these techniques to achieve his objective. These techniques are the common denominator to all human activity. The well trained scientist has the basic equipment to be a doctor, lawyer, merchant or what have you. The degree of success will be determined by the acuity of his observations, vision or decisiveness.

EDUCATION COMMITTEE NOTICE

One of the best ways to capture the interest of students in chemistry is personal contact with chemists. The Education Committee of the Maryland Section will be pleased to serve as a clearing house for bringing together interested chemists and the schools who could use them as visitors. A brief note to the Co-chairman, Dr. M. J. Albinak at Essex Community College, Baltimore, Md. 21237 will bring further information without any commitment on your part.

IF YOU CHANGE YOUR ADDRESS . . . Please do not notify the Editor of the *Chesapeake Chemist*, but send your new and old addresses to: The American Chemical Society, 1155 Sixteenth Street, N.W., Washington, D. C. 20036. The Maryland Section will then be notified.

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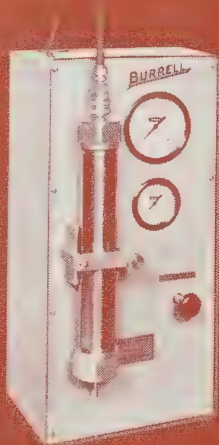
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DR. ALFRED R. BADER

Alfred R. Bader was born in Vienna, Austria in 1924. However, his higher education was obtained in Canada and the United States. He has earned a B.Sc., B.A., and an M.Sc. from Queen's University in Canada, an M.A. and a Ph.D. from Harvard University. This last degree was awarded in 1950. Dr. Bader was a Research Chemist from 1950 to 1953 at the Pittsburgh Plate Glass Co., and for another year there was a Group Leader for organic research. Dr. Bader was Chief Chemist at Aldrich Chemical Co. in 1954 and became president of the company in 1955, a position he holds at the present time.

Although Dr. Bader's research interests lie in the areas of fatty acids, quinones, reaction mechanisms, alkenyl-phenols, and indoles he will be discussing a hobby "Chemistry and Art" at the November meeting. If you have any small, original pieces of art you wish Dr. Bader to examine, he has invited you to bring them along to the meeting for informal discussion after the meeting.

COVER

The Scholar by Candlelight, a painting done by Rembrandt when in his early twenties. Dr. Bader is planning to discuss this painting in his talk.

CHEMISTRY AND ART

As a collector of old master paintings I look every year at several hundred old paintings—in junk and antique stores and at auctions all over the world—and have to decide, usually within minutes, whether a painting is worth buying. The first criterion is, of course, the general artistic merit of the work—often hard to discern in paintings covered with centuries of dirt. Secondly, is the painting really what I think it is? I am offered a painting said to be by a Dutch 17th century artist—are the pigments those used by 17th century artists? Are the wood or canvas and the ground those used by the 17th century Dutch artists? Once I have acquired an old painting, the surface dirt is usually easily removed with mild solvents, and the decision has to be made how much restoration to do. Is the painting an original, a workshop production or a later copy? Is the painting in its original size? What is the condition of the support—be it canvas, wood, metal or slate? How much old restoration is there and should it be removed? Almost every old painting has some overpaint—was this added to hide losses or subjects considered undesirable by previous owners? If the painting is signed, is the signature original? The last questions can generally be answered by a combination of physical and chemical means, chiefly examination with ultraviolet light and under a magnifying glass, and tests with various solvents.

..... Tear-Out Dinner Reservation Form

There is enclosed \$.....(\$4.25 per person)* for cocktails and dinner at Eudowood Caterers, Eudowood Plaza, on Wednesday, November 19, 1969 for the following persons.**

Name (Please Print or Typewrite.) Affiliation

*Please make checks payable to Maryland Section, ACS and mail together with reservation form to Mr. Allen Bednarczyk, McCormick and Co., Inc., 204 Wight Ave., Cockeysville, Md. 21030, or phone 666-3155, 666-3156.

**Return by November 17.

**CHEMICAL SOCIETY OF WASHINGTON—
FALL PROGRAM**

Members of the Maryland Section are invited to attend the meetings of the Chemical Society of Washington (Washington Section of the American Chemical Society). The details of their November and December meetings which are available to date are given below. Further information may be obtained from Mrs. Lee Goodall, 737-3305 (toll call to Washington, D.C.) between 9:30 A.M. and 3:30 P.M., Monday through Thursday.

**NOVEMBER 13, 1969—Georgetown
University**

Topical Groups—5:00 P.M.

Analytical—To be announced

Chemical Education—Jay A. Young, Professor, Kings College, Wilkes-Barre, Pa. Title to be announced.

Inorganic—Professor Lauri Vaska, Clarkson College of Technology, Potsdam, N.Y. "Oxygen Carrying Metal Complexes".

Organic—Professor Jerome A. Berson, Department of Chemistry, Yale University, New Haven, Conn. "The Geometry of Transition States".

Physical—To be announced.

Lecture—8:30 P.M.

J. P. Collman, Professor, Department of Chemistry, Stanford University, Stanford, Calif. "Complexes Containing Molecular Nitrogen and Oxygen" (tentative title).

**DECEMBER 11—National Bureau of
Standards, Gaithersburg, Md.**

Topical Groups—5:00 P.M.

Food and Agricultural Chemistry—Martin Jacobson, ARS, USDA, Beltsville, Md. "Recent Progress in the Chemistry of Insect Sex Pheromones".

Inorganic—Professor R. Bruce King, University of Georgia, Athens, Ga. "Polydentate Tertiary Phosphines and their Metal Complexes".

Medicinal and Biochemical—Philip A. Khairallah, Research Division, The Cleveland Clinic, Cleveland, Ohio. "Role of Rennin and Angiotensin in Experimental Hypertension".

Polymers—Professor William Graessley,

**NEW MARYLAND
SECTION MEMBERS**

The following people have recently joined the American Chemical Society or transferred into the Maryland Section from some other state. We welcome them to the Maryland Section and invite them to attend the monthly meetings and participate in the other activities of the Maryland Section.

Pvt. Carroll Dwight Arnett,
Edgewood Arsenal.

Ronald Lee Baker, Kramer Ct.,
Glen Burie.

Donna Lou Berglund, Goucher
College, Towson.

Richard Alton Farr, E. Elpin
Drive, Catonsville.

Allan C. Hamilton, Bedford Rd.,
Bel Air.

Christopher Peter Johnson, III,
Edgewood Arsenal.

Arthur D. Ketley, W. R. Grace
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John Alfred Kilgour, Seversky
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Dennis Alan Wentz, Johns
Hopkins Univ., Baltimore.

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Department of Chemical Engineering, Northwestern University, Evanston, Ill. "Molecular Entanglements and Flow Behavior in Amorphous Polymers".

Lecture—8:30 P.M.

Daniel Banes, Director, Division of Pharmaceutical Sciences, Food and Drug Administration, CPEHS, HEW, Washington, D.C. Title to be announced.

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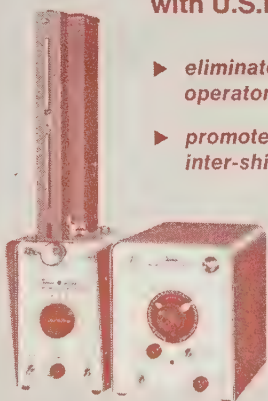
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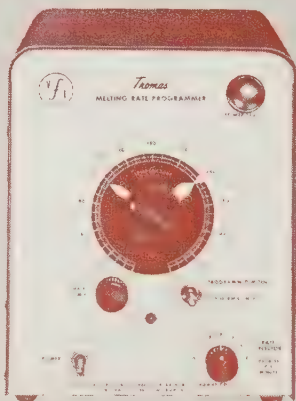
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27 APR 1953

WORLD AT WORK



BUSINESS • FINANCE

BADER: LOOK OUT DU PONT

Alfred Bader told Aldrich Chemical Co., Inc., shareholders Thursday of a 30% increase in sales for the quarter, but at least one participant in the annual meeting wasn't satisfied.

The shareholder asked Bader for a long term evaluation of the Milwaukee based firm and the Aldrich president was ready with an answer.

Projecting the growth of Aldrich and Du Pont for the past 10 years into the future, Bader estimated that Aldrich could surpass Du Pont in size in 76 years.

For the most part, however, Bader stuck to shorter term forecasting. Profits for the first quarter should also be up 30% over a year ago, he said, noting that final figures won't be available until information from overseas subsidiaries has been received.

Bader singled out for comment dramatic increases in sales in England and Germany after introduction of Aldrich's new handbook of organic chemicals. Sales in England during the first month after the hand book was introduced were up 72%, he noted.

Bader said he expects results for the full year to be "extremely good." Aldrich earnings during the fiscal year ended Dec. 31 amounted to \$810,646 or \$1.21 per share on sales of \$6,178,491.

In a related action directors of Aldrich approved payment of a semiannual dividend of 12 cents a share May 18 to stockholders of record May 11.

DIVIDENDS

	Rate	Record	Pay- able
Pe- Stk. Of Pay- Rate riod Record able			
INCREASED			
Bearings Inc	.35	..	5-15 6-1
Binney & Smith	.175	..	5-11 6-8
Chrysler Corp	.35	..	5-10 6-11
Cook United	.33	..	5-25 6-15
Elhyl Corp	.25	..	6-15 7-1
First SecurityCp	.46	S	5-25 6-11
Hoover Co	.19	..	5-18 6-12
Interpublic Grp	.20	..	5-10 6-15
Norwest Pub Svc	.41	..	5-15 6-1
Sigma Mines	.15	S	6-29 7-31
Union Pacific	.54	..	6-11 7-2
Wurlitzer Co	.20	..	5-10 6-1
IRREGULAR			
US LeasREst	.44	..	5-4 5-18
INITIAL			
Progressive Cp n	.04	..	5-9 5-23
Signode Corp new	.198	..	5-8 6-1
STOCK			
Barber Oil	2pc	..	5-7 7-1
Gen Reinsurance (x)		..	5-4
(x)-2 for 1 stock split.			
PacCoast Hold	3pc	..	5-7 5-28
Washington Natl	25pc	..	4-25 5-7
RESUMED			
Lodge & Shipley	.05	..	5-7 5-21
LIQUIDATING			
Univ Marion	4.00	..	5-7 5-29
EXTRA			
Gulf Oil Canada	.10	..	6-1 7-2
Sigma Mines	.05	..	6-29 7-31
REGULAR			
Am BusinessPd	.05	Q	6-1 6-15
Brown & Sharpe	.05	Q	6-1 6-15
Budd Co	.10	Q	5-10 6-1
Capital Hold	.065	Q	5-15 6-15
Carbon Fuel	.40	Q	5-15 6-1
Carborundum	.07	Q	5-11 6-1
Caro Pipeline	.20	Q	6-15 7-1
Carrier Corp	.108	Q	5-15 6-1
Ceco Corp	.243	Q	6-8 7-2
Centill PubSvc	.30	Q	5-16 6-8
CI Conv Fund	.10	Q	5-9 5-15
Clow Corp	.17	Q	7-3 7-20
Cons Foods	.325	Q	6-11 7-1
Cross, AT Co	.105	Q	5-9 5-23
Delta Air Lin	.125	Q	5-8 6-1
Donnellev, RR	.12	Q	5-14 6-1
DurrFillauerMed	.025	Q	5-15 6-10
Exxon Corp	.95	Q	5-9 6-11
Faberger Inc	.10	Q	6-8 6-29
Franks Nursery	.08	Q	5-11 5-25
Freeport Miner	.20	Q	5-15 6-1
Griesdieck Co	.20	Q	5-31 6-15
Gulf Oil Canada	.15	Q	6-1 7-2
Heublein Inc	.23	Q	6-15 7-2
Hexcel Corp	.108	Q	5-4 5-18
Hulton, EF&Co	.10	Q	5-15 6-1
Illinois ToolWks	.09	Q	5-11 6-1
Kaweckl BeryInd	.05	Q	6-8 6-28
Kollmorgen Corp	.10	Q	6-1 6-15
Larwin MtgIny	.35	Q	5-18 6-1
Liberian IronOre	.69	Q	5-4 5-23
Macks Stores	.04	Q	5-31 6-22
Mead Corp	.15	Q	5-7 6-1

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said Thursday the Federal Re
would be helpful to apply ide
ments to member and nonme
banks are at a competitive dis
serve Board's ability to regula
is weakened. Since 1950, he s
American Bankers Association
the system and nearly 1,500
main outside the system, while

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EX CORP.'s \$1.5 billion antit
ed to gather information abo
petitors and to "put the scre
feld, now a securities analy
New York, said in 1971 he
pheral task force" and told to
Telex and other peripheral

profiles

FRIEND:

Dr. Alfred Bader

A brilliant chemist, an astute and competent businessman, and an authority on 17th century Dutch biblical paintings; it sounds like three separate persons, but is, in fact, one man -- Dr. Alfred Bader -- friend of Carroll College. When questioned about his wide-ranging interests, Dr. Bader said, "It's as simple as ABC -- Art, Bible, and Chemistry!" Born in Vienna, Austria, Dr. Bader attended undergraduate school at Queens University in Canada, and received his Ph.D. in chemistry from Harvard University. He came to Milwaukee to work in the research department of Pittsburgh Plate Glass Co.; and when they wanted to move him to Pittsburgh, he decided that he would rather stay in Milwaukee. So he and a friend founded the Aldrich Chemical Company in 1951, taking the name from the last name of his friend's fiancée. Aldrich manufactures organic chemicals in small amounts, and Dr. Bader attributes the company's success in the face of competition from large industries to "dedication and paying attention to detail -- that's all we have."

His association with Carroll came about when Dr. Ray Wendland was chairman of the Chemistry Department in the mid 60's, and he became acquainted with Dr. Bader and asked him to speak to some of his classes. A rapport developed, and the relationship continued with Dr. Bader becoming a consultant to the department, as well as a major contributor in terms of time, expertise, and money. In talking about his relationship to the Chemistry Department, he says, "It is pure pleasure, and I have a great respect and liking for the professors."

He is very modest in talking about his accomplishments in the field of chemistry, but he enjoys elaborating on his avocation of collecting 17th century Dutch art. He has more than two hundred paintings in his personal collection, and has given numerous

works of art to his alma mater, Queens University in Canada, attempting to build up their collection of Old Masters. He is so knowledgeable about art that he was asked to be the Guest Curator at the Milwaukee Art Center exhibition entitled "The Bible Through Dutch Eyes" in 1976. He prepared a fully illustrated descriptive catalog for the show, which has become a standard reference work. In addition, he lectures on art and has also published a "fair amount" on iconography, which is the study of the meaning of paintings.

He is on the Board of Overseers Committee for the Harvard University Chemistry Department, as well as their Fogg Museum of Art. He also has taught Sunday School at Temple Emanu-El B'ne Jeshurun for twenty-five years, and in addition to those classes, teaches two electives, one in Christianity and the other entitled "The Bible Through Dutch Eyes." He was honored by his temple in May of 1976 for his many years of devoted service.

According to Dr. Richard Bayer of Carroll's Chemistry Department, Dr. Bader "is a very compassionate soul; he has great concern for people." Dr. Bader himself expressed such a sentiment in an interview with Harry S. Pease of the Milwaukee Journal in January of 1976. He said: "I think there is so much order in the universe, there must be a God. The question is whether He takes an interest in us. I happen to believe so, but the question of Job is still there -- why are so many scoundrels doing well and so many good men doing miserably?"



*Bader
(Milwaukee Journal Photo)*

DEL-CHEM BULLETIN

may, 1974

NEWS OF THE DELAWARE SECTION, AMERICAN CHEMICAL SOCIETY



Charles Hindsley
Tenor



Joan Holfeld
Soprano

**Hear The Wilmington Opera
Society at the May Meeting**

(SEE PAGE 4)

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Chairman's Column

The scientific and technological activities of the American Chemical Society and the Delaware Section are pretty well known to Delaware chemists and even many non-chemists in this area. Our local section, topical group meetings, and national and regional meetings are familiar to most. The ACS scientific publications are well recognized. Our awards for scientific achievement are well publicized. Even our continuing education programs are heard about by all local chemists at least. Less known, however, are the various efforts the Delaware Section has made and is making to benefit the community. These include activities of the Chemistry and the Environment Committee, the Contributions Committee, and the Education Committee. I would like to mention briefly what is going on in the Education Committee, as for a long time it has made an important contribution to education in Delaware.

The activities of the Education Committee, unlike the Continuing Education Committee which is providing continuing educational opportunities for chemists, are focused on the local school system and to a lesser extent the University. It tries to assist both students and teachers in various ways. In March, the Committee cosponsored with the Department of Public Instruction and the Del-Mod System a symposium for high school chemistry teachers with experts brought in from Ontario. Thirty-five teachers participated in the program which covered high school chemistry preparation for the University, consumer chemistry for non-science majors, and laboratory demonstrations.

This summer, we expect to put on another Summer Science Workshop for science students from high schools throughout Delaware. Last year, approximately 25 students participated in the program which included visits to the National Institutes of Health, Goddard Space Flight Center, doing an actual

(continued on p. 14)

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GENERAL MEETING

WEDNESDAY, MAY 15, DU PONT COUNTRY CLUB

General Interest Meeting

5:30 Social Hour

6:15 Dinner

Roast Turkey — \$5.25. (with cocktail, \$6.25). For dinner reservations, call Mrs. Linda Martine, Du Pont Experimental Station, 772-4221, by noon, Monday, May 13.

7:15 After-Dinner Program

Joan Holfeld, soprano, and Charles Hindsley, tenor, representing the Wilmington Opera Society, will present a number of popular opera selections.

8:00 Main Program

Prof. W. J. Dreyer, Professor of Biology, California Institute of Technology. "Sculpturing Living Forms with Genes and Chromosomes"

Abstract: How is it possible for genes and chromosomes to program the development of complex forms and patterns as found in human brains and human physical features — or insects or birds? Although the answer to this question remains unknown, the results of studies in immunity and antibody molecules provide some fascinating clues. This lecture and film will convey some understanding of the way the genetic code programs all our life processes. These include growth and aging, controlling disease and even our method of rejecting cancer cells. Eventually man will be able to alter the normal process of growth and development in ways which stagger the imagination. The social, political, philosophical, legal and medical consequences of this new wisdom represent a great challenge for future generations.

Prof. Dreyer's ideas on a potential "smart bomb" against cancer have recently been featured in the *News-Journal*.

Sociality Committee Welcomes New Members

The goals of the Sociality-New Chemists Involvement Committee are to welcome new members to the section, promote fellowship and increase participation in the various section activities. New members to the section are contacted by the Sociality Committee and invited to a free dinner at one of the monthly general meetings. At the meeting, their host introduces him or her to other new members and to a number of people who are active in section activities.

It has been our experience that most ACS members are not familiar with how their section is run or with the variety of activities available. Members of the Sociality Committee have taken a big step

in overcoming these problems by contacting section's committee chairmen and finding out about the functions and activities of each committee. By reporting this information to the rest of the committee, we can all keep up to date with new or continuing programs. As a result of being on the Sociality Committee, several of our members have identified a program they are interested in and have joined the appropriate committee.

Any ACS member, whether new to the section or not, who would like to join the Sociality Committee, so that he might become more familiar with this section, should contact Paul Kalicky, Du Pont Experimental Station, 772-2172.

PAUL KALICKY, *Chairman,
Sociality-New Chemists
Involvement Committee*

A Chemical Company in Your Garage

An Interview with DR. ALFRED BADER

President, Aldrich Chemical Company

Interested in starting your own chemical company? Dr. Alfred Bader, founder and president of Aldrich Chemical Company, was interviewed by the Professional Relations Committee of the Delaware Section. In this interview, Dr. Bader tells how he did it and gives some good advice on to get started.

Q: If one were going to hang out a shingle that said "Chemist" or start manufacturing a product as a chemist, how would one go about it?

A: If someone were mainly an organic chemist who could make a good many things and had just a small lab, a garage for that matter, where he could make a good many compounds, several dozen on a small scale, he could quickly find the people to buy them. I didn't know this at the time I started Aldrich. I had the mistaken idea that one interesting compound might support us. We had one compound that had first been made in Canada while I was a graduate student with the professor who first made it: methyl-nitrosoguanidine, which at the time was used as a starting material for diazomethane. I had made many batches under Louis Fieser at Harvard. Everyone at Harvard used it, and so I thought if only I could make it I could send out flyers to various companies and support myself. It didn't work that way. I sold \$1705 worth the first year. I decided we had to make some other compounds. By the second year we had 12 compounds and sold \$5400 worth; by the third year we had \$15,000 worth. The garage where we started had become too small and we rented quarters. Certainly the idea that one parent compound that could be made a few kilos at a time would support the chemist just is not so; but on the other hand, I know a good many competent organic chemists that have very small laboratories around the country that make a few dozen compounds and do very well.

Q: Your experience indicates that more manufacturing than sales ability is in-

involved. How do you go about telling people about what you have?

A: At first we simply sent out a mimeographed sheet saying, "This material is available, 100 g/\$25," and my wife and I sat down at home during the evening and copied the names and addresses of everybody who published in the *Journal of Organic Chemistry* and built up our mailing list. Pretty soon we got the first order.

I might say it is always a pleasure to come to the Experimental Station because about the fourth year of the company I was sort of in doubt whether I could really make a go of it. The third year we sold \$15,000 worth, and it was nip and tuck. Then one day in October of our fourth year, we got an order from Joe Marshall, a purchasing agent at the Experimental Station. He ordered 500 lb — 500 lb! — of suberic acid at \$38 a pound. I remember looking at the order — \$19,000 — you know, the kind of order that was more than the previous year's sales! I knew I could make, any chemist knows how to make, suberic acid. Hexanediol was cheap. You brominate, you treat with cyanide, and you hydrolyze — three steps. Joe insisted he had to have it by Christmas of that year. We had three 22-liter flasks. I must have worked 16 hours a day, 7 days a week, brominating and reacting with cyanide and hydrolyzing. We got the 500 lb out, and that of course made an enormous difference. That year, the fourth year, we sold \$45,000 worth and were able to hire our first lab technician.

Q: Were you employed at another job at this time?

A: At the beginning I was working for Pittsburgh Plate Glass, and I wanted to make chemicals within PPG, but they said, "No, it will never amount to anything." So I asked them if they would mind if I did this weekends and evenings. They said, "We don't care what you do in your free time as long as you work 8 hours a day and turn out your work here." And then after the third year, PPG

decided to move the research laboratories of the paint division from Milwaukee to Springdale, Pa. I had come to like Milwaukee so well that I decided to leave PPG and work full time. Just at that time, of course, I wasn't at all certain whether with \$15,000 in sales we could make it — when that order came along.

Q: What kind of profit margin were you working on in the early days? How did you determine your pricing?

A: We had no idea. You do it by the seat of your pants. Take the suberic acid. Hexanediol costs 50 cents a pound, but I knew it was a fair amount of work — I had made batches a few times for Louis Fieser. I knew that if we sold it for \$5 or \$10 a pound, we just couldn't do it, even though the materials weren't very much. On the other hand, if we were \$60 a pound, we simply wouldn't get the order; and so I simply picked a figure out of a hat which bore no relationship to any accounting, because I knew no accounting. You can go through engineering (and my first degree was chemical engineering) or chemistry and never learn any accounting. I never had any accounting, so it was a long, long time — 15 years — before we actually hired an accountant.

Q: After your first compounds, how did you decide what you were going to add to your catalog?

A: I decided to add those things that I knew how to make that weren't available. In the first ten years we never added a compound that was in Eastman Kodak because we felt we hadn't any chance to compete with Eastman. Everybody knew Eastman. In our ninth or tenth year we added some compounds first, and then two or three years later Eastman added the compounds. And we said, "Oh, my gosh, now we'll never sell any more of that," but people kept buying from us. Suddenly a light went up that we could compete with Eastman, and now of course we have no trouble because Eastman is so expensive. They sell to distributors, and we sell directly. Eastman gives 40% to distributors, and we don't give anything to anybody. And so we can be cheaper, and we have found that we can compete.

Q: So you really had no marketing

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strategy?

A: Well, we looked for compounds that have a couple of handles. If I knew how to make tetradecane, what could I do with it? We always look for compounds that have a couple of functional groups. I had done a lot of work reacting dienes with phenols to make unsaturated phenols, and it seemed to me that there might be some modest market. I had been lab assistant to Louis Fieser who three or four times a week said to me, "Here's a literature prep — I want half a kilo," and these were almost always synthetic starting materials. I knew how to make these. I remember the first compounds we added were ethyl diazoacetate, ethanedithiol, and butadiene monoxide — a few things like that which have a couple handles, are not terribly easily made and weren't in Eastman, and could be made in a 12- or 22-liter flask.

Q: What do you say is the possibility of an Alfred Bader starting from scratch today and doing the same thing, now that Aldrich is fully developed and there are still Eastman and a couple of others for competition?

A: I think it would work if the person was hard-working and a good chemist. In the last two years, particularly, with a number of chemists being laid off, there have been a number of companies starting, and some of them have done very well. Very often people do not give this enough time. Usually when people start they are either good in chemistry but poor in business or selling, or they are good in selling but they don't know how to make the chemicals. It takes a combination — not that I knew anything about business in the business school sense — but I know if I buy something in Germany for a buck and I sell it for two, that is all right.

Q: As you were growing, you must have had various points where you needed financing that you didn't have the cash for.

A: That we needed at one point. We have never had a bank loan. We have never had a mortgage. We have never owed anything to anybody, but I started out with a partner. This incidentally is how the name Aldrich came about. We were each engaged to be married and we tossed up and I lost. My partner's fiancée's name was Betty Aldrich. He was an attorney and he took half of the company of Aldrich for setting up the paper work, and I didn't know that this was pretty dumb when I was doing all the chemistry and all he did was incorporate, but I didn't know what was involved in the operation of the company. And then when I wanted to leave PPG because I didn't want to move to Springdale, we needed some money; and so we went to a very well-to-do businessman in Milwaukee, and we sold him one-third of the company for \$25,000. He was to put in \$5000 immediately and then \$1000 a month as time went on, with a proviso that any time he wanted to pull out, he could put the stock back into the company and get his money back over two years. Now he came in in September of '54; and by May of '55, when he had put in \$12,000, he came to us and said, "Well, you are growing steadily, but this company is never going to be worth \$75,000 to justify \$25,000 investment; therefore I am exercising my option," and then it was pretty hard for

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a while. But then that DuPont order came along, and that paid essentially his \$12,000 back, and at that point I went to my partner who was simply an attorney who didn't do anything. "Look, I have given up my job; I'm working 16 hours a day." I gave him three options of either selling his half to me for \$15,000, or I would sell my half to him for \$3000 but then take the money and start my own company, or I offered to buy 20% for \$6000 — that would have given me 70%. He was a very busy man and couldn't pay much attention to this little tripocket of a company, and he took out the \$15,000 that I owed him over three years. At that point we had gone out of the garage — we started in a garage which cost us \$25 a month — it only had one switch, cold water, and no hood. We rented quarters for \$100 a month. There we were able to hire our first lab technician, who is still with us.

Q: It seems like a paper will appear where someone describes a new reagent, and practically in the same journal there is an Aldrich ad on the back for this new reagent. How do you do this?

A: We read the journals very carefully. We don't make market surveys or anything like that — that's for the birds. The best market survey is to make a kilo, put it into the catalog, and if people buy it — fine; if not — we haven't lost very much. We never throw stuff out. If things don't sell well — if among our 8000 chemicals one sells less than \$50 a year, that's really a dog. We just take it out of the catalog and put it into a library of rare chemicals and keep selling it at a unit price. All those chemicals have one price.

Q: Do you still buy compounds from people operating in garages?

A: Oh, sure. And you know, there it is really a matter of getting to know the people. We work with perhaps two dozen very small groups. There is a fine company in Detroit run by a very hard working, honest, very fine fellow. We buy a number of things from him, and he can make things in the 100-200 kilo range more cheaply than we can. He doesn't know what his overhead is. He doesn't do any accounting. His wife does the bookkeeping, and he turns out from that garage,

with one fellow working with him, about \$200,000 worth a year. He is very happy.

Q: Do you have any trouble from patent infringement?

A: About once a month we get a letter from somebody saying, "Cease and desist." We write back and we say, "Look, really, we are really only going to make five or ten kilos. We will be happy to pay you 5% royalty." We get a letter I would say twice, three times, a year from DuPont. Then we ask for license and we get the license, and it says you can't make more than 100 pounds or 1000 pounds or something like that; and some companies want a 5% royalty and on some a 10% royalty — it is not terribly important. A number of companies have come to us and said, "Look, we have a patent and we know how to make it, but we don't want to bother making it because there may be no market future. Will you make it under license from us and report to us how much you sell; and if you get to a quantity X, tell us what it is — we want to make it. And report to us how many units you have sold." What in essence they are getting is a free market survey, which is fine with us.

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Q: Would you say today that most of your business is with the academic world or industrial research or government?

A: Well, I think, neither. The government is 8% and that's spread over many, many laboratories. We do a very fair amount in bulk now. Probably over 30% of our business actually is in the 100 kilo to a few tons range. The academic business I would say is now 25%, and that of course is very important because students learn about us, then go out into industry and continue to use our compounds.

You know, back in the early 50's we always had the same battle. The chemist was used to looking into one book. If it was not in the DPI catalog, you made it yourself; and you know how DPI treated people then. This was one of the reasons really why I went into the fine chemical business. I remember I needed a chemical to finish my Ph.D. thesis. It was *ortho*-isopropylphenol, and I didn't know at the time that it was really Dow who made it about once a year. I ordered 500 g from Eastman, and after six weeks I still didn't have it. So I wrote them a letter on Harvard stationery saying, "Gee, I need that real badly — please rush it to me." And I got back a postcard — I wish I had kept it — it was a form thing saying, "Dear Sir: We have received your order number so and so. The order is in hand. Don't bother us. The more you write, the longer it will take for you to get the order. You'll get it when we have it." And I said, "My God, if that is the fine chemical business in the United States, I've got a place in it." Every company occasionally has to back order things. We have got roughly 3% of our compounds back-ordered, but I hope we never treat our customers like that.

Q: I was interested in the comment you made before that you looked for chemicals that had a couple of functional groups on them. Offhand, can you think of anything else that would approximate planning?

A: The compound should be at least difunctional. The compound should not be commercially available. If something is available from DuPont or Allied or what

have you in drum lots, Eastman and MCB and Baker who buy in drum lots and repackage — they package quite cheaply — are going to have the business. It shouldn't be commercially available, and you should be able to make it. On the telephone in one day I could sell 10 kilos of cyclobutylamine if I knew how to make it economically. Cyclobutanone is such a hard thing to make. We still make it by the old Roberts method from methylene-cyclobutane. So cyclobutanone is expensive. If you could make cyclobutylamine at \$500 a kilo — I'd take 10 kilos right away. If you knew how to make cyclooctatetraene without having the hazard of handling acetylene under pressure, you could sell a lot of that. Many such things.

Q: How many people do you employ right now — chemists, Ph.D.'s, etc?

A: We employ 14 Ph.D.'s in all. Of these, two are in our German company — we have a plant in Germany. One is in our company in England, and the other eleven are in Milwaukee. So worldwide, about 300 people, of which a little over 40 are graduate chemists.

Q: What sort of problems did you run into — or did you run into any — with safety hazards and shipping these chemicals, especially in the early years?

A: Well, in early years, luckily, we didn't have these unbelievable government restrictions that there are now — I mean, both in relation to explosives and in relation to what the government thinks are carcinogenic compounds. We now have the most stupid, unbelievable regulations, and you can quote me on that. For a hundred years organic chemists have been using 2,4-dinitrophenylhydrazine as a standard reagent for aldehydes. You can't ship it today. It is on a list of high explosives, and anyone that ships you 100 g is subject to \$5000 fine.

Q: Have you had any terminations?

A: We asked one man to leave who was completely nonproductive, and we talked to him over a period of several years. We gave him 6 months' notice, and he had over \$15,000 coming to him from the profit-sharing plan. He was a very kind person who simply didn't turn out any work.

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TOPICAL GROUPS

Analytical

The May meeting of the Analytical Group will be held May 14, 1974 at the Executive Club, 9th and Shipley Streets, Wilmington, Delaware. The topic of discussion will be "Analytical Study of the Activation of Molecular Oxygen by Metal Peptides," by Dr. Dale Margerum, Professor of Chemistry, Purdue University.

Molecular oxygen reacts spontaneously with peptide complexes of copper (II) and nickel (II) neutral solution to oxidize the peptide. The copper (II) reaction is inhibited by light. The analytical problems in identifying the initiators, reaction intermediates, and the products of the oxygen activation reaction will be discussed.

To make dinner reservations, contact Lois Weyer, Hercules, Inc., 995-3216 by 12:00 noon May 10, 1974.

Biochemical

DR. JOHN C. WRISTON, JR.

DATE: Monday, May 13

TIME: 8:00 P.M.

PLACE: Atlas Chemical Industries
ICI - America
Main Office Assembly Room

TOPIC: Glucosylation of Proteins

Dr. Wriston is Professor of Chemistry at the University of Delaware where his major research interest in the last eight years has been the purification and properties of the enzyme L-asparaginase from various sources. He has just returned from a sabbatical leave spent in the Carlsberg Laboratory, Copenhagen, working with Professor Martin Ottesen on protein modification by the covalent attachment of sugars.

Abstract: As many of the serum proteins contain carbohydrate moieties it was postulated that carbohydrate residues might determine the half-life of certain asparaginases introduced into the circulation. Chemical methods for coupling sugars to proteins will be described together with preliminary results obtained

in the modification of chymotrypsinogen and asparaginase with water-soluble carbodiimide as a coupling agent. The main burden of the discussion, however, will be to explain the rationale behind these experiments and to outline the direction to be pursued in the future.

NOTE: Dinner will be at 6:00 PM, Poor Richard Inn, Route 202, Concord Pike (Independence Mall).
For reservations please call 428-4486 (Amy Law).

Show This to Your Technician

DATE: May 1

TIME: 7:30 PM - Short business meeting
8:00 PM - Topic Program

PLACE: Hercules Country Club

SPEAKER: Doris J. Watson, Assistant Manager Tech. Literature
Special Manager Turf & Horticulture

SUBJECT: "Growing for Show"

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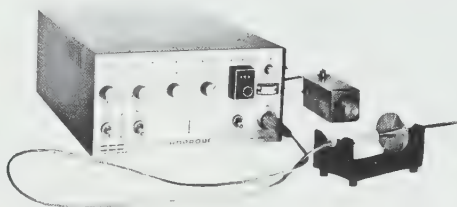
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FEBRUARY EXECUTIVE COMMITTEE

Audit Committee — R. Blomberg

The Audit Committee reported on its audit of the Delaware Section books, the books of the various committees maintaining separate accounts, and on the condition and location of various equipment owned by the section. The audit report corrected several discrepancies in the various books and recommended the writing off of equipment valued at \$294.79 which either could not be located or was in poor condition. Recommendations were made relating to improving the handling of the financial affairs of the section. These recommendations included reducing the number of separate committee accounts outstanding.

Appointment of Councilor and Alternate Councilor — W. Calkins

The Executive Committee approved the appointment of E. S. Bloom as councilor to fill the 1973-74 term of Clay Smith who has resigned. The alternate councilor spot created by Bloom becoming councilor will be filled by Veronika Foldi. At the January meeting it had been decided that Clay Smith's vacancy would be filled in the next election. This action was reconsidered so that the section would have a full slate of councilors at the Los Angeles meeting.

By-Laws Committee Report — L. Wright

The By-Laws Committee reported that the only item to be submitted to the membership for a vote concerned article IV, section 6, paragraph 4, which spells out how to replace a councilor who has resigned.

Reactivation of Del Chem Bulletin Advisory Committee — W. Calkins

R. Walck, previous editor, has resigned as chairman and R. Schmoyer, previous business manager of the *Bulletin*, has been

appointed chairman. Two vacancies on the committee have been filled with the appointment of Herman S. Skolnik and Gene Magat.

Continuing Education Committee — P. M. Subramanian

The scheduled activities for 1974 are a seven session course of "Engineering Analysis for Chemists" arranged in cooperation with the Chem. Eng. Dept., Univ. of Delaware; audio tape course on "Applications of Raman Spectroscopy" in May; Prof. Wunderlich's tape course on "Crystals in Linear Macromolecules" in September.

Events being negotiated for the Fall are a colloquium on organic chemistry by Prof. Wenkert, "Evening with Prof. H. Taube", and audio tape courses on "Fluorescence and Phosphorescence Spectrometry" and "Applications of Orbital Symmetry."

(continued on p. 14)

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Investments Committee — R. Tietz

Stock transfer problems that have prevented previous recommendations for changes in the section's holdings from being carried out have now been overcome. The Investments Committee's recommendation was to put \$15,400 of the section's assets into 4 year savings certificates yielding 7.9%, purchase 200 shares of American General Bond now yielding 7.7%, and retain the 118 shares of Delmarva Power and Light now held. It was moved and passed that only 50% of the section's investment funds be placed in 4 yr. certificates and that the rest, after the D.P. & L. and American General Bond holdings, would be invested in a utility not subject to the vagaries of the oil situation. The treasurer was authorized to proceed.

New Business

J. Schaefer reported that the Delaware Section ranked fourth in contributions to the PEP Campaign. Total contributions nationally were \$114,920.

B. Monroe briefly discussed progress toward legislation on licensing of analytical chemists.

A. Hale reviewed the resolution for major changes in the functioning of the ACS that will be considered by the council at the L.A. meeting. This resolution, printed in the Jan. 21, 1974, issue of *C. & E.N.*, is designed to make the Society more responsive to the members. Art Hale is one of the originators of the resolution.

Officers' Attendance

Present: Calkins, Wright, Anton, Repka, Skolnik, Rondstedt, Cairncross, Hale, Schaefer, Vandenberg, Bloom, Anderson, Burmeister, Dunlop.

Absent: Trofimenko, Chamot, Walck, Yolles.

Chairman—cont'd.

The Committee is currently trying to organize a tutoring program for high school chemistry students and is considering reopening a film library for instructional films.

In past years, the Education Committee has collected and distributed surplus journals and books for donations to schools and colleges. It has collected and distributed surplus laboratory equipment and chemicals to assist local schools and provided science lectures for local organizations.

The Education Committee is making a real contribution to the community, drawing on the knowledge and skill of chemists. Perhaps you would like to help in this worthwhile task. Call Professor Wayne Anderson, Chairman of the Education Committee at the University of Delaware, Chemistry Department, or me at the Du Pont Experimental Station.

— WILLIAM H. CALKINS

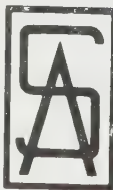


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MARCH EXECUTIVE COMMITTEE

Review of Separate Financial Accounts

The separate accounts maintained by several committees were reviewed to determine if the accounts should be closed and the business handled directly by the section treasurer, or if they should be continued. It was moved and passed that the *Del-Chem Bulletin*, the Technicians' Affiliate and the Continuing Education Committee should continue their accounts, but that quarterly financial reports must be made to the section treasurer. It was moved and passed that the Communications Committee should continue as in the past and that the Summer Science Workshop of the Education Committee would maintain a separate account with a closing report required.

Office of Treasurer-Elect

The By-laws Committee with the Treasurer will study the advisability of having the office of Treasurer-elect in the section. A report will be made at the May Executive Committee Meeting.

Membership

Winnie Bloom reported that the membership of the section was 2690 as of March.

Certification of Analytical Chemists

Bruce Monroe, Gene Magat and Dave Breslow met with Representative Andrew

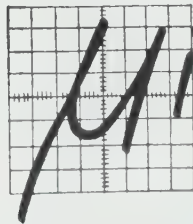
Knox about the possibility of establishing a procedure whereby Analytical Chemists might be certified by the state. This meeting was to implement a motion of the October, 1973 Executive Committee. Based on this meeting, Bruce Monroe reported that chances of passage would be good if the profession indicated support. It is not possible to prepare a bill in time for passage this session, so any legislative action will be postponed until 1975.

In the meantime, the Chairman of the section will appoint a committee to continue working. The committee will be heavily analytical, but also will have a member of the Professional Relations Committee, and, if possible, a forensic chemist.

Non-Member Charges to ACS Functions

A committee chaired by Anthony Anton recommended the following action: a 10-20% fee increase, depending on the magnitude of the fee, for non-members at ACS functions; that non-members be differentiated from members at the monthly dinner meetings by a special name tag; that the Section no longer subsidize dinner for non-members at the monthly meetings; that the Section continue to subsidize activities for member family guests; that the Section subsidize members of other societies invited to participate in the Section activity; that the individual must designate that he is a member to receive the reduction.

It was moved and passed that the recommendations are adopted as written with



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the proviso that the Technician Affiliates be included as members; that Anthony Anton's committee continue as constituted; and that the action be publicized in the *Del-Chem Bulletin*.

Young Chemists Involvement Committee — P. Kalicky

The committee now consists of 14 members, all at DuPont Experimental, but will expand membership to other locations in March. All members, through contacts with various other committees, have familiarized themselves with the functioning of the Delaware Section. They are now in a good position to serve as hosts for new members at a monthly meeting.

Expenses of A. Hale for Los Angeles Meeting

It was moved and passed that the Delaware Section reimburse A. Hale, Councilor, up to one half of the transportation costs incurred attending the Los Angeles meeting. Reimbursement will be carried out in compliance with national ACS policy.

Ladies' Night Changed to General Interest Night

It was moved and passed that Ladies' Night be known henceforth as General Interest Night.

Technicians' Affiliate Advisor

Allan Cairncross will replace Ron LeBleu, who has resigned, as advisor to the Technicians' Affiliate. Burke Welldon will remain as the other advisor.

Arrangements Committee

The Arrangements Committee was requested to see if temperature can be better controlled at monthly meetings.

Officers' Attendance

Present: Calkins, Wright, Anton, Schaefer, Skolnik, Rondestvedt, Cairncross, Chamot, Hale, Bloom, Trofimenko, Anderson.

Absent: Repka, Vandenberg, Foldi, Walck, Yolles, Burmeister, Dunlop.

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NICK NACKS/by Alan C. Nixon

Still An F!

Under the heading "Societies Still Failing" *Industrial Research*, a monthly "free" mag, reports the results of a reader survey in its January '74 issue. Their readers, mostly technical society members, say their societies are not providing adequate job oriented support for them (87%) although 78% think they should. They think (68%) that one big professional society (like AMA) should be founded to do it. Only 3% belong to unions, but 52% say they would consider joining, 68% think it would affect the professional image of their position (a tricky question), whilst 74% think large numbers of technical workers will be organized in the future.

Tongue in cheek answers aside, it is obvious in spite of real advance in concern and action in the last few years by the technical societies, there is much left to be done — in both accomplishment and communication.

Have Chemists A Future?

This is the heading of an article by M. L. Burstall in a recent issue of *Chemistry in Britain* (1973 — p. 510). Burstall's answer is, "Of course they have. But what kind of future? According to this analysis chemists will only survive through a policy of ruthless opportunism." The position of chemists in Great Britain is much the same as in this country. Their largest group of science graduates are chemists who are employed in industry and academia as well as government. They had a rough time during the recent recession. The prospects for teaching in the future look dismal and they are worried about the industrial component. Burstall's advice of "ruthless opportunism" that he gives British chemists, should be very well taken to heart by their confreres in this country. The "ruthless opportunism" that Burstall recommends is similar to what several people including Dave Young and myself have advocated in the past for American chemists. This is that they should take advantage of their chemical training and background to move into jobs that are not strictly chemistry but somewhat related and broader in scope. He suggests that chemistry is valuable for mind training in that it conveys not only information

but also an attitude of mind with respect to a solution of problems. He says, "Chemists study complex systems by judicious simplification and logical analysis of experimental results" and suggests that "non-chemical problems can be attacked in a similar way. I think this is the wave (or ripple) of the future and we should strive to adapt the educational system the best way we can to accommodate this requirement. Obviously we can't teach all the subjects that would be useful in this broader approach but there should be at least one course which gives an overview of the broader fields in which chemists might find occupations with some opportunity to take specific courses that could be useful in the future.

Friedman Finance

Examining the Treasurer's Report for 1973 brings out the fact that the election of Bernie Friedman resulted in a return of almost \$2 per member to the Society (i.e. the members). This was a result of his determination to make the short term money in the ACS Cash and Investment Pool work harder by increased investment in high yield short term paper and to reduce the amount of idle money held in non-interest bearing bank accounts. His success was based on his experience with the Chicago school board Investment Fund which actually runs a negative cash balance and his determination to dissipate the fog of financial fluff that surrounded the management of our monied meanderings. (I had tried to do the same thing when I came aboard but I don't have the same talent as a fog cutter as Bernie has.)

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HARRY W. GALBRAITH, Ph.D.

The Pension Situation

Both the House and Senate have passed bills to reform the pension situation and the matter will go to a Conference Committee to resolve the differences. Although the final details are not known, it is expected that those parts of the bills which are common will be retained in the final version. Although the bill is extremely important from the standpoint of workers as a whole, it will, when it is eventually in full operation (which will take several years), have a profound effect on the future well-being of Americans in general. It does not seem to answer the specific needs of chemists and engineers. This will require essentially instant vesting (i.e. complete portability) to satisfy the needs of this class of migrant workers. The new rules coming out of the legislation will probably allow employers to choose between three vesting plans—full vesting after ten years, 25% after five with increasing each year until full vesting would occur after 15 years with the same employer, or the rule of 45, providing 50% vesting after employees age and years of service total 45 with increases of 10% a year thereafter until full vesting. Again, with the same employer.

It is hoped that out of the legislation would come a provision which would allow Pensions for Professionals to set up a nationwide multi employer, scientists and engineers only plan, to which employers can voluntarily contribute which would have improved vesting and portability provisions not necessarily available to all employees of the employers concerned. (At present this sort of discrimination is illegal.) It is also hoped there will be provisions to prevent forfeiture of pension credits earned while employed on government contracts terminated before the normal vesting period and that the Department of Labor will make a special three year study of the pension problems of scientists and engineers and make recommendations for new legislation.

Meanwhile, the PFP continues to slowly pick up new adherents now having a total of nine societies represented on its Board of Trustees and more nibbling. Major discussion is going on with the Institute of Electrical and Electronics Engineers (the biggest engineering society

— 160K) who have been extremely active in the pension field for the last couple of years and worked hard to try and bring about the new legislation. PFP and IEEE have not been able to get together and IEEE has set up PTP (Pensions for Technical Professionals) with the avowed purpose of bringing a more comprehensive set of pension plans into the field than PFP has. It is hoped that PFP and PTP will merge (to bring about PFTP?) in the not too distant future. However, as the situation stands now and probably for many years in the future, the goal of instant vesting will require strong effort on the part of all scientific and engineering societies and probably all organizations having exempt employees as their members in order to *persuade* employers to advance favored treatment to this class of employee (i.e. us). In my mind the quid pro quo will be the fact that this class of employee is exempt from the Wages and Hours Act, i.e. they do not get paid overtime for working more than 40 hours a week.

Letter

Dear Section Secretary,

The U. S. Congress has been considering changes in private pension plans which can be of importance to many chemists. One of the areas found to be a problem by the ACS Council Committee on Professional Relations has been the lack of adequate vesting. Cases of terminated employees have been investigated where the employee had no vesting in the Company's pension contribution after 14 years of service. It is the opinion of the Committee that Local Sections should request their secretary to write to the Congressmen and Senators in their territory to urge action on the pending Pension Legislation which is apparently subject to compromise between the House and the Senate. The vesting problem is one of the matters being considered. Here is an opportunity to be of service to chemists.

Yours very truly,
DONALD S. HIRTLE
Pension Liaison Sub-Committee
ACS Council Committee on
Professional Relations

Ed. Note: Members of the society are also invited to express their views on this matter.

PEOPLE

Du Pont — Experimental Station

C. B. Catanach was promoted to research associate. *S. C. Malhotra* was transferred to the fluorocarbons division of the Plastics Department at Parkersburg, W. Va.

Bill Phillips, an associate director of research, accepted an offer of transfer to the Development Department from CRD.

Ralph Hardy was appointed associate director, CRD. *Elmo Beyer* was appointed research supervisor.

Harlan Foster retired after thirty-nine years of service.

Vernon Wittenbach, BS, MS, Ph.D. in Horticulture from Michigan State, joined the Central Research Department.

Joseph Sansregret joined the exploratory research group, as a research chemist. He received a BS from the University of Portland (Oregon) and a Ph.D. from Washington State University.

Du Pont — Christina Lab.

Stephen A. Maddox was transferred to Old Hickory, manufacturing division. *Charles J. Schmidt*, supervisor, R & D, spunlaced, elected to retire after more than twenty-nine years of service. *William J. Barnes*, senior research engineer, PNEU-MACEL group, retired after twenty-nine years of service. *John Stephens* was employed as a research chemist in the spunlaced group.

John W. Strantz, development engineer, engineering department, transferred to the film department and was appointed supervisor — manufacturing.

Du Pont — Chestnut Run

James M. Meyer has been promoted to technical supervisor in the adhesives and latex group. *Robert L. Morgan* has been promoted to division head in charge of the electrical industry products group.

Hercules — Home Office

Lucien G. Maury, general manager of international, has been named general manager of Hercules Europe.

Hercules — Research Center

Kenneth E. Steller, organics research division, has been promoted to senior research chemist. *Lois* (not Louis, as reported in March) *Weyer*, MS from the University of Delaware, is new to the analytical division.



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Group honors Bader

Alfred R. Bader, chairman of the board of Sigma-Aldrich Corp. and the Aldrich Chemical Co. here, has been named 1983 Engineer of the Year by the Engineers & Scientists of Milwaukee.

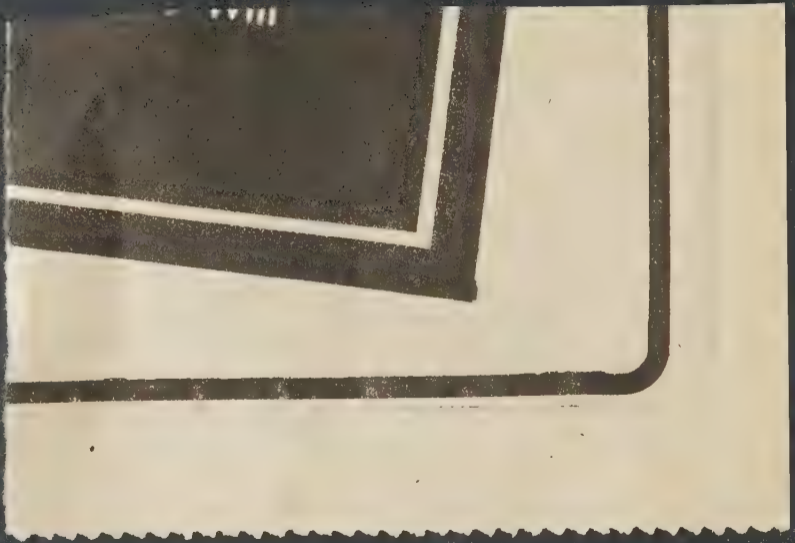
The 31st recipient of the award, Bader is the author or co-author of 24 scientific publications in the field of organic chemistry and holds 27 patents for research development. He will be honored by the Milwaukee Council of Engineering and Scientific Societies at the annual Engineers' Week Dinner Feb. 22 at the Memorial Center.

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'Arty' Chemist To Lecture

EAST LANSING — Alfred Bader is an industrialist who developed a garage-size chemical company into a major national corporation. He's also an Austrian-born art connoisseur known for his research on and restoration of 17th century Dutch paintings.

Bader the chemist and Bader the connoisseur will deliver three lectures Oct. 6 at Michigan State University: "Chemistry in Art" at 2 p.m. and "The Bible Through Dutch Eyes" at 8 p.m. in the Kresge Art Gallery and at 4 p.m., "A Middle-Sized Chemical Company" in Room 136 of the MSU Chemistry Building. Admission to all events is free.

The Milwaukee resident is chairperson and chief executive officer of the Aldrich Chemical Company, Inc., which specializes in research and specialty chemicals.

A fellow of the Royal Society of Arts, Bader is also a guest curator at the Milwaukee Art

Center. He has donated about 30 paintings from his private collection to the center.

Bader has found his chemistry background useful in determining the worth of paintings. "As a collector of old master paintings I look every year at several hundred old paintings, in junk and antique stores and at auctions all over the world," he says. Testing with various solvents and an examination under ultraviolet light can help determine a painting's authenticity, he explains.

In discussing the Bible through Dutch eyes, Bader points out, "One of the remarkable aspects of life in 17th century Holland was the study of the Bible and the identification of the Dutch with the people of the book and their destiny. Never before had a Christian people studied the Bible so carefully."

Bader's MSU appearance is sponsored by the MSU Department of Chemistry.

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"How well I know the black poisons of his soul," Aram Saroyan writes at the outset of a book which has been compared to "Mommie Dearest," in which Joan Crawford's daughter, Christina, revealed the alleged horrors inflicted by her movie star mother.

But "Last Rites" is more than an expulsion of anger. It is the story of a son's determination to understand his father's demons and to make peace. In the end, it is a healing story.

It was in April 1981, when he learned his father was dying in his home town of Fresno, Calif., that Aram decided to write down his thoughts. "It was like a torrent unleashed...This book was like an emotional un-

in the last 20 years," said Aram. "Making him a flesh and blood human being will certainly spark new interest. It already has."

For the son, who has struggled to carve a literary identity of his own, "Last Rites" was a breakthrough into the literary mainstream after years of obscurity.

"Last year was the first year I pretty much made a living from writing," he said.

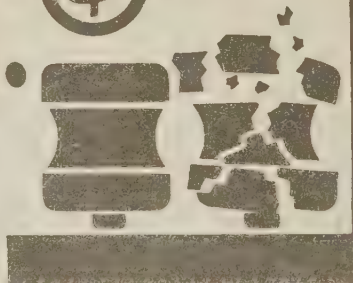
Soroyan has completed a "straight biography" of his father as an artist. He also has a new screenplay based on the early life of his mother, the former Carol Marcus, now Mrs. Walter Matthau, and the friends of her girlhood — Oona O'Neill and Gloria Vanderbilt.

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Local scene

Art, chemistry mix

For Alfred Bader, the worlds of art and chemistry intermingle.

So on Wednesday, he'll offer free Michigan State University lectures on both.

The Austrian-born Bader is president of the Aldrich Chemical Co. in Milwaukee. He's also a guest curator at the Milwaukee Art Center and an expert on the restoration of 17th-Century Dutch paintings.

THOSE INTERESTS work together, Bader says. His chemistry skill helps him test the authenticity of paintings.

His talks Wednesday will include: "Chemistry in Art," 2 p.m., Kresge Gallery; "A Middle-sized Chemical Company," 4 p.m., Room 136, Chemistry Building; and "The Bible Through Dutch Eyes," 8 p.m., Kresge.

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THE MILWAUKEE JOURNAL
INSIGHT
Sunday April 18, 1976



The Old Testament through Dutch eyes
page 6

Observations

America, the vulnerable. If every American family were suddenly required to send \$400 overseas, people would blow their stacks. Yet, that's just about what happened in 1974 when America's bill for foreign oil abruptly jumped to \$26 billion from \$9½ billion the previous year. That tab will rise to \$35 billion by the end of next year, which means that every family will be sending a gift package of over \$500 to foreign oil producing countries, according to Federal Energy Administration data.



Are you concerned about it? You should be. And you should tell your elected officials. They're still holding up measures to step up the search for more oil and gas in this country, and to mine more of America's abundant coal—steps America must take now to control that costly foreign oil habit.



Tight squeeze. "How can you fit five people into a compact car," asked a commuter from Warren, Ohio, after "Observations" noted that a 5-rider car pool sharing a compact each day could save \$502 yearly on a 10-mile commute. "If I sit up, I bump my head. If I slouch, my knees and legs are stiff when I get out," she wrote. "Who are those midgets you used for your survey?" We used government statistics, but your comment raises a valid question posed in a later column: that unrealistic mileage mandates could limit production of big cars some American families need.



What price energy? A new law requires the manufacturer to tell how much electricity each appliance consumes. If enough people become energy conscious in buying appliances, says the Federal Energy Administration, the nation's savings could increase in a decade to the equivalent of 350,000 barrels of oil a day. Which appliances use the most electricity? Based on average U.S. residential rates, here's what a typical family of five pays annually: hot water heater, \$127; frostless 14-cubic-foot refrigerator, \$55; frostless freezer, \$53; range with oven, \$36; clothes dryer, \$30; color TV (tube type), \$20; electric blanket, \$4; radio, \$3; shaver, 5¢.



Upcoming on T V. A young girl's loss of childhood innocence mirrors the end of an epoch when "Sunset Song," a new six-part Masterpiece Theatre drama, begins next Sunday night on public television. It's the evocative story of a sensitive Scottish country lass, with thunderclouds of World War I brooding overhead. We think you'll like it.

Mobil

Observations, Box A, Mobil Oil Corporation, 150 East 42 Street, New York, N.Y. 10017

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INSIGHT

April 18, 1976

SUNDAY MAGAZINE OF THE MILWAUKEE JOURNAL

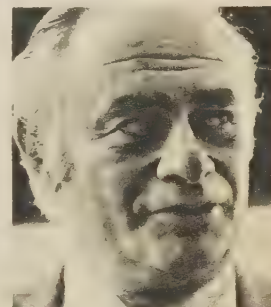
Mike Moore, Editor

The Old Testament, richly interpreted 6

In this issue, we offer you a glimpse of a remarkable collection of religious paintings by some of the finest of the old Dutch masters. The collection — 70 paintings assembled by the Milwaukee Art Center — will be on display at the center through May 23.

King of the second bananas 12

With his face, actor Martin Balsam will never be a leading man. So who cares? He's given us some memorable moments on the screen, stage and TV. "The character roles I play," says Balsam, "depict men with problems and they offer a chance for some real acting."



Sue Reilly

Are reel people real? 16

Speaking of movies as we were (sort of) just above, how do we measure truth in the flicks? After all, truth and reality are slippery concepts at best, and they slide around plenty in the world of film.

James Arnold

The shopping center blues 24

As our author's revered grandfather used to say, "It don't take no house to fall on me." Which is about as good a way as any to describe this particular shopping trip to a megacenter called Northridge.

Bea Bourgeois

When Jackie Robinson was a "nigra" 32

Just 30 years ago, baseball was a white man's game. Oh, there were "colored" teams, but they played each other, and the sports establishment paid little attention to them. And then, in '47, two men with guts — Branch Rickey and Jackie Robinson — began remaking the game.

Harold Parrott

Other features

Mel Ellis	18
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Glad You Asked That	36
Two Strikes on the American Dream	39

On the cover

"The Widow of Zarephath and Her Son" is one of 70 religious paintings by old Dutch masters now at the Art Center. It is the work of Abraham van Dyck, who lived in Amsterdam in the 17th century. As you might guess from the style and texture, Van Dyck was much influenced by Rembrandt.

The Old Testament, richly

DRAMATIC EPISODES from the Old Testament spring to life with almost photographic immediacy in the 70 Dutch 17th century Old Master paintings on display through May 23 at the Milwaukee Art Center. The show, "The Bible Through Dutch Eyes," was assembled under the supervision of the Viennese born chemist and art historian Alfred R. Bader, a resident of Milwaukee for the past 25 years. As honorary guest curator, Bader, 51, has included paintings from private collections and from such prestigious institutions as the Art Institute of Chicago, the Metropolitan Museum of Art, the Rhode Island School of Design, the National

Gallery of Canada, the Minneapolis Institute of Art, the J. Paul Getty Museum and the Yale University Art Museum.

Of particular interest are 10 works on loan from the important but little known holdings of Dr. E. Schapiro, of London, England. The Schapiro paintings are being shown in the United States for the first and last time. After the closing of the exhibition here, they will be shipped directly to the Hermitage, Leningrad, USSR, where they have been accepted into the permanent collection.

Augmenting the exhibition is a detailed catalog written by Bader. Each painting in the show is





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interpreted

reproduced, along with the corresponding biblical text, full technical information and a commentary of scholarly and popular interest. Captions for paintings reproduced in this issue of *Insight* are drawn from Bader's catalog notes.

Visiting hours at the Milwaukee Art Center, 750 N. Lincoln Memorial Dr., are 10 a.m. to 5 p.m. Tuesday through Sunday. Admission is free from 10 to 11 a.m. daily. After that, admission is \$1 for adults and 50 cents for students and senior citizens. Children under 12 and Art Center members are admitted free. The Art Center is open today, Easter Sunday. —James Auer of *The Journal*

And Sarah saw the son of Hagar the Egyptian, which she had born unto Abraham, mocking. Wherefore she said unto Abraham, Cast out this bondwoman and her son: for the son of this bondwoman shall not be heir with my son, even with Isaac. And the thing was very grievous in Abraham's sight because of his son. And God said unto Abraham, Let it not be grievous in thy sight because of the lad, and because of thy bondwoman; in all that Sarah hath said unto thee, hearken unto her voice; for in Isaac shall thy seed be called. And also of the son of the bondwoman will I make a nation, because he is thy seed.
GENESIS 21:9-13

Signed in initials and dated 1653, "The Dismissal of Hagar" is the earliest known dated work by Nicolaes Maes (1634-1693), a student of Rembrandt. Based on a Maes drawing in Berlin, it shows Ishmael as a fledgling hunter, with bow and arrow, and Hagar with a gypsy *bern*, a headdress familiar from many earlier depictions of gypsies. In the 17th century gypsies were believed to be descendants of Egyptians. For this reason the headdress is particularly appropriate for Hagar, the Egyptian. Although Ishmael was 14 when Isaac was born, and thus in his teens at the time of the dismissal, he is usually depicted much younger. The 34½ by 27½ inch canvas is on loan from the Metropolitan Museum of Art.

Continued

And when money failed in the land of Egypt, and in the land of Canaan, all the Egyptians came unto Joseph, and said, Give us bread: for why should we die in thy presence? for the money faileth.
GENESIS 47:15

Active in Amsterdam in the middle of the 17th century, Jan van Noordt was strongly influenced by Jacob Jordaens and Rembrandt's students of the 1640s. In this canvas, "Jacob Selling Grain to the Egyptians," Van Noordt foreshadows the free handling of paint and light colors used by the Venetian 18th century artists. Illustrated in the 29 by 46 inch work, on loan to the Milwaukee Art Center from a private American collection, are conditions during the famine in its later stages. By this time, the Egyptians had become desperate and were selling themselves and their families to Pharaoh, and their desperation is evident in this painting.



Now it came to pass on the third day, that Esther put on her royal apparel, and stood in the inner court of the king's house, over against the king's house: and the king sat upon his royal throne in the royal house, over against the gate of the house. And it was so, when the king saw Esther the queen standing in the court, that she obtained favor in his sight: and the king held out to Esther the golden sceptre that was in his hand. So Esther drew near, and touched the top of the sceptre.
ESTHER 5:1, 2

One of the more popular scenes from the Book of Esther is "Esther Before Ahasuerus," depicted here by Aert de Gelder. Measuring 18½ by 24¼ inches, the oil on panel is one of the artist's earlier works. Probably painted in the 1660s, it depicts a beautiful, self-assured young Esther, a delightful contrast to the king. According to Jewish tradition, the four women of surpassing beauty in the world were Sarah, Rahab, Abigail and Esther. As de Gelder grew older, his Esthers became chubbier and plainer. The painting is on loan from a private American collection.



The Old Testament



And he returned to the man of God, he and all his company, and came, and stood before him: and he said, Behold, now I know that there is no God in all the earth, but in Israel: now therefore, I pray thee, take a blessing of thy servant. But he said, As the Lord liveth, before whom I stand, I will receive none. And he urged him to take it; but he refused.
II KINGS 5:15, 16

Depicted in this 45½ by 64½ inch canvas, from the Bob Jones University Collection of Sacred Art, is the story of Naaman, the Syrian general, offering gifts to Elisha after his cure from leprosy. Authorship of the painting is uncertain. Scholars say it appears to be closest to the works of Jan Tegnagel (Amsterdam, ca. 1584-1635), brother-in-law of Jan and Jacob Pynas. But almost all of Tegnagel's works are on wood and signed, while this is on canvas and unsigned. □

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SCOREBOARD

Pro Hockey

Table with columns for NHL Conference (Patrick Division, Norris Division, Adams Division), W, L, T, Pts, and GP. Lists teams like Philadelphia, New York Rangers, Chicago, etc.

Table with columns for AHL Division (East Division, West Division), W, L, T, Pts, and GP. Lists teams like New York Rangers, New York Islanders, etc.

Pro Basketball

Table with columns for NBA Division (Atlantic, Central, Eastern, Pacific), W, L, T, Pts, and GP. Lists teams like Boston, Philadelphia, New York, etc.

Basketball

Chemist Is an Art Historian

By Harry S. Pease of The Journal Staff. When Alfred R. Bader was in graduate school at Harvard a professor declared: 'Alfred, you haven't made up your mind whether you want to be a chemist or an art historian.' He still hasn't.

And so, from 8 to 5—with no time out for lunch—Bader presides over the affairs of Sigma-Aldrich Corp., which was formed last summer by merger of a St. Louis firm with Aldrich Chemical Co., Inc.

Weekends, even then, Bader taught in a synagog school. Murphy was the first Canadian manufacturer to formulate vinyl plastics and sales doubled in Bader's first year.

College Hockey

Some of his own paintings and some of the 30 or so that he has given to the center will be included in the exhibition.

His interest in art goes back to his boyhood in Vienna. He bought his first drawing when he was 10 and it got me into trouble," he recalled.

BUSINESS NEWS

Wake Speed Law Rapped at Hearing

Journal Madison Bureau Madison, Wis. — Petitioners from nine property owners asking the state to waive its "no wake" law for their lakes...

AP Stand on Secrecy Criticized

By The Associated Press A state legislator accused of taking part in a secret meeting that led to the development of the current state budget said he was dismayed by an open meeting resolution adopted last fall by the Wisconsin Associated Press Association.

Waivers Supplied The "no wake" law rules out water skiing. All but two people at the hearing supported the granting of waivers...

Water Skiing Favored Gerald Randerson, Crivitz, noted that Boundary Lake was a family lake with no life jackets on boats...

Stepson Accused in Green Bay Slaying Special to The Journal Green Bay, Wis. — Terrance Nelley, 25, stepson of slaying victim Marvin Boggess, has been accused of offering \$1,000 to another man to kill Boggess.

Plan on Cash Pinch Given Journal Madison Bureau Madison, Wis. — The State Administration Department will recommend legislation to allow the state to contract for a 5% increase in income taxes...

Bank President Quits in Madison

Madison, Wis. — Walter Smith, president of First Wisconsin National Bank of Madison, announced his plans to leave the city for Denver, Colo.

Faculty Announced

Denver, Colo. — UPI-Union Pacific Corp. said its Rocky Mountain faculty includes 100 professors.

Salas Planned

Tokyo, Japan — UPI-Kabot Ltd. a major Japanese cement and farm implement manufacturer...

NCAA Picks Stencil as Grant Alternate

Kansas City, Mo. — AP — The National Collegiate Athletic Association (NCAA) awarded \$1,500 each to football players...

Kaufman Quits Post at St. John's

Special to The Journal Delaford, Wis. — Gary Richert, athletic director at St. John's Military Academy here, announced Friday that basketball coach Darval Kaufman had resigned effective Jan. 4.

Horner Wins in Swim Meet

Honolulu, Hawaii — AP — Brad Horner of the University of Hawaii won the 200 yard butterfly event in the Rainbow Swimming meet here on Friday.

What Stocks Did

Table showing stock market performance for Dow Jones, NYSE, and other indices.

Stocks Gain on Bargain Hunting

New York, N.Y. — AP — Bargain hunting in issues depressed by December tax selling helped the stock market begin the new year with a broad advance Friday.

The Market

Trading was extremely light, however, with many investors awaiting an extended holiday weekend.

The Dow Jones average of 30 industrial stocks rose 0.36 to 858.71.

Gainers outnumbered losers 310 to 318 among the 1,800 stocks traded on the New York Stock Exchange.

The Standard & Poor's 500 stock index picked up 71 points to 90.90 and the NYSE's composite index rose 48.45 points.

B. O. B. board volume fell to 10,300,000 shares from 16,970,000 Wednesday. It barely surpassed the 10,200,000 total recorded for the previous Friday the day after Christmas.

Middle South Utilities was the day's most active issue, which changed at 4½.

Chrysler's auto, also active, jumped 1½ to 11½. Reports from London said British Airways leaders were expected to give their final approval Saturday to a government rescue plan for Chrysler United Kingdom Ltd.

A number of the rail, Chesapeake System climbed 1½ to 35½ on a higher fourth quarter report. On the Ontario shore Northern picked up 21 to 34 3/8 on a bid for a new company franchise in 1976.

The American Stock Exchange market, a blue chip index gained .83 at 84.31.

In the over the counter market the NASDAQ composite index was up .44 at 78.06.

NEW YORK (AP) — The Dow Jones Industrial Average rose 0.36 to 858.71 today.

Advances: 310. Declines: 318. Unchanged: 20. Total volume: 10,300,000 shares.

NYSE Composite: 90.90. S&P 500: 90.90. Industrial: 104.10. Retail: 104.10.

U.S. Treasury: 104.10. U.S. Gov. Bonds: 104.10. U.S. 10-year: 104.10.

U.S. 30-year: 104.10. U.S. 20-year: 104.10. U.S. 5-year: 104.10.

U.S. 1-year: 104.10. U.S. 6-month: 104.10. U.S. 3-month: 104.10.

U.S. 15-day: 104.10. U.S. 7-day: 104.10. U.S. 1-day: 104.10.

U.S. 1-hour: 104.10. U.S. 30-minute: 104.10. U.S. 15-minute: 104.10.

U.S. 5-minute: 104.10. U.S. 1-minute: 104.10. U.S. 30-second: 104.10.

U.S. 15-second: 104.10. U.S. 5-second: 104.10. U.S. 1-second: 104.10.

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U.S. 1/16-second: 104.10. U.S. 1/32-second: 104.10. U.S. 1/64-second: 104.10.

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U.S. 1/8192-second: 104.10. U.S. 1/16384-second: 104.10. U.S. 1/32768-second: 104.10.

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CONFERENCE	
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6	54
20	10
10	6
14	88
20	16
4	44
133	109
15	18
4	34
114	143

Basketball

AREA HIGH SCHOOL Nonconference
Custer 63, Racine Park 56.

TOURNAMENTS
Lakeland
Milwaukee South 71, Three Lakes 50.
Minocqua 76, Wintler 59.

STATE HIGH SCHOOL
Independence 59, Gilmanton 58, overtime.
Marquette Central 65, Menominee, Mich. 64.
Appleton Xavier 80, Menasha 62.

STATE COLLEGE
Milton 72, St. Francis, Ill. 65.
Palmer 63, UW — Richland 62.

TOURNAMENTS
Green Bay Classic
Semifinals
UW — Oshkosh 83, Lake Superior 82.
UW — Green Bay 75, UW — Whitewater 69.

Dan Donovan Tournament
At Dubuque, Iowa
Semifinal
UW — Platteville 75, Loras 61.

NATIONAL COLLEGE
East
Allegheny 75, Glenville 69.
Army 81, New Hampshire 63.
Boston College 94, Connecticut 83.
Brandeis 76, Middlebury 74.
Central Connecticut 85, Worcester Tech 76.
Niagara 75, Brigham Young 60.
Sefon Hall 103, Southwestern Louisiana 84.

South
Clemson 103, Biscayna 71.
East Carolina 81, Citadel 76.
Rutgers 91, Stelton 62.
Taylor 99, Oglethorpe 80.
Winston-Salem 103, North Carolina Cent. 82.
Grambling 100, Tennessee-Chattanooga 95.

Midwest
Ottawa 84, Nebraska Wesleyan Mo.—St. Louis 105, Indiana St. 78.
Northern Michigan 82, Saginaw Valley 74.

Southwest
Texas—El Paso 71, Southern Colorado 54.

WEST
Boise State 95, Seattle Pacific 74.
California Baptist 86, Oregon Tech 85.
Fresno State 98, Sacramento State 76.
Nevada-Reno 103, Hayward State 81.
Northern Arizona 88, Fort Lewis 68.
Northern Colorado 84, Calvin 80.
San Diego State 75, New Mexico 58.
Santa Barbara 83, Creighton 81.
UC — Davis 81, Luther, Iowa 71.
Pacific 80, San Francisco State 72.
UCLA 111, Denver 79.
UC International 66, Claremont 53.

TOURNAMENTS
First Round Games
Big Four
At Greensboro, N. C.
No Carolina State 104, Duke 95.
Wake Forest 95, North Carolina 83.

Bluebonnet Classic
At Houston
Houston 78, Houston Baptist 59.
San Francisco 77, Texas A. and M. 75.

Lafayette Invitational
At Easton, Penn.
Army 81, New Hampshire 63.
Lafayette 91, Rochester 68.

Presidential Classic
At Washington, D. C.
Penn St. 63, Harvard 55.
George Washington 75, Brown 59.

Golden Empire Classic
At Fullerton, Calif.
Bakersfield St. 101, Chapman 70.
Fullerton 94, San Diego 61.

The Market . . .

Stocks Gain on Bargain Hunting

New York, N. Y. —AP— Bargain hunting in issues depressed by December tax selling helped the stock market begin the new year with a broad advance Friday.

Trading was extremely light, however, with many investors taking an extended holiday weekend.

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Middle South Utilities was the day's most active issue, unchanged at 14½.

Chrysler, also active, jumped 1½ to 11¼. Reports from London said British union leaders were expected to give their final approval Saturday to a government rescue plan for Chrysler United Kingdom Ltd.

Among the rails, Chessie System climbed 1¼ to 35½ on a higher fourth quarter earnings

Chemist Is an Art Historian

By Harry S. Pease of The Journal Staff

When Alfred R. Bader was in graduate school at Harvard a professor chided: "Alfred, you haven't made up your mind whether you want to be a chemist or an art historian." He still hasn't.

And so, from 8 to 5 — with no time out for lunch — Bader presides over the affairs of Sigma-Aldrich Chemical Co., which was formed last summer by merger of a St. Louis firm with Aldrich Chemical Co., Inc.



—Journal Photo by Stephen Liljegen

The rest of his waking hours he devotes to collecting and studying paintings and to Bible studies which, in addition to their spiritual connotations, dovetail with his special interest in the work of the 17th century Dutch and Flemish masters.

Artists of the era drafted pictures with photographic precision. Frequently they chose to depict Biblical scenes of high drama. Contemporaries knew what they were painting about, but identification sometimes vanished with the years. A consequence is the modern science of iconography, a kind of detective work in which Bader ranks with professionals.

Encyclopedic knowledge of the Bible is one requisite. Clues may be subtle — a ring worn by a figure, the attitudes in which figures are posed, even facial expressions which hint at the emotions that charged the event.

Honored by Temple

Bader, 51, was honored last May with a reception at Temple Emanu-El B'ne Jeshurun that marked his 25th anniversary as a Sunday School teacher there and almost his 25th anniversary as a Milwaukeean. He came to town on Wednesday, taught as a substitute Saturday and Sunday and joined the faculty the next week.

"Now I teach Bible to kids 11 and 12 whose parents I taught," he said. "I also teach two electives each year, 'The Bible Through Dutch Eyes' and a course in Christianity."

Despite his long service to the Reformed congregation, he worships with Congregation Anshe Sfarid, an Orthodox group, in part because he admires the Biblical scholarship of Rabbi David Shapiro.

"The Bible Through Dutch Eyes" also is the title of an exhibition of Old Masters at the Milwaukee Art Center this year. Bader is honorary guest curator, a task that occupies much of his time now.

Weekends, even then, Bader taught in a synagogue school.

Murphy was the first Canadian manufacturer to formulate vinyl paints and sales doubled in Bader's first year.

"The president called me in, gave me a nice check and said he wanted me to go back to school," Bader said. He headed for Harvard and a Ph.D. He also taught Sunday School and bootlegged some courses in which he studied more art history.

Queen" from Australia, with a value reported in 1969 as \$37,500. Bader said at the time that it was, in its way, a work of art.

However, he did not want it just for the sake of possession. "Danny refused to wear it. She said it was just too big and showy," he said. He sold it.

Job Took Him Here

"It's a sickness that runs in the family," he said with a smile. His engineer grandfather collected Egyptian art and others of his forebears collected Italian works of the 16th and 17th centuries.

New degree in hand, Bader went back to Murphy. The company wanted him but had been bid to Pittsburgh Plate Glass (now PPG Industries). Pittsburgh brought him to Milwaukee in February, 1950.

Bader acknowledges that he sometimes drives a hard bargain with dealers. Often, though, he will have a painting cleaned up and sell it to a friend at practically no profit or give it to a museum.

On a recent visit to his company's German plant Bader detoured to Lucerne, Switzerland, to attend an auction. He bought, among other things, a 17th century Italian painting by a student of Caravaggio.

"It's a picture of a beautiful girl holding a platter of whipped cream and strawberries," Bader said. "The only thing is, I don't think 17th century Italians ate whipped cream and strawberries."

"I'm sending the painting to my restorer and I'm betting the whipped cream all comes off. That girl has to be holding the head of John the Baptist. Somebody made strawberries out of the blood."

He said he thought he would give the painting to Queen's College, to which he has made many other gifts. "I'm trying to make my alma mater a sort of Canadian Oberlin," he said.

Oberlin, in the Ohio town of the same name, is noted for its fine arts programs. Prof. Wolfgang Stechow, an art historian there who died recently, was Bader's good friend.

Bader has given a number of paintings to Oberlin and the Minneapolis Institute of Arts, whose former director, Anthony M. Clark, also was a close friend.

"I have an awful lot of paintings but only about 50 that I really want to keep," the chemist said.

One consequence of Bader's immediate plunge into Sunday School teaching at Temple Emanu-El was his marriage. The director's daughter was a student at the former Milwaukee Downer College and she had a friend named Helen Daniels whom she introduced to the young chemist. Bader and "Danny" were married in 1952.

They now have two sons, David, 17, and Daniel, 14, both students at Riverside.

In 1954, PPG moved its research lab to Springdale, Pa. "I didn't feel like moving," Bader said. "I joined Aldrich Chemical Co. full time. Our total sales were \$15,000 that year."

"There were two of us who owned the company 50-50. Neither of us had much money. We went to an investor in town here. He bought one-third of the stock for \$25,000, with the proviso that he could sell us back his stock and get his money over a period of time. He did it, too."

In Aldrich's last full year before the merger it had over \$12 million in sales. With Sigma, the total will run above \$45 million.

Washington County Ozaukee County

THEY Set THE PACE

Waukesha County Milwaukee County

His interest in art goes back to his boyhood in Vienna.

"I bought my first drawing when I was 10 and it got me into trouble," he recalled.

Refuge in England

"My uncle gave me for my birthday 10 schillings (\$2) to buy a Voigtlander box camera. Instead I went to an auction house and bought the drawing.

"My uncle was aghast. He went to my mother and said, 'That boy needs psychiatric care.'"

Bader gave the drawing to the Minneapolis Institute of Arts a few years ago.

He lived in Vienna until he was 14. Hitler's shadow stretched over Austria in 1938, and the aunt Bader thinks of as a mother sent the youth to England and a lonely kind of safety.

"I worried a good deal about what would become of me," he said. "There was a committee to take care of kids 12 to 16 who had no relatives in England. When you live with a family and somebody pays them 21 shillings a week to look after you. . . ."

What did happen to him was a well disguised blessing. The British learned that Bader's uncle, a Hungarian count the youth did not know at all, was a Nazi. Bader was interned.

He was held in a prisoner of war camp in Canada from July, 1940; until November, 1941.

"We had some very able people in the camp and they set up a camp school," he recalled. "One was a biochemist who later became a professor at Johns Hopkins." That was Bader's introduction to his science.

Strawberries, or?

"He's a fantastic trader in art and chemicals," said the friend. "One of his favorite hobbies is scrounging around antique shops, picking up paintings that others have overlooked and reselling them. If somebody else were selling, it would be an outrageous profit. With him, it's just reasonable value."

One of the Puzzles

Even while being interviewed he pondered his hobby. He regarded a small painting by Aert de Gelder, the last and one of the ablest students of Rembrandt. It depicts a lovely woman with a group of Oriental potentates.

"Is it really Queen Esther before King Ahasuerus?" he asked. "I'm not at all sure."

"Well, this is just one of many puzzles."

Dogmatism is missing from his religion as it is from his expertise in art.

"I think there is so much order in the universe there must be a God," he said. "The question is whether He

Lake Spe Rapped

Journal Madison Bureau
Madison, Wis. — Petition from lake property owners asking the state to waive "no wake" law for their lake of 50 acres or less might be acted on in time for the boating season, a Department

AP Stand on Secrecy Criticized

By The Associated Press
A state legislator accused of taking part in a secret meeting that led to the development of the current state budget said he was dismayed by an open meetings resolution adopted last fall by the Wisconsin Associated Press Association.

Rep. Marlin Schneider (Wisconsin Rapids) said the resolution contained a conflict between freedom of the press and freedom of assembly.

Schneider's opinion was outlined in a letter that association president Robert Willis, editor of The Milwaukee Sentinel, said he received Friday.

Schneider is one of several Democratic members of the Legislature's Joint Finance Committee who have been accused of violating the state open meeting law by discussing budget matters behind closed doors. The case is before the State Supreme Court. The legislators insist that the meeting was a legal, private political caucus.

"While we are public officials, we are also political partisans, which makes us unique from most local officials," Schneider wrote. "In partisan confrontations, it is necessary to establish party position and discipline in the legislative process."

"There are things I know about the conduct of the internal affairs of certain state agencies that I would never dare make public without endangering people's lives."

The resolution adopted by editors and other executives of Wisconsin newspaper members of the AP called for establishment of a minimum penalty of \$50 for a public official who attends a meeting that violates the state's open meeting law.

The resolution also recommends that any language in the existing law that has been interpreted to exempt any public body should be revised in a manner to prevent such exemptions.

Wills issued a statement suggesting that Schneider was being overly dramatic.

"People's lives, of course, should not be endangered," he said, "but when it comes to policies, principles and the purse strings, the public is entitled to know."

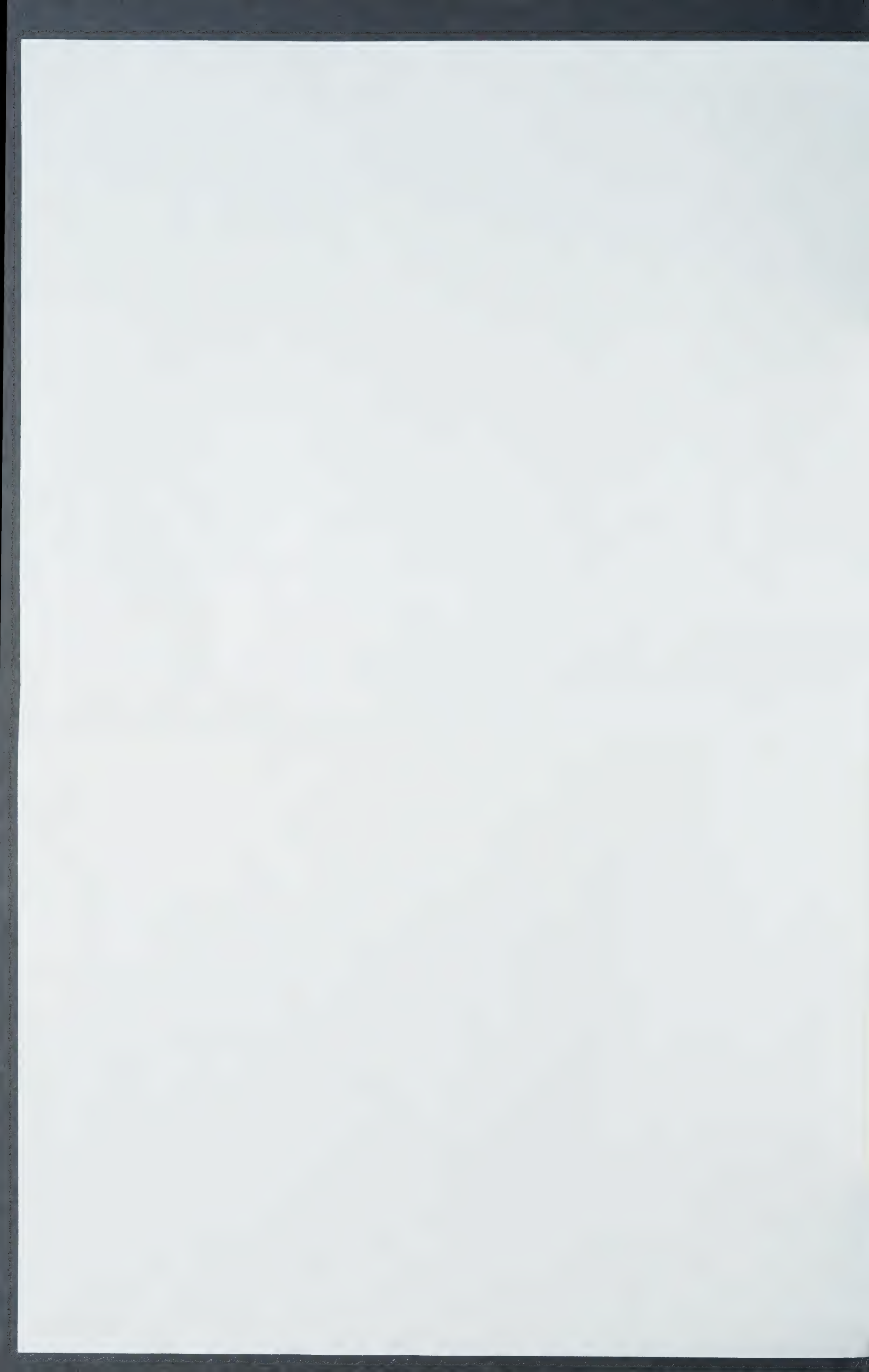
Stepson Accused in Green Bay

Special to The Journal
Green Bay, Wis. — Terrance Nelley, 25, stepson of slaying victim Marvin Boguskie, has been accused of offering \$1,000 to another man to kill Boguskie.

Brown County Dist. Atty. William Appel said Friday that he believed that Nelley, who is among three people being sought in the case, offered the money to Mark Moes, 18, of Green Bay.

Moes is being held without bail on charges of first degree murder and attempted first degree murder. Also being held was John Schroeder, 18, of Green Bay, in lieu of \$75,000 bail on a charge of aiding and abetting first degree murder.

Warrants have been issued for Nelley, who lived with his stepfather, Walter Bergeron,



"Canadian neither by birth nor by domicile, he passionately wants to do for art at Queen's what few Canadians have ever dreamt of doing anywhere"

Alfred Bader

By David McTavish

At the Agnes Etherington Art Centre a major collection of Old Master paintings is quietly being acquired, entirely due to the sustained generosity of a single individual. No other art centre in a Canadian university enjoys such donations, and even the large museums in the important metropolitan areas boast few benefactions of a similar nature. The donor of these works of art is neither Canadian by birth nor by domicile. Yet he passionately wants to do for Queen's University what few Canadians have ever dreamt of doing anywhere.

Not surprisingly the benefactor, Dr. Alfred Bader, is a skilled art historian, but that is by way of avocation. By profession he is a chemist, and as President of Sigma-Aldrich Corporation he runs an international chemical business from Milwaukee, Wisc. In this capacity Bader is obliged to travel constantly, both in North America and abroad. These trips may be primarily motivated by business, but they are also seized upon as precious opportunities to indulge his preoccupations with art. They provide ideal occasions to survey works of art at dealers' and in salesrooms, to visit museums and special exhibitions, and to consult with scholars and other collectors. As with everything Bader undertakes, these activities are entered into with precision of mind, firmness of resolve, and intense concentration. These activities have, in

fact, become obsessions. They are also the source of enormous pleasure. It is hard to imagine Alfred Bader living otherwise. In mock solemnity, Bader likes to confide that he is suffering from an incurable illness, that he is uncontrollably consumed by an overwhelming passion for art.

Alfred Bader is not, however, attracted equally to all types of art. Painting is his prime interest, particularly Dutch painting of the 17th century. Rembrandt and his school decidedly take pride of place. Even as a boy in Vienna, Bader was fascinated by such pictures, superb examples of which he could see at the Kunsthistorisches Museum. His immediate family collected works by contemporary Austrian painters like Klimt, but these did not interest young Alfred. Instead he shocked his family when, at age ten, he used money given to him by an uncle to buy a box camera to purchase instead an Old Master drawing at an auction. This first acquisition was Italian, by the 18th century Pompeo Batoni, but it has stood the test of time perfectly. Much later Bader donated the drawing to the Minneapolis Institute of Arts, where the related painting is located.

Vienna remained Bader's home until the annexation of Austria by the Nazis in 1938. The 14-year old boy was then sent to supposed safety in England, but with the internment of 1940 he was ignominiously shipped to Canada — to a prisoner-of-war camp on the Richelieu River. Eventually he was paroled, and in November 1941 he gained admittance to Queen's University in Chemical Engineering. Thus began Bader's remarkable association with the University. He took his B.Sc. degree in 1945, but since he had concurrently been accumulating credits in history, he was awarded a B.A. the following year. A Master of Science followed in 1947.

These were not easy years for a young student who was forbidden to divulge his background and had to report to the RCMP every week. Yet he was not easily discouraged. Even though English was his second language, he entered the Andrina McCulloch speaking contest and won it, and then, at the urging of his professors, joined the debating team and enjoyed success there, too. On balance, Bader's memories of Queen's are now entirely affectionate.

From Kingston Bader went to Harvard for doctoral studies in chemistry, but the greater resources of that university soon began to excite an old interest. Again Bader began to pursue studies in two distinct disciplines, art history now competing with research in chemistry. The contest between the two became serious enough for one chemistry professor to declare anxiously: "Alfred, you haven't made up your mind whether you want to be a chemist or an art historian." That is a decision he has never made, but it is of little importance, because he does both brilliantly.

During the summers and after graduation from Queen's, Bader had worked for the Murphy Paint Company of Montreal. Though he intended to return to them after receiving his Harvard doctorate, the company had meanwhile been sold to Pittsburg Plate Glass, and they posted him to Milwaukee. In 1954 Bader left PPG rather than be moved again. With a partner he bought Aldrich Chemical Company, whose total sales for the first year were \$15,000. But under his guidance the company has flourished so spectacularly that last year its sales exceeded \$100 million. For the first time, the Sigma Aldrich Corp. also made *Fortune's* list of the top 1000 corporations in the United States.

(continued)

Author David McTavish, B.A., M.A. (Toronto), Ph.D. (London), is Associate Professor and a faculty adviser in the Art Department's Art History section.

As the Old Masters collection grows, its special features become more clearly defined...and the values of donor Alfred Bader are becoming increasingly manifest — challenging and worthy

During these years of continuous industrial expansion, Bader's interest in art has not been held in abeyance but has grown apace. To a remarkable degree, and in the most novel ways, he has combined his twin interests. Not only are his business trips organized to accommodate activities related to his art collecting, but the covers of Aldrich's chemical catalogues and of the house organ *Aldrichimica Acta* always show pictures from his own collection. There need be very little repetition of the paintings shown, either, because "our chemist-collector" (as Bader refers to himself in these publications) is continually adding to his holdings. Thus, even the frequent visitor to his house or office will be startled by new works by both well-known and obscure artists, by a newly acquired portrait by the young Rembrandt, or a rare biblical subject by a virtually unknown painter. Bader cannot stop. He buys new pictures and chemicals weekly.

This is not, however, a case of unmitigated acquisitiveness. Inquisitiveness also represents a fundamental instinct. Bader

loves problems, and he loves even more the operations involved in solving problems. Nothing excites him more than to discover an unknown work of art and then to detect who painted it and what it represents. Not only is his knowledge of art history called upon, but his knowledge of chemistry also comes into play; his familiarity with pigments, oils and resins and their processes of aging stands him in good stead in assessing Old Master works of art. Nor is this quest for the correct answer an operation conducted in isolation. All who are willing and able are enlisted. Although Bader frequently laments his isolation in Milwaukee, this does not mean he is unaware of what transpires elsewhere; in fact, he conducts a voluminous correspondence with specialists the world over.

Bader's acquisitiveness should not be identified with possessiveness, either. Over the years he has given dozens of pictures to such public institutions as the Milwaukee Art Center, the Institute of Arts in Minneapolis, the Allen Memorial Art Center, Oberlin College, and the Fogg Art Museum at Harvard. But by far the largest number of works of art have been directed to the Agnes Etherington Art Centre at Bader's *alma mater*. Their impact on students' experience in Art and Art History is incalculable.

The benefactions to Queen's began in an unobtrusive way in 1967 with the gift of a 16th century Venetian canvas. The picture shows Christ half-length as the *Salvator Mundi*, with his hands supporting a crystal sphere. In a letter to a staff member who had helped negotiate the gift, Bader wrote: "Naturally I hope that this will be only the first of many pictures which you will help me bring to Queen's." Working with a succession of staff members, Bader has achieved that goal. But even the slightest suggestion to the effect that he might have realized his ultimate goal is abhorrent to Bader; he passionately wants to continue giving and further enriching the Art Centre's collections.



14th Century sculpture of St. Catherine of Alexandria trampling the Emperor underfoot is the earliest work given to the Agnes Etherington Art Centre by Dr. Bader. This piece is the subject of a poster offered by the Art Centre to mark its 25th anniversary. (Please see July-August Review for order form.) At right, a more typical Bader gift is this 17th Century painting by Dutch portraitist Thomas de Keyser. 'Portrait of a Gentleman' was added to the Permanent Collection in 1979.



Though the artist who painted the *Salvator Mundi* has never been identified by name, this does not diminish the picture's intrinsic interest. The same holds true for another Italian picture, *The Blind Belisarius*, another early gift from Dr. Bader. The canvas shows Justinian's once victorious general, Belisarius, who, having been falsely accused of treason, is now infirm and reduced to begging in the streets. In such straits Belisarius is recognized by some of his former soldiers. This subject of deeply moving pathos is of the type preferred by Bader; indeed this canvas by an anonymous Baroque artist is one of his favourite pictures.

Although the majority of Bader's donations to the Agnes Etherington Art Centre are paintings, the earliest work is a piece of Gothic sculpture. Representing St. Catherine of Alexandria, the 104-cm. figure was acquired from a Detroit collection as a work of French Gothic sculpture. More recent research has suggested that instead it is Spanish, from the area of Catalonia. Whatever the exact origin of the 14th century work, the sculpture is a fine example of medieval devotional art, with the mythical and talented princess trampling underfoot the Emperor, who according to legend had instead ordered Catherine's execution.


As with Bader's personal collection, the gifts to Kingston focus on Dutch 17th-century painting. Artists of the period specialized in many types of subject matter, and most types are now represented in the collection. One portrait that has recently attracted much attention bears the monogram (along the edge of the step at the right) of Thomas de Keyser. De Keyser was the most fashionable portraitist in Amsterdam before the arrival of the young Rembrandt in the city in 1631/32, and de Keyser well knew how to flatter his prosperous and self-satisfied sitters. The man portrayed in the Kingston portrait has not been identified, but he clearly was a person of means, being shown in discreet but expensive dress, with lace collar, row of diminishing white buttons, kid gloves

The Sacrifice of Manoah' is an Old Testament subject painted in 1640 by one of Rembrandt's first pupils, Govaert Flinck, and presented by

and elaborately decorated walking stick — the epitome of the self-assured burgher.

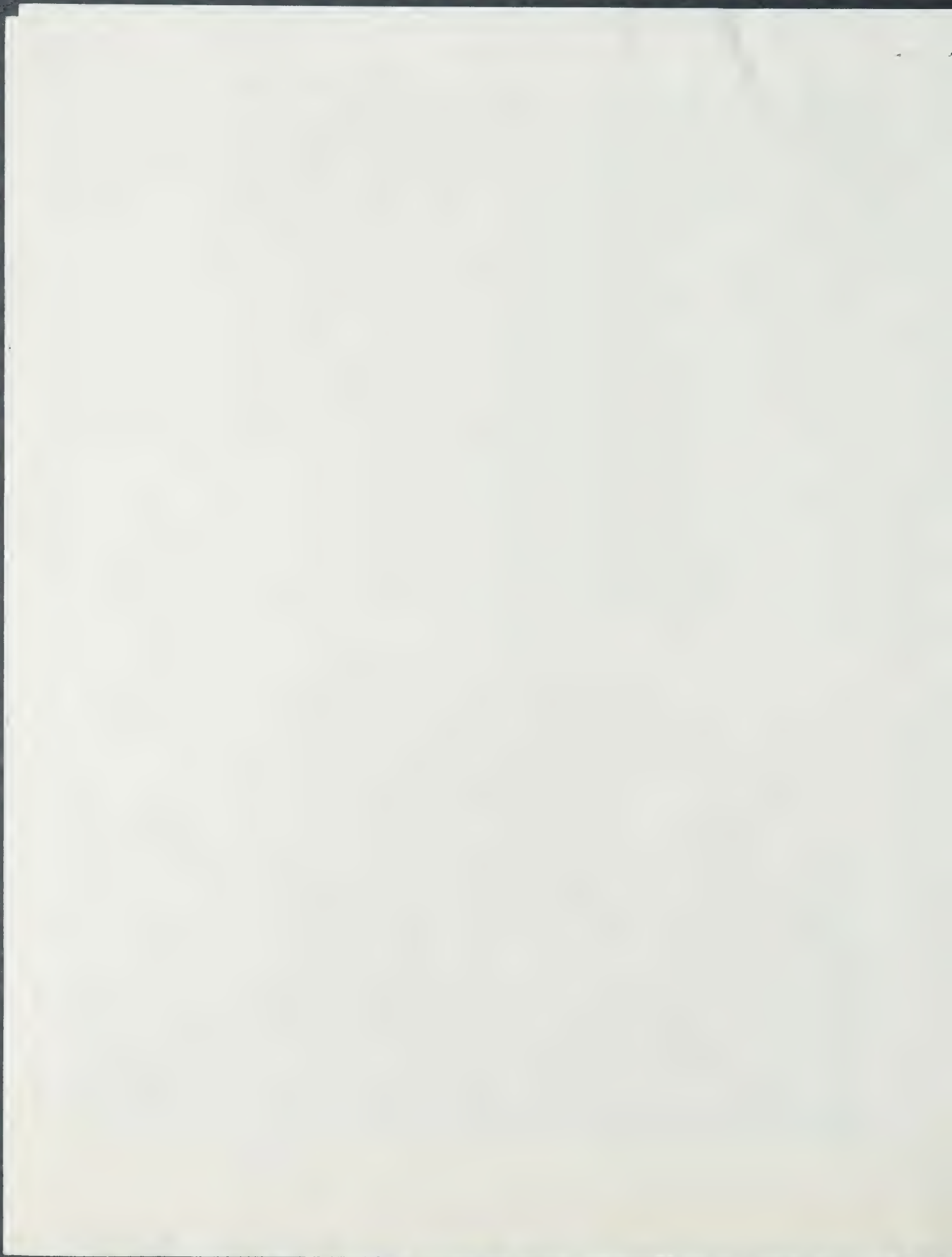
Rembrandt is not represented in the Queen's collection, but many of his associates and pupils are, including his close friend from the Leiden years, Jan Lievens. A particularly striking example of the school of Rembrandt is Govaert Flinck's *Sacrifice of Manoah*, which is signed and dated 1640. Flinck had been one of Rembrandt's first pupils in Amsterdam, but by 1640 he was an independent artist. Nonetheless, this picture, with its deep rich colour and abundance of varied textures, as well as the pose of the figures, still owes an enormous debt to Flinck's teacher. The subject comes from the Old Testament and involves the announcement of the birth of the hero Samson.

Taken together, the works of art given by Alfred Bader to the Agnes Etherington Art Centre disclose a predominant interest in the human figure, especially in the human figure caught in a dramatic or emotional situation. And the immediacy of human confrontation — either between one figure and another in the picture itself or else between a figure and the spectator of the picture — is time and again reflected in the immediacy of the execution of the work. Obviously Alfred Bader has a special fondness for boldly painted canvases, for pictures that are executed in a painterly fashion, or are *malerisch*, as the great Swiss art historian Wölfflin has called the technique.

Thus, as the collection grows, its special features become more clearly defined, even though the individual objects may appear very different. The values of the donor are what is becoming increasingly manifest. That these values are challenging and worthy is its own reward. That the donor wishes such works to reside in the Agnes Etherington Art Centre and to be a teaching resource for Queen's Fine Arts students is in Canada a unique enrichment of university life. 

Alfred Bader in 1975. This painting reflects its donor's predominant interest in the human figure, boldly painted.





Art Restoration Boosts Value, Chemist Says

Amateurs Can Find Quality Paintings, Manage Simple Work, Toledoans Told

Flea markets, second-hand stores, and antique shops are fertile areas for amateur art collectors looking for old paintings that might be restored into beautiful and sometimes even valuable objects, a Milwaukee chemist and art restorer said in Toledo Thursday.

Dr. Alfred R. Bader, president of the Aldrich Chemical Co., said such amateur collectors should keep two main pieces of advice in mind: first, look for quality paintings; second, use extreme care in efforts at restoration.

How can amateur collectors judge quality?

"That is the most difficult question I can ever be asked," Dr. Bader said. "It can't be put into words. The only way to tell good paintings is to look at a lot of them in museums."

Dr. Bader spoke at a meeting of the Toledo Section, American Chemical Society, in the Little Theater of the Toledo Museum of Art.

Amateurs can learn to use a number of solvents to remove dirt or discolored varnish from old paintings — improving the general quality of the painting, and sometimes revealing new aspects of a painting that had been hidden by discoloration or overpainting.

Dr. Bader cautioned, however, that even after spending many years at such restorative work himself, he still attempts only the simplest restorations, leaving more difficult jobs for professionals.

He said he usually works very carefully on a small section of a painting at a time, with a small amount of solvent on cotton, using ultraviolet light that shows when all the layers

of varnish have been dissolved.

Dr. Bader expressed concern that modern artists have not developed the technical skills of painting as thoroughly as artists did hundreds of years ago, and thus are painting works that deteriorate far more quickly.

Today's artists also are giving too little thought to the difficulties they inadvertently are creating for chemists who may try to restore their damaged or discolored paintings 150 or 200 years from now, Dr. Bader said.

He cited, for example, one instance in which the painter of an acrylic recommended the use of an acrylic varnish to coat and protect the surface of the painting. A restorer working on such a painting 150 years from now thus would have no way of determining where the varnish ended and the paint began.

Noting his familiarity with the major art museums in the United States, Dr. Bader told the capacity audience that the Toledo Museum must rank among the top five museums in America.

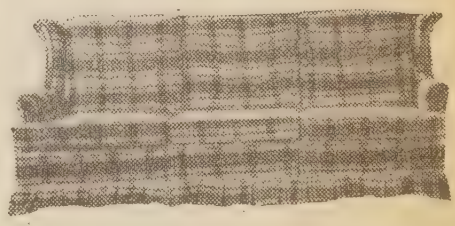
"You don't know how lucky you are to be in a city with a truly moving collection of such fantastic beauty. If I could live my life over again I would try, as much as possible, to find a position in Toledo rather than any other very fine town that is completely devoid of the old masters."

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Collector applies detective skills

By Karen B. Tancill
of the Journal Times

One way of acquiring an art collection is to go to an art gallery and follow the gallery owner's advice.

"That's no fun at all," said Alfred Bader, speaking at a Racine meeting of the Milwaukee Section of the American Chemical Society. Bader said he would rather have to do some work for his art collection — detective work.

A chemist and chief executive officer of Sigma-Aldrich Chemical Company of Milwaukee, Bader collects 17th century Dutch art. The collection has been developed through his patrols of auction houses and antique galleries, where he buys old paintings and uses his skills as a paint chemist and his avocation as an art historian to determine the name of the artist and the history of the painting.

Bader said his art collecting began when he was a boy in Vienna. His uncle had given him money to buy a Voightlander camera, instead Bader bought a drawing.

Bader showed slides of some of his successful detecting work at the meeting.

Several of the pieces had religious themes. The Dutch, said Bader, studied the Bible very carefully. Many Dutch families read the Bible page by page every day.



Alfred Bader
art collector

together.

Bader does only preliminary restoration himself.

He starts his paint removal with petroleum ether and turpentine; if that solvent is unsuccessful, he tries other formulas. He works under ultraviolet light because varnish film fluoresces differently from paint film, he said.

Linseed oil, the medium the Dutch used to hold the paint pigment, takes 400 years to completely polymerize. When the oil is completely polymerized, said Bader, it becomes very hard to dissolve the paint in common solvents.

Bader lets professional restorers finish the job. How long that takes, he joked "depends on how well your

restorer likes the painting. I've had some paintings a restorer didn't like and it's taken them years."

Occasionally Bader has bought a painting that didn't turn out to be what he thought it might be. But, he said, he always has managed to sell the painting for what he paid for it. Bader uses reproductions of paintings in his collection on the covers of magazine his chemical firm puts out.

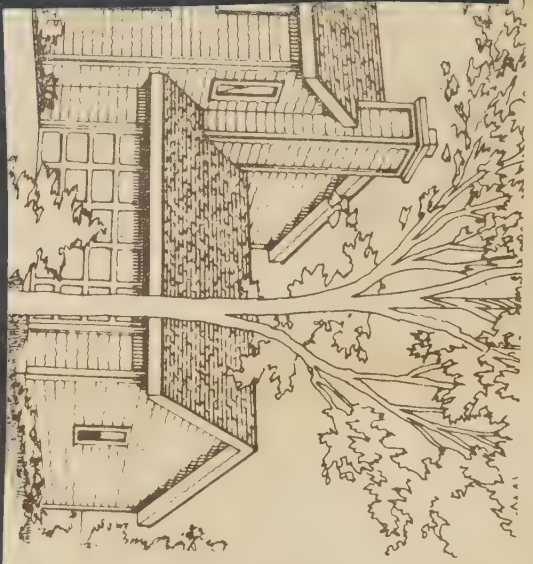
The Milwaukee Art Museum mounted a show of "The Bible Through Dutch Eyes" from Bader's collection five years ago. Bader also has given paintings to Oberlin College, Queen's College in Kingston, Ontario, Canada, and the Minneapolis Institute of Arts.

One of Bader's finds, a landscape he obtained on a speaking engagement in Rochester, N.Y., was by Van Terlour, a student of Rembrandt. "He was totally unknown. Nobody had every seen a painting by him," said Bader.

Another painting turned out to be a self portrait by Michael Sweets. When Bader acquired the painting, the image appeared to be a man pointing. But after paint had been removed, it turned out the man's finger, instead of pointing, was actually in the nose of a skull.

"You can understand why a squeamish Victorian had it over-painted," Bader said.

Another painting, Bader discovered after restoration, was actually two paintings — the wings of a dyptich. A dealer had married the wings



Sun room at rear of house protrudes onto a terrace

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Ref

Dutch Art Evoke Spiritual Depths

By DEAN JENSEN

All that we can see about us, all that we can touch with our hands or thoughts is but a concealment for the larger, impermissible and a eternal mysteries.

Who put us here? Why? What is to follow this world?

From time immemorial man has been trying to find the answers.

And, at least since the time of the cave painters 30,000 years ago, the artist has at tempted to "materialize" the being and gods of his religious beliefs in stone or a paint.

Religious themes in art as old as art itself, of course by invoking them in art, artists of all places and periods have sought to discover their own place in the scheme of things.

But when the 17th Century Dutch art comes to mind, one is not likely to think of religion as a primary concern of the painters of Holland and Flanders.

The reason: Led by such dazzling painters as Rembrandt, Vermeer and Anthony Van Dyck, the Dutch School painters elevated a more, unembellished kind of art that faithfully recorded scenes of ordinary towns and country life in Holland in the 1600s.

A major exhibition of more than 70 religious works by Dutch masters opened Friday at the Milwaukee Art Center. It will continue through May 23.

Titled "The Bible Through Dutch Eyes," the show should correct the belief held by many that 17th Century Holland did not produce great religious art.

While the Dutch School painters of everyday scenes and people, still lifes and

landscapes have stolen their thunder — at least so far as the 17th Century Dutch art is concerned — there were a indeed some giants of religious art in 17th Century Holland. That is the exhibition makes altogether clear.

The show was organized by Dr. Alfred Bader of Milwaukee, an internationally recognized collector and expert on Dutch and Flemish painting.

In an introduction to his

seeing Abraham Van Dyck's beautiful painting of the widow Zurephah lovingly gazing down at her son as they pray before a sparsely covered dinner table.

But the rewards to the gallery goer surely are no numbers to list here.

What makes the exhibition a real success, is that it accomplishes two things.

Not only does it focus attention on some powerful religious works too long covered over by the dusts of time, it reveals man the artist at a time and place in history when he soared to new heights in his triumphs in handling light, shadow, composition and color.

TOLEDO SCHOOLS OFFER GLIMPSE OF FUTURE

Continued From Page 5

Thomas Brennan said after the visitation.

The Toledo specialty schools "not only integrated pupils in terms of races but also economic classes," Toledo board member Edward Foster said.

Toledo Board President Robert Jackson also underlined the voluntary aspects of the program — something many in

TOLEDO SCHOOLS OFFER GLIMPSE OF FUTURE

Continued From Page 5

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59 Outdoor
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ROBIN AND MARIAN

THE DUCHESS AND THE DIRTWATER FOX

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1-94 Exit College Ave.
FREE ADMISSION
SAT., 11 A.M. - 10 P.M., SUN., 11 A.M. - 7 P.M.

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Parishes And College Far Apart

The worlds of church and campus are far apart, but campus ministers enjoy good rapport with the churches.

By JAMES M. JOHNSTON, Sentinel Religion Editor

The campus minister and the parish pastor live in different worlds.

Certainly the trivia of many congregations — such as bingo and fish fries, carnivals, coffee dinners, fasset about altar cloths and vestments and debates over the color of the roof or sanctuary rug — stir little excitement among college-age youths.

For do middle-aged parishioners who comprise most congregations outside campus neighborhoods find much inspiration from the coffee house offerings.

Avant garde drama and art, the poetry of Allen Ginsberg, super-modern liturgy and music and dialog on abstract intellectual topics say too little — though sometimes too much — to the committed middle class churchgoer.

I don't think the rest of the city puts too much emphasis on the University of Wisconsin at Milwaukee.

Commented Rev. James M. Johnston, pastor of St. Michael's of the United Methodist in Higher Education.

"Most Wisconsin Synod Lutheran clergymen have no idea what is going on at the university," said the Rev. Richard D. Ziesmer of the Wisconsin Lutheran Student Center.

These expressions from the clergy of vastly different campus ministries with different types of students and young adults in their circles, illustrate the separation of church and campus.

Perhaps cross-fertilization could help both sectors — the church people who believe they represent the practical, realistic world, and the students, who see themselves as idealists pointing to the world of tomorrow.

Father Roy A. Matelin of the Downtown Campus Ministry complained that the noncampus public has a hard time understanding college students.

"It's hard to tell older congregants to be patient with young people, and allow for persons growing up," Matelin observed.

The campus minister is sought to direct the Father William R. Coats of the Episcopal Campus Rectory, who frequently finds himself receiving slings and arrows from Episcopalians who think his religion and politics too liberal.

Report that their denominations seemed to be dead, even to a director like Father William R. Coats of the Episcopal Campus Rectory, who frequently finds himself receiving slings and arrows from Episcopalians who think his religion and politics too liberal.

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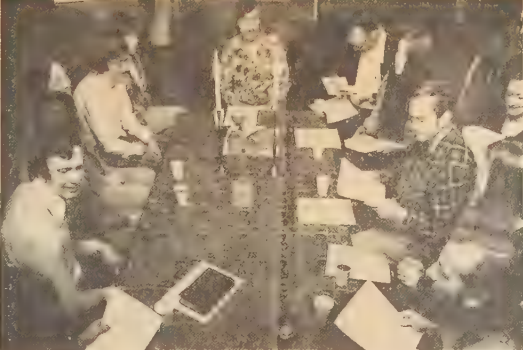
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The Rev. D. Alan Davis, at the head of the table, conducted a Eucharist at the Coffee House, 631 N. 19th St., one recent Sunday night. This is a project of the Lutheran Campus Ministry.

Renzo's University Lutheran Chapel is a congregation that has an unusual interest in the established church.

The Rev. Philip Knutson, coordinator, often sponsors dialog between college faculty members, clergy and students.

The Lutheran Campus Ministry keeps in touch with its congregations of the American Lutheran Church and the Lutheran Church in America through a newsletter.

The campus ministry also helped put on the medieval style Reformation festival last fall.

Probably the closest rapport of this ministry is with the Lutheran Church of the Redeemer, in whose basement the coffee house operated by the Rev. D. Alan Davis draws hundreds of college youths and others every week for art, liturgy, and poetry readings.

UIMH) feels no need to conduct services on its own. The ministers speak at churches and organizations in the city on an average of once a month.

The Rev. James E. Thesler, one of the UIMH ministers, said they met with clergy of the upper and lower east side regularly. One church, Rounly Baptist in Whitefish Bay, gave the UIMH a substantial financial donation voluntarily.

Ziesmer said his relations with Wisconsin Synod congregations are "the best," adding, "There are those who think I should be converting the whole world over here at UWM. But this is not like a parish, where the pastor has a captive audience."

Ziesmer's rapport with his own clergy members is understandably better than that which he has with some university faculty members.

One professor had once disturbed the thinking of a conservative Lutheran student-pastorship of the Wisconsin Lutheran Student Center.

Ziesmer, who embraces the ultracritical biblical views of the Wisconsin Synod, happened to talk to the professor.

"He told me that he didn't believe the Bible and that I don't either," Ziesmer reported. "He said if I did, would believe in the law of an eye for an eye and a tooth for a tooth as retributive justice."

"He also told me I would go along with the apostles of Christ who put down women. Now we all know the professor had just picked some parts of the Bible and quoted them out of context. The whole of the Old and New Testaments do not teach these things."

Next Saturday — The future of the campus ministry.

GAC To Have Black Dancers

Palm Sunday, commemorating the entry of Christ into Jerusalem, will be the theme of worship in most churches Sunday.

A different sort of ceremony will be held at Grand Avenue Congregational Church, 213 W. Wisconsin Ave., Sunday.

Opening the service at 10:45 a.m. will be a dialog and union readings by the congregation on Christ's journey toward Jerusalem and His Palm Sunday experience.

Then a procession by the chancel choir will depict the palm waving entry into Jerusalem.

The worship service will close with an interpretive dance by the Ko Thi Dancers, a Black group which will present a prelude to the somber Good Friday Crucifixion episode, which will be the theme of worship in most churches Sunday.

Palm Sunday worship in many churches will include the distribution of palm fronds, recalling the branches strewn in the path of Christ as He entered the city.

The fronds will later be burned and the ashes used in rites at the beginning of Lent on Ash Wednesday, 1977.

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HOLY WEEK Services LUTHERAN CHURCHES ADORATION MEMORIAL BAY SHORE CAPITOL DRIVE EPIPHANY PEACE REDEEMER FIRST LUTHERAN FOX POINT JACKSON PARK KING LAKE PARK UNITY

Last-minute bills were certain to die, but legislators didn't care

By Richard P. Jones

Madison, Wis. —UPI— Barkeeps and liquor salesmen should be able to let customers stop and sample a shot at no charge, a state lawmaker says.

In fact, Rep. John Robinson (D-Wausau) feels so strongly about it that he walked into the Assembly last Friday and introduced a bill to do just that.

Only trouble is, the Legislature adjourned for good a few hours later. His bill was sent to committee and died a quick death.

Lawmakers will return for a veto session late in May, but that's it. Gov. Earl Earl could call a special session, but one on this bill seems unlikely.

But Robinson wasn't the last representative to introduce a bill the final day.

Rep. Margaret Knastick (D-Milwaukee) was. She offered a modest proposal — Assembly Bill 1181, to get the Milwaukee Fire and Police Commission out of Police Chief Harold Dreier's hair.

Earl had just signed a bill to let the commission make department rates. It was enacted amid some nasty debate and strong opposition from Dreier. Her bill would undo all that. It too went to die in committee.

The final Senate bill also was offered just hours before the final gavel.

Sen. Susan Engstetter (R-Menomonsee Falls) offered Senate Bill 719 to let the University of Wisconsin Board of Regents set faculty and staff pay without bothering the Legislature or troubling taxpayers.

Even a last-minute news release failed to save her bill from the death that befalls all bills not enacted by the end of a session.

In debate on bills to designate state symbols, someone asked about the cost. H. Rupert Theobald, Legislative Reference Bureau chief, said printing 1,000 copies cost from \$11.70 for a one-page bill to \$23.79 for a four-page bill.

But those bills were debated.

Why introduce a bill so late that only its death is cer-

tain? Do lawmakers hope to curry favor along the campaign trail? Are they fulfilling past campaign promises? Or are they just trying to get a jump on next session?

There ought to be a law, a wine salesman said, so Robinson introduced the sample bill. Shoppers can sample cheese and sausage. Why not wine?

Robinson said he drafted it sometime ago, but waited to introduce it until he was certain it would not pass. It needs refinement, he said.

"The whole reason was just to give it public attention and put people on notice that there probably will be a bill coming in next session," he said. "If you can at least raise the public's awareness on an issue, there's no harm."

"In fact, there's a benefit. One of the criticisms we get is that legislation moves through too quickly."

Sen. Joseph Czarnecki (D-Milwaukee) introduced not one, but two bills the last week. One would prohibit officials on trade missions from accepting gifts. The other? It duplicated an Assembly bill to make the trilobite the state fossil.

"These aren't the types of things you go home and run for re-election on," he said.

Other bills introduced weeks ago were destined to die.

"I introduced a bill that I knew was dead as dead could be, but I wanted it on record so it could be a focal point," said Assembly Speaker Thomas Loftus (D-Sun Prairie). It went to committee. The chairman said there was no time for a hearing. "I said, 'Fine. I don't want a hearing. I can count!'"

Loftus only wanted Minnesota to take note. His bill (A-1111), introduced March 6, would let a Minnesota resident who owns land in Wisconsin fish and hunt in Wisconsin at resident rates if Minnesota allows the same.

"You often get a leg up next session," he said. He said people often request bills and should be able to get one before the Legislature. Introductions can be deceptive, but the practice isn't limited to the final days, he said.

"You may carry the favor of some very small group," said Loftus, discounting that practice.



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The inevitable question is, *why?*

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We decided long ago the new Electra should respond to the throttle. So we enlisted the aid of Bosch, acknowledged world experts in fuel injection, to help us evaluate Electra's fuel injection system, one of the world's most sophisticated multi-port fuel injection systems. Then, to see how it would do in the real world, we drove the Electra on the



Autobahn, where there are vast sections with no speed limit. Not that you're going to do a lot of wide-open running, as our test engineers did. But the knowledge is reassuring when you have an 18-wheeler to pass.

Then, we tried the oxygen-thin altitudes and steep grades of the Austrian Alps. Electra's fuel injection system is designed to handle such conditions. And it did. The secret here is a mass air-flow sensor, a tiny electronic device that measures the mass of the air as it enters the engine, and allows for tiny rapid-fire corrections in the fuel charge—up to 80 times a second, for optimal performance.

A MOST UN-TRADITIONAL ELECTRA. TO BE SURE.

The Alps, with their slippery, twisting roads, also highlighted two more of Electra's noteworthy features—front-wheel drive and fully independent rear suspension. The traction of front-wheel drive, together with the ability of the rear wheels to handle bumps independently, endows the new Electra with impressive roadholding. Combined with Electra's traditional ride smoothness, the new Electra is an absolute pleasure on long drives.

NOT JUST HIGH TECH—HIGH TOUCH.

Happily, the new Electra is not all new.

Inside, per Electra tradition, you will find generous room for six adults, and true comfort for six adults. Indeed, Electra's interior dimensions are within an inch or so of its



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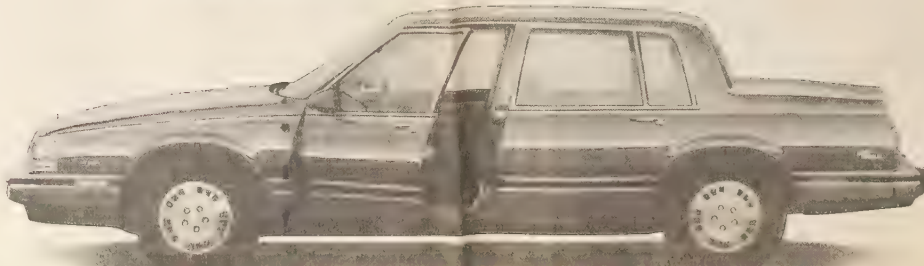
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Farrakhan blames controversy on media

AP/Washington Post — Black Muslim leader Louis Farrakhan, a key supporter of the Rev. Jesse Jackson, says the media are focusing on pre-contrived controversies rather than on the real threats to the black civil rights leader's life.

Farrakhan denied Wednesday that he had threatened anyone, including Washington Post reporter Milton Coleman, and said the media should stop badgering Jackson on the issue as he sought the Democratic presidential nomination.

Farrakhan defended himself in a second controversy, having called Adolf Hitler a great man. He said he thought Hitler was also "wicked Wickedly great."

Meanwhile, Democratic Party Chairman Charles F. Mansatt said Thursday that he reacted with disgust and outrage to Farrakhan's remarks.

"I gather we have someone from a religious movement who isn't on the political process and the political part of it at all," Mansatt said, "and I think a lot of the statements I've been reading at least are ones of great concern and outrage to many people."

Farrakhan assailed the media Wednesday for what he called "wicked and malicious tampering with my words" in a March 11 radio broadcast. In that broadcast, he warned Coleman, a black, that "some day we will punish you with death" for reporting Jackson's reference to Jews as "Hymlies" and New

York as "Hymlies town."

He said his comment about punishing traitors with death — which was interpreted by some as a death threat to Coleman — dealt only with the reality after the Nation of Islam sets up an independent nation, of which Coleman might not be a member.

During the same radio sermon, which was broadcast nationwide, Farrakhan said, according to the Chicago Tribune:

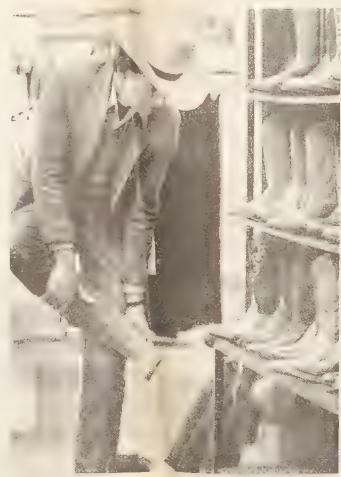
"Here, the Jews don't like Farrakhan, so they call him Hitler. Well, that's a good name. Hitler was a very great man. He wasn't great for me as a black person, but he was a great German, and he rose Germany up from the ashes of her defeat by the united force of Europe and America after the first World War."

"Now, I'm not proud of Hitler's evils against the Jewish people. But that's a matter of record. He rose Germany up from nothing. Well, in a sense you could say there's a similarity in that we're rising our people up from nothing. But don't compare me with your wicked killers."

Asked about those comments, Farrakhan said:

"I don't think you would be talking about Adolf Hitler 40 years after the fact if he was some minuscule crackpot that jumped up on the European continent. He was indeed a great man, but also wicked. Wicked, by great."

In the last week, Jackson has spent much of his time in interviews trying to keep at arm's length from Farrakhan's remarks without alienating Farrakhan's following.



FITTING STOP — Democratic presidential hopeful Gary Hart took time out from campaigning for some personal shopping Wednesday in Denver. He tried on a pair of suede boots but in the end only purchased a Western shirt.

Mondale, Reagan court autoworkers

Associated Press — Missouri, Texas and Arizona are taking Wednesday off in his home town of Denver.

The Rev. Jesse Jackson, the third Democratic hopeful, was visiting Indian reservations in Arizona and New Mexico Thursday. In Phoenix Wednesday, he said the mining of Nicaraguan harbors by CIA-backed rebels was an act of war and criticized Reagan for it.

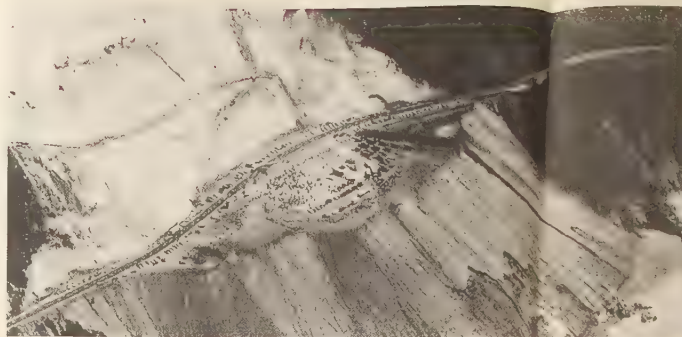
"I do not call for his impeachment, but it is provocative and a de facto state of war," Jackson said. "If he operates beyond the law, it must be challenged."

Mondale, also stopping in Phoenix before going on to California, criticized the mining, too. "It's wrong. It's counterproductive," he said.

After seven weeks of major battles every week, the Democratic campaign now heads into three weeks of smaller skirmishes before the next big round in early May. Arizona attracted the Democrats because of its caucus on Saturday; Missouri Democrats hold their caucuses next Wednesday.

The only other contests this month are caucuses in Utah and Vermont. Among the remaining contests are Texas, which holds a caucus May 5, and California, which has its primary June 5 — both states for which Hart has high hopes.

Mondale has the backing of organized labor, including the United Auto Workers, and in Reagan's audience some of the autoworkers wore caps bearing Mondale's name. The head of the Kansas City UAW local, William Barker, a Mondale backer, said at least 1,500 workers were still laid off from the Ford plant.



ROUTE 1 REOPENED — A gala celebration marked the opening of California's Highway 1 Wednesday after the majestic Big Sur coastal road was closed by a huge landslide 13 months ago. The May 1 slide, caused by the spring rains of 1983, isolated residents and forced motorists to detour inland. Dave Ackerman, of the state Department of Business, Transportation and Housing, said nearly 3 million cars a year traveled the coastline highway, which meanders between Eureka in the north to San Juan Capistrano in the south, a distance of more than 600 miles.

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Doctors' guidelines propose right to die

Washington Post Service — Ten prominent doctors Wednesday proposed a bill of rights for dying patients, suggesting that hopelessly ill victims be given the right to die if they choose rather than submit to further treatment.

Physicians, these doctors said, should be allowed to stop tube-feeding irreversibly comatose or vegetative patients, if the family agrees and the patient would have agreed.

The annual declaration, one of the strongest on the patient's right to a humane death, was published in the New England Journal of Medicine in an attempt, its authors said, to offer some "universally accepted guidelines" for doctors caught between technology and the need for compassion.

The signers included Helen Taussig of Johns Hopkins, originator of the famed "blue baby" operation, the first successful attempt to repair infant hearts. Among other signers were Edward Hook, chief of medicine at the University of Virginia in Charlottesville, and Charles Mortel,

chief of cancer treatment at the Mayo Clinic.

The statement was drafted at a meeting organized by the Society for the Right to Die, a group that lobbies for "living will" laws: legislation to establish a person's right to say in advance how he or she wants to be treated, if dying.

The 10 doctors said: Doctors should decrease or halt aggressive treatment if it would only prolong an uncomfortable process of dying. But the patient or the family should decide, if possible.

Doctors and hospitals should respect a patient's right to refuse treatment. And doctors should take the time to tell patients their choices.

A doctor who is not sure about a patient's chances of recovery should consult specialists.

"Appropriate and compassionate care" should have priority over undue fears of criminal or civil liability, or advice of lawyers "whose primary objective is to minimize liability."

Patients should seldom, if ever, be denied the truth.

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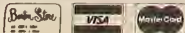
FARAH DUCK AND POPLIN SLACKS. (Shown left and center) Casual slacks in cotton and Dacron polyester with a contrasting stripe belt. In many basic colors. Prep sizes 27-30. (\$51)

FARAH DRESS SLACKS. (Shown right) Easy care Dacron polyester with Viscose release finish. With contrasting stripe belt. In navy and grey. Junior and Prep sizes. Also available, matching Farah blazers. Junior sizes, \$6.99. Prep sizes, \$8.99. (\$51)

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Farrakhan blames controversy on media

Washington Post Service
Washington, D.C. — Black Muslim leader Louis Farrakhan, a key supporter of the Rev. Jesse Jackson, says the media are focusing on pre-conceived controversies rather than on the real threats to the black civil rights leader's life.

Farrakhan denied Wednesday that he had threatened anyone, including Washington Post reporter Milton Coleman, and said the media should stop badgering Jackson on the issue as he sought the Democratic presidential nomination.

Farrakhan defended himself in a second controversy, having called Adolf Hitler a great man. He said he thought Hitler was also "wickedly great."

Meanwhile, Democratic Party Chairman Charles T. Manatt said Thursday that he reacted with disgust and outrage to Farrakhan's remarks.

"I gather we have someone from a religious movement who isn't or hasn't been particularly involved in the political process and the political part of it at all," Manatt said, "and I think a lot of the statements I've been reading at least are ones of great concern and outrage to many people."

Farrakhan assailed the media Wednesday for what he called "wicked and malicious tampering with my words" in a March 11 radio broadcast. In that broadcast, he warned Coleman, a black, that "some day we will punish you with death" for reporting Jackson's reference to Jews as "Hymies" and New

York as "Hymietown."

He said his comment about punishing traitors with death — which was interpreted by some as a death threat to Coleman — dealt only with the reality after the Nation of Islam sets up an independent nation, of which Coleman might not be a member.

During the same radio sermon, which was broadcast nationwide, Farrakhan said, according to the Chicago Tribune:

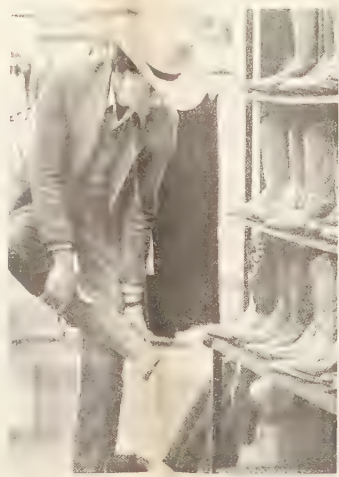
"Here, the Jews don't like Farrakhan, so they call him Hitler. Well, that's a good name. Hitler was a very great man. He wasn't great for me as a black person, but he was a great German, and he rose Germany up from the ashes of her defeat by the united force of Europe and America after the first World War."

"Now, I'm not proud of Hitler's evils against the Jewish people. But that's a matter of record. He rose Germany up from nothing. Well, in a sense you could say there's a similarity in that we're rising our people up from nothing. But don't compare me with your wicked killers."

Asked about those comments, Farrakhan said:

"I don't think you would be talking about Adolf Hitler 40 years after the fact if he was some minuscule crackpot that jumped up on the European continent. He was indeed a great man, but also wicked. Wickedly great."

In the last week, Jackson has spent much of his time in interviews trying to keep at arm's length from Farrakhan's remarks without alienating Farrakhan's following.



FITTING STOP — Democratic presidential hopeful Gary Hart took time out from campaigning for some personal shopping Wednesday in Denver. He tried on a pair of suede boots but in the end only purchased a Western shirt.

Mondale, Reagan court autoworkers

Associated Press
With the Democratic presidential race at a midpoint lull, Walter Mondale is on the same mission as Republican President Reagan, courting autoworkers and claiming credit for the domestic auto industry's partial recovery.

Both Mondale, the re-established front-runner for the Democratic nomination, and Reagan, unopposed for renomination by the GOP, were in Missouri Wednesday touring auto assembly lines.

Mondale visited a Chrysler Corp plant near St. Louis while Reagan was 250 miles away at a modernized Ford Motor Co. plant in Claycomo, near Kansas City.

"Reagan in an auto plant is like a fox in the chicken coop," said Mondale. "This is the president who caused the worst trade year in our nation's history and who will not stand up against the flood of imports."

Said Reagan:

"Times have been rough, and yes, the recession was much deeper and longer than almost anyone predicted. But these problems had been building up for 20 years, and we were determined to find a real economic cure, not just resort — as they had so often in the past — to another political quick fix."

Missouri, Texas and Arizona after taking Wednesday off in his hometown of Denver.

The Rev. Jesse Jackson, the third Democratic hopeful, was visiting Indian reservations in Arizona and New Mexico Thursday. In Phoenix Wednesday, he said the mining of Nicaraguan harbors by CIA-backed rebels was an act of war and criticized Reagan for it.

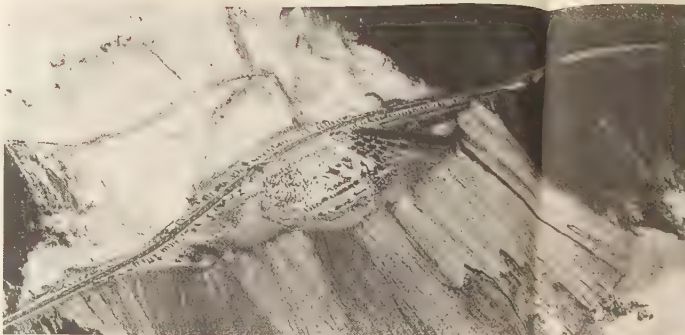
"I do not call for his impeachment, but it is provocative and a de facto state of war," Jackson said. "If he operates beyond the law, it must be challenged."

Mondale, also stopping in Phoenix before going on to California, criticized the mining, too. "It's wrong. It's counterproductive," he said.

After seven weeks of major battles every week, the Democratic campaign now heads into three weeks of smaller skirmishes before the next big round in early May. Arizona attracted the Democrats because of its caucus on Saturday; Missouri Democrats hold their caucus next Wednesday.

The only other contests this month are caucuses in Utah and Vermont. Among the remaining contests are Texas, which holds a caucus May 5, and California, which has its primary June 5 — both states for which Hart has high hopes.

Mondale has the backing of organized labor, including the United Auto Workers, and in Reagan's audience some of the autoworkers wear caps bearing Mondale's name. The head of the Kansas City UAW local, William Barker, a Mondale backer, said at least 1,500 workers were still laid off from the Ford plant



ROUTE 1 REOPENED — A gala celebration marked the opening of California's Highway 1 Wednesday after the majestic Big Sur coastal road was closed by a huge landslide 13 months ago. The May 1 slide, caused by the spring rains of 1983, isolated residents and forced motorists to detour in-

land. Dave Ackerman, of the state Department of Business, Transportation and Housing, said nearly 3 million cars a year traveled the coastline highway, which meanders between Eureka in the north to San Juan Capistrano in the south, a distance of more than 600 miles.

—AP Photo

Doctors' guidelines propose right to die

Washington Post Service
Washington, D.C. — Ten prominent doctors Wednesday proposed a bill of rights for dying patients, suggesting that hospitably ill victims be given the right to die if they choose rather than submit to further treatment.

Physicians, these doctors said, should be allowed to stop tube-feeding irreversibly demented or vegetative patients. If the family agrees and the patient would have agreed.

The unusual declaration, one of the strongest on the patient's right to a humane death, was published in the New England Journal of Medicine in an attempt, its authors said, to offer some "universally accepted guidelines" for doctors caught between technology and the need for compassion.

The signers included Helen Taussig of Johns Hopkins, originator of the famed "blue baby" operation, the first successful attempt to repair infant hearts. Among other signers were Edward Hook, chief of medicine at the University of Virginia in Charlottesville, and Charles Moertel,

chief of cancer treatment at the Mayo Clinic.

The statement was drafted at a meeting organized by the Society for the Right to Die, a group that lobbies for "living will" laws: legislation to establish a person's right to say in advance how he or she wants to be treated, if dying.

The 10 doctors said: Doctors should decrease or halt aggressive treatment if it would only prolong an uncomfortable process of dying. But the patient or the family should decide, if possible.

Doctors and hospitals should respect a patient's right to refuse treatment. And doctors should take the time to tell patients their choices.

A doctor who is not sure about a patient's chances of recovery should consult specialists.

"Appropriate and compassionate care" should have priority over undue fears of criminal or civil liability, or advice of lawyers "whose primary objective is to minimize liability."

Patients should seldom, if ever, be denied the truth.

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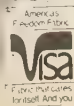
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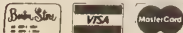
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UW will present honorary degrees to 7 achievers

Special to The Journal
Madison, Wis. — Seven persons who have distinguished themselves in fields ranging from theater to chemistry will receive honorary degrees from the University of Wisconsin — Madison at commencement ceremonies May 20.

The recipients are:
Alfred K. Bader, chairman of Aldrich Chemical Co. in Milwaukee. Bader is an accomplished research chemist and art historian who has made Aldrich one of the world's leading synthesizers and suppliers of organic chemicals. He frequently lectures on art history.
Orville G. Bentley, assistant secretary of agriculture. Bentley received his doctoral degree in biochemistry from UW — Madison, was dean of

the University of Illinois College of Agriculture for 17 years and now is with the US Department of Agriculture.

Joyce Carol Oates, author. She has won acclaim for her contemporary view of American life in novels and short stories and has written critical essays on authors ranging from Shakespeare to John Updike. Among her many works are "A Garden of Earthly Delights" and "Do With Me What You Will." She has a master's degree in English from UW — Madison.

Russell W. Peterson, president of the Audubon Society, former governor of Delaware and chemist. As a research chemist, Peterson directed Du Pont's successful development of Dacron. As governor, he is credited with improving the state's prison system and protecting its environment. He is a native of Portage and has a doctor's degree in physical chemistry from UW — Madison.

Alan Schneider, theater director. Schneider has staged the American premieres of some of the

greatest modern playwrights, including Samuel Beckett, Tennessee Williams and Arthur Miller. He has been a professor at Catholic University, Boston University, Juilliard School and the University of California at San Diego. He is a UW graduate.

Evelyn Steenbock, scientist and philanthropist Steenbock, who worked as a researcher for the Wisconsin Alumni Research Foundation, collaborated with her late husband, Harry, in devising a method of enriching milk with vitamin D. She has a master's degree in biochemistry from UW — Madison.

Paul Vanderbilt, curator emeritus of the Wisconsin Historical Society. He was a pioneer in the use of photographs and other visual images to document the state's and nation's historical and cultural past. He developed the standards and methods for documenting historical photographs while heading the Prints and Photographic Division of the Library of Congress.

THE STATE

Givens, state make deal

Madison, Wis. —UPI— John Givens III, now a supervisor in the Kenosha Job Service office, has reached an agreement with the state on personnel charges he filed last year.

Givens, former director of the Milwaukee Job Service office, will receive \$12,234, representing about a year's difference in back pay between the higher salary at the Milwaukee post and the Kenosha job.

Givens will continue to receive the \$43,428 annual salary he got in Milwaukee. He also will get certain transfer rights.

In return, he will drop his complaints before the Personnel Commission and the US Equal Employment Opportunity Commission.

Forests dry, fires increase

United Press International
A tenfold increase in forest fires in northern Wisconsin has officials hoping that a predicted rain will be beneficial.

"It's been much drier this year and more dangerous," said Earl Meyer, a forest fire prevention specialist for the Department of Natural Resources.

To date, Meyer said, 543 forest fires have burned 2,083 acres of forest in northern Wisconsin, compared with 57 forest fires that burned 84 acres in the same period a year ago.

At one point this week, humidity dropped as low as 7% — virtually a desert level — in the Woodruff area.

Dead trees, brush and grasses from last year had dried out, causing them to burn easily, Meyer said.

PSC will allow phone cutoffs

Staff Correspondent
Madison, Wis. — The state's Public Service Commission Thursday affirmed the rights of some local telephone companies to disconnect local telephone service for non-payment of long-distance charges.

The ruling goes against the position held by some consumer groups, including the Citizens' Utility Board. It would effect Wisconsin Bell, which bills long-distance charges for American Telephone & Telegraph Co., its former corporate parent.

The three-member commission, as part of a broader order dealing with phone service in the new deregulated era that took effect Jan. 1, ruled that because there was no widely available method to block toll calls only, local companies should be allowed to disconnect local service if the local company handles the billing for a long-distance carrier and settles bill disputes.

Some consumer groups objected to such a practice, arguing that since local operating companies like Wisconsin Bell were not formally associated with the long-distance carrier, they should not be allowed to disconnect local service because the long-distance bill had not been paid. The rule, which would make permanent an emergency order approved by the commission in December, must formally be approved by the Legislature before it would become final.

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C6. Solid rope	\$325	\$159	\$375	\$184	\$415	\$204		
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B7. Double solid rope	\$315	\$154
B8. Multi-braided herringbone	\$380	\$189

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STAR

Indianapolis
SUNDAY
December 19, 1982

MAGAZINE



**The
Codes
In Your
Zip
Page 6**

**Madonna
& Child
Page 13**

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Before restoration (above) Madonna and Child seemed seated in front of a drape. When overpaint was removed (right) an arm and part of Joseph's face appeared.

Revelation of Madonna & Child



One example of how the spirit of Christmas is forever renewed hangs today in the Allison Mansion at Marian College. It is one of the college's proud possessions, the painting *Madonna and Child*, a fitting focal point for the foyer of the mansion in Northwest Indianapolis.

Although the painting was received years ago as part of an inheritance left to the college, it wasn't until about six years ago that its importance was realized, explains Sister Sandra Schweitzer of the Marian art department.

Alfred Bader, a Wisconsinite who came to the Allison Mansion to give a speech, restored paintings as a hobby.

Continued on Next Page

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**Madonna
 & Child**

Continued from Page 13

He recognized *Madonna and Child* as a work by Post-Renaissance painter Giovanni Battista Salvi, known as Sassoferrato.

Inspired by this revelation, Marian officials launched a campaign for funds to have the work restored; like most paintings of that era it had been made dingy by time and temperature. The restoration campaign was led by Sister Mary Jane Peine of the college art department, who died two years ago.

Restoration produced a surprise.

Whereas it appeared in the painting that *Madonna and Child* were seated next to a drape, special photography revealed that the drapery had been painted over part of a figure. When the drape was removed, the arm and part of the face of Joseph was revealed.

The "new" painting was rehung in the mansion Dec. 17, 1976, in time for that year's holiday. There the 41-by-29-inch canvas remains today, a perennial reminder of the endless surprise and variation of the Christmas story. ☆



Detail of the painting during restoration shows improved sky tones.

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Synthesizing the History of Polymer Science

Synthetic polymers are now ubiquitous in modern life, yet polymer science as a distinct field is barely sixty years old. A recent study sponsored by the National Research Council estimates that at least one-third of all industrial chemists deal with polymers of one kind or another, and that polymer processing accounts for nearly \$100 billion of value added in American manufacturing. The importance of polymers in the national and world economy is clearly matched by the intellectual achievements of chemists and chemical engineers in understanding the structure and properties of synthetic macromolecules. Progress has been impressive since the introduction of Bakelite some seventy-five years ago. Awareness of the heritage of polymer science has increased markedly in recent years. The first generation of polymer pioneers has begun to publish reminiscences of the exciting decades of the 1920s and 1930s when the very notion of macromolecules was first elucidated, and historians of chemistry have also focused on these debates. Recently *Festschriften* for Herman Mark and Giulio Natta have appeared, and in 1982 Marcel Dekker published a symposium on *The History of Polymer Science and Technology*. Consensus over the centrality of polymer science to modern chemical practice, the recent heightened

Continued on page 7

Inside CHOC News

- More details on the AIChE diamond jubilee..... page 3
- Introducing the CHOC staff page 5
- CHOC manuscripts and recent acquisitions pages 12 and 13
- Full contents on last page

Center for History of Chemistry Inaugural

The official inauguration of the Center for History of Chemistry was held on 11 March 1983 at the University of Pennsylvania on the occasion of Joseph Priestley's 250th birthday. The day's events, attended by several hundred people, included the opening of a major Priestley exhibition in the Rosenwald Gallery of Van Pelt Library; the first national meeting of the CHOC Advisory Board; an honorary degree convocation; research symposia by chemists and historians; and the annual Edgar Fahs Smith Lecture sponsored by the Philadelphia section of the American Chemical Society.

Glenn T. Seaborg of the University of California, Berkeley, presided over the opening of the exhibit, "Joseph Priestley, Enlightened Chemist," by Du Pont chairman Edward G. Jefferson. Jefferson discussed Priestley's chemical contributions, among them the isolation and study of the gases ammonia, carbon monoxide, carbon dioxide, hydrogen chloride, nitric oxide, sulfur dioxide, and, of course, oxygen. Jefferson pointed out that Priestley's chemical investigations were only one aspect of his polymathic endeavors in theology, education, and natural philosophy. There is irony in the fact that Priestley's discovery of "dephlogisticated air" in 1774 was a key piece of evidence in the construction of Lavoisier's oxygen theory of combustion, which led to the demise of the phlogiston theory, defended by Priestley to the last. Jefferson noted that "while the subsequent history of chemistry demonstrated that Priestley's defenses of phlogiston were erroneous, they still displayed the ingenuity, courage, and honesty that marked all of Priestley's disputations. Those virtues, along with his optimism, his commitment to progress, and his allegiance to reason, make him the *enlightened* chemist that we honor today."

Continued on page 2



The CHOC Inaugural: A portion of the "standing room only" crowd at the opening of the exhibit on "Joseph Priestley, Enlightened Chemist," listening to . . .

American Chemical Society
Center for History of Chemistry
 University of Pennsylvania

CHOC is a joint venture of the American Chemical Society and the University of Pennsylvania established in January 1982 to discover and disseminate information about historical resources and to encourage research, scholarship, and popular writing in the history of chemistry, chemical engineering, and the chemical process industries.

The aims of the Center are to develop a program of interviews and undertake oral histories of major developments in modern chemistry; to locate manuscripts and archival records of in-

dividuals, societies, trade associations, and companies important in the history of chemistry, chemical engineering, and the chemical process industries; to offer aid in sorting and cataloguing papers and preparing inventories; to encourage the deposit of personal papers and other records in appropriate regional archives; to develop a central catalogue of manuscripts, with finding aids and other reference tools, at the Edgar Fahs Smith Memorial Collection; and to make known the achievements of chemists, chemical engineers, and the chemical industry.

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Following the exhibit opening, several symposia were held while the CHOC Advisory Board met in the Smith Collection. The Department of Chemistry conducted tours of the regional laser facility and the laboratory for research on highly conducting polymers. These tours were punctuated by lectures on "Lasers in Chemical and Biochemical Research," by Robin Hochstrasser, and "Polyacetylene, (CH)_x: The Prototype Conducting Polymer," by Alan G. MacDiarmid. Concurrently, the Priestley exhibit was open to view, and Whitfield J. Bell, Jr., executive officer of the American Philosophical Society, gave an entertaining and informative talk on "Priestley's Philadelphia." Using city directories, correspondence, and other contemporary sources, Bell painted a portrait of the physical arrangement, social character, and cultural milieu of Philadelphia in the 1790s. He recounted Priestley's connections with such Philadelphia institutions as the American Philosophical Society, the University of Pennsylvania, and the First Unitarian Church, and notable individuals like Benjamin Rush, John Adams, and Thomas Jefferson. With the Priestley exhibit surrounding the audience, Bell's lecture vividly evoked Priestley's life in America.

The next event of the day was the degree convocation in the Rosenwald Gallery, at which Penn president Sheldon Hackney presided. Complete with academic regalia and a brass chamber ensemble, the ceremony included greetings from Fred Basolo, president of the American Chemical



... Nobel laureate Glenn T. Seaborg (University of California, Berkeley) introduce ...

Society, and an address on "The Internationalism of Chemistry" by Nobel laureate Christian Anfinsen of the Johns Hopkins University. President Hackney conferred honorary doctor of science degrees on Sir George Porter, Director and Fullerian Professor of the Royal Institution of Great Britain, Nobel laureate in chemistry, and past president of the Chemical Society; Charles C. Price, Benjamin Franklin Professor emeritus at the University of Pennsylvania, former chairman of the Department of Chemistry, and past president of the American Chemical Society; and Glenn T. Seaborg, University Professor of Chemistry at the University of California, Nobel laureate in chemistry, and past president of the ACS.

Sir George Porter conveyed special greetings on CHOC's inauguration from the Royal Society of Chemistry and the Royal Institution. In a series of witty remarks, Porter discussed Priestley's status as a political refugee in America. He then reminded the audience that his own Royal Institution had been founded by the flamboyant American expatriate, Benjamin Thompson, who had been forced to leave the colonies because of his Tory loyalties. Thompson is better known as Count Rumford, and for marrying Lavoisier's widow in 1805.

Following a reception and dinner later that evening at the University Museum, Sir George Porter presented the annual Edgar Fahs Smith Lecture on "Joseph Priestley and Photosynthesis Today" at the Harrison Auditorium, thus providing a fitting conclusion to an exciting, edifying, and entertaining day.

AICHe Diamond Jubilee

The AICHe celebration of seventy-five years of chemical engineering continues throughout 1983. Terry Reynolds's anniversary history of the Institute (see *CHOC News*, Spring 1983, p. 4) will be available this summer, and *Chemical Engineering Progress* plans a special Diamond Jubilee section in the October 1983 issue. In related activities, AICHe committees have honored leading chemical engineers and selected the top ten achievements of modern chemical engineering.

Basing the awards on AICHe service, membership in the National Academy of Engineering, national awards received, and senior executive status in industry, the Diamond Jubilee Committee has selected the following individuals as Eminent Chemical Engineers to be honored at the Washington meeting: Neal R. Amundson (University of Houston), Thomas Baron (Shell Development Company, retired), Manson Benedict (MIT, emeritus), R. Byron Bird (University of Wisconsin), Theodore A. Burtis (Sun Company), Stuart W. Churchill (University of Pennsylvania), Donald A. Dahlstrom (Envirotech Corporation), W. Kenneth Davis (former Deputy Secretary of Energy), Harry G. Drickamer (University of Illinois), James R. Fair (University of Texas), George E. Holbrook (Du Pont, retired), Hoyt C. Hottel (MIT), Olaf A. Hougen (University of Wisconsin, emeritus), Arthur E.

Humphrey (Lehigh University), Donald L. Katz (University of Michigan), Chalmer G. Kirkbride (Kirkbride Associates), Ralph Landau (Listowel Inc.), Jerry McAfee (Gulf Oil Corporation, retired), John J. McKetta, Jr. (University of Texas), Arthur B. Metzner (University of Delaware), Max S. Peters (University of Colorado), Robert L. Pigford (University of Delaware), J. Henry Rushton (Purdue University, emeritus), Klaus D. Timmerhaus (University of Colorado), James Wei (MIT), James W. Westwater (University of Illinois), Charles R. Wilke (University of California, Berkeley), and W. Robert Marshall (University of Wisconsin).

Also in connection with the Diamond Jubilee, a distinguished panel of chemical engineers has selected the profession's top ten achievements during the past century. These include the production of oxygen and nitrogen by cryogenic distillation of air; the development of agricultural chemicals (including synthetic ammonia); the production of fissionable isotopes during World War II; the commercial-scale production of antibiotics; establishment of the synthetic rubber industry; the emergence of the plastics industry and new plastics processing techniques; the development of synthetic fibers; petrochemicals processing and the panoply of new petroleum-based products; the development of environmental technology; and, most recently, innovations in biochemical processing and engineering. It is readily apparent from this list that chemical engineers have made major contributions to the basis of modern material culture.



... Edward G. Jefferson (Du Pont), who spoke on "Priestley Today."



Among those attending were William O. Baker (Bell Labs), University of Pennsylvania librarian Richard De Gennaro, Penn trustee John W. Eckman (Rorer Group Inc.), ...

A brochure describing the pioneering process and product innovations in these areas, with an emphasis on the past twenty-five years, will be available from AIChE headquarters this summer.

Priestley Celebrations

The CHOC inauguration in March was just the first of a round of Priestley celebrations taking place on both sides of the Atlantic in 1983.

The Dickinson College Library mounted an exhibit entitled "Joseph Priestley, 1733-1983: An Intellectual Presence at Dickinson" from 30 March to 30 May. The exhibit highlighted the collection of Priestley's scientific apparatus (including the famous burning glass) acquired for Dickinson by Thomas Cooper in 1811, and the Priestley Family Collection of books, manuscripts, and artifacts donated by his descendant Mrs. Temple Fay in 1965. (An exhibit catalogue is available from the library.)

On 13 April, Bucknell University and the Susquehanna Valley section of the American Chemical Society cosponsored a set of events celebrating Priestley's birthday and the issue of a commemorative stamp by the United States Postal Service. A first-day-of-issue ceremony was held at the Priestley House in Northumberland, Pennsylvania, that morning, with remarks by Donald Shuman (New York City's Postmaster



ACS president Fred Basolo speaking at the first day of issue ceremony for the Priestley commemorative stamp in Northumberland, Pennsylvania, 13 April 1983. Courtesy David J. Rhees.

and a native of Northumberland) and ACS president Fred Basolo. The afternoon session at Bucknell included lectures on "Priestley, Paine, and Blake" by Michael Payne (Bucknell University) and "Synthetic Oxygen Carriers of Biological Interest" by Fred Basolo. ACS president-elect Warren Niederhauser introduced the evening speaker, Erwin Hiebert (Harvard University), who gave a talk on "The Natural Philosophy and Theology of Joseph Priestley."

The American Institute of Chemists issued a special souvenir card in honor of the first day of issue of the Priestley stamp, a fitting tribute to a special event in chemical philately.

In England, Priestley's 250th birthday was also observed in a variety of exhibi-

tions and historical events. The Science Museum, London, mounted a small exhibit, and visitors to Manchester College, Oxford, could view a display of material illustrating Priestley's connection with the Warrington Academy (from which Manchester College is descended) in the 1760s. At the Bodleian Library in Oxford, Barbara Smith and Michael Hill organized an exhibit and an informative catalogue, both entitled "Joseph Priestley, 1733-1804: Scientist, Teacher, and Theologian."

Both the British and American Priestley celebrations will climax with historical symposia devoted to the interpretation of Priestley's multifaceted contributions to Enlightenment culture. For details see "Meetings."



... Sidney M. Edelstein (Dexter Chemical), and David P. Sheetz (Dow Chemical).



As the Advisory Board of the Center prepares to meet, Alexander Giacco (Hercules Inc.), Alfred Bader (Aldrich Chemical) and David Sheetz share a joke, while John Eckman and Arnold Thackray (Director of CHOC) compare notes...

Priestley Exhibition Catalogue Available

The CHOC exhibition, "Joseph Priestley, Enlightened Chemist," on display at the University of Pennsylvania's Van Pelt Library 11 March-27 May 1983, was assembled from the collections of over a dozen museums, libraries, and private collectors. It is the most varied display of Priestley artifacts ever mounted in the United States. Highlights of the exhibition include Priestley's *Chart of History*, his air gun, letters to and from Benjamin Franklin, rare chemical glassware, a replica of Priestley's burning lens, and the Rembrandt Peale portrait of Priestley. Of special interest was Priestley's "spark tube" from the Smithsonian's National Museum of American History, which was reunited with his specially fitted air pump, loaned by the Franklin Institute Science Museum. Priestley used the pump to evacuate the tube so that he could generate very bright spark discharges for the entertainment of his friends. The two instruments had been separated since the early nineteenth century until brought together again for the CHOC exhibition. Also featured was a superb collection of eighteenth-century caricatures from the collection of Derek A. Davenport (Purdue University) documenting Priestley's role in British political and religious controversies. A smaller version of the exhibit will be present at the August meeting of the American Chemical

The Legacy of Joseph Priestley: 1733-1983

The last event in the United States of this Priestley anniversary year will take place at the Washington ACS meeting 29-30 August. The symposium is sponsored jointly by the Division of History of Chemistry and the Division of Chemical Education. Monday's sessions include talks by leading historians of science and historians, a political scientist, a Unitarian minister, and an amateur. Tuesday morning will conclude with an account of Priestley's contributions to the early history of photosynthesis. This will serve as a historical lead-in to Melvin Calvin's afternoon Perspectives Lecture on "Artificial Photosynthesis." ACS President Fred Basolo will follow with an account of his work on "Syn-

thetic Oxygen Carriers of Biological Interest," a fitting topic for the occasion since Priestley was the first to report the dramatic change in the color of blood on exposure to dephlogisticated air. The final talk will be given by that Priestley-like figure, Linus Pauling. His topic will be "Social and Political Commitment and the Scientist." The opportunity to learn more about one of the most influential, protean, and admirable figures in the history of ideas will not come again until the year 2433. Better come now!

DEREK A. DAVENPORT
Purdue University

Society in Washington, D.C., and available for touring to regional ACS meetings and the like.

The catalogue for the Priestley exhibition constitutes CHOC Publication #1 and is now available for \$3.00, postpaid. This thirty-six page illustrated booklet, written by David J. Rhees (who organized the exhibit), provides an overview of Priestley's multifaceted contributions to Enlightenment culture, a listing of objects in the exhibition, and a selected bibliography. Orders should be sent to Publications, Center for History of Chemistry, E. F. Smith Hall/D6, 215 S. 34th Street, Philadelphia, PA 19104.

Introducing the CHOC Staff

Arnold Thackray is the Director of CHOC. He studied chemistry under A. R. Battersby at Bristol University in England and worked as an industrial chemist before turning to the history of science. After obtaining his doctorate at Cambridge in 1966, he crossed the Atlantic to the other Cambridge. Thackray moved from Harvard to the University of Pennsylvania in 1968, where he was the founding chairman of the Depart-



... and Paul M. Klaas (J. T. Baker Co.) exchanges reminiscences with Charles C. Price (chairman of the CHOC Policy Council) and Nobel laureate Christian B. Anfinsen (Johns Hopkins).



Afterwards, Fred Basolo (ACS president) and Amos Smith (CHOC Policy Council) prepare for the honorary degree convocation . . .

ment of History and Sociology of Science. He has also held faculty appointments in Oxford (Visiting Fellow, All Souls College), Cambridge (Fellow, Churchill College), and at the London School of Economics, the Institute for Advanced Study, the Center for Advanced Study in the Behavioral Sciences (Palo Alto), and the Hebrew University of Jerusalem.

Professor Thackray's interests lie in understanding science, technology, and medicine as elements of modern culture. His first investigations dealt with the European intellectual traditions of chemistry, and resulted in *Atoms and Powers: An Essay on Newtonian Matter-Theory and the Development of Chemistry* (1970). That work led on to *John Dalton: Critical Assessments of His Life and Science* (1972) and—indirectly—to *Gentlemen of Science: The Early Years of the British Association for the Advancement of Science* (1981, written with Jack Morrell). A second train of research concerns the American chemical and chemical engineering communities in the past century, especially within a context of quantitative history and policy questions. The coedited volume *Toward A Metric of Science: The Advent of Science Indicators* (1978) will be followed by *Chemistry in America, 1876-1976: An Historical Application of Science Indicators* (forthcoming, written with J. L. Sturchio, P. T. Carroll, and R. F. Bud) and a report on "University-Industry Connections and Chemical Research" commissioned by the National Science Board. A third, more occasional, line of inquiry

has resulted in various articles on the development of the history and sociology of science as a field of scholarly endeavor, and in a coedited book on *Science and Values: Patterns of Tradition and Change* (1974).

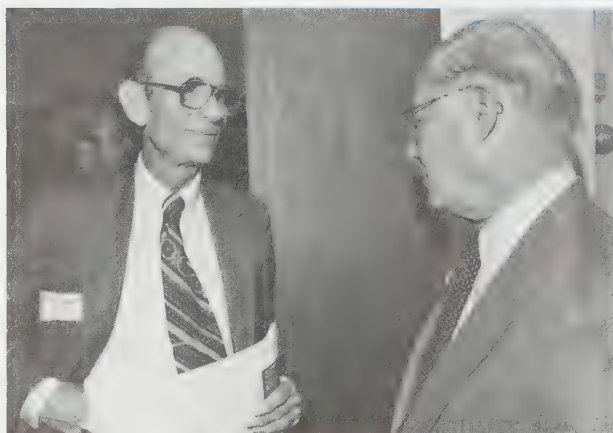
Thackray is president of the Society for Social Studies of Science and a member of the Executive Committee of the History of Science Society and of the Educational Advisory Board of the John Simon Guggenheim Memorial Foundation. He is a Fellow of both the American Association for the Advancement of Science and the Royal Society of Chemistry. Professor Thackray edits *Isis* (the official journal of the History of Science Society) and serves as curator of the Edgar Fahs Smith Memorial Collection in the History of Chemistry, in addition to directing CHOC. In his leisure hours he likes to visit his wife and three children and grow roses in the Philadelphia suburb of Wayne.

George D. Tselos, Assistant Director for Archives, received his bachelor's degree in biology from Carleton College. After graduate work in both zoology and history, he received a master's degree and doctorate (1970) in modern American social history from the University of Minnesota. He taught American history at Monmouth College in Illinois before joining the Newberry Library in Chicago in 1974 as a Humanities Program Fellow. The following year he taught in the Minnesota history department, then pursued graduate studies in library and archival administration at Minnesota. From 1977 to 1982

Tselos was field representative for the Urban Affairs Archives at Wayne State University in Detroit, Michigan. He has published on American history and archival administration and has spoken to numerous professional and community groups on historical topics and on the importance of preserving historical documentation from all walks of life.

John A. Heitmann, Assistant Director for Programs, holds a bachelor's degree in chemistry from Davidson College and a master's degree in history from Clemson University. While enrolled at Clemson, he worked full time as a state chemist for the Department of Agricultural Chemical Services. Between 1974 and 1978 he was a chemist in the metallurgical industry in Louisiana, first at AMAX Nickel in Braethwaite, then at Freeport Minerals Research and Development Laboratory in Belle Chasse. Heitmann then returned to graduate school at the Johns Hopkins University, where he received his doctorate in the history of science in 1983, with a dissertation on the role of chemistry and chemical engineering in the Louisiana sugar industry. While at Hopkins he also taught history of science at Towson State University in Maryland. Heitmann's duties at CHOC include implementing historical programs and maintaining close ties with ACS divisions and local sections.

Jeffrey L. Sturchio, the Editor of *CHOC News*, is Assistant Professor of History in the Department of Humanities at the New Jersey Institute of Technology. A graduate of Princeton, Stur-



... while John C. Haas (Rohm and Haas) talks with Warren Niederhauser (ACS president-elect) ...



... and Stuart W. Churchill (past president, American Institute of Chemical Engineers) and another participant listen to an anecdote from Claude Deischer (curator emeritus, Edgar Fahs Smith Collection).

chio obtained his doctorate in the history and sociology of science at the University of Pennsylvania in 1981. While at Penn, he was assistant curator of the Edgar Fahs Smith Memorial Collection and taught a course in the history of chemistry given previously by Edgar Fahs Smith, Claude K. Deischer, and Arnold Thackray. Sturchio's research interests lie in the relations of chemistry and chemists with the American chemical industry. Sturchio was a fellow at the National Museum of American History in 1980-81, and Visiting Assistant Editor with the Thomas A. Edison Papers at Rutgers University in 1982-83.

Continued from page 1

interest in history among the field's practitioners, and the advanced age of many of the pioneers combine to form a powerful rationale for CHOC to focus on the intellectual, institutional, and industrial history of polymer science as our first special project.

Discussions on the form and scope of the project are under way with leading chemists, chemical engineers, and industrial executives (including William O. Baker, Norbert Bikales, Edward Jefferson, Ralph Landau, Herman Mark, Carl Marvel, Herbert Morawetz, and Charles Price), and with representatives of the Polymer Division of the American Chemical Society. Initial plans include a program of oral history interviews with leading participants across the spectrum of polymer science, and an archival

survey of extant academic, government, and industrial sources on the development of new programs, products, and processes in the field from the 1930s to the recent past. The project will pay particular attention to such major developments as the synthetic rubber program during World War II and the emergence of key institutions such as the Polymer Research Institute at Brooklyn Polytechnic after the war.

The history of polymer science is as much one of industrial products as it is of intellectual productions. With that in mind, CHOC will also collect material dealing with the transition from laboratory to plant, and eventually to market, in the development of polymers. Little is known at present about the historical evolution of the scale-up of laboratory processes for the production of synthetics, and even less about the panoply of machines and other devices for molding, laminating, extruding, and spinning new polymeric materials. Engineering developments and the artifacts of polymer practice will also receive attention.

Ultimately CHOC will compile a collection of oral history transcripts, publish inventories of printed and manuscript resources for the history of the field, create traveling exhibits on polymer history, and distribute popular accounts of the manifold contributions of polymer science to contemporary life. CHOC is now exploring sources of funding for this project. We welcome comments and information from interested readers.

Sources for History of Chemistry

The Bancroft Library

The Bancroft Library, a major research center on the Berkeley campus of the University of California, offers varied and valuable resources for the history of chemistry. Bancroft holdings, including manuscript collections, oral history interviews, and rare books, will be of particular interest to researchers concerned with twentieth century science and science-based technology. The History of Science and Technology program at Berkeley has intensified the search for source materials in this area. Among the collections pertaining to chemistry are papers and correspondence of Emil Fischer, Willard B. Rising, William C. Bray, Wendell M. Latimer, William F. Giauque, Samuel Ruben and Martin D. Kamen, William Z. Hassid, and Eugene Huffman. These papers offer insights into both the content of chemical research and its institutional contexts.

Emil Fischer, winner of the Nobel Prize for chemistry in 1902, tackled a number of important problems in organic chemistry, among them the structure of sugars, the constitution of the uric acid group, and protein structure. Fischer, who had studied with Adolph von Baeyer, was affiliated with several German institutions, of which the most significant was the University of Berlin. This association lasted from 1892 until Fischer's death in 1919. The Fischer collection contains research notes and manuscripts of papers and lectures; it is also a rich mine for scientific correspondence of the late nineteenth and early twentieth centuries.

Most of the other collections bear upon the development of research and teaching in chemistry at the University of California, Berkeley. Willard B. Rising was called to Berkeley to head the newly organized College of Chemistry in 1872; he retired in 1908. His papers contain correspondence, departmental records, notes, and drafts of publications and lectures. Under the vigorous leadership of Gilbert N. Lewis, Rising's successor as dean, the chemistry program at Berkeley continued to grow in size and stature. William C. Bray, a spe-



At the honorary degree convocation, Sir George Porter brings greetings to CHOC from the Royal Society of Chemistry.



*Zev Hassid
and Samuel Ruben.
Courtesy
Bancroft Library.*

cialist in the kinetics of inorganic reactions, began his Berkeley career in 1912. The Bray collection includes correspondence, research notes, and drafts of papers. Wendell M. Latimer and William F. Giaque (both Berkeley Ph.D.s) and Joel Hildebrand also joined the staff. Giaque devoted his long career to the study of thermodynamics, especially low-temperature research, and was awarded the Nobel Prize in 1949 for his development of the method of adiabatic demagnetization. A large collection of his correspondence and papers has recently come to the Bancroft Library; additions are expected. Several oral history interviews explore the varied career of long-time Berkeley chemistry professor Joel Hildebrand, who died in April at age 101. These interviews also deal with developments in the University of California chemistry department, as do files relating to faculty members and academic departments preserved in the University Archives. Materials in the archives are accessible through the Bancroft Library.

Latimer, after outstanding work on the entropies of aqueous ions and on the hydrogen bond, with other Berkeley chemists and physicists turned his attention to nuclear chemistry. The Radiation

Laboratory, organized and expanded by the physicist Ernest O. Lawrence, offered considerable stimulus to Berkeley research in this field. In conjunction with the construction and deployment of a series of ever larger cyclotrons at the Rad Lab, Berkeley chemists built a radium-beryllium neutron source and isolated heavy water to provide a deuterium source for bombarding other elements. Among those working at the laboratory were Samuel Ruben and Martin D. Kamen, whose studies of photosynthesis led to the discovery of carbon-14 (this on the eve of the 1940 presentation ceremonies for Lawrence's Nobel Prize in physics). Ruben and Kamen made use of this new radioisotope in investigating carbon fixation. Many of their research notes, infused with the exhilarating spirit of discovery, are now a part of the Bancroft's history of science collection. The papers of Zev Hassid, who also worked with Ruben, complement the Ruben-Kamen collection; those of Eugene M. Huffman deal with work in analytical chemistry at the Lawrence Berkeley Laboratory.

The acquisition of the large and valuable collection of Ernest Lawrence's papers, in which the historian of chemistry will find much of interest, helped

focus attention on the development of the Radiation Laboratory, now Lawrence Berkeley Laboratory. To supplement the Lawrence collection, a series of oral history interviews was undertaken to preserve the recollections of physicists, chemists, engineers, and administrators affiliated with the Radiation Laboratory. The final transcripts (edited and indexed) and tapes are available to researchers at the Bancroft Library; copies of the transcripts can also be provided at cost to other noncirculating libraries. Among those interviewed were Glenn Seaborg, who shared the 1951 Nobel Prize in chemistry with his Rad Lab colleague Edwin McMillan, and Melvin Calvin, head of the Bio-Organic Unit and Nobel laureate in chemistry for 1961. Seaborg's and McMillan's awards came for the discovery and identification of neptunium and plutonium; Calvin's, for unraveling the path of carbon in photosynthesis. These interviews address such issues as physics and chemistry at the laboratory, the relationships between the laboratory and academic units on campus, wartime research, sources of funding, and the role of the Atomic Energy Commission. Interviews with James Arnold and Stanley Miller offer a comparative perspective on nuclear chemistry at Princeton, Chicago, and San Diego.

ROBIN E. RIDER
University of California, Berkeley

Rensselaer Polytechnic Institute

When the Rensselaer School opened in Troy, New York, in 1824, it was one of the first institutions of higher education in the country to be established primarily for the task of scientific education. Later renamed Rensselaer Polytechnic Institute, the school was founded by Stephen Van Rensselaer, the wealthy patron, and Amos Eaton, a lawyer turned natural philosopher. Their intention was to "teach persons in the application of science to the common purposes of life." The school's science curriculum declined somewhat after the early years as applications were emphasized more than science in response to the demand for engineers. But a tradition of science survived,

especially in the field of chemistry.

RPI awarded its first doctorate in chemistry in 1926, and by 1958 it had awarded its hundredth doctorate: less than a decade later the department awarded its two hundredth degree. One of the strengths of RPI's Archives and Department of Special Collections is in the history of chemistry. Four individuals—E. N. Horsford, Henry B. Nason, W. P. Mason, and Paul Harteck—representing distinct historical periods, are documented through personal and professional papers that are arranged, described, and available for research in the archives.

The Eben Norton Horsford Papers (17.5 linear feet) span the years 1755–1944, with the bulk of the collection documenting the period from 1834–93. Horsford was an 1838 civil engineering graduate of RPI. He studied analytical chemistry with Liebig from 1844 to 1846 and received his A.M. from Harvard in 1847 before becoming Rumford Professor at the Lawrence Scientific School.

Horsford's papers consist primarily of correspondence, but also include notes and drafts of scientific papers. The collection, relating primarily to his scientific and business activities, documents his teaching career, his early involvement with the American Association for the Advancement of Science, and his founding of the Rumford Chemical Works. Also included in the collection are family papers of his first wife, Mary L'Hommedieu Gardner. The papers were given to RPI in 1966 by Mrs. Augustus Fiske, and there are no restrictions on their use. An unpublished finding aid is available.

The Nason Collection (1 linear foot) covers the period 1858–96, from the time Henry Nason joined the RPI faculty until after his death in 1895. Nason was a student of Friedrich Wöhler's at Göttingen, where he received his Ph.D. in 1857. After holding simultaneous appointments at Beloit College and RPI (1858–66), he devoted his full-time activities to teaching chemistry, mineralogy and (later) geology at RPI until his retirement in 1894. Nason was president of the American Chemical Society in 1890, and a fellow of the Chemical Society of London.

The collection contains two scrapbooks, one belonging to Nason, the other to his wife Frances, along with numerous professional publications. Nason's scrapbook contains social memorabilia, such as invitations, pro-



Teaching laboratory for qualitative analysis in RPI's Walker Building, circa 1875. Courtesy Rensselaer Polytechnic Institute Archives.

grams, and newspaper clippings, as well as some personal correspondence. Mrs. Nason's scrapbook contains tributes to her husband and letters of condolence upon his death, as well as some social memorabilia. There are no restrictions on the use of these materials. A detailed index to these scrapbooks is available.

The William Pitt Mason Papers (1.5 linear feet) document the life and works of a second RPI graduate (class of 1874) and former RPI faculty member who devoted himself to the field of analytical chemistry and sanitary engineering. Mason was internationally known for his research in water analysis and his advocacy of pure water supplies in the late nineteenth century. He returned to his alma mater in 1875 as assistant to Nason, and became head of the chemistry department twenty years later. In 1912–13, when the department of chemical engineering was established at RPI, he became its first head and remained in that position until his retirement in 1925.

Mason's papers span the years 1877–1924, with the bulk of the material falling in the period 1885–1915. The collection consists primarily of letterpress books of scientific and business correspondence, and copies of Nason's published articles. The scientific corre-

spondence relates primarily to his professional consulting activities, especially his work in the analysis of local water sources. The papers were given to RPI in 1967 by Dr. Stanley Bunce and contain no restrictions on their use. An unpublished finding aid is available in the repository.

The Paul Harteck Papers (5 linear feet) document the life and career of this distinguished physical chemist. Educated in Vienna and Berlin, Harteck received his Ph.D. in 1926 in the areas of physical chemistry, applied mathematics, and theoretical physics. After working with Fritz Haber at the Kaiser Wilhelm Institut für Physikalische Chemie, Harteck spent the year 1933 as an associate of Ernest Rutherford's at the Cavendish Laboratory. He returned to Germany as director of the Institute for Physical Chemistry in Hamburg, and not long after became involved in Germany's development of nuclear energy. In 1951, Harteck accepted a position as Distinguished Research Professor at RPI and continued his research in photochemistry and atomic reactions. Harteck continued his research as an emeritus professor until 1982.

The Harteck Papers span the years 1933–1982 and consist primarily of correspondence, both personal and professional. Many of the early letters are in



Paul M. Harteck,
RPI's Distinguished Research Professor
of Physical Chemistry, 1982. Courtesy
Rensselaer Polytechnic Institute Archives.

German. Included are Harteck's communications with Nobel laureates Ernest Rutherford, Fritz Haber, James Chadwick, and Otto Hahn, as well as a lengthy series of letters from K. F. Bonhoeffer, director of the Max Planck Institute for Physical Chemistry. The papers, including photocopies of some originals, were given to RPI by Professor Harteck in 1982. There are no restrictions on their use, and a preliminary inventory is available.

In addition to the personal papers of individuals, the RPI Archives also has Institute administrative records from 1888 to the present, and, though not extensive, the papers of the Department of Chemistry (1955-75) and Department of Chemical Engineering (1922, 1939-74).

For further information on these collections or any other materials, researchers may write to the Institute Archives, Rensselaer Polytechnic Institute, Troy, NY 12181. Telephone (518) 270-6706.

ELIZABETH C. STEWART
Rensselaer Polytechnic Institute

CHOC would welcome news of published or unpublished histories of ACS Divisions and local sections; oral history interviews with prominent chemists and chemical engineers; and other material having to do with the history of the society and its members since 1876.

Report from the Policy Council

The fourth meeting of the CHOC Policy Council was held on 8 April 1983 at the 17th Middle Atlantic Regional Meeting of the ACS in White Haven, Pennsylvania. Charles C. Price (University of Pennsylvania) chaired the session, which began with a progress report by CHOC Director Arnold Thackray. He introduced George Tselos and John Heitmann to the group; discussed the inaugural celebration in March (noting that widespread press coverage included an article in the 4 April issue of *Chemical & Engineering News* and interviews on local television news and National Public Radio's "All Things Considered"); reported on CHOC News, the success of the CHOC exhibit booth at the ACS Seattle meeting, and the status of fund-raising efforts; and raised the prospect of forming a "Friends of CHOC" group.

The rest of the meeting focused on committee reports (see *CHOC News*, Spring 1983, p. 12). Derek Davenport (Purdue University) discussed the Priestley symposium and related activities planned for Washington, and reiterated the importance of CHOC representatives speaking to as broad a spectrum of ACS constituencies as possible. Ned Heindel (Lehigh University) reported that he and John Stock had begun work on the history of chemical instrumentation. Leon Gortler (Brooklyn College) and Jeffrey Sturchio (New Jersey Institute of Technology) presented a report on the implementation of CHOC projects, as requested at the last meeting of the Policy Council. Gortler stressed the importance of beginning to do some oral history soon, and discussion turned to possible CHOC projects on synthetic rubber and polymer chemistry in general. Finally, Sister Mary Virginia Orna's subcommittee reported on joint CHOC-HIST programs for the St. Louis and Philadelphia ACS national meetings in 1984. Proposals were presented for two continuing series of symposia, one on regional resources for the history of chemistry, and another on the regional history of the chemical industry. Both series would capitalize on the peripatetic nature of national meetings. The Policy Council instructed the subcommittee to report further at the next meeting.

CHOC: The Task Ahead

This is the second in a series of papers presented at the CHOC-HIST symposium on "The Task Ahead" at last fall's ACS meeting in Kansas City (see *CHOC News*, Winter 1982, p. 3, and Spring 1983, p. 5-6).

Arnold Thackray needs little introduction to historians of chemistry. Now emeritus professor of chemistry, history of science, and director of liberal studies at the University of Wisconsin-Madison, his many publications include the seminal *Development of Modern Chemistry* (New York: Harper & Row, 1984). Professor Thackray was the 1968 recipient of the Dexter Award of the ACS Division of History of Chemistry.

The Case of the Overzealous Secretary; or, The Importance of Ephemera in Documenting the History of Chemistry

In the past, collectors, chroniclers, librarians, recorders, archivists, antiquarians, and historians have been inclined to collect and preserve the papers of the great and even the near great. Such preservation has been important to those wishing to reconstruct the past. However, as is well known, such papers can also result in the distortion of history, since holdings on a given subject are frequently incomplete, and particularly since the lives of the not-so-great are easily overlooked. They too had a part in the human enterprise.

I once heard a listener inquire, at a meeting of scholars, why no one wrote the history of common folk. A historian responded, "Where does one find the source material for such history?" If we are to have an unambiguous history of chemistry, we must not only encourage the preservation of the papers of leaders of the profession, but also be sure that sources are available which reveal in their totality the growth, successes, and failures of the chemical community—including the "common folk."

From personal experience, I know that certain significant questions cannot be answered because essential source materials are unavailable. This is even

true of the work of leaders in the field, since such persons frequently fail to understand the nature of historical problems and the relevance of unpublished material. There are other reasons for gaps in resource materials. The papers of many chemists have been lost permanently for reasons beyond their control—reasons such as uninformed action by next of kin, catastrophes (such as fires, floods, or explosions), or political upheavals. In my work on the history of the chemistry department at the University of Wisconsin, I was confronted with a peculiar void in the period 1919–35 in departmental archives, a void attributable to the overzealousness of a departmental secretary who simply threw out all files more than two years old while the chairman, J. Howard Mathews, was away on a lecture tour! As a result, departmental records for that period are virtually non-existent except for what can be recovered from university administrative archives. I have had some serendipitous help from a source that would usually be considered trivial—the *Chemical Bulletin* of the Chicago Section of the American Chemical Society.

The Chicago Section's vehicle became, after World War I, a regional bulletin carrying announcements relevant not only to Chicago chemists, but also to chemists in sections scattered around the Midwest, including the Wisconsin section with headquarters in Madison. The *Chemical Bulletin* carried the usual announcements to members of the cooperating sections, but also included articles expressing opinions and reviews of general interest to the chemical community. The *Bulletin* also carried extensive personal items about chemists in the Chicago section and about chemists in the cooperating sections. These items have been of considerable help to me in reconstructing the post-World War I period in the history of the Wisconsin chemistry department. Numerous items about these chemists appeared in the pages of Wisconsin Section news, as well as in news items about Wisconsin alumni employed in the Chicago area and elsewhere in the Midwest.

Publications such as section newsletters are generally looked upon as ephemeral communications to the ACS membership. They serve a timely purpose, such as announcing meetings, informing members of section business, and providing information on candi-



Important ephemera

dates for election, then are quickly thrown away. But I have found the Wisconsin Section news surprisingly useful despite the varying completeness of information submitted by different section editors—sufficiently valuable to have the pages from 1919 to 1951 xeroxed and bound.

This personal experience causes me to feel that within reason, trivia are worth preserving. There are presently more than fifty publications of ACS sections. They vary somewhat in format and content. Some, like the *Chemical Bulletin*, are regional; others, like the *Amalgamator* (Milwaukee), are the organ of a single section. Many carry extensive personal items about local chemists. Certainly such publications need not be available in every research library, but there should be a mechanism which encourages one or possibly several repositories to collect them, with a central clearinghouse such as the Center for History of Chemistry to provide information about their availability.

Besides section publications, a few ACS divisions produce newsletters or bulletins. HIST has produced a newsletter whenever an officer has been sufficiently motivated. Does anyone possess a full set? Other divisions with newsletters include Chemical Education and Chemical Information. Do full sets exist? The chemistry fraternity, Alpha Chi Sigma, has long published *The Hex-*

agon, and the honorary chemical society, Phi Lambda Upsilon, publishes *The Register*. How many full sets exist? Where?

Some chemistry departments produce a newsletter for alumni, sometimes the occasional product of a motivated professor, infrequently the regular product of a department. Harvard, Penn, Illinois, and Wisconsin fall into the latter category. Once again, such publications are ephemeral in nature and seldom systematically preserved. They vary enormously in content. The most successful carry information about the department, the faculty, and particularly the alumni. Should complete sets be saved? If so, where? By whom? And should information be available in CHOC?

A few departmental histories have been published, some recent examples coming from the chemistry departments of Southern Illinois University and the University of North Carolina. The University of Illinois published a centennial brochure and has, for several decades, turned out decennial chronicles. Should such projects be encouraged? How widely should such publications be available? I might also note the production of company newsletters and other publications, mostly of an ephemeral nature. How many companies systematically preserve such publications? Are they of value to historians? Who may have access to such files?

In summary, I have pointed to the existence of a variety of ephemeral publications (sometimes no more than a mimeographed sheet) dealing with chemists and the chemical profession. They are not systematically preserved at present. Perhaps it is time to reconsider this situation. Can and should the Center for History of Chemistry serve as a coordinator?

AARON J. IHDE
University of Wisconsin

The Conservation of Historic American Chemical Instruments

One of the items discussed at the third meeting of the CHOC Policy Council (see *CHOC News*, Spring 1983, p. 12) was a proposal from Jon B. Eklund (National Museum of American History) for a joint CHOC-Smithsonian project to locate and preserve historic American chemical instruments. Ned D. Heindel (Lehigh University) and I were asked to explore this proposal. Action is a matter of some urgency: as pointed out in *Chemical & Engineering News* in July 1979, historic instruments are "another endangered species." It is natural to throw out the old when something newer comes along. Occasionally, the discarded instrument is either unique or the last of its kind. The fact that a certain type of instrument was once in wide use does not mean that an example can be had for the asking. An appeal for help in locating a pre-1930 CO₂ flue gas monitor, for instance, has so far produced no response. Weights and measures are of global concern, yet the principal balance used in the lengthy work of reestablishment of British standards after their destruction by fire in 1834 has not been found, despite a fifteen-year search.

Although the principal concern of the CHOC-Smithsonian project will be with American instruments, many of the devices employed in our laboratories are of European ancestry. We must not reject a truly historic instrument because it has only "immigrant" status. The rise of American technology caused a great spurt in the development of industrial instrumentation, much of which was

truly native. In October 1982 the Instrument Society of North America inaugurated its Heritage Section, with aims analogous to those of the CHOC-Smithsonian proposal. Perhaps we can work alongside the ISA and other interested groups in finding and saving historic scientific instruments of all kinds.

The conservation of historic instruments is of course the primary concern. Although the safest location is in a museum, no such institution has unlimited exhibition or storage space. There are quite a number of well-maintained collections of instruments, both private and industrial. There is no need to disturb such collections, although some specific items might be more than welcome in a national collection. An important aspect of the project should be the cataloguing of such collections, so that a national register may be assembled.

An obvious adjunct to cataloguing is the search for necessary background information. Many makers of now-historic instruments seem to have limited their writings to invoices and the like, which rarely survive. The hunt for wills, apprenticeship indentures, and similar documents for early instrument makers are difficult without the help of specialists. The transition from custom work to commercial production brought other problems. Documentation then became a matter of industrial company records, which are rarely stored forever! Patent searches help, but rarely tell the whole story of the design and use of new

chemical instruments. Valuable information is often obtained by interviewing those pioneers who are still with us: there is plenty of room for oral history in this field. Perhaps present-day instrument makers will be encouraged to preserve the prototypes that will give rise to the instruments of tomorrow. Historians of the future will then be able to begin at the beginning.

The finding of actual instruments and relevant background information is not always straightforward. The success of this project will depend heavily on the cooperation of all who place some value on our scientific heritage. We look forward to hearing from those who are interested.

JOHN T. STOCK
University of Connecticut

Resources of the Center for History of Chemistry

CHOC Manuscript Collections

Though not intended primarily as a repository for archives, CHOC has the capacity to store and care for limited quantities of documents and other manuscript records. The Edgar Fahs



This "View of Practical Chemistry" from the April 1751 issue of the *Universal Magazine* depicts a variety of sand baths and other furnaces set up for distillations, extractions, and related operations. The accompanying discussion, third in a series begun in 1747, provides instruction on "the power of fire upon bodies, and the method of regulating it, so as to produce the desired effect." From the E. F. Smith Memorial Collection.

Smith Collection houses a variety of manuscript material on the history of chemistry, most notably the papers of Smith himself. Three times president of the American Chemical Society and professor of chemistry at the University of Pennsylvania, Smith was also one of the founders of the ACS Division of History of Chemistry and author of several histories of chemistry and biographies of early chemists (see *CHOC News*, October 1982, pp. 5-6). Smith's papers include his unpublished autobiography, a revealing account of the professionalization of chemistry in late nineteenth-century America, and hundreds of letters and other memorabilia collected from his contemporaries and famous chemists of earlier generations.

In connection with his own historical writing, Smith was particularly interested in the letters and lecture notes of the first teachers of chemistry in America. The Smith Collection thus contains substantial holdings of material on such figures as Joseph Priestley (who came to America in 1794), Benjamin Rush, Robert Hare, James Curtis Booth, and Charles M. Wetherill. Among the historians of chemistry who used the resources of the Smith Collection in its first two decades were Tenney L. Davis and Charles A. Browne, both of whom made significant contributions of their own papers and collected materials to the collection.

This tradition continues. Recently CHOC acquired two small but significant collections of documents. The first, a gift to the Smith Collection from his daughter, consists of the published papers and autobiography of Isidor Traube, a German biochemist and cousin of Hans Krebs who had arranged for the papers to be deposited in the Smith Collection. The second is a series of bound notebooks of J. M. Weiss, consulting chemical engineer. The gift of his son, F. B. White, Weiss's notebooks are arranged alphabetically by subject (e.g., acids, Bakelite experiments, catalysts). They date from 1910 to 1941 (though most entries are from the 1920s), and include notes on experiments and procedures, summaries of conferences, and current literature. Weiss was associated professionally with many of the pioneering industrial chemists of his time (especially in the Northeast), and his conversations with them are condensed in these notebooks.

A more detailed description of CHOC

manuscript holdings is available to interested researchers upon request.

ELEANOR MAASS

Recent Acquisitions

As part of CHOC's program to document the history of chemistry, chemical engineering, and the chemical process industries, we are actively building the holdings of books and journals in the Smith Collection. The generosity of friends makes this endeavor immeasurably easier: from time to time, we will note gifts of particular interest in the columns of CHOC News.

Albert Matlack of Hockessin, Delaware, recently donated a rare edition of Guyton de Morveau's *Lecciones de Química, Teórica y Práctica . . .* (Madrid: Espinosa, 1789). Originally published in 1777-78, the lectures were arranged as part of the public courses of chemistry held at the Dijon Academy beginning in 1776. The lectures were widely read and appreciated by European chemists when originally issued: indeed, in the preface

to the 1789 Madrid edition the translator asserts that no book is better suited for the study and teaching of chemistry. Accordingly, he decided to issue a Spanish version following the new nomenclature of Guyton de Morveau, Lavoisier, Berthollet, and Fourcroy. His source for the new chemical "language" was the 1788 Spanish edition of their *Méthode de nomenclature chimique* by Pedro Gutierrez Bueno, professor of chemistry at the Real Laboratorio de Madrid. The *Lecciones* thus amply demonstrates the active interest of Spanish chemists in the chemical reforms of the 1780s.

Chemical nomenclature was also the subject of another recent gift to the Smith Collection. James L. Wood of the Chemical Abstracts Service (CAS) contributed a set of books that had belonged to Austin M. Patterson, director of the CAS from 1909 to 1914 and a CAS consultant on nomenclature from 1916 to 1956. Patterson had developed his interest in this area when enlisted by his successor Evan J. Crane to tackle the problem of preparing the first Decennial Index for *Chemical Abstracts* in 1916. With C. E. Curran, Patterson

LECCIONES DE QUÍMICA, TEÓRICA Y PRÁCTICA,

DISPUESTAS

Por un nuevo método, y con arreglo á los descubrimientos modernos, para servir á los Cursos públicos de la Academia de Dijon.

Por Mrs. de Morveau, Maret y Durande, de la misma Academia.

Traducidas al Castellano,

Adaptando la nueva Nomenclatura, y añadidas, y corregidas por la segunda edicion de 1788.

TOMO PRIMERO.



Con las licencias necesarias:

MADRID: MDCCLXXXIX.

EN LA IMPRENTA DE DON ANTONIO ESPINOSA,
CALLE DEL ESPEJO.

Se hallarán en la Librería de D. Felipe Tieso, calle de las Carretas, frente del Correo.

Title page of Guyton de Morveau's Lecciones. In 1776 the Dijon Academy appropriated funds for a public course of lectures on chemistry directed by Guyton. Maret and Durande were the other members of the Academy committee who dealt with the relations of chemistry to medicine and botany, respectively. From the E. F. Smith Collection.

devised a systematic method for naming and indexing chemical compounds that was the foundation for later CAS efforts in this field. Among the classics on chemical nomenclature owned by Patterson were the *Méthode de nomenclature chimique* (Paris, 1787) and James St. John's 1788 English translation; J. Johnson, *Translation of the Table of Chemical Nomenclature Proposed by De Guyton, . . . Lavoisier, Berthollet & de Fourcroy* (London, 1799); and Richard Chenevix, *Remarks upon chemical nomenclature according to the principles of the French Neologists* (London, 1802). Patterson's collection also includes less well known volumes on the subject, like the *Vocabulary & tables of the old & new nomenclature of the names of all subjects of chemical science* (Edinburgh, 1796), and a comparison of old and new terminology in chemistry and mineralogy compiled by L. J. Sevrin (Paris, 1807). These volumes add depth to the Smith Collection's already rich holdings on this aspect of the "chemical revolution."

Other recent gifts have greatly augmented our coverage of nineteenth- and early twentieth-century chemical treatises and textbooks. William A. Cunningham, emeritus professor of chemical engineering at the University of Texas at Austin, donated over two dozen titles from the period 1839-1939, including works by John White Webster (the Harvard chemistry professor convicted of murder in a notorious trial in 1850), Ira Remsen, Wilhelm Ostwald, and Arthur A. Noyes. Finally, Thomas Jefferson University and the Rohm & Haas Company donated a variety of older books on chemistry and chemical technology culled from their research libraries. These included volumes by such European chemists as Gay-Lussac, Gerhardt, Liebig, and Thomas Thomson; and such Americans as James Curtis Booth, Frank W. Clarke, and John W. Draper (first president of the American Chemical Society).



Priestley's house in Northumberland

PUBLICATIONS

With this issue, CHOC News inaugurates a column of book reviews as part of our coverage of new publications in the history of chemistry. As before, authors and readers are urged to notify the Editor of pertinent material on the history of chemistry and chemical technology. We are particularly interested in noting historical articles appearing in nonhistorical journals; let us know if you come across useful articles in unlikely places

Penicillin Priorities

John C. Sheehan. *The Enchanted Ring: The Untold Story of Penicillin.* xvi + 224 pp., bibl., index. Cambridge, Mass./London: MIT Press, 1982. \$15.

This short book reviews the discovery of penicillin, its development as a wonder drug, the massive World War II efforts to produce it in quantity from natural sources, its eventual synthesis in the laboratory, and finally, the legal battles over the patent rights that continued long after the synthesis was complete. The book is partly historical and partly autobiographical. (It is "soft" history in the sense that it contains no footnotes, but it does provide a short "Selected Bibliography.")

The first chapter of the book, titled "The Lonely Search," was almost enough to dissuade this reader from going further. It was intended as an introduction, but it promises a book filled with the personal successes and the philosophy of John Sheehan. Fortunately, most of the remainder of the book does not fulfill that promise. I suggest that readers skip the first chapter or skim it quickly.

Sheehan then gets down to the business of reviewing the early history of penicillin. He begins with the work of Fleming, reviews the research and early clinical experiments of Florey and Chain, and then relates the story of the first mass use of penicillin following the Coconut Grove fire in Boston in November 1942. In the midst of this he discusses the Nobel Prize given for the discovery of penicillin, and some of the controversy regarding credit given for the discovery. He also devotes a short section to modern chemotherapy

and the discovery of the sulfanilamides.

In the next chapter Sheehan deals with the crash program to produce large quantities of penicillin for use in World War II. His account of the sometimes reluctant cooperation of the British with the Americans, and of pharmaceutical firms and government laboratories, is intriguing and exciting. This program was much too complex to be covered fully in this short book, but historians of science should thank Sheehan for calling attention to an episode which will repay further scholarly study.

Although the commercial isolation of penicillin from natural sources was an enormous success, the laboratory synthesis eluded scientists throughout the war. In 1948 Sheehan left Merck and Company for MIT, where he turned his attention to, among other problems, the total synthesis of penicillin. In Chapter 4, "The Impossible Problem," he describes the chemistry of penicillin and early difficulties in determining its molecular structure; in Chapter 5, "The Conquest of Penicillin," he describes much of his own work leading to the synthesis of penicillin. He recounts his development of dicyclohexylcarbodiimide for the synthesis of peptide bonds (a good story on its own) and how he used the reagent in the final steps of the penicillin synthesis. These two chapters again leave the reader wishing for a more complete study. I'm afraid the layman will find the information much too technical, the few structures and equations bewildering, while the chemist—particularly the organic chemist—will wonder why Professor Sheehan has offered such a sketchy treatment of his work. I suspect he was trying to satisfy both scientists and non-scientists and, as is usually the case, will manage to satisfy neither. Nonetheless, the outlines of the synthesis are clearly presented; it merely remains for someone else to fill in the details.

Finally, Sheehan describes the legal battles over the patent rights to penicillin. It is obvious that his anger and frustration have mounted over the more than twenty years the case has been considered by the patent office and the courts. Unfortunately his detailed description seems nearly as long as the patent battle. The "Epilogue" contains a quick review of the whole story with comments on its historical, legal and ethical implications.

Sheehan tells a fascinating tale of sci-

entific cooperation, chemical genius and human determination. The book has its shortcomings, but it does provide a foundation on which some very fine history of science may be built.

LEON GORTLER
Brooklyn College

Reidel Launches History of Chemistry Series

The D. Reidel Publishing Company recently announced the inauguration of a book series in the history of chemistry. The series, "Chemists and Chemistry," aims to present biographies of both famous and lesser-known figures who had an impact on the chemical thinking of their time, as well as monographs dedicated to the history of specific areas of chemical science. Reidel hopes to reach a broad audience of chemists interested in the foundations and development of their science, and to provide valuable sources for professional historians of science.

Works already under contract include biographies of Amedeo Avogadro (1776-1856); Jean-Baptiste Boussingault (1802-1887), discoverer of the nitrogen cycle and a founder of experimental agricultural chemistry; and Thomas Beddoes (1760-1808), Oxford chemistry professor 1788-1792, proponent of "pneumatic" medicine, and mentor to the young Humphry Davy.

The first volume of "Chemists and Chemistry" is scheduled to appear early next year. Reidel will consider further contributions to the series. Interested authors should contact Mr. Ian Priestnall, D. Reidel Publishing Company, 479-483 Voorstraat, P.O. Box 17, 3300 AA Dordrecht, Holland.

Wisconsin Chem Department History Approaches Publication

Aaron Ihde has written a history of the Wisconsin chemistry department from its beginnings in 1854, when S. P. Lathrop taught two seniors in the summer, to its present position as a leading producer of American chemists. Professor Ihde's manuscript deals with the beginnings of graduate instruction

in chemistry at Wisconsin; the role of key figures like Louis Kahlenberg, J. H. Mathews, and Farrington Daniels; the relations of chemistry to other fields on the Wisconsin campus; and the career patterns of Wisconsin's chemical graduates in government, industry, and academe. This history is presented in the context of broader trends in American higher education and industry.

At present, the publication of the volume is still being negotiated. The December 1982 issue of the *Badger Chemist* included a call for those who would like to obtain a copy of the book to indicate their interest by writing to Chemistry Department History, Chemistry Department, 1101 University Avenue, University of Wisconsin, Madison, WI 53706. The probable price of the book will be between \$20 and \$25, but no money need be sent at this time. Some indication of prepublication demand will enable the price to be kept as low as possible, and those who reserve a copy now may be eligible for a reduced price upon publication. We look forward to the early appearance of what promises to be an important and interesting study of the rise of a leading academic chemical center.

Seventy-Five Years of Chemistry in Oklahoma

Who was the chemistry professor who stood on his head to demonstrate the concept of equilibrium? What chemical company supplied most of the flourides used in early cavity-fighting toothpaste tests? The answers to these questions, as well as more serious matters of the development of chemical education and the chemical industry in Oklahoma, will be found in *Oklahoma and Chemistry: A Report to Oklahomans from the Chemists and Chemical Engineers of Oklahoma* (1982), written by Wayne E. White and John W. Palm. Sponsored by the Oklahoma sections of both the American Chemical Society and the American Institute of Chemical Engineers in honor of the state's Diamond Jubilee, *Oklahoma and Chemistry* is a popular account of the contributions of chemists and chemical engineers to Oklahoma's economy and society over the past seventy-five years. To obtain further information or to order a copy, contact either M. A. Brainerd, Brainerd Chemical Company, P.O.

Box 45010, Tulsa, OK 74145; or W. C. Trombold, VanWaters & Rogers, P.O. Box 50387, Tulsa, OK 74150. Single copies are \$5.50, and quantity discounts are available.

Joseph Black Commemorative Symposium

The Royal Scottish Museum has recently announced the publication of *Joseph Black, 1728-1799: A Commemorative Symposium* (Edinburgh: Royal Scottish Museum Studies, 1982), the proceedings of the museum's observance of Black's 250th birthday in 1978. His development of the concepts of latent and specific heats and his role in the establishment of pneumatic chemistry have reserved for Black a special place in the history of chemistry. As a leading exponent of philosophical chemistry, Black was also a significant force in the Scottish Enlightenment and played a major part in the exceptional success of the Edinburgh Medical School.

The volume begins with an outline biography by R. G. W. Anderson and concludes with a detailed survey by William A. Cole of extant sets of manuscript student notes of Black's famous chemistry lectures. Christopher Lawrence assesses the philosophical context of Black's work. Peter Swinbank sketches the teaching of experimental science at Glasgow during Black's tenure, while Henry Guerlac examines the evolution of Black's ideas on change of state and specific heat while at Glasgow. Andrew Doig discusses Black's success as a prominent physician. W. P. Doyle analyzes Black's accommodation to Lavoisier's new chemistry in his Edinburgh teaching, while J. R. R. Christie discusses the extent to which the received picture of Black has been colored by the attitude of his editor and disciple John Robison.

This volume is a companion to R. G. W. Anderson's *The Playfair Collection and the Teaching of Chemistry at the University of Edinburgh, 1713-1858* (1978), which includes a discussion of Black's contributions to the teaching of medicine and chemistry at Edinburgh and a catalogue of his surviving apparatus. Both books are available from the Royal Scottish Museum, Administration Office, Chambers Street, Edinburgh EH1 1JF, Scotland.

European Chemistry Museums

J. W. van Spronsen writes to inform us of two of his recent publications which will interest inveterate museum visitors (and supplement the guide noted in *CHOC News*, October 1982, p. 9). *Historie van de Scheikunde in Europese Musea*, Mededeling No. 215 uit Museum Boerhaave (Leiden, 1983) is an informative and profusely illustrated guide to fifteen European museum collections of interest to chemists, including the Technical Museum, Vienna; the National Technical Museum and "Gold Lane" in Prague; the Röntgen Museum (Renschheid-Lennep, Federal Republic of Germany); the Palais de la Découverte, Curie Laboratory, and Institut Pasteur in Paris; the Royal Scottish Museum, Edinburgh; the Istituto e Museo di Storia della Scienza in Florence; the Museum Boerhaave in Leiden; and the Werner Collection of the Inorganic Chemistry Institute at the University of Zurich. Each entry discusses the exhibits and their historical significance, with references for further reading and the museum's address and hours of operation. This guide is a sequel to a similar catalogue by van Spronsen published in 1973 by the Rijksmuseum voor de Geschiedenis der Natuurwetenschappen in Leiden. Both volumes may be purchased from the author. Van Spronsen has also compiled *A Guide to European Museums and Expositions on Chemistry and History of Chemistry* (Budapest: Museum of Science and Technology, 1981) under the auspices of the Federation of European Chemical Societies Working Party for History of Chemistry. This pocket-sized pamphlet covers some three dozen collections in fifteen countries. For further information on the availability of these publications, contact Dr. J. W. van Spronsen, Veenendaalkade 463, 2547 AL Den Haag, Nederland.

Early American Practical Chemistry

Students of chemical technology in early America are indebted to Evald Rink (Eleutherian Mills Historical Library), compiler of *Technical Americana: A Checklist of Technical Publications Printed Before 1831* (Millwood, New York: Kraus International Publications, 1981). This invaluable compendium of a broad range of

printed sources on technology, engineering, manufacturing, mining, and transportation includes sections on chemistry and pharmaceutical chemistry, fertilizers, dyeing and painting, chemical manufactures, and mineral production. Rink's bibliography suggests the rich and untilled resources for investigating the relations of chemistry and industry in the colonial and early national periods.

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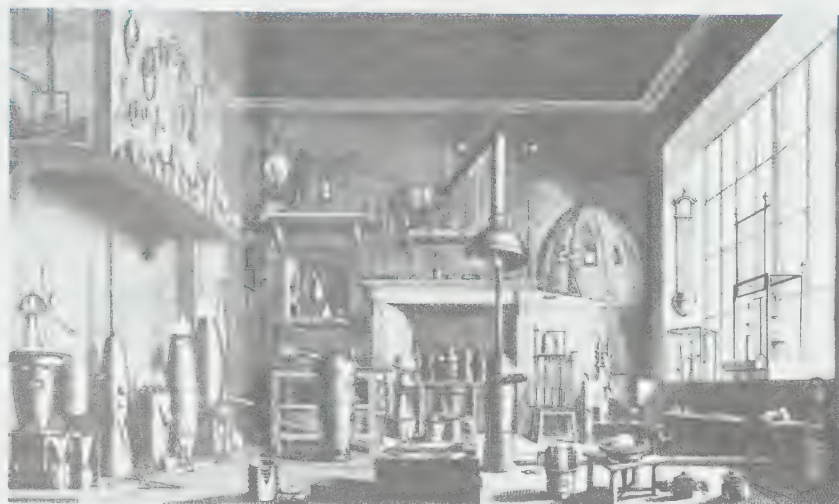
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Paul M. Priebe; George B. Kauffman. "Making Governmental Policy Under Conditions of Scientific Uncertainty: A Century of Controversy About Saccharin in Congress and the Laboratory." *Minerva*, 18 (1980 [1982]), 556-574.

R. Steven Turner. "Justus Liebig versus Prussian Chemistry: Reflections on Early Institution-Building in Germany." *Historical Studies in the Physical Sciences*, 13 (1982), 129-162.

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MEETINGS

186th ACS National Meeting, Washington, D.C., 28 August–2 September 1983.

The Washington meeting promises a plethora of historical programs. Activities begin on Sunday, 28 August, with exhibits on "Chemistry in Philately" (sponsored jointly by the Divisions of History of Chemistry and Chemical Education) and a traveling version of the CHOC exhibition "Joseph Priestley, Enlightened Chemist." These exhibits will be displayed in the exposition area, where participants will also find a CHOC information booth.

The highlights of Monday and Tuesday, 29–30 August, will be the symposium on "The Legacy of Joseph Priestley: 1733–1983." Sister Mary Virginia Orna (College of New Rochelle) will preside on Monday morning, with papers scheduled by Robert E. Schofield (Iowa State University), "The Professional Work of an Amateur Chemist: Joseph Priestley, 1733–1804"; Isaac Kramnick (Cornell University), "Joseph Priestley: Science and Political Reform"; Derek Davenport (Purdue University), "Joseph Priestley in Caricature"; and John Ruskin Clark (San Diego, California), "Priestley's Epistemological Integration of Science and Theology." O. Bertrand Ramsay (Eastern Michigan University) will chair the afternoon session, which will include talks by John McEvoy (University of Cincinnati), "Joseph Priestley and the Chemical Revolution: A Thematic Overview"; Fred-eric L. Holmes (Yale University), "Lavo-

isier and Priestley in the 1770s"; Arthur L. Donovan (Virginia Polytechnic Institute & State University), "Evolution and Revolution: Joseph Black and Joseph Priestley on Pneumatic Chemistry and Natural Philosophy"; Bernard Langer (Ramapo College), "Joseph Priestley as Chemical Theorist"; and Harold Goldwhite (California State University, Los Angeles), "Priestley and Warltire, 'The Celebrated Itinerant Teacher.'"

John McEvoy will chair the Tuesday morning session of the Priestley symposium, featuring papers by Aaron J. Ihde (University of Wisconsin), "What Did Lavoisier Know and When Did He Know It?"; A. Truman Schwartz (Macalester College), "Priestley's Materialism: The Consistent Connection"; Seymour S. Cohen (State University of New York at Stony Brook), "Faith and Reason: Joseph Priestley and Thomas Cooper in Pennsylvania"; Donald J. D'Elia (State University College, New Paltz), "Dr. Joseph Priestley and His American Contemporaries"; and Jeffrey L. Sturchio (New Jersey Institute of Technology), "The Same Summer and the Same Sun: Priestley, Ingenhousz, and the Elucidation of Photosynthesis, 1771–1787." The concluding session of the symposium, on Tuesday afternoon, features two Nobel laureates—Melvin Calvin and Linus Pauling—and ACS president Fred Basolo (see box, p. 5).

Also scheduled for Tuesday afternoon, 30 August, is a HIST session of general papers. The diverse array of topics includes biographical studies of J. J. Berzelius, Otto Bayer, W. Albert Noyes, Jr., and William J. Sparks; the chemical kinetics of Lewis Carroll's

friend, A. G. Vernon Harcourt; the reception of Kekulé's dream accounts by psychologists and psychoanalysts; the discovery of DDT; and early automation in the chemical industry. This session will follow the annual Dexter Award luncheon, at which Arnold Thackray will make his acceptance address.

From the eighteenth-century focus of the Priestley symposium, attention shifts later in the week to the recent history of physical organic chemistry. On Wednesday and Thursday, 31 August–1 September, the Divisions of History of Chemistry and Organic Chemistry are cosponsoring the Louis P. Hammett Symposium on the History of Physical Organic Chemistry (see box for further details).

3rd BOC Priestley Conference, London, England, 12–15 September 1983.

The Historical Group of the Royal Society of Chemistry (with the support of the Society for the History of Alchemy and Chemistry) has organized a historical symposium as part of this year's BOC Priestley Conference to celebrate the 250th anniversary of Priestley's birth. The day-long symposium will be held 13 September. For further information, contact Dr. John F. Gibson, The Royal Society of Chemistry, Burlington House, London W1V 0BN, England.

Society for History of Technology, Washington, D.C., 20–23 October 1983.

The highlight of this meeting for *CHOC News* readers will be a session on "Chemists and Chemical Engineers: Professionalization and Conflict, 1870–

Dow Appoints Company Historian

E. N. Brandt, senior counselor in Public Affairs, has been designated historian of the Dow Chemical Company, Midland, Michigan. In this capacity, he will report to H. H. Dow, corporate secretary. "We are inaugurating an effort to collect and preserve items significant to the history of the company in an organized way," Dow said. "Up to now we have not done this—not systematically, at least—and we are in danger of losing materials that may be critical for future historians." Brandt will be responsible for screening and selecting a Dow historical collection. A 30-year Dow employee and former public relations director of the company, Brandt worked closely with Pulitzer Prize winner Don Whitehead, who wrote "The Dow Story," a company history published in 1968.



Dow Chemical metallurgical laboratory, 1924. Courtesy Dow Chemical Company.

1930" sponsored by the Pelicans, SHOT's interest group for the history of chemical technology. This session, scheduled for 9:00 a.m., Friday, 21 October, will include papers by Terry S. Reynolds (University of Wisconsin), "The American Institute of Chemical Engineers: The Struggle for Legitimacy, 1908-1930"; Thomas J. Misa (University of Pennsylvania), "A Changing Market for Chemical Knowledge: Applied Chemistry and Chemical Engineering at the University of Pennsylvania, 1851-1909"; and Jean-Claude Guédon (Université de Montréal), "Chemical Engineering by Design." John A. Heitmann (CHOC) will chair the session, and Daniel P. Jones (University of Illinois Medical Center) and Robert L. Pigford (University of Delaware) will comment.

Other papers of interest deal with the large-scale production of helium in the United States during World War I and I. G. Farben and synthetic rubber development during the Third Reich. For details contact the SHOT secretary, Prof. Carroll Pursell, Department of History, University of California, Santa Barbara, CA 93106.

History of Science Society, Norwalk, Connecticut, 27-30 October 1983.

The relations of science and industry will be a major theme of the Burndy Library meeting. CHOC Director Arnold Thackray will chair a session on "Science and Industry in Twentieth-Century America: Resources and Research Agendas," scheduled for Friday morning, 28 October. Thackray will also comment on the papers by Spencer Weart (AIP Center for History of

Hammett Symposium on the History of Physical Organic Chemistry

A two-day symposium on the history of physical organic chemistry in honor of Louis P. Hammett will be among the highlights of the Washington ACS meeting. Organized by Leon Gortler (Brooklyn College) and Cheves Walling (University of Utah) and jointly sponsored by the Divisions of History of Chemistry and Organic Chemistry, the symposium will be held 31 August-1 September 1983. The list of participants reads like a "who's who" of the field.

Wednesday morning's proceedings will include "Physical Organic Chemistry in the United States, 1875-1932," by D. Stanlev and Ann Tracy Tarbell followed by Paul D. Bartlett on "Cationic Mechanisms" and Frank H. Westheimer on "The Application of Physical Organic Chemistry to Biochemical Problems." The morning concludes with "Historical Perspectives on Linear Free Energy Relations" by Ernest Grunwald and remarks by Louis P. Hammett

The other sessions of the symposium will provide a diverse array of perspectives on the history of physical organic chemistry. Among the announced topics are the quantitative study of acids and bases; an early challenge to the Hammett equation; the role of free radical chemistry in the field's development; studies of reaction kinetics and mechanisms; the importance of conformational analysis and other stereochemical considerations; the contributions of British physical chemists; and the emergence of communities of physical organic chemists in the United States and Britain. Scheduled speakers include Joseph F. Bunnett, Cheves Walling, Ernest L. Eliel, Anthony Trozzolo, Jeffrey I. Seeman, O. Bertrand Ramsav, Leon Gortler, Martin D. Saltzman, John Shorter, Christopher L. Wilson, Frank R. Mayo, M. Christine King, Thomas T. Tidwell, James G. Travnham, and Thomas A. Evans.

Physics), "Obstacles to a History of Modern Industrial Physics"; Arthur L. Norberg (Charles Babbage Institute), "Availability of Resources and Themes in the History of Computing"; and Charles Weiner (Massachusetts Institute of Technology), "Genetic Engineering: The Risks and Benefits of Contemporary History."

Robert Multhauf (National Museum of American History) will chair a Friday afternoon session on "Polymers, Plastics, and Profits: Science and Invention in the Modern Chemical Industry," including papers by Jeffrey L. Sturchio (New Jersey Institute of Technology), "Bakelite Between the Wars"; David A. Hounshell and John K. Smith (Eleu-

INTERESTED IN FUTURE ISSUES?

The initial issues of CHOC NEWS are being distributed to a wide audience of chemists, chemical engineers, industrialists, and historians of science and technology. If you would like to continue receiving copies in the future, please detach and return this form. Thank you.

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therian Mills-Hagley Foundation and University of Delaware), "The Chemist and the Company: Wallace H. Carothers and Du Pont"; and Sheldon Hochheiser (Rohm & Haas Company), "Cast Sheets, Cockpits, and Jukeboxes: The Development of Plexiglas in the United States." John A. Heitmann (CHOC) will comment.

For details contact the HSS secretary, Dr. Audrey B. Davis, NMAH 5000, Smithsonian Institution, Washington, DC 20560.



American Institute of Chemical Engineers Diamond Jubilee Meeting, Washington, D.C., 30 October–5 November 1983.

Anniversary celebrations will culminate with the AIChE's Diamond Jubilee meeting. This week-long event at the Washington Hilton features a series of plenary sessions on energy and the environment, some 85 technical sessions, and a Wednesday evening gala which President Reagan is scheduled to attend. Readers of *CHOC News* may be particularly interested in the Tuesday morning session "AIChE: Yesterday and Today," to be chaired by Klaus Timmerhaus (University of Colorado) and Frank Verhoff (West Virginia University). AIChE president Robert H. Marshall and past presidents W. Kenneth Davis, Donald Dahlstrom, and Irving Leibson will address the development and future directions of chemical engineering and the AIChE, with special attention to government relations and human re-

sources. For further information on the Diamond Jubilee meeting, contact Ms. Lois DeLong, Public Relations, AIChE, 345 East 47th Street, New York, NY 10017.

187th ACS National Meeting, St. Louis, Missouri, 8–13 April 1984.

CHOC plans to cosponsor a symposium on "Information Sources in the History of Chemistry" with the Division of History of Chemistry. Further details will be contained in the next issue of *CHOC News*.

HIST will also sponsor its usual program of general papers (abstracts due by 15 December 1983) and symposia on the "History of Chemical Information Science II" (with the Division of Chemical Information) and "True Stories of Small Chemical Businesses" (with the Division of Small Chemical Businesses). For further information, contact the program chairman, Prof. O. Bertrand Ramsay, Department of Chemistry, Eastern Michigan University, Ypsilanti, MI 48197.

188th ACS National Meeting, Philadelphia, Pennsylvania, 26–31 August 1984.

The Philadelphia meeting will rival this year's Washington gathering in historical activities. Tentative plans include a new CHOC exhibit; joint CHOC-HIST symposia on information sources in the history of chemistry and the history of the chemical industry in the Delaware Valley; a CHOC-CHED-HIST workshop on the history of chemistry for chemistry teachers; other symposia on the history of catalytic oxidation and chemical information science; and a HIST session of general papers (abstracts due to the program chairman by 4 May 1984).

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CHOC NEWS, an occasional publication of the American Chemical Society, Center for History of Chemistry, University of Pennsylvania, reports on the Center's activities and other news of the history of chemistry, chemical technology, and the chemical industry. Address inquiries and information to the Editor, Jeffrey L. Sturchio, at the Center for History of Chemistry, E. F. Smith Hall/D6, University of Pennsylvania, 215 South 34th Street, Philadelphia PA 19104. Telephone: (215) 898-4896.

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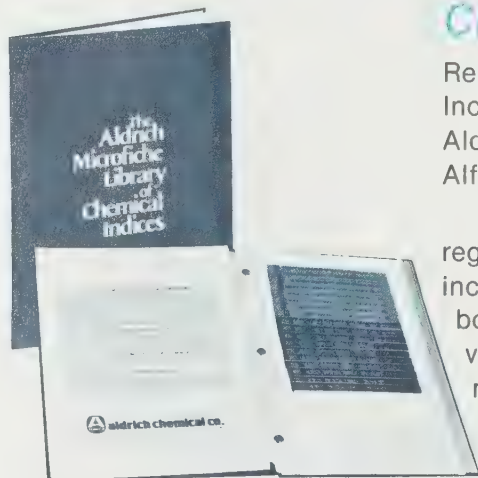
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About Our Cover:

This portrait of Adriaen Brouwer by the Flemish artist Joos van Craesbeeck (1605 - 1662) was the first painting acquired by our chemist-collector, Dr. Alfred Bader, and we know it has remained one of his favorites. Consequently, we considered it appropriate for the cover of this issue which features the article "Our Chemist-Collector Approaches Sixty." Furthermore, nothing could better depict the surprise of our chemist-collector upon seeing this *Aldrichimica Acta*.

As our chemist-collector approaches sixty, all his friends and colleagues wish him many more productive years in chemistry and art.

Are you interested in our *Acta* covers? Selections from the Bader Collection, with 30 duotone reproductions, many of previous *Acta* covers, and an introduction by Professor Wolfgang Stechow is available to all chemist art-lovers.

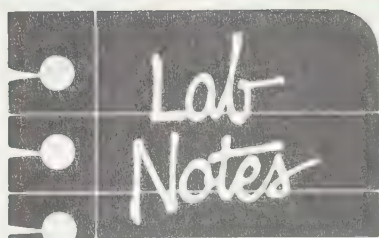
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Many of the early issues of the *Aldrichimica Acta* have become very rare. Please do not throw your issues away. In time, we believe that complete sets will become valuable, and — if you do not want to keep them — there probably are chemists near you who would be interested.

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To prolong the life expectancy of a GC syringe, we trim a septum to $\frac{3}{16}$ " using a cork borer, and place it at the base of the needle to provide a small cushion that protects the barrel tip during injections. Over the past 2 years, the life expectancy of our syringes has increased from about one month to over one year.

Judith L. Vozza
State Health Laboratory
1520 West Adams Street
Phoenix, AZ 85007

I would like to report a simple solution to a laboratory annoyance.

Application of vacuum grease to ground-glass surfaces always has been a messy job. I now keep the grease in a 10-ml disposable syringe and dispense it neatly as needed. Syringes are easily filled with grease by removing the plunger and squeezing the grease straight from the tube or by using a spatula if filling from a jar. The tip that comes on the needle end of the syringe makes a good cap.

Joseph H. Saugier
Associate Radiochemist
Midwest Research Institute
425 Volker Boulevard
Kansas City, MO 64110

For some time it has been known that a variety of homogeneous bimolecular reactions can be accelerated at high pressures (above 2,000 atm). Recent synthetic applications of high-pressure chemistry have included Diels-Alder cycloadditions, Michael additions and enolate condensations. Often selectivities and yields of such reactions are significantly improved, while conditions involving high temperatures or the addition

of Lewis acids can be avoided. Recently we began an investigation of the reduction of sterically hindered prochiral ketones with the asymmetric reducing agent Alpine-Borane (Aldrich) at elevated pressures.

Our initial explorations into high-pressure chemistry revealed that a number of groups are using a wide variety of equipment derived from both commercial and "homemade" sources. In general, the apparatus used consists of a hydraulic pump, a pressure intensifier (for pressures above 2,000 atm), a gauge, a pressure vessel and a valve to isolate the pressure vessel during reaction and release the pressure at the end of the reaction. Research pressure vessels from commercial sources have internal volumes ranging from about 5cc to more than 100cc, while fabricated vessels may cover a wider size range to meet individual needs.

One major difficulty with high-pressure work involves the design of a sample cell to isolate reactants from the hydraulic fluid during the reaction. A suitable sample cell must meet several strict requirements, especially retaining impermeability to the pumping fluid at high pressures while remaining resilient to rapid pressure changes. Additionally, the cell should be air-tight, easily filled, inexpensive, inert and readily available in a variety of sizes. Commonly, a sealed Teflon tube is used; unfortunately such tubes are often difficult to fill and seal, and become expensive if a number of sizes are stocked for use.

Fortunately an excellent cell can be easily formed from Aldrich disposable syringes. The all-poly design meets all the requirements. Other disposable syringes fail to remain closed to the pumping fluid at high pressures within the vessel while glass syringes often shatter when the pressure is released. In practice, a sample is taken up into the syringe in the normal manner. The needle is then replaced with a syringe cap. When necessary, the handle and finger holds are cut away to facilitate an easy fit of the cell into the pressure vessel.

We have used these cells for more than 30 days at 6,000 atm without mishap. When the reaction is over, the contents are emptied and the syringe is disposed of. Because the Luer and plunger seal are retained, these cells are especially suited for use with air-sensitive samples; their low cost and inertness also make them attractive for a wide range of chemistry.

Jim McLoughlin
Department of Chemistry
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**"Please
Bother
Us."**

by

Ypina Bader.

When the history of chemistry in our century is written, Prof. Barry Sharpless' asymmetric epoxidations will surely be among the most significant discoveries. One of Prof. Sharpless' important reagents in these epoxidations is anhydrous *tert*-butyl hydroperoxide. Some years ago Prof. Sharpless had suggested that we offer anhydrous TBHP in solutions, but the solutions in chlorinated solvents are unstable. Recently, Prof. Sharpless suggested that we offer the TBHP solution in toluene¹ which is stable.

Naturally we made it.

1) Hill, J.G.; Rossiter, B.E.; Sharpless, K.B. *J. Org. Chem.* 1983, 48, 3607.

27,016-4 *tert*-Butyl hydroperoxide,
anhydrous, 3.0M solution in toluene
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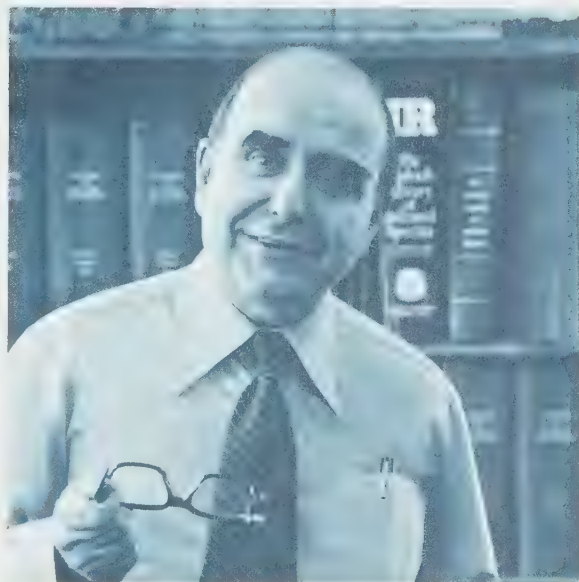
It was no bother at all, just a pleasure to be able to help.

"OUR CHEMIST-COLLECTOR" APPROACHES SIXTY

In 1924, Vienna, so recently the flamboyant capital of the Austrian Hungarian Empire and echoing the strains of the waltzes of Johann Strauss, was hardly recovering from World War I and the effect of the Peace Treaty. The lively, bustling, self-indulgent, high-living Viennese had been forced to change their lifestyle.

This was the world into which our "Chemist-Collector," Chairman of Sigma-Aldrich and Founder of Aldrich, Dr. Alfred Robert Bader, was born. His mother was a Hungarian of noble family. His father, son of the Chief Engineer to Ferdinand de Lesseps, builder of the Suez Canal, had died shortly after his birth, and he was brought up by his dearly loved aunt and uncle. From early childhood on, he was exposed to art in his own home and to the Old Masters at the Kunsthistorisches Museum in Vienna. It should not have been totally surprising, therefore, when at age ten he used money given to him for another purpose to acquire an Old Master drawing at an auction.

By the mid-thirties, Austria was heading towards the Anschluss with Germany. When possible, Jewish youngsters were sent off to presumably friendlier and safer environments. In 1938, saying goodbye to his surrogate parents for the last time, Alfred Bader journeyed to England, a move which may well have



Dr. Alfred Bader

saved him from death at the hands of the Nazis.

At fourteen, Alfred found himself at school in Brighton, Southern England, and, despite a strange language and an unfamiliar lifestyle, he was an exceptional student, whose qualities were soon recognized. He received a modest grant (supplemented by the occasional deal in stamps) to study chemistry at the Brighton Technical College. During this period his interest in art continued, and he became immersed in the study of the Bible. This combination of chemistry, art and Bible became his lifelong passion. Even at this early stage, he had begun to shape a future as scientist, businessman and collector.

This relatively settled interval in his life was soon to be disturbed by the German army advancing to the

beaches of Northern France, placing England in danger. Fearful of a threatened invasion, Churchill considered that refugees from Europe could be a potential threat to the security of Great Britain. He then made his "Collar The Lot" decision to intern not only potential Nazi-sympathizers but also a great many refugees. Most were interned on the Isle of Man off Britain, but many were shipped overseas. In 1940, Alfred found himself part of a shipload of German Jewish refugees destined for a prisoner-of-war camp on the

Richelieu River near Montreal, Canada. However, finding himself interned with able and learned tutors, Alfred put this most difficult period to good use, furthering his learning of the Bible and science.

Being hungry for any kind of news, he, like others in the camp, read through every line of any available newspaper. In doing so, he ran across the obituary of an elderly lady who had been his benefactor in England.

Editor's Note: Since our Chemist-Collector would never have permitted us to devote space in the *Aldrichimica Acta* to him, the references to his early days necessarily depended upon recollections of reminiscences by him to friends and associates and could not be checked for accuracy with the "source." Hence, for any inaccuracies in history, our apologies.

The item listed her son of Montreal among her survivors. Alfred's note of condolence led to a lifelong close association with his second surrogate family, the Wolf family of Montreal. Mr. Wolf helped to arrange for Alfred's parole from the camp in November, 1941, and for his admission to Queen's University in Kingston, Ontario, notwithstanding the absence of standard, formal admission requirements and the fact that the term was well along. His gratitude to Queen's University for this special accommodation is manifested by his service on its Board of Trustees and his contributing to a major collection of Old Masters in its Agnes Etherington Art Centre.

While at Queen's, Alfred overcame the obstacles of English as a second language so well that he entered and won the McColloch speaking contest and the sorely needed prize money associated with it. Thereafter, at the urging of his professors, he became a member of the University's championship debate team. He also served as president of the Hillel House and in other campus leadership positions while earning a B.Sc. degree in Chemical Engineering (1945), a B.A. in History (1946) and a M.S. (1947). During the summer and after graduation, Alfred worked for the Murphy Paint Company of Montreal. Here he generally spent a couple of days visiting customers to discover their needs, then as quickly as possible formulated a suitable paint. Sales soon doubled. Thus Alfred was first shocked to find his job terminated until he realized the company simply wished him to further his education and was prepared to assist with funds.

Alfred attended Harvard which provided him with years of stimulation and excitement. Of course, Alfred began to pursue studies in two distinct disciplines, art history competing with research in chemistry. The contest between the two became concern enough for one chemistry professor to declare anxiously, "Alfred, you haven't made up your mind whether you want to be a chemist or an art historian." Alfred decided perhaps reluctantly for chemistry. As

a doctoral research student of the famous Louis Fieser¹, he received great inspiration. Upon receiving his doctorate, Alfred intended to return to his former employer, but in the meantime, the Murphy Paint Company had been sold to Pittsburg Plate Glass, and they placed him in Milwaukee.

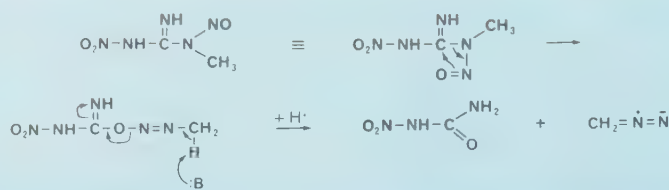
There, he was employed as a Research Chemist and later became Organic Group Leader in the paint division. Alfred found it wasteful of research chemists' time and talent to prepare high-purity intermediate compounds necessary to get on with the heart of the research itself. At that time, the only significant U.S. source for such products was a division of Eastman Kodak Company. He suggested to his superior to form a division to augment the list of high-quality intermediates available to research chemists. The proposal was rejected.

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pounds. Today, Aldrich is one of the world's major suppliers of such stable isotopes. The same year Alfred established Boranes, Inc., an Aldrich subsidiary, to develop entirely new chemical technology based on borane chemistry discovered by Professor H. C. Brown of Purdue University who was later to be recognized with the Nobel Prize in chemistry. Up to that point, Professor Brown had tried in vain to interest larger companies in the technology. In contrast, Alfred, with characteristic vision and decisiveness, promptly recognized and acted on the opportunity. Today, this activity is carried on at a separate plant in Sheboygan, Wisconsin.

In 1975, Aldrich merged with Sigma Chemical Company to form Sigma-Aldrich Corporation, thus combining the world's leading supplier of research biochemicals with what had become the leading supplier of organic and inorganic research chemicals. Alfred Bader, as well as two of Sigma's founders, Aaron Fischer and Dan Broida, envisioned the opportunity for interplay between the technical, service, and marketing strengths of the two companies in a way which would better serve the

research community thus making the combined company greater than the sum of its parts.

Sigma Chemical, having started in a small storefront in 1948, had a similar humble beginning. Its first biochemical product was ATP (adenosine triphosphate), a major source of energy in living organisms. The growth of Sigma had been due mainly to the vision, energy and hard work of its president, Dan Broida. Upon the merger, Dan Broida became Chairman and Alfred Bader President. In 1980, Broida stepped aside, and Bader became the Chairman. Unfortunately, Sigma-Aldrich was not to have the continuing support of Broida for long, for he passed away in 1981. However, as Bader has stated, "Broida was a legend in his own lifetime and probably did more than anyone else to advance biochemistry. Sigma will remain a lasting monument to his vision and untiring work."

At the time of the merger, Sigma also had a subsidiary, B-Line, which manufactured and distributed metal components for strut and cable tray systems used in routing electrical and mechanical services in industrial in-

stallations and utilities. Emphasizing the same principles of quality product and service, B-Line has prospered over the years as part of the Sigma-Aldrich organization.

Although some relatively small companies were acquired by Sigma-Aldrich over the years — such as, Makor Chemicals, Ltd. in Jerusalem which had the unique ability to produce bacterial and fungal toxins, and Floyd Green's Dyes and Stains Company — the major growth was internal, based on the development of new products and related product lines supplied at competitive prices backed by unsurpassed service.

Today, Sigma and Aldrich products are purchased by universities, research institutions, hospitals and industry in nearly every country in the world. Over one million catalogs are distributed. Apart from the USA, Sigma-Aldrich now has warehousing and production plants in England, Germany and Israel and sales locations in Canada, Belgium, France and Japan.

Alfred, as Chairman of a company that now employs over 1,800 people, must surely reflect that this is a far cry from his garage of 1951.

Over the years, Alfred has travelled extensively both in the USA and overseas visiting customers and suppliers. He is known throughout the chemical industry and at many universities. Early on, his main mode of transport was the train, usually at night, while he snatched a few hours sleep to maximize the use of time and minimize expenses. In his customary manner, he soon became an expert on train timetables. As the company grew, Alfred also had the comfort of being driven from place to place by the company's salesmen. Alfred readily adapted to this way of life having the ability to fall asleep quickly, occasionally arousing for a few minutes to comment, "what lovely countryside," without necessarily gazing out of the window. Suitably refreshed between visits to customers and suppliers, Alfred would devote the full day to business. There was hardly any time for eating. A quick sandwich generally sufficed. Even



Alfred Bader and Dan Broida

Research at Aldrich. This made possible the carrying on of contract work for governmental and pharmaceutical clients with the natural fall-out of both new products and greater insight into the needs of the research chemist.

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Another unique development by Aldrich was the formation of the ABC (Alfred Bader Chemical) Division of Rare Chemicals. This certainly stemmed from Alfred's passion for collecting, in this case, chemicals. But again, he saw the possibilities of acquiring rare and difficult-to-obtain chemicals from universities and laboratories around the world and making them available to others in the research community. Today, over 23,000 such products are offered. The chemicals are featured now in the "Aldrich Microfiche Library of Chemical Indices."

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Aldrichimica acta



Aldrichimica Acta Preview Issue 1967

in the evening, little thought was given to culinary delights, for then Alfred either switched his attentions to looking for objects of art or had further business meetings. At the end of such a day, it was not uncommon for Alfred to remark, "put that down to a day's holiday." The Aldrich salesmen, who perhaps had driven hundreds of miles, did not always agree with these well meant comments, but everyone admired his stamina.

During the growth of the company, Alfred continued his intense interest in art — particularly Old Masters — and the Bible. He has assembled an important private collection of 17th-Century Dutch Masters, and found time to teach Bible at a

religious school. Being unable to resist fine paintings, Dutch or otherwise, the homes of Alfred's friends and business associates, museums and universities became the beneficiaries of his remarkable eye for those acquisitions which did not fit into his private collection. Apart from Queen's University, institutions benefiting from his Old Master "finds" include The Milwaukee Art Center, the Allen Memorial Art Center, The Minneapolis Institute of Arts, Oberlin College, and the Fogg Art Museum at Harvard.

As a recognized art historian, Alfred was invited to act as guest curator of The Milwaukee Art Center in 1976 and to organize an exhibition "The Bible through Dutch Eyes." He produced a scholarly catalog reflecting his insight and knowledge of painting and the Bible. He is a much sought-after lecturer throughout the USA, Canada and Europe on subjects such as "the Bible as represented by the Dutch Masters" and "the chemistry involved in the restoring of works of art." He was selected as Fellow of the Royal Society of Arts in London in recognition of his achievements as an art collector and



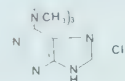
The chemist-collector at his desk in 1972

historian, and his research in art restorations.

Ten years ago, on the occasion of Alfred's fiftieth birthday, Professor Wolfgang Stechow wrote in the introduction to "Selections from the Bader Collection:" "Lots of art historians could learn a great many things from Alfred Bader; and all art lovers are indebted to his zeal, his perspicacity and his often proven generosity in sharing his treasures with them."

In spite of his enthusiasm for art, chemistry was never neglected. Alfred has authored or co-authored 25 scientific publications covering a wide range of topics in the field of organic chemistry with the emphasis being on practical rather than theoretical chemistry. He also holds 27 patents.

His first scientific publication dealt with the osmium tetroxide oxidation of some long-chain unsaturated fatty acids² while the most recent concerned some work on purin-6-yltrimethylammonium chloride.³ It is interesting to note that Aldrich now offers all the starting materials which Alfred had to prepare for this research.



purin-6-yltrimethylammonium chloride

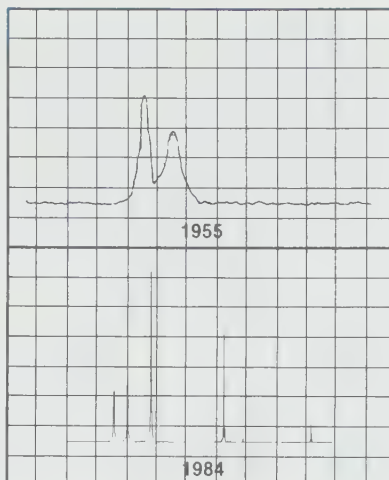
Of course, even Alfred could not completely resist the allure of elucidating structures using new techniques. His 1955 paper on "The Proton Magnetic Resonance Spectrum and Structure of Diketene"⁴ confirmed that liquid diketene exists in the 3-buten- β -lactone form. The contrast of his spectra with those recently taken on Aldrich's 300MHz (superconducting magnet) NMR equipment dramatically illustrates the strides in technology during the last decades.

While Alfred's practical nature and knowledge of chemistry provided the backbone in building Aldrich, he has also proved to be a most successful businessman. Yet, he is known to his many friends and acquaintances as a person who attaches little importance to the so-called "luxuries of life." Paintings — one of his weaknesses, although he does admit to others — are an exception. He still lives in the

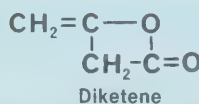
same house, which he himself describes as modest, bought in the early days of Aldrich. He generally drove a car discarded by an Aldrich salesman when it had been driven over 100,000 miles. One of Alfred's own favorite tales concerns the time he drove up to a fund-raising event. The house employee took one look at Alfred and his car and informed him that tradesmen were to use the back entrance.

Kind at heart as many friends can certainly substantiate, Alfred has never suffered fools gladly, and he would be the first to admit that patience is not one of his virtues. Indulging in few hobbies or interests outside of chemistry, the Bible, and art, Alfred's pragmatic, decisive approach and singlemindedness go far toward accounting for his success in the world of both chemistry and art.

Over the years Alfred Bader's contributions to science, industry and art have been recognized in many ways, including an Honorary Doctorate of Science degree from the University of



Diketene NMR Spectra



Wisconsin-Milwaukee; the 1983 Engineer-of-the-Year Award given annually to a Milwaukee-area engineer or scientist in recognition of distinguished contributions to the profes-

sion and the community; and honorary doctorates from the University of Wisconsin-Madison and Purdue University to be awarded this year.

As Alfred Bader approaches his 60th birthday his coworkers and associates at Sigma-Aldrich wish "Our Chemist-Collector" many more productive and fruitful years of activity as our Chairman and as a renowned art collector and historian.

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- 1) Fieser, L.F.; Bader, A.R. *J. Am. Chem. Soc.* **1951**, *73*, 681.
- 2) Bader, A.R. *ibid.* **1948**, *70*, 3938.
- 3) Klemm, R.; Schulze, H.; Eitlinger, M.G.; Bader, A.R. *J. Med. Chem.* **1966**, *9*, 981.
- 4) Bader, A.R.; Gutowsky, H.S.; Williams, G.A.; Yankwich, P.E. *J. Am. Chem. Soc.* **1956**, *78*, 2385.

The Authors

Dr. Tom Cori, President, Sigma-Aldrich Corporation.

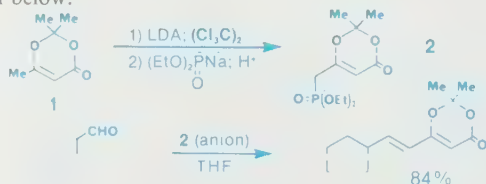
Ralph N. Emanuel, Managing Director, M. Emanuel, Ltd., Leatle Market, England.

Dr. David Harvey, President, Aldrich Chemical Company.

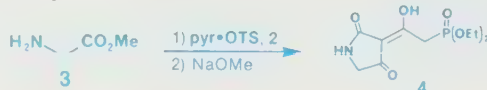
Marvin E. Klitsner, Partner, Foley and Lardner, Attorneys at Law.

Diketene-Acetone Adduct (2,2,6-Trimethyl-1,3-dioxen-4-one)

Over 30 years ago, the adduct derived from diketene and acetone, **1**, was shown to function as a convenient replacement for diketene in various reactions.¹ Recently, this interesting heterocycle has re-emerged as the precursor to a novel phosphonate β -keto ester synthon, **2**. Easily prepared from **1**, the anion of phosphonate **2** reacts with a variety of aldehydes to afford the expected Nazarov-type reagents in excellent yields, as shown below.



Even more impressive is the ease with which **2** reacts with α -amino esters to form 3-acetyltetramic acids activated toward olefin formation at the acetyl methyl group. Thus, glycine methyl ester (**3**) affords the corresponding tetramic acid **4** after two mild steps:



As expected, the anion of **4** (or similar acids) reacts with carbonyl compounds to afford the enoyl tetramic acid derivatives in high yield:



The above conversions are mild enough that acid- and heat-sensitive molecules have been constructed.

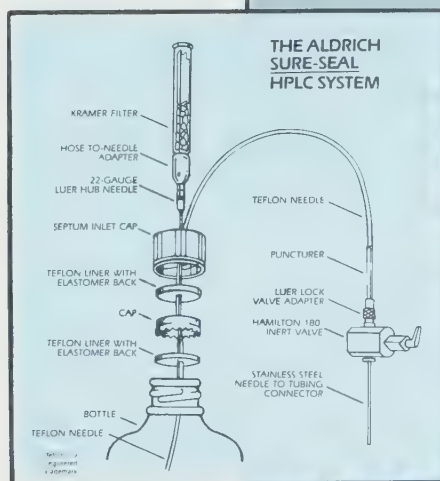
The potential utility of **1** in organic synthesis employing modern methodology is just beginning to be appreciated. The acidity of the vinyl methyl protons coupled with the latent β -keto ester function should stimulate other chemists to follow Professor Boeckman's fine start in developing adduct **1** as a useful natural product synthon.

References:

- 1) Carroll, M.F.; Bader, A.R. *J. Am. Chem. Soc.* **1953**, *75*, 5400.
- 2) Boeckman, Jr., R.K.; Thomas, A.J. *J. Org. Chem.* **1982**, *47*, 2823.

24,510-0	2,2,6-Trimethyl-1,3-dioxen-4-one (diketene-acetone adduct)	100g \$15.00
18,544-2	Hexachloroethane	100g \$7.60; 500g \$22.50
D9,923-4	Diethyl phosphite	250g \$6.25; 1kg \$21.90
23,223-8	Pyridinium 4-toluenesulfonate	25g \$19.50
		100g \$71.25

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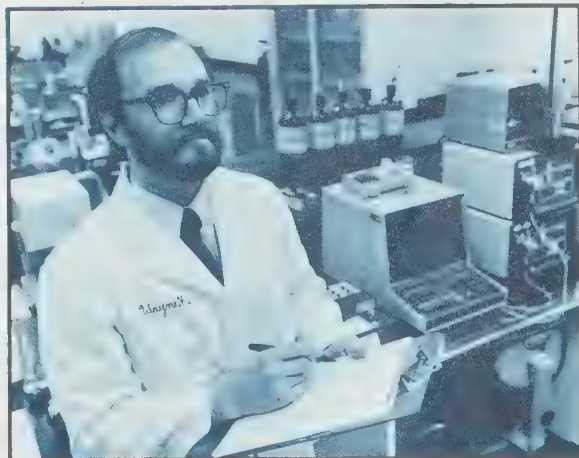
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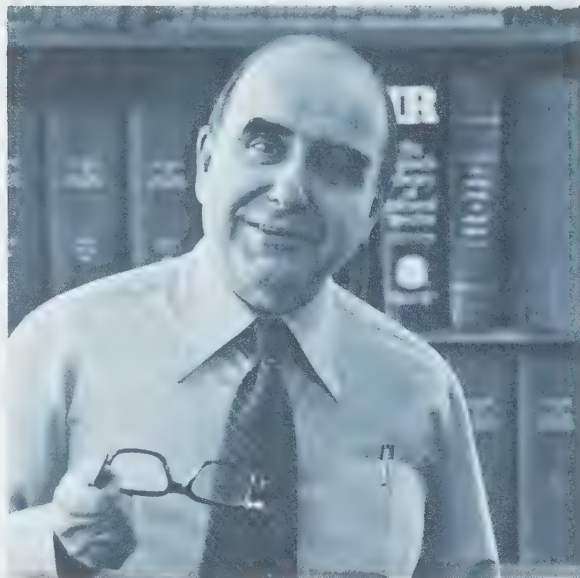
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"OUR CHEMIST-COLLECTOR" APPROACHES SIXTY



Dr. Alfred Bader

In 1924, Vienna, so recently the flamboyant capital of the Austrian Hungarian Empire and echoing the strains of the waltzes of Johann Strauss, was hardly recovering from World War I and the effect of the Peace Treaty. The lively, bustling, self-indulgent, high-living Viennese had been forced to change their lifestyle.

This was the world into which our "Chemist-Collector," Chairman of Sigma-Aldrich and Founder of Aldrich, Dr. Alfred Robert Bader, was born. His mother was a Hungarian of noble family. His father, son of the Chief Engineer to Ferdinand de Lesseps, builder of the Suez Canal, had died shortly after his birth, and he was brought up by his dearly loved aunt, a widow. From early childhood on, he was exposed to art in his own home and to the Old Masters at the Kunsthistorisches Museum in Vienna. It should not have been totally surprising, therefore, when at age ten he used money given to him for another purpose to acquire an Old Master drawing at an auction.

By the mid-thirties, Austria was heading towards the Anschluss with Germany. When possible, Jewish youngsters were sent off to presumably friendlier and safer environments. In 1938, saying goodbye to his mother for the last time, Alfred Bader journeyed to England, a move

which may well have saved him from death at the hands of the Nazis.

At fourteen, Alfred found himself at school in Brighton, Southern England, and, despite a strange language and an unfamiliar lifestyle, he was an exceptional student, whose qualities were soon recognized. He received a modest grant (supplemented by the occasional deal in stamps) to study chemistry at the Brighton Technical College. During this period his interest in art continued, and he became immersed in the study of the Bible. This combination of chemistry, art and Bible became his lifelong passion. Even at this early stage, he had begun to shape a future as scientist, businessman and collector.

This relatively settled interval in his life was soon to be disturbed by the German army advancing to the

beaches of Northern France, placing England in danger. Fearful of a threatened invasion, Churchill considered that refugees from Europe could be a potential threat to the security of Great Britain. He then made his "Collar The Lot" decision to intern not only potential Nazi-sympathizers but also a great many refugees. Most were interned on the Isle of Man off Britain, but many were shipped overseas. In 1940, Alfred found himself part of a shipload of German Jewish refugees destined for a prisoner-of-war camp on the Richelieu River near Montreal, Canada. However, finding himself interned with able and learned tutors, Alfred put this most difficult period to good use, furthering his learning of the Bible and science.

Being hungry for any kind of news, he, like others in the camp, read through every line of any available newspaper. In doing so, he ran across the obituary of a lady who had been the daughter-in-law of his benefactor in England.

Editor's Note: Since our Chemist-Collector would never have permitted us to devote space in the *Aldrichimica Acta* to him, the references to his early days necessarily depended upon recollections of reminiscences by him to friends and associates and could not be checked for accuracy with the "source." Hence, for any inaccuracies in history, our apologies.

The item listed her son of Montreal among her survivors. Alfred's note of condolence led to a lifelong close association with his second surrogate family, the Wolff family of Montreal. Mr. Wolff helped to arrange for Alfred's parole from the camp in November, 1941, and for his admission to Queen's University in Kingston, Ontario, notwithstanding the absence of standard, formal admission requirements and the fact that the term was well along. His gratitude to Queen's University for this special accommodation is manifested by his service on its Board of Trustees and his contributing to a major collection of Old Masters in its Agnes Etherington Art Centre.

While at Queen's, Alfred overcame the obstacles of English as a second language so well that he entered and won the McCulloch speaking contest and the sorely needed prize money associated with it. Thereafter, at the urging of his professors, he became a member of the University's championship debate team. He also served as president of the Hillel House and in other campus leadership positions while earning a B.Sc. degree in Chemical Engineering (1945), a B.A. in History (1946) and a M.S. (1947). During the summer and after graduation, Alfred worked for the Murphy Paint Company of Montreal. Here he generally spent a couple of days visiting customers to discover their needs, then as quickly as possible formulated a suitable paint. Sales soon doubled. Thus Alfred was first shocked to find his job terminated until he realized the company simply wished him to further his education and was prepared to assist with funds.

Alfred attended Harvard which provided him with years of stimulation and excitement. Of course, Alfred began to pursue studies in two distinct disciplines, art history competing with research in chemistry. The contest between the two became concern enough for one chemistry professor to declare anxiously, "Alfred, you haven't made up your mind whether you want to be a chemist or an art historian." Alfred decided perhaps reluctantly for chemistry. As

a doctoral research student of the famous Louis Fieser¹, he received great inspiration. Upon receiving his doctorate, Alfred intended to return to his former employer, but in the meantime, the Murphy Paint Company had been sold to Pittsburgh Plate Glass, and they placed him in Milwaukee.

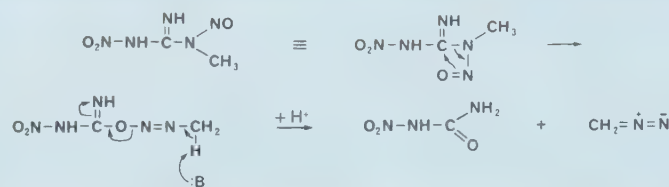
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Aldrichimica Acta First Issue 1968

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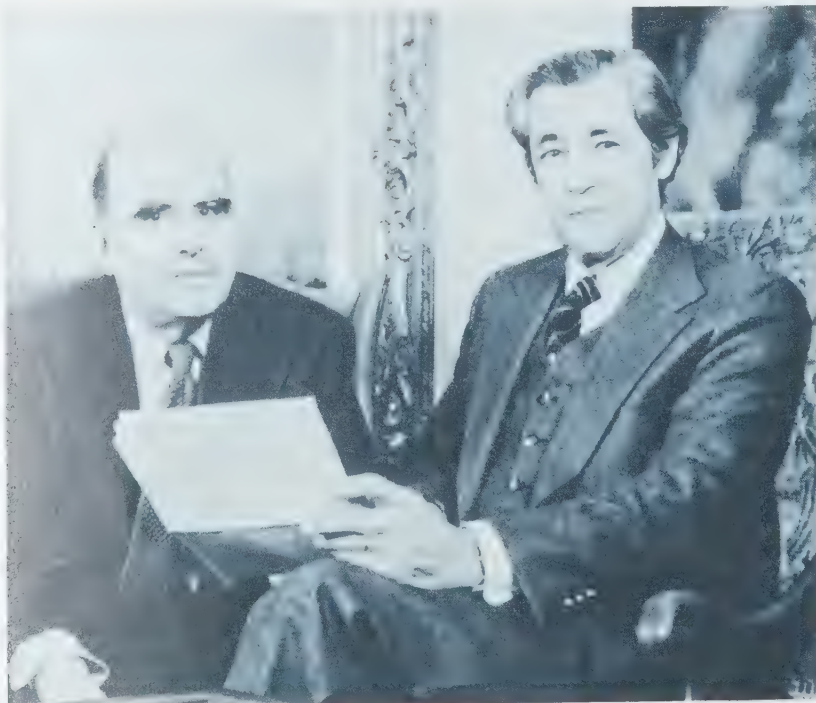
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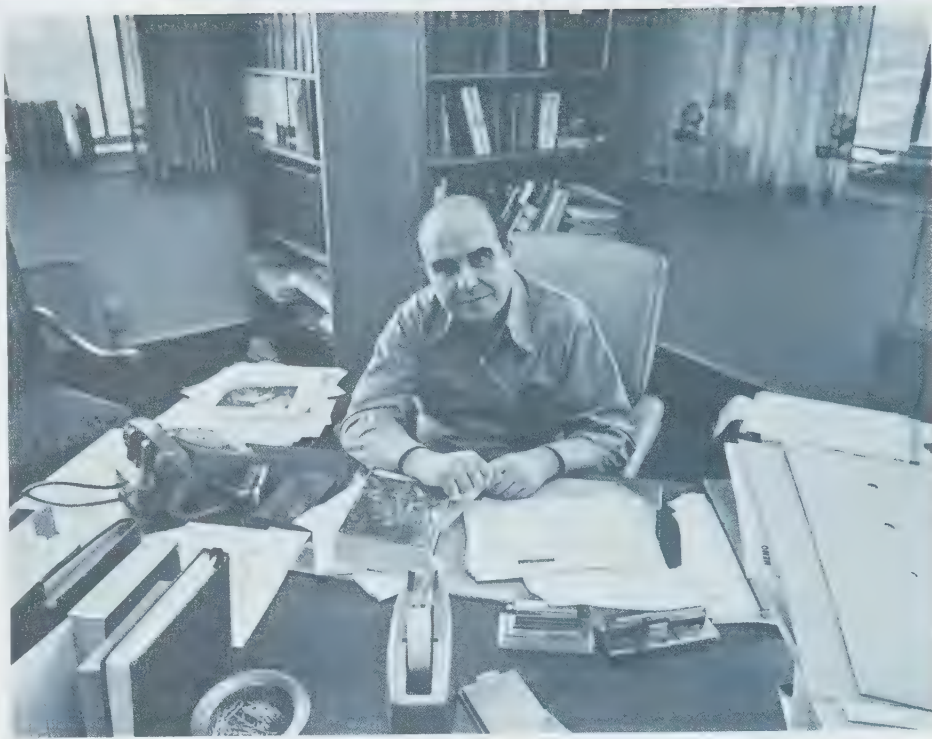


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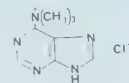
The chemist-collector at his desk in 1972

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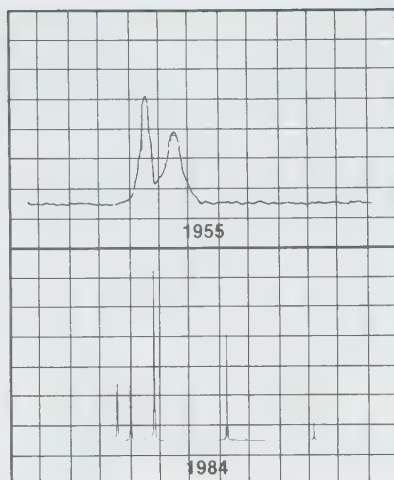
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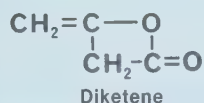
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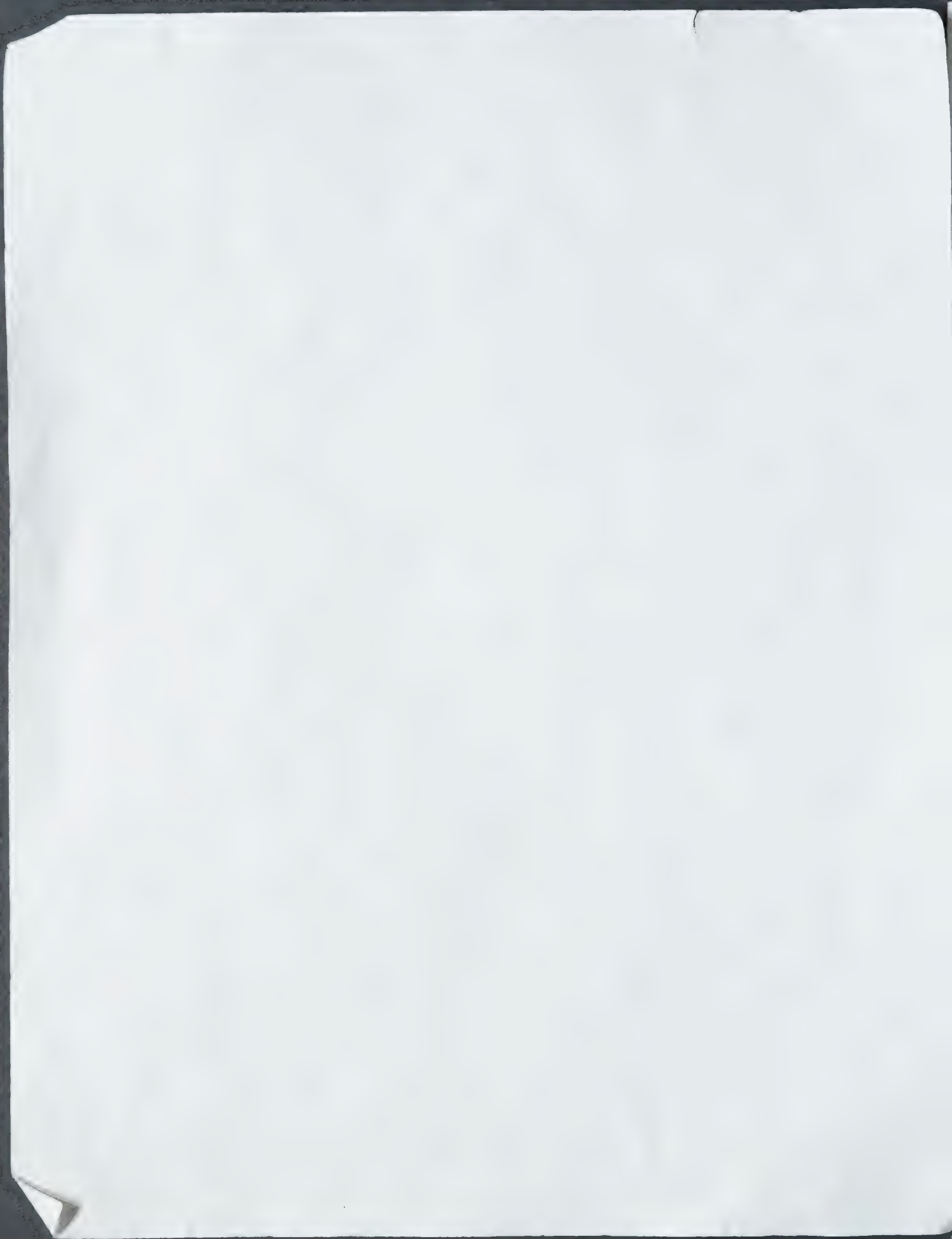
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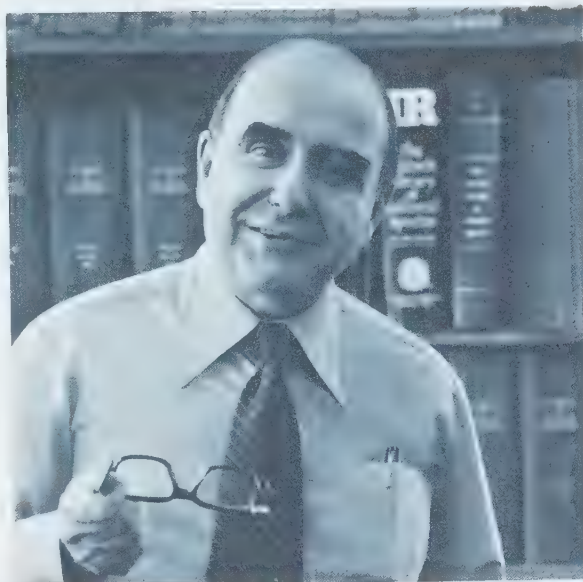


"OUR CHEMIST-COLLECTOR" APPROACHES SIXTY

In 1924, Vienna, so recently the flamboyant capital of the Austrian Hungarian Empire and echoing the strains of the waltzes of Johann Strauss, was hardly recovering from World War I and the effect of the Peace Treaty. The lively, bustling, self-indulgent, high-living Viennese had been forced to change their lifestyle.

This was the world into which our "Chemist-Collector," Chairman of Sigma-Aldrich and Founder of Aldrich, Dr. Alfred Robert Bader, was born. His mother was a Hungarian of noble family. His father, son of the Chief Engineer to Ferdinand de Lesseps, builder of the Suez Canal, had died shortly after his birth, and he was brought up by his dearly loved aunt, a widow. From early childhood on, he was exposed to art in his own home and to the Old Masters at the Kunsthistorisches Museum in Vienna. It should not have been totally surprising, therefore, when at age ten he used money given to him for another purpose to acquire an Old Master drawing at an auction.

By the mid-thirties, Austria was heading towards the Anschluss with Germany. When possible, Jewish youngsters were sent off to presumably friendlier and safer environments. In 1938, saying goodbye to his mother for the last time, Alfred Bader journeyed to England, a move



Dr. Alfred Bader

which may well have saved him from death at the hands of the Nazis.

At fourteen, Alfred found himself at school in Brighton, Southern England, and, despite a strange language and an unfamiliar lifestyle, he was an exceptional student, whose qualities were soon recognized. He received a modest grant (supplemented by the occasional deal in stamps) to study chemistry at the Brighton Technical College. During this period his interest in art continued, and he became immersed in the study of the Bible. This combination of chemistry, art and Bible became his lifelong passion. Even at this early stage, he had begun to shape a future as scientist, businessman and collector.

This relatively settled interval in his life was soon to be disturbed by the German army advancing to the

beaches of Northern France, placing England in danger. Fearful of a threatened invasion, Churchill considered that refugees from Europe could be a potential threat to the security of Great Britain. He then made his "Collar The Lot" decision to intern not only potential Nazi-sympathizers but also a great many refugees. Most were interned on the Isle of Man off Britain, but many were shipped overseas. In 1940, Alfred found himself part of a

shipload of German Jewish refugees destined for a prisoner-of-war camp on the Richelieu River near Montreal, Canada. However, finding himself interned with able and learned tutors, Alfred put this most difficult period to good use, furthering his learning of the Bible and science.

Being hungry for any kind of news, he, like others in the camp, read through every line of any available newspaper. In doing so, he ran across the obituary of a lady who had been the daughter-in-law of his benefactor in England.

Editor's Note: Since our Chemist-Collector would never have permitted us to devote space in the *Aldrichimica Acta* to him, the references to his early days necessarily depended upon recollections of reminiscences by him to friends and associates and could not be checked for accuracy with the "source." Hence, for any inaccuracies in history, our apologies.

The item listed her son of Montreal among her survivors. Alfred's note of condolence led to a lifelong close association with his second surrogate family, the Wolff family of Montreal. Mr. Wolff helped to arrange for Alfred's parole from the camp in November, 1941, and for his admission to Queen's University in Kingston, Ontario, notwithstanding the absence of standard, formal admission requirements and the fact that the term was well along. His gratitude to Queen's University for this special accommodation is manifested by his service on its Board of Trustees and his contributing to a major collection of Old Masters in its Agnes Etherington Art Centre.

While at Queen's, Alfred overcame the obstacles of English as a second language so well that he entered and won the McColloch speaking contest and the sorely needed prize money associated with it. Thereafter, at the urging of his professors, he became a member of the University's championship debate team. He also served as president of the Hillel House and in other campus leadership positions while earning a B.Sc. degree in Chemical Engineering (1945), a B.A. in History (1946) and a M.S. (1947). During the summer and after graduation, Alfred worked for the Murphy Paint Company of Montreal. Here he generally spent a couple of days visiting customers to discover their needs, then as quickly as possible formulated a suitable paint. Sales soon doubled. Thus Alfred was first shocked to find his job terminated until he realized the company simply wished him to further his education and was prepared to assist with funds.

Alfred attended Harvard which provided him with years of stimulation and excitement. Of course, Alfred began to pursue studies in two distinct disciplines, art history competing with research in chemistry. The contest between the two became concern enough for one chemistry professor to declare anxiously, "Alfred, you haven't made up your mind whether you want to be a chemist or an art historian." Alfred decided perhaps reluctantly for chemistry. As

a doctoral research student of the famous Louis Fieser¹, he received great inspiration. Upon receiving his doctorate, Alfred intended to return to his former employer, but in the meantime, the Murphy Paint Company had been sold to Pittsburgh Plate Glass, and they placed him in Milwaukee.

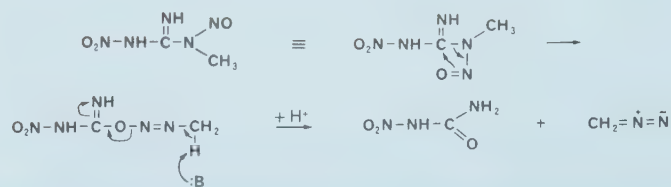
There, he was employed as a Research Chemist and later became Organic Group Leader in the paint division. Alfred found it wasteful of research chemists' time and talent to prepare high-purity intermediate compounds necessary to get on with the heart of the research itself. At that time, the only significant U.S. source for such products was a division of Eastman Kodak Company. He suggested to his superior to form a division to augment the list of high-quality intermediates available to research chemists. The proposal was rejected.

He then requested and received permission to try it on his own during his spare time. In 1951, he rented a \$25.00-a-month garage, acquired some basic equipment and made MNNG, 1-methyl-3-nitro-1-nitroso-guanidine which was used as a starting material for diazomethane, and a few other compounds. Not wishing

to resign his position and stay in Milwaukee, a city he had come to like. The development of Aldrich now became his full-time occupation.

Alfred began Aldrich with the idea of offering a list of organic chemicals other than those available from Eastman. But, he soon recognized the necessity for developing a complete line of organic chemicals for research. This required the establishment of a network of reliable suppliers to augment Aldrich's then limited production facilities. He also sought close ties with research chemists to enable him to know and even anticipate their needs. Accordingly, he established and developed friendships and working relationships with chemists throughout the world, giving them valuable assistance and promptly responding to their requests and suggestions. Over the years, he has personally helped many able and deserving chemists at universities with research grants underwriting their research, and helping some of them on their way to becoming leading chemists of their time.

While building Aldrich into the world's foremost supplier of high-quality fine organic chemicals, Alfred has been the first to acknowledge his debt to the countless dedicated em-



Diazomethane production from MNNG

to personalize the company by using his own name he suggested to the attorney preparing the articles of incorporation that they toss a coin between "Daniels" and "Aldrich," the names of his own and the attorney's fiancée. The coin came up "Aldrich."

In 1954, Pittsburgh Glass decided to move its research division to Springdale, Pennsylvania. Although sales from his personal venture were only \$15,000 per year, Alfred decided

ployees, many of whom are still with the company. But his employees in turn credited him with the vision, drive and readiness to make the pragmatic decisions necessary for such an achievement.

Alfred's enthusiasm and creativity attracted other able chemists who began to cast their lot with Aldrich. Among these was the late John Biel, whose contributions to medicinal chemistry at Lakeside Laboratories, had made him an ideal Director of

Research at Aldrich. This made possible the carrying on of contract work for governmental and pharmaceutical clients with the natural fall-out of both new products and greater insight into the needs of the research chemist.

A catalog evolved which proved to be not only a valuable sales tool but also an indispensable handbook of fine chemicals. This catalog, readily recognized by the Old Master paintings from Alfred's collection reproduced on the front cover with descriptions by "Our Chemist-Collector," soon became Aldrich's hallmark. The 1984-1985 edition will list over 16,000 products.

In 1967 Alfred launched the *Aldrichimica Acta* to promote Aldrich products and also to disseminate chemical review articles by leading chemists. Today, the *Acta* is perhaps more attentively read than many a scientific journal, and there is no shortage of able prospective authors. With his customary attention to detail, Alfred still zealously guards the quality of the *Acta* which is published quarterly, although for this issue he cannot be held responsible.

Another unique development by Aldrich was the formation of the ABC (Alfred Bader Chemical) Division of Rare Chemicals. This certainly stemmed from Alfred's passion for collecting, in this case, chemicals. But again, he saw the possibilities of acquiring rare and difficult-to-obtain chemicals from universities and laboratories around the world and making them available to others in the research community. Today, over 23,000 such products are offered. The chemicals are featured now in the "Aldrich Microfiche Library of Chemical Indices."

Even in the early days, Alfred realized that looking for a number of compounds from Aldrich's regular



Alfred Bader and Professor Gilbert Stork in search of rare chemicals at Columbia University

and ABC inventory (over 37,000 chemicals in 1984) containing a particular structural fragment was no easy task. Thus, Aldrich developed a computer-search service capable of locating the required compounds. This unique, free service is now used by scientists worldwide.

Of course, emphasis was placed on supplying quality products. From the infrared spectra taken in the labora-

tory during routine analyses, there developed "The Aldrich Library of Infrared Spectra" in 1970. Alfred rightly surmised that such a book of quality spectra would be welcomed by the research community. This book, currently in its third edition, and its subsequent companion, "The Aldrich Library of NMR Spectra," have established Aldrich compounds as the standard reference.

In the leading scientific journals, Aldrich advertisements were soon a regular feature on the back outside cover. The emphasis was generally on promoting new products, often those suggested by Alfred's friends and colleagues at universities.

These varied developments helped establish Aldrich as a major supplier of research chemicals. However, Alfred soon recognized the potential for supplying larger quantities and enlarged Aldrich's production capabilities to become an important source of bulk specialty chemicals. As the business expanded, so did the need for space. After intermediate moves, Aldrich acquired its present St. Paul Avenue headquarters in 1967.

Looking beyond the confines of the United States, Alfred, during the course of his travels to Europe, found a most useful German supplier - later to become known as EGA Chemie. In England, he persuaded an old friend of his war-time sojourn there, to assist with the development of sales and Ralph N. Emanuel, Ltd. was founded. In 1970, both these European companies became totally owned subsidiaries and ultimately bore the Aldrich name. From such beginnings, Aldrich was to become an international company well known on every continent.

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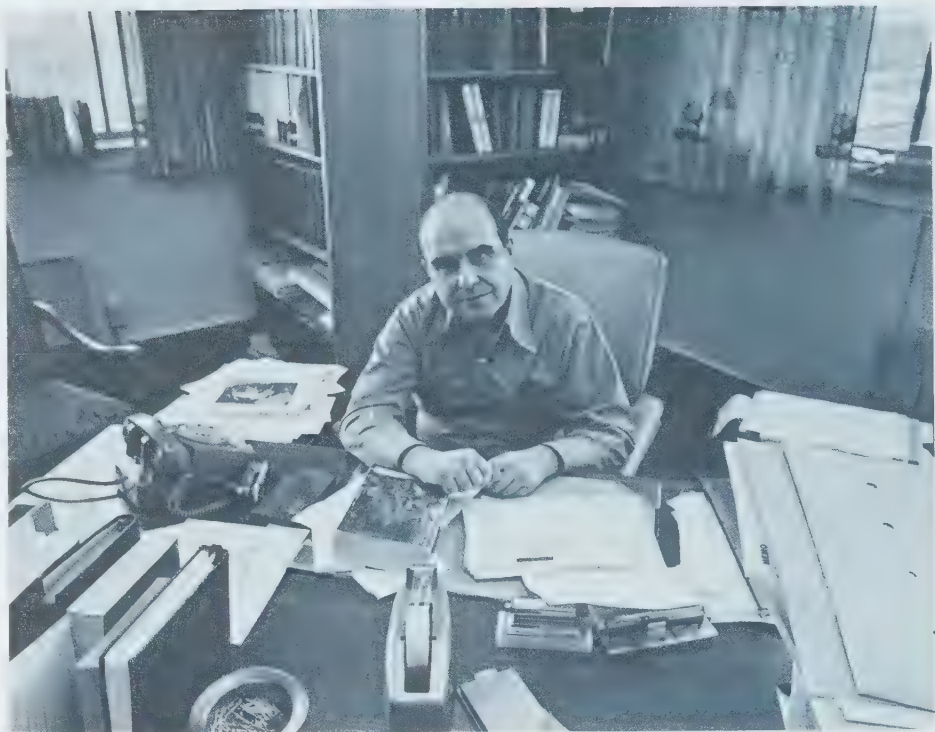


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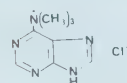
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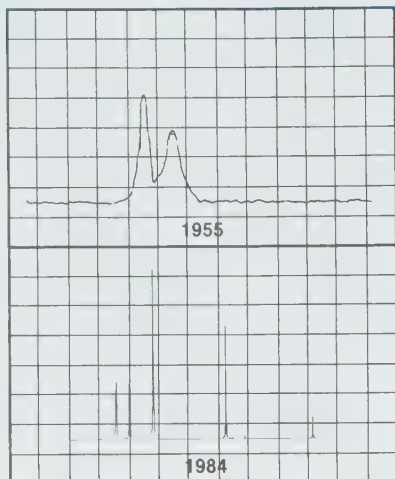
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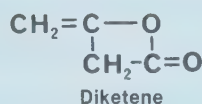
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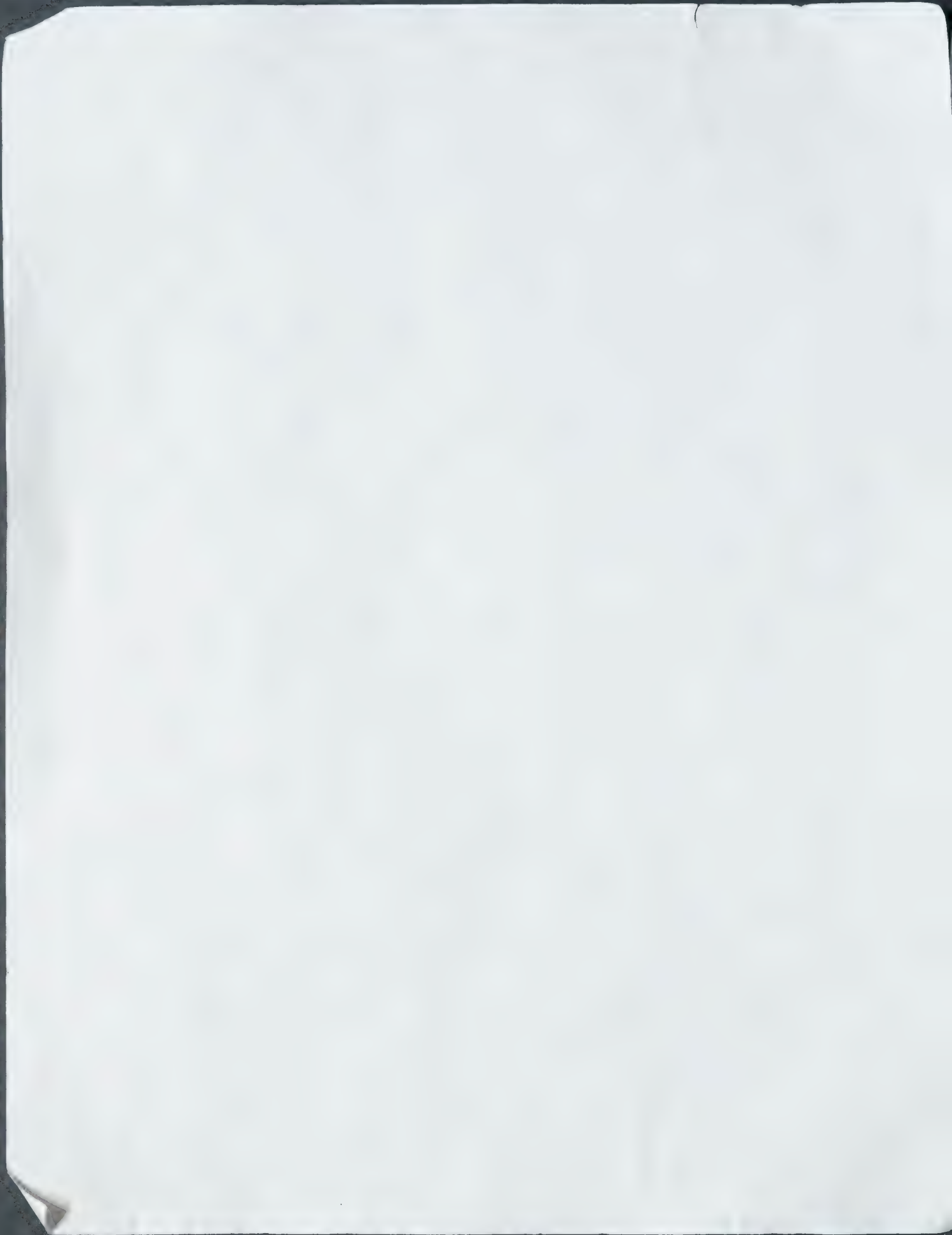
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Ralph N. Emanuel, Managing Director, M. Emanuel, Ltd., London, England.

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Marvin E. Klitsner, Partner, Foley and Lardner, Attorneys at Law.

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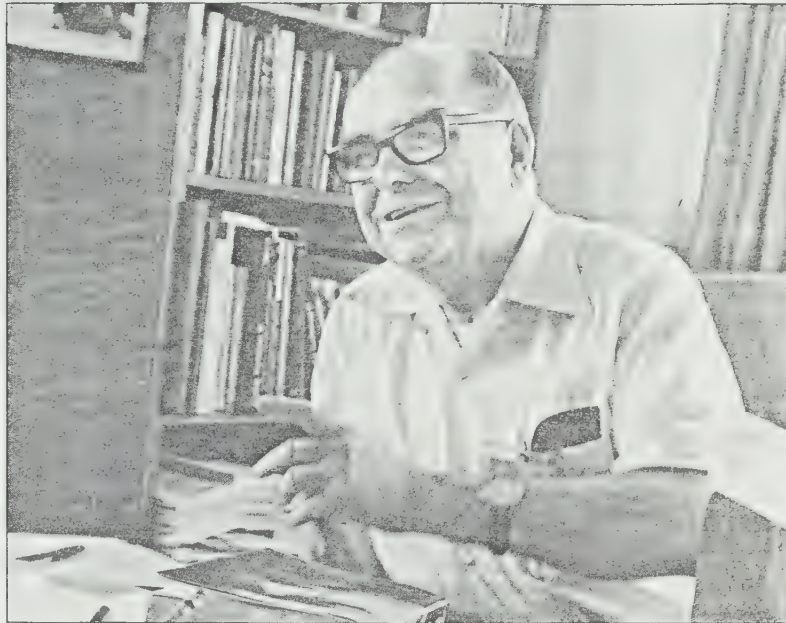


The Spotlight

Sigma-Aldrich: A Little Company Carves a Big Niche

"The most important thing I have learned in business," says President Alfred A. Bader of specialty chemical maker Sigma-Aldrich Corp., "is that a little company can compete against the giants and do very, very well." Bader and Sigma-Aldrich have proved it. The \$68-million-sales company vies successfully against the likes of Eastman Kodak Co. and American Cyanamid Co. in providing laboratories with chemicals for research and diagnostic purposes. By offering a wide array of high-quality products and paying careful attention to its customers' needs, Sigma-Aldrich has carved out a 30%-to-40% share of the \$100 million research market for specialty chemicals.

During the past five years, the company's sales and earnings have increased at a compounded annual rate of 15%



Bader: Getting a big return from diversifying and high quality

IMS International: Making the Most Of Market Research

In 1957, IMS International, Inc. was having trouble getting its foot in the door. As a new market research firm trying to peddle pharmaceutical audits to European drug companies, it met skepticism at every turn. "They didn't think they needed us," recalls David Dubow, IMS founder, president and chief executive officer. "In France," he laughs, "they thought we were members of the CIA and were going to sue us for economic espionage."

The tables have turned dramatically for IMS. Today, it is the largest and most successful marketing service organization in the health care field. Doing business in almost fifty countries, its client list includes virtually every major and medium-sized pharmaceutical company in the world.

Since going public in 1972, IMS has quadrupled sales and doubled earnings per share. Last year, net income rose 36% to \$8.2 million on sales of \$113.5

million; fully diluted earnings went up 33% to \$1.84. The company also initiated a regular quarterly cash dividend of 5 cents a share. Dubow, who divides his time between IMS's London and Manhattan offices, expects sales and profits to rise another 20% this year.

IMS's major product, the pharmaceutical audit, is a monthly compilation of data—prescription volume, dosages, treatments, brand preferences and so forth—which is gathered from statistically selected groups of drugstores, wholesalers and doctors around the world and keyed into computers at the company's data-processing centers. The audits are used by drug companies in evaluating market size and trends, formulating marketing strategies, forecasting sales and the like. IMS has virtually no competition in this major part of its business. "The cost of replicating its data base is prohibitive," says analyst Lawrence A. Rader of Merrill Lynch, Pierce, Fenner & Smith.

To make its data bank an even more effective marketing tool, IMS has just introduced an important new service for customers: on-line access via computer terminals. As Dubow explains: "It's like a telephone system. The client pays so

much for installation and so much for every question." The system, called MIDAS, is now being used by ten major drug companies, including Pfizer and Switzerland's F. Hoffmann-La Roche & Co. Moving slowly, IMS expects to have fifteen customers by the end of the year. "That's as fast as we can set up and organize," Dubow says. "We don't have any trouble selling this one." Rader agrees. "By 1982-83," he says, "MIDAS will be a \$25 million product."

Over the years, IMS has further capitalized on its proprietary position by developing a battery of medical and other reports for the drug industry. And two years ago, Dubow decided to apply its expertise to a new field—market studies for the liquor industry—which he hopes to eventually offer in major markets throughout the U.S. Overall, the market research division accounted for 67% of IMS's revenues and 81.9% of operating income last year.

Dubow began diversifying in the early 1970s. IMS's communications division was created by a string of acquisitions, principally in Europe. Besides selling medical magazines and manuals, it is doing a booming business in Germany and Belgium producing medical news on

and 14%, respectively. And last year earnings showed a sharp 24% gain to \$9.2 million, or \$2.15 a share. Bader makes no predictions for this year, but analysts who follow the company are forecasting sales and earnings increases of 20%-to-25%, and they expect growth to continue at around 20% a year through the early 1980s.

Sigma-Aldrich was formed four years ago by the merger of Aldrich Chemical Co., which Bader had founded in the mid-1950s, and Sigma International Ltd. Sigma founder Dan Broida became chairman of the new company, while Bader took on the job of running it. The meshing of the two operations was extremely smooth, Bader says, because although each produced very different chemicals, they held the same views on product quality and customer service and their distribution methods were very similar.

Sigma sells biochemicals and diagnostic products to hospitals, medical laboratories and university biomedical departments. The biochemicals are used in fields that study the life processes, such as immunology, neurology and endocrinology; the diagnostic products to detect liver and kidney diseases as well as heart attacks. Aldrich sells organic chemicals to university chemistry departments and the research laboratories of chemical and pharmaceutical companies such as Abbott Laboratories and

Ciba-Geigy. Together, the two operations account for 75% of company sales and 89% of profits.

Sigma-Aldrich's third arm, acquired by Sigma in 1971, is B-Line Systems Inc., which produces metal frameworks used to support shelves, pipes and lighting fixtures in industrial plants. Much less profitable than the chemical business—25% of sales, 11% of earnings—the division is run independently.

Few companies can match Sigma-Aldrich's diversity of products and customers. It lists almost 40,000 different chemicals in its catalogues, holds a \$25 million inventory and last year sold to around 27,000 customers. Its average sale comes to less than \$100, and no one customer or product accounts for as much as 2% of sales. The company produces about 40% of its vast product line itself, buying the rest from outside suppliers. All chemicals are put through rigorous quality-control testing, which has given the company a preeminent reputation among research chemists. The company claims it can fill most orders within 24 hours.

Marketing is done through a small sales force, which distributes free almost 300,000 copies of the company's two catalogues, one for Sigma and one for Aldrich. Containing detailed information on the structure, use and dangerous properties of most chemicals now marketed, the catalogues are virtual Bibles

for research chemists—and advertising for Sigma-Aldrich.

Developing the catalogues, and getting them accepted, took years. Bader produced his first "catalogue" back in the early 1950s, when he was a research chemist at PPG Industries. It consisted of one page, listing one chemical. When he set up his own shop, Bader at first offered only chemicals that Eastman Kodak, the giant in the field, did not. Then in the late 1950s he decided to compete directly with Kodak, and today, he says, the Sigma-Aldrich catalogue is larger and more complete than Kodak's.

Of late, Sigma-Aldrich has been expanding aggressively overseas. The company operates subsidiaries in Canada, the U.K., Japan, Germany and Israel, and international business last year accounted for almost 40% of sales and around 30% of pretax profits. Bader, who has been spending a good percentage of his time talking to potential customers in Europe and Japan, has high expectations abroad, where, he says, Sigma-Aldrich faces little competition. "We haven't even touched the South American market," he notes.

Bader is just as optimistic about the growing need for his company's products at home. "The big advances will be the application of biochemistry to the life sciences," he says, "and that's our market."



Dubow: Building on a strong proprietary position and diversifying

cassettes. The division contributed 22% of sales last year.

Looking ahead, though, laboratory testing looks like IMS's biggest growth

area. Its two labs—New Jersey's Biodynamics and Life Science Research in England, which was acquired last year for \$1.7 million—do toxicological testing

for the chemical, food, drug and cosmetics industries. After several problem years, Biodynamics' sales almost doubled last year to \$7.3 million. With the full benefit of the British laboratory this year, Dubow expects sales in the life sciences division to increase 56%, far faster than the company as a whole, to around \$20 million.

Two developments should help keep the division on a fast growth track. For one, earlier this year IMS was hired by a subsidiary of Exxon Corp. to staff and operate a new research and environmental health laboratory being built adjacent to Biodynamics in Franklin Township, New Jersey. Working on a fee basis, IMS should realize close to \$5 million on the deal over ten years, according to Dubow, who is also quick to point out another obvious benefit. "It means more business to us," he says, "because other companies will figure that if Exxon picks IMS, we must be pretty good. We have already been contacted by other companies."

Besides that, Dubow expects to get a good chunk of new business from the effects of the 1976 Toxic Substances Control Act, which requires product safety testing for all chemicals used in

1984/16

FOR IMMEDIATE RELEASE

PICTURES FROM THE AGE OF REMBRANDT
SELECTIONS FROM THE PERSONAL COLLECTION
OF DR. ALFRED BADER

October 13 - November 25, 1984

On Saturday, October 13 the Agnes Etherington Art Centre opens the largest exhibition of old master works presented by the gallery in its twenty-six year history. It is a handsome exhibition of Dutch 17th century paintings on loan from the personal collection of Alfred and Isabel Bader of Milwaukee, Wisconsin.

The exhibition has been organized by the Art Centre as a tribute to Dr. Bader on the occasion of his sixtieth birthday. Alfred Bader is an alumnus of Queen's University (Applied Science '45, Ph.D. Harvard) and a member of the Queen's Board of Trustees. He is Chairman and Chief Executive Officer of the Aldrich Chemical Company in Milwaukee. Dr. Bader combines his professional work as a scientist with his knowledge and great love of art history and art conservation. He is a long-standing benefactor of several art museums, especially the Agnes Etherington Art Centre. In 1967 he initiated an on-going and far-sighted donation of European paintings which, at the present time, numbers over fifty items. Art Centre Director, Robert Swain, writes: "We have benefited materially from Alfred Bader's generosity and intellectually from his own historical studies and researches. And just as the world has benefitted from the humanity of Dutch paintings, so too, in our community, do we find a parallel in Alfred's and Isabel's continuing support and generosity."

The 36 paintings in the exhibition represent a selective overview of genres and aesthetic concepts prominent in Dutch 17th century art. They include portraits, Biblical scenes, landscape, still-life and genre scenes. Alfred Bader's main interest as a collector has been the School of Rembrandt, especially Biblical subjects. As the title reflects, the exhibition includes works by Rembrandt Van Rijn (1606-1669), the most outstanding of Dutch 17th century artists, and by his contemporaries and students. Among the other well-known artists in the exhibition are

Information

Hours

Tues / Sat 10 am - 5 pm
Sun 1 pm - 5 pm

Evenings
Tues & Thurs 7 pm - 9 pm

Closed Mondays, except holidays.

The Art Centre is closed on
Christmas Day, New Year's Day,
Good Friday and Labour Day. For
other holidays consult the Bulletin

Admission is free

Parking is available in the
underground garage at the corner of
University Avenue and Stuart Street.
The University Avenue exit is
directly across the street from the
Art Centre. After 5 pm and on
weekends parking is free in the
other University parking areas
nearby; enter from Union Street.

Tours and special programmes can
be arranged by phoning 547-6551.
At least three week's notice is
required when a guide is requested.

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advance.

The Agnes Etherington Art Centre is
a community and regional art
gallery. It is supported by Queen's
University, the Canada Council, the
Ontario Arts Council and the
provincial Ministry of Citizenship
and Culture, the Corporation of the
City of Kingston, the National
Museums of Canada, and the
membership of the Gallery Associa-
tion.

Agnes Etherington Art Centre | Queen's University Kingston | Telephone 547-6551 

Jan Lievens (1607-1674), Jacob van Ruisdael (1628/9-1682), Nicolaes Maes (1634-1693), Pieter Claesz. (1596/7-1660) and Hendrick Terbrugghen (1588-1629).

The works have been selected and researched by Dr. David McTavish of the Department of Art at Queen's. Dr. McTavish has lent his scholarship and advice to Dr. Bader and to the Art Centre in the development of the old master collection at the gallery. He has written a handsome, fully-illustrated catalogue to accompany the exhibition. The catalogue was designed by Peter Dorn, RCA of Queen's Graphic Design Unit.

Pictures from the Age of Rembrandt will be seen only in Kingston. The Art Centre gratefully acknowledges the support of the Ontario Arts Council, The Friends of Queen's and the Office of the Vice-Principal (Services) in mounting the exhibition.

Dr. Alfred Bader will deliver two public lectures in conjunction with the exhibition opening: the first, Rembrandt and the Jews, on Friday, October 12 at 12:00 noon, in Room B201, Mackintosh-Corry Hall; and the second, Art and Chemistry, on Saturday, October 13 at 10:00 a.m. in Room 209, Ontario Hall. The public is invited to attend.

The Gallery Association will hold a gala fund raising preview for its members on the evening of Friday, October 12 at 7:30 p.m.

The exhibition continues until November 25.

For further information, please contact: Catherine Gold
Education Officer
547-6551



Neighbors lead state in ad funds

By Alvin L. Curtis

A new study comparing the amount Wisconsin spends for advertising and promotion to recruit businesses and that spent by 12 other states shows the state well behind neighboring Michigan and Illinois.

However, overall, Wisconsin is in the middle of the pack on what it spends to recruit businesses.

The study was prepared for Forward Wisconsin Inc., the state's public/private marketing agency, this summer. It shows Wisconsin well behind not only Michigan and Illinois, but also a group of southern states including North Carolina, Florida, Tennessee and Kentucky.

"We are falling way behind the competition," said Patrick A. LeSage, president of Forward Wisconsin. In a telephone interview Monday. "You ask yourself, 'Who's the competition?' It's our neighboring states."

When companies interested in locating in the Midwest start looking around, "Who's getting the message out?" LeSage said.

Wisconsin will spend about \$517,000 for out-of-state advertising and promotion to recruit new businesses in fiscal 1985. Illinois will spend \$1.04 million for advertising and promotion, while Michigan will spend \$938,000.

The study attempted to look only at advertising and promotion costs. The numbers do not include salaries or overhead costs.

Aside from competing states in the Midwest states such as North Carolina, Florida, Tennessee, \$743,000, Florida, \$689,000, Tennessee, \$667,000, and Kentucky, \$540,000.

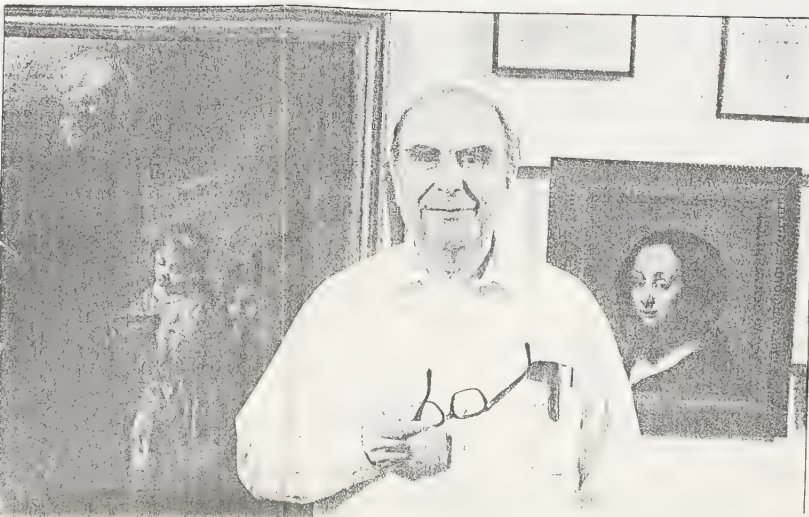
In advertising alone, Wisconsin ranked 9th out of 12 states, at \$250,000. In promotion, it was the 5th of 11 states, at \$267,000.

Forward Wisconsin is funded by the state and private industry. During the current special session on economic development, the Legislature is considering restoring \$500,000 from the Forward Wisconsin budget which was eliminated from the state budget for the second year of the biennium.

LeSage said private pledges already surpassed \$600,000 and that he hoped the Legislature would match that amount. He said the Forward Wisconsin budget was one of the topics would discuss in a meeting with Gov. Earl Wednesday.

Study

Turn to Page 3



Alfred R. Bader, chairman of the Sigma-Aldrich Corp., is a Harvard-educated chemist and collector of fine art.

— Sentinel photo by Ned Vespa

Chemist mixes knowledge, savvy

By Avrum D. Lank

Jack Nathan Eisen-drath was the best man at Alfred R. Bader's wedding. The two live near each other, and in the 1950s, they went into business together and named their venture the Aldrich Chemical Co., after Eisen-drath's wife, the former Bettie Aldrich.

Eisen-drath no longer is involved with the company and has not seen his erstwhile partner for many years. What does he think of the extraordinary man with whom he once did business?

"Bader is just about the sharpest mind you can find," said Eisen-drath, a lawyer. "In chemistry, he is an expert. In street-wisdom, he is even more of an expert."

Bader, 61, is a multimillionaire. Indeed, he has made the most of his opportunities.

An Austrian-born Jew, he found his way to England during the Nazi era. As an Austrian teenager — "by accident of birth," he says — he was imprisoned by the British as an enemy alien. In 1940, he was taken to a detention camp near Montreal.

Son of the chief engineer to Ferdinand de Lesseps, builder of the Suez Canal, and accustomed to a cultured life in prewar Vienna, Bader made the most of his circumstances.

According to a biography published by the company to honor his 60th birthday: "Finding himself interested with able and learned tutors, Alfred put this most difficult period to good use, furthering his learning of the Bible and science."

Sigma

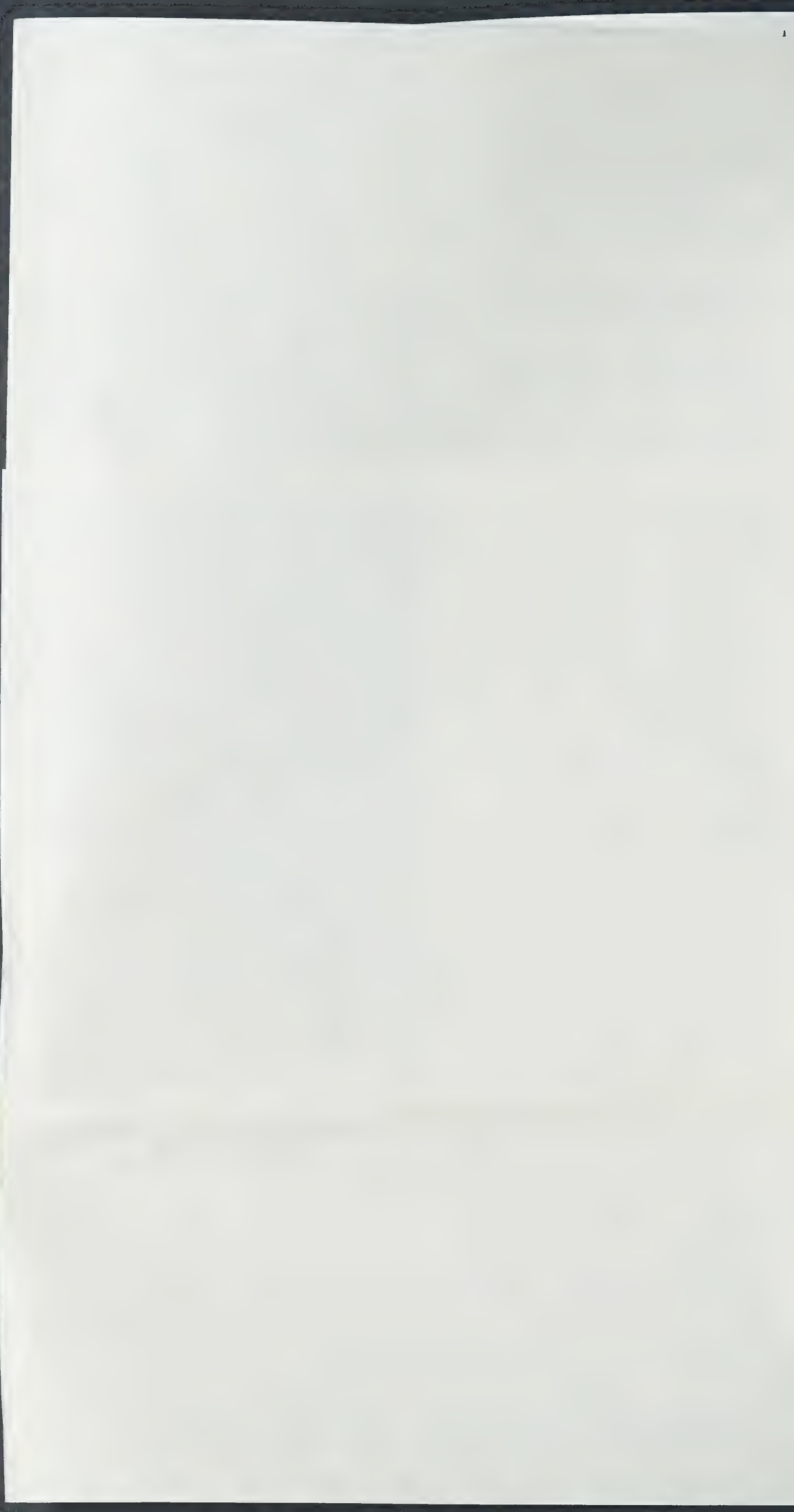
Turn to Page 2

Coca-Cola put under glass

By Phil Cash

"I heard of crazier ideas," said

Six companies given



Chemist mixes knowledge and savvy

Sigma From Page 1

Eventually, he was able to negotiate a parole and enrolled in Queen's University in Kingston, Ontario, earning degrees in chemical engineering and history. Bader now serves on the board of the institution.

After graduating, and while he was at school, Bader went to work for the Murphy Paint Co. in Montreal.

Murphy, realizing Bader's ability, sent him to Harvard University to earn a Ph.D.

He did so, in chemistry, but also pursued another lifelong passion, art.

Bader is an avid art collector and has loaned and donated pictures to many museums. Fine art graces the

cover of Aldrich's catalogs. Bader helps select it.

While Bader was at Harvard, Murphy was sold to the Pittsburgh Plate Glass Co. When Bader returned, Pittsburgh sent him to its research center in Milwaukee.

In Milwaukee, Bader met Eisendrath. And in August 1951, they started Aldrich Chemical as a supplier of fine chemicals for laboratory research. Both men put up \$250, with Eisendrath doing legal work and Bader, chemistry.

The strategy was to avoid head-to-head competition with the giant of the field, the Eastman Kodak Co., by offering chemicals not in Kodak's catalog.

While many chemicals were manufactured by Aldrich, the company also purchased and repackaged others in smaller quantities, a strategy Aldrich still uses.

And then, as now, Aldrich sold by catalog only.

The combination worked.

In the first year, sales were \$1,705. Sales rose to \$5,400 the second year, and \$15,000 the third.

In 1954, when Pittsburgh Plate Glass moved its research center east, Bader left that company to give full attention to Aldrich.

Bader recalls that, when he quit, his boss told him: "You are a good chemist, but you can't run a business; you'll be bankrupt in two years ... come back."

Bader never returned.

In 1955, he bought Eisendrath's share of Aldrich for \$15,000.

"I was working 14 hours a day. Jack had done all he could as an attorney," Bader said. "I was doing all the work, why share 50-50?"

As Eisendrath recalls it: "He came to me and told me, 'I want to take over the company, or you can take it over.' I hustled about trying to find

someone with Alf Bader's ability to run the company, but there was no way I could."

Both of them knew Bader would start his own company if he left Aldrich.

Bader said that he offered to let Eisendrath keep 30% of Aldrich, but Eisendrath decided to sell his share and make a capital gain of \$14,750 on his \$250 in four years.

"Jack was very angry, and I can understand," Bader said.

"That is an understatement," Eisendrath said, "but I don't have any regrets."

He said he did not regret that he had not held onto 30% of Aldrich, a stake which, today, would be worth several million dollars.

Under Bader's hand, Aldrich prospered, improving sales and profit every year.

In 1965, Bader sold some stock to the public. An additional offering was made in 1967.

In 1975, the company merged with the Sigma Chemical Co. of St. Louis, a leading producer of biochemicals and twice as large as Aldrich, to form the Sigma-Aldrich Corp. Bader now is chairman of Sigma-Aldrich.

Aldrich Chemical and Sigma Chemical are run independently. They have financed the purchase of a third operation, B-Line Systems Inc., Highland, Ill., a maker of components for strut, cable tray and pipe support systems.

In the first half of 1985, Sigma-Aldrich earned \$14.2 million on sales of \$106 million, more than its annual sales and earnings of five years earlier.

It is a multinational company with sales and production facilities in Europe, Japan, Israel and Canada, as well as the United States.

In Milwaukee, Aldrich Chemical is based in a drab-looking building at 940 W. St. Paul Ave., in the middle of the Marquette Interchange. It has four other buildings in Milwaukee, as

well as operations in Sheboygan County.

Inside the Milwaukee headquarters, about 400 workers produce and sell many of the 30,000 chemicals in the Sigma-Aldrich line.

Bader presides over it all from an office on the eighth floor. The office is stuffed with chemical manuals and paintings — primarily from the 17th century Dutch masters, who delighted in creating subtle effects with light, dark and shadow. The top two floors of the building — all above the sprinkler system — are filled with art.

Company publications refer to Bader as the "chemist-collector" and, if he has not done lab work for more than a decade, his passion for art is unabated.

Not that he has neglected business.

Bader works long hours, and often answers his own telephone. His grasp of the details of his business amazes colleagues.

By 1985, with public offerings and the merger with Sigma, Bader found himself with 7.1% of the stock of the company. His divorced wife, Helen, had 7%, and trusts for their children held 3.2%.

Interests associated with Sigma, however, had about 40% of the company and they wanted to sell the entire organization. Bader resisted.

Had a large firm bought Sigma-Aldrich, he said, it could have all shares except those of the Bader family.

Eventually, it was agreed that the Sigma interests would sell some stock to the public and some to the company.

According to the prospectus for the sale, which was made in August, Bader abstained from the board vote to "approve the purchase of shares from the selling shareholders on the terms described." The purchase cost the company about \$30 million, some of which was borrowed.

It also left Bader as the largest individual shareholder of the still-independent company.

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CAREER SEMINAR



Organizations and People

frequently in the United States and Canada.

around the town

[Cont'd. from page 17]

VENGEANCE

Montrealer **Aviva Ravel's** 1-act play *Vengeance* will be presented in the Jewish Public Library auditorium Oct. 24 at 8 p.m. A discussion will follow. This event is co-sponsored by the JPL and the Montreal Second Generation.

CHEMIST/COLLECTOR

Chemist and art collector **Alfred Bader** will be the guest speaker at Congregation Shaar Hashomayim Oct. 26 at 8.30 p.m. on *The Bible Through Dutch Eyes*.

Born in Vienna, Bader was one of the many young German and Austrian Jew-

ish refugees via Britain interned in a camp on the Richelieu River in 1940.

In 1941, with the help of the Wolff family of Montreal, Bader was released from the camp and admitted to Queen's University in Kingston where he earned degrees in chemical engineering, organic chemistry and history.

Today, he is chairman of Sigma-Aldrich Chemical Corp. in Milwaukee with production plants in England, West Germany and Israel.

He owns a fine collection of works by 17th century Dutch masters and is learned in the field of art and the Bible. He lectures

Organizations and People

cov Perez will speak on the 40th anniversary of the creation of the State of Israel

RUSSIAN JEWRY

Anna Gonshor will speak on Russian Jewry at a meeting of 60 Plus of the Golden Age Association Oct. 29 at 1.45 p.m. at the Davis YM-YWHA.

CLASSICAL MUSIC

An afternoon of classical music will be presented at

the Creative Social Centre at Congregation Chevra Kadisha-B'nai Jacob Oct. 26 at 1.30 p.m. Clarinetist **Theodora Starthopoulos**, pianist **Helena Kohn-Albert**; and cellist **Deborah Naomi Black** will play pieces from Beethoven and Mozart.



old and Hennie Bernett make plans for reunion of the Byng High School Oct. 25.

restaurant. Class members from Massachusetts, New

Organizers include **Ruth (Raby) Baker, Rose**

Neighbors lead state in ad funds

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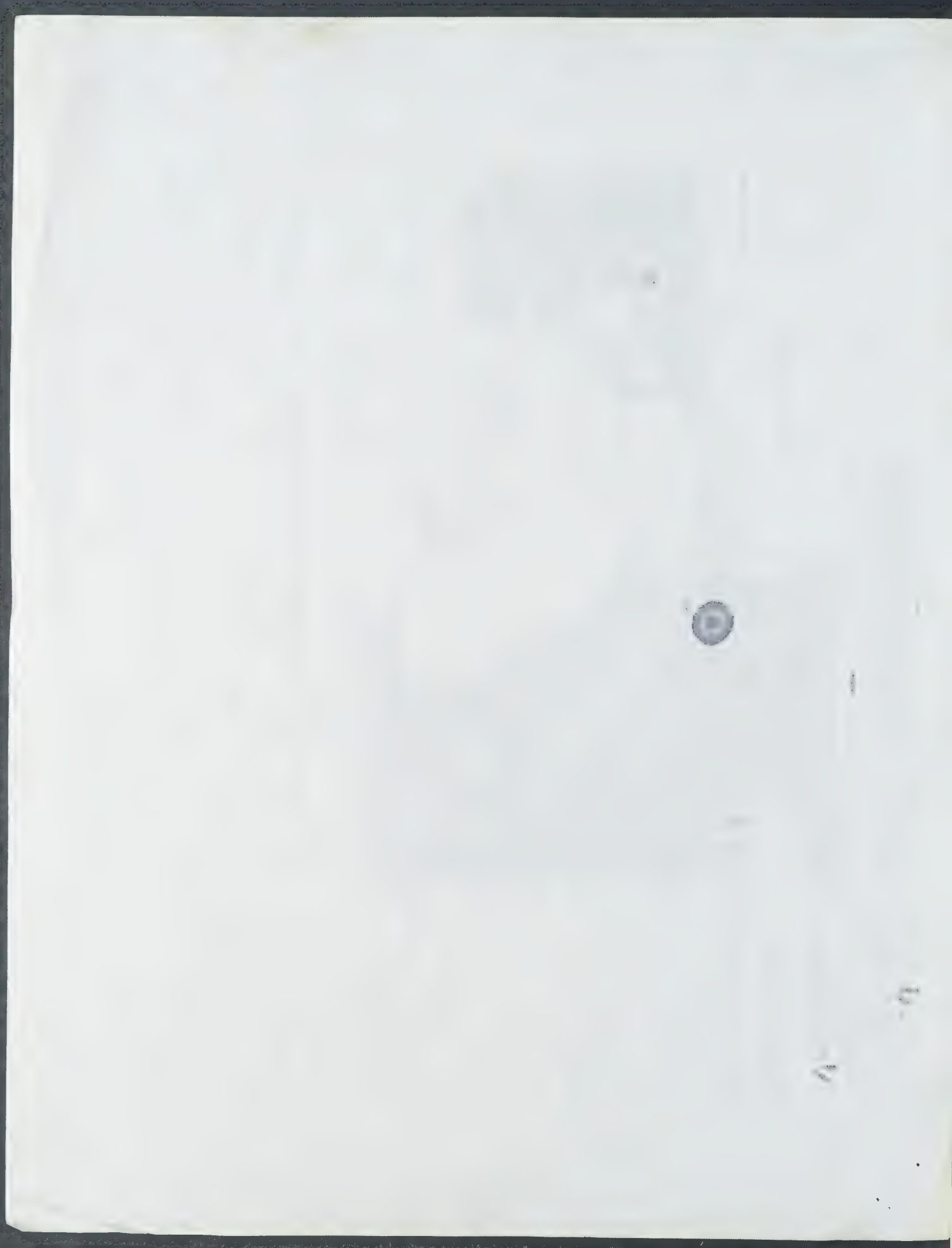
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Sigma

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CAREER SEMINAR
Tuesday, October 1
7:00 P.M.

RED CARET HOTEL
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Milwaukee

CAREER OPEN HOUSE
Wednesday, October 2
12 and 6:00 p.m.

MERRILL LYNCH REALTY
12665 W. North Ave
Brookfield

CAREER SEMINAR

Report of U.S. TELEPHONE OF WISCONSIN, INC. Milwaukee, Wisconsin
For the Year Ended December 31, 1986

	Amount
Telephone Plant	0
Investment and Fund Accounts	0
Current Assets	0
Cash and Cash Equivalents	467,000
Marketable Securities	1,100,000
Accounts Receivable	1,100,000
Prepaid Expenses	1,100,000
Other	0
Total Current Assets	2,667,000
Prepayments and Deferred Debits	0
Total Assets and Other Debits	2,667,000
LIABILITIES AND OTHER CREDITS	0
Capital Stock and Retained Earnings	0
Common Stock	0
Retained Earnings	0
Total Capital Stock and Retained Earnings	0
Long-Term Debt	0
Current Liabilities	0
Accounts Payable	0
Deferred Credits and Reserves	0
Other	0
Total Liabilities and Other Credits	0
Operating Income	0
Operating Revenues	0
Operating Expenses	0
Net Income	0
Other Income	0
Interest Charges	0
Net Income before Extraordinary and Delayed Items	0
Extraordinary and Delayed Items	0
Total Income	0
Net Income	0
Balance, First of Year	0
Net Income for Year	0
Other Changes	0
Net Increase (Decrease) to Retained Earnings	0
Balance, End of Year	0


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someone with Alf Bader's ability to work in a company, but there was no way I could.

Both of them knew Bader would start his own company if he left Aldrich.

Bader said that he offered to let Eisendrath keep 30% of Aldrich, but Eisendrath decided to sell his share and make a capital gain of \$14,750 on his \$250 in four years.

"Jack was very angry, and I can understand," Bader said.

"That is an understatement," Eisendrath said, "but I don't have any regrets."

He said he did not regret that he had not held onto 30% of Aldrich, a stake which, today, would be worth several million dollars.

Under Bader's hand, Aldrich prospered, improving sales and profit every year.

In 1985, Bader sold some stock to the public. An additional offering was made in 1987.

In 1975, the company merged with the Sigma Chemical Co. of St. Louis, a leading producer of biochemicals and twice as large as Aldrich, to form Sigma-Aldrich Corp. Bader now is chairman of Sigma-Aldrich.

Aldrich Chemical and Sigma Chemical are run independently. They have financed the purchase of a high-tech plant in St. Louis, Mo., for the production of a new type of support systems.

In the first half of 1985, Sigma-Aldrich earned \$11.2 million on sales of \$100 million, more than its annual sales and earnings of five years earlier.

It is a multinational company with sales and production facilities in Europe, Japan, Israel and Canada, as well as the United States.

In Milwaukee, Aldrich Chemical is based in a drab-looking building at 940 W. St. Paul Ave. In the middle of the Marquette interchange. It has four other buildings in Milwaukee, as

well as the prospectus for the sale, which was made in August, Bader abstained from the board vote to approve the purchase of shares from the selling shareholders on the terms announced. The purchase cost the company about \$30 million, some of which was borrowed.

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It also left Bader as the largest individual shareholder of the still-independent company.

inside the Milwaukee headquarters' 300,000-sq-ft offices produce and sell 300,000 units of a top chemical in the Sigma-Aldrich line.

Bader presides over it all from an office on the eighth floor. The office is staffed with chemical manuals and is run by a team of chemists and painters — primarily from the 17th-century Dutch masters, who delight in creating subtle effects with light, dark and shadow. The top two floors of the building — all above the sponsor system — are filled with art.

Company publications refer to Bader as the chemist-conductor and, if the fact is not obvious, to more than a decade of his passion for art is unshared.

Not that he has neglected business. Bader works long hours, and often at his desk with a telephone. His grasp of the details of his business amazes colleagues.

By 1985, with public offerings and the merger with Sigma, Bader found himself with 7.1% of the stock of the company. His divorced wife, Helmi, had 7%, and trusts for their children held 3.2%.

Interests associated with Sigma, however, had about 40% of the company and they wanted to sell the entire organization. Bader resisted.

Had a large firm bought Sigma-Aldrich, he said, it could have jilted shares except those of the Bader family.

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Anheuser-Busch plans Colorado plant

projects going on right now in Colorado and will mean a lot to the state's economy.

Busch said that while the beer industry overall has reported flat sales in recent years, his company has continued to grow, making construction of the Fort Collins brewery "not only possible, but essential."


Last year, Anheuser-Busch said more than 64 million barrels of beer, representing 34.6% of the U.S. beer market.

At a news conference to announce the construction plan Monday, August A. Busch III, chairman of the based company, said the five-million-barrel-per-year plant would employ about 500 people when completed.

Gov. Richard Lamm, who was present for the announcement, said it was "great news for Fort Collins. It's one of the largest privately financed

Time Imported Automobiles from

REINA



Fort Collins, Colo. — AP — Anheuser-Busch Co. says its 12th brewery will be built in Fort Collins at a cost of \$100 million, with 1988 targeted for completion.

At Eisendrath recalls it: "He came to me and told me, 'I want to take over the company, or you can take it over. I hustled about trying to find

share of Aldrich for \$15,000."

"I was working 14 hours a day and he said all he could do was sit at home and read the newspaper, doing all the work, why share 50-50?"

Bader never returned.

In 1955, he bought Eisendrath's share of Aldrich for \$15,000.

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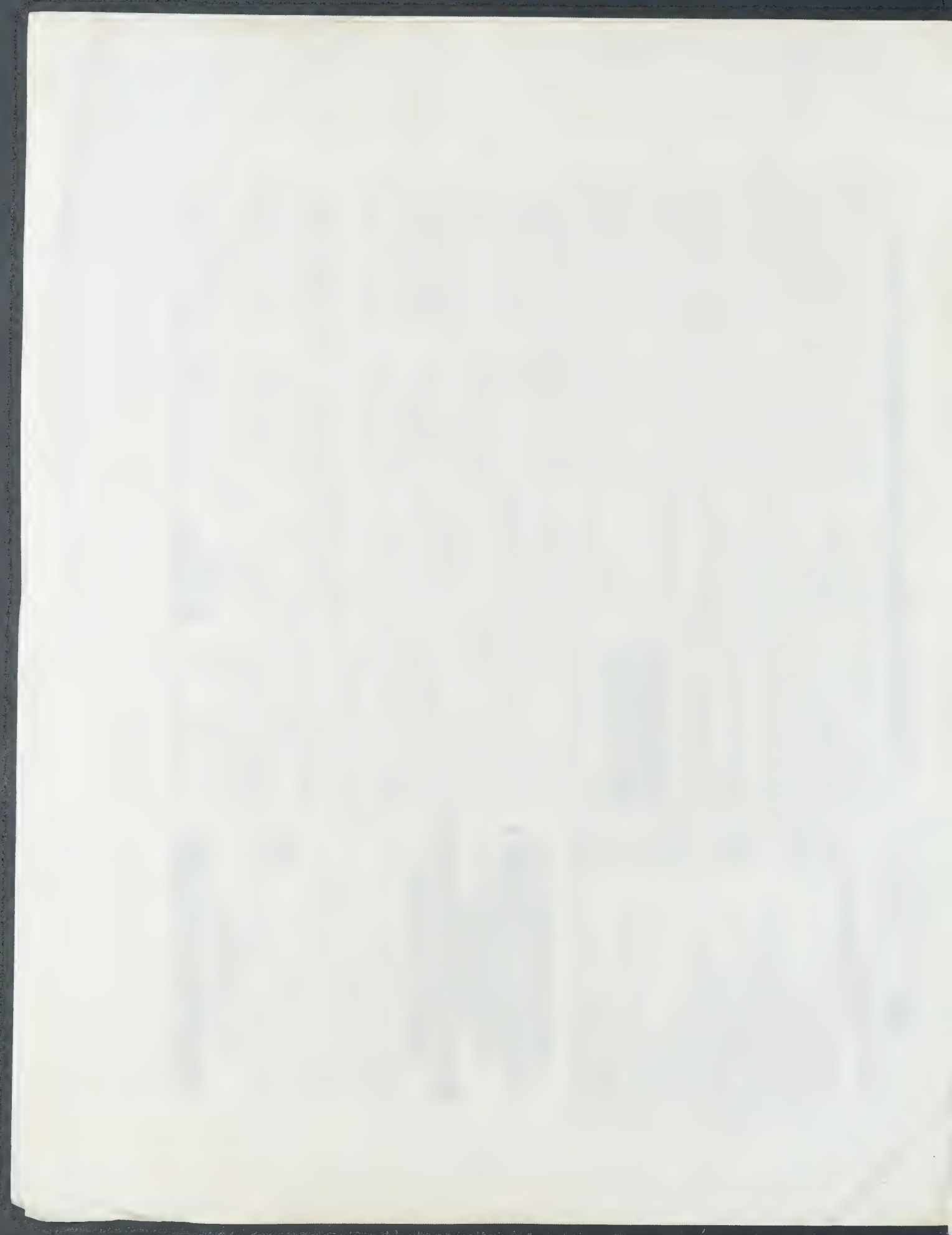
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F.Y.I.
Rich Murrell

Portland Press Herald

P.O. Box 1460 Portland, Maine 04104
(207) 775-5811

Thursday, November 20, 1986—PAGE 10

A visiting detective

Millions of dollars' worth of brains are down the road from my home. They flourish in a benign and protected environment called Bowdoin College.

Frequent samplings of these special brains are open to outsiders. A menu is published weekly, showing which brains will be performing where and when. Some weeks the offerings sound too highfalutin or exotic for my taste buds, which have become less venturesome of late. However, as the nip of winter stirs my lazy gray matter and I set out on a random taste-testing of current specials at the liberal arts college.

The short menu gives more answers than any long book to the question, "What is a liberal arts education?"

One flip answer today says, "Something amorphous, which takes four years of reading and costs \$60,000." But a few items from the current sampling at Bowdoin demonstrate the wide embrace of "liberal arts" — and most are open and free to the public.

Are you scared by the Soviets? Then try the lecture, "Technological Backwardness and Soviet Military Thought" by a strategist from the U.S. Naval War College.

Puzzled by your dreams? Try the Jung seminar on "Symbols of the Unconscious; Analysis and Interpretation."

Are you stirred up by animal vivisection? Hear a visiting professor and author talk on "The Abolition of Animal Experimentation".

In the mood for music? Or theater? The Bowdoin menu offers Randy Bean's Jazz Group or, alternately, a piano recital featuring works of Hayden and Brahms. In theater, choose a Masque & Gown production of "Othello," the BBC film, "Hamlet" or "The Bicycle Thief" from Italy.

Want to more about AIDS? Bowdoin is offering experts — one lecture on "Politics, Policies and Culture; AIDS in France, Britain and the United States" by a Tufts University professor and another by research scientists and doctors.

What's it like to be an exiled writer from a totalitarian state? Hear "The Position of the Estranged Writer in the Modern World", a lecture by Soviet emigre novelist Vassily Aksyonov, and find out.

The weekly menu at Bowdoin is pretty esoteric for this newspaperman. But I picked two topics light-miles from from my deadline world, and about which I had absolutely no knowledge. One was the jaw-cracker "Aerodynamics, Thermoregulation and Evolution of Insect Wings," a lecture by Mimi Koehl, associate professor of biology at the University of

Bill Caldwell

On Maine



California, Berkeley. I left fascinated, astounded, but still a stranger in a foreign land.

The second lecture was intriguingly titled "The Adventures of a Chemist/Art Collector" and turned out to be a better, more exciting, true-life detective story than anything on TV.

The detective-lecturer was Alfred Bader, a chemist who is chairman of a small company, Aldrich Chemical. His thrills, pleasures and, presumably, his disappointments come from collecting and detecting 17th-century paintings. Bader haunts the auction rooms and galleries of the world, gambling that he can spot a silk purse hidden in a sow's ear — a wonderful 1620 painting, perhaps, hidden beneath layers of dirt, flaking paint and darkening varnish.

When he gambles and buys one — and Bader buys more than 200 paintings a year — he first has it cleaned chemically. "The varnish used 300 and 400 years ago," he says, "was made from the bodies of insects from India. As centuries pass, that varnish turns a deeper and deeper brown, obscuring original colors and original details."

As tastes and conventions change over the centuries, segments of the original may be censured and painted over or even partially knifed off. X-rays and other detective methods can reveal these radical alterations. Then Bader must decide whether to retain modern restorers to repaint and revarnish those missing parts as close to the original as detective work can make it. The decision to do this may offend some. It always involves great amounts of skill, time and money, sometimes recouped by the beauty revealed, the treasure recovered or the investment recouped many times over.

Using slides and anecdotes to describe his treasure hunts, Bader took his audience of about 50 Bowdoin students and eight outsiders on fascinating hunts for original truth in 350-year-old paintings. The audience was deliciously infected by this chemist/collector in his middle 60s, whose joy and reputation are built upon getting rid of the smirch and giving original beauty back to the world.

Tapping into the million-dollar brains at a nearby college can be exhilarating. Try it.

The Portland Press Herald



Seminar to focus on God's existence

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His schedule includes:

7 p.m. Friday, "Cosmology - An Evidence of God's Existence," and 8 p.m., "The Source - Design or Chance?"; Saturday - 10 a.m., "UFOs, Ancient Astronauts and the Bermuda Triangle," 1-4 p.m., "Evolution," 7 p.m., "The Nature of God," and 8 p.m., "Which God Should We Serve?" These sessions will be in Collins Building No. 101, University of Wisconsin-Stevens Point.

"Problems of Human Suffering" will be the topic for the 9:30 a.m. Bible class for adults and teens Sunday at Stevens Point Church of Christ, 1112 Sandy Lane. This will be followed by a.m. worship service and "The Use of Evidence in Evangelism and Personal Work" at 1:30 p.m.

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News of Organizations

Stevens Point Chapter, DAR

To commemorate the 200th anniversary of the Constitution, Stevens Point Chapter, National Society Daughters of the American Revolution met recently in the home of Mrs. Harold Roberts for its annual Constitution Week potluck luncheon and regular meeting.

Mrs. Russell Swanson, regent, opened the meeting with the DAR Ritual, the Pledge of Allegiance to the Flag of the United States of America, led by Mrs. Howard Woodside, the American's Creed and the Preamble to the Constitution.

Mrs. Mark Makhohl, National Defense chairman, read "The Moral Foundations of Republican Government" by Edwin Meese III, U.S. attorney general, published in the National Defender of May 1987 in which he states in part: "Not only is the Constitution our fundamental law, it is also the institutional expression of the philosophical foundation of our political order, the basis of our very way of life."

A review of activities not previously reported included a "Minuteman" breakfast at the Holiday Inn to commemorate the Battle of Concord, an important event of the American Revolution; memorial services at the graveside of our "Real Daughter," Elizabeth Omas Seward, daughter of patriot Thomas Omas; an annual Flag Day picnic at the home of Mr. and Mrs. Richard Toser; and a trip to Portage for a tour of Surgeon's Quarters at Fort Winnebago owned, restored and maintained by Wisconsin Society, DAR. Surgeon's Quarters is open to visitors from May 15 through Oct. 15. Mrs. John Barnes, a member of Stevens Point Chapter, is treasurer of Surgeon's Quarters Board.

In cooperation with the citywide Bicentennial celebration, Stevens Point Chapter participated in many of the planned activities. Mrs. Swanson served as a member of the Bicentennial Committee. She distributed handbills and programs, and sold booster buttons and tickets to the kick-off dinner at which Justice Shirley Abrahamson spoke.

Mrs. Robert Chesbrough, Mrs. Roberts and Mrs. Toser participated in polls on the Constitution in CenterPoint Mall, obtaining signatures to "This is My Constitution." The chapter loaned its large, handmade flag, posters and bunting for use in displays in CenterPoint Mall and Manufacturers Direct Mall, Plover. It donated the New Hampshire state tree, one of 13 trees representing the 13 original colonies, dedicated at the riverfront ceremony on Sept. 17. Mrs. Gerald Wick was responsible for displays of proclamations by Plover Village President

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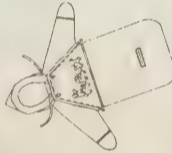
• Jackets

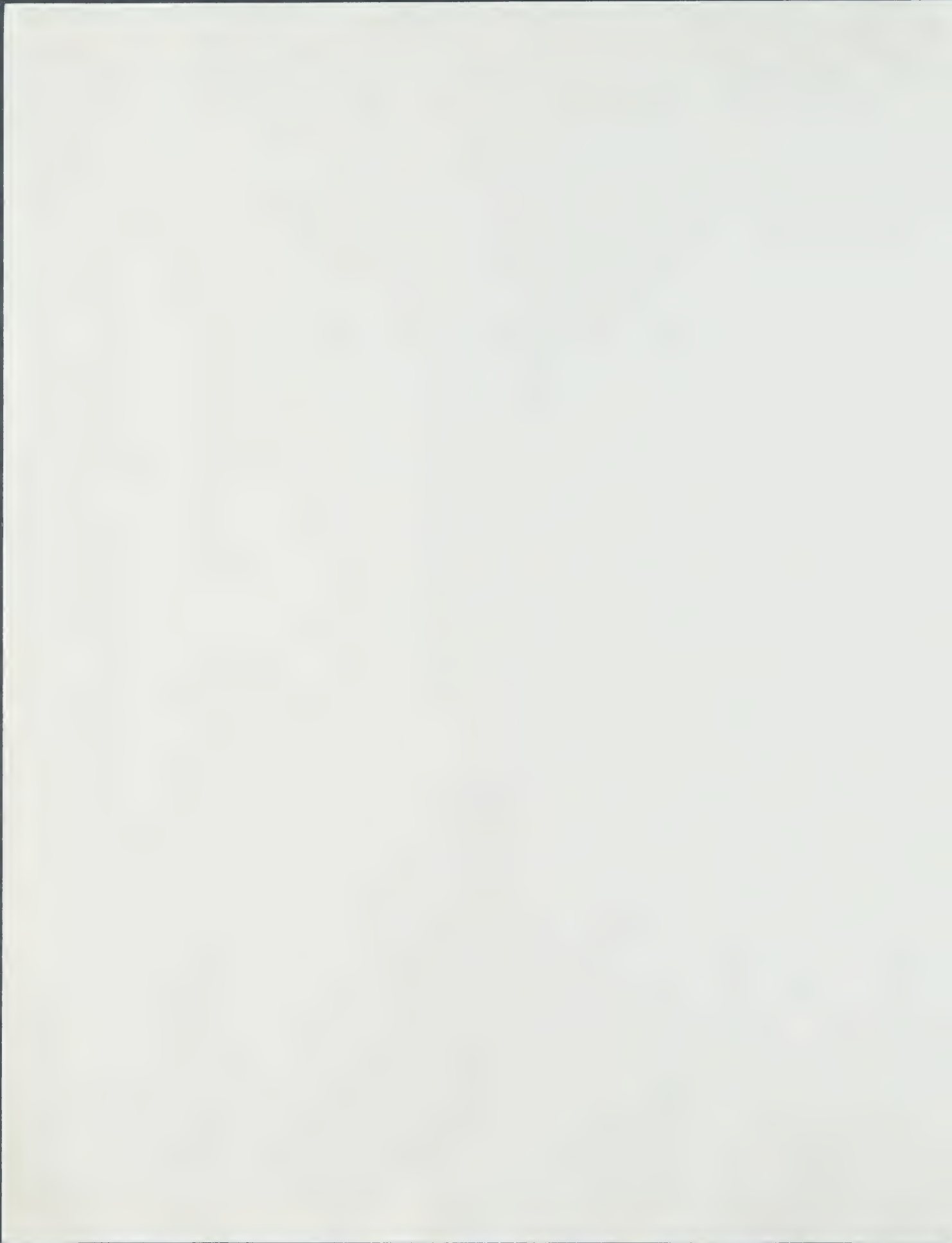
• Rainwear

Additional Sportswear Separates

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Sale prices good thru Oct. 31





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grades from UW-Madison, UW-Milwaukee, Purdue University and Queen's University.

Interested in the restoration of art, he has developed presentations which describe how chemistry can be incorporated into this process.



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Daniel Schlatter at the Plowier Library and by Stevens Point Mayor Scott Schultz at the Charles M. White Library. She also encouraged book displays in libraries at P.J. Jacobs Junior High School, Benjamin Franklin Junior High School, Stevens Point Area Senior High School and Facelli High School, and provided Constitution crossword puzzles to members and to these schools.

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Sale prices good thru Oct. 31

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Janesville-Milwaukee gas pipeline approved

MADISON, Wis. (AP) — A public utility's proposal to construct a 58-mile natural gas pipeline between Janesville and Milwaukee has received state approval over objections of a petroleum supplier and landowners.

The Public Service Commission granted Tuesday the request of Wisconsin Gas Co., which says the new pipeline would give it access to another supplier and reduce its cost of gas. All three commissioners approved the request. The PSC staff had recommended rejection.

Many landowners along the designated route sided with ANR Pipeline Co. of Detroit which currently provides about 90 percent of Wisconsin's natural gas supplies. ANR said it stands to lose up to 25 percent of its Wisconsin sales if the pipeline taps a competitor's supply.

William Brackett of Washington, D.C., an ANR attorney, said it was not immediately known if the PSC decision would be challenged in court.

Wisconsin Gas would provide \$14.2

million of the construction cost. Northern Natural Gas Co. of Omaha, Neb., would finance the remaining \$13.6 million of the \$27.8 project.

About 750,000 natural gas customers would be served by the pipeline from Wisconsin Gas, Wisconsin Natural Gas Co., Wisconsin Southern Gas Co. and Wisconsin Power & Light. The promised savings to consumers and the added assurance of adequate supplies in the future were two arguments cited by the PSC commissioners.

"If Wisconsin is to remain competitive (for natural gas), it is necessary to build the pipelines," commission chairman Charles Thompson said.

Mary Lou Munts said the decision was "the hardest one I've had to make" as commissioner, in part because of environmental concerns.

"I don't think any of us has a desire to build something across someone's property," commissioner George Edgar said.

ANR offered to provide natural gas to Wisconsin Gas at a reduced rate. But "it does not provide the flexibility and adaptability" needed for the future supplies, Edgar said.

The pipeline would cross Kettle Moraine State Forest, Vernon Marsh, the Fox River, several other streams and many farms.

Plans call for the pipeline to be six feet below the surface. Metering stations would be above ground, but they would be landscaped, the utility says.

Mrs. Munts said she felt better about approving the pipeline route after taking an airplane flight over the area.

"I felt much better seeing it from the air," she said. "We kept seeing how the route swung to avoid even small stands of trees."

"It's going to cost a bit more, but those extra dollars are going to buy a lot of public good will," she said. While price competition is important, the commissioners said, it is also prudent to provide gas customers with another distributor because of the uncertainty of future supplies.

"In a world of uncertainty, it is important to have flexibility," Edgar said.

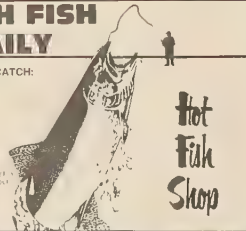
Thomas Schrader of Milwaukee, executive vice president of Wisconsin Gas Co., said construction could begin next spring. The target for completion is next August, he said.

FRESH FISH DAILY

THIS WEEK'S CATCH:

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1988

Five units OK pact with state

MADISON, Wis. (AP) — A proposed contract offering state workers 2 percent and 2.1 percent pay raises during the next two years has been approved by five of six units of the state employees union.

However, one unit of the 25,000-member Wisconsin State Employees Union did oppose the contract, the union said Tuesday. That unit is made up of 110 state research, statistics and analysis workers, the union said.

Ratifying the contract were blue collar, technical, professional staff service, security and clerical workers.

Neil Gleason, president of the research unit, said his members will meet again next Monday to discuss whether to accept the contract or ask for another round of negotiations with the state.

He said the unit's initial decision not to ratify the pact was based on many items, ranging from the pay raises offered to concerns on layoff language and sick leaves.

The Legislature's Joint Committee on Employment Relations will get a report on the negotiations Thursday.

DJs suspended for

Chemical PastTimes / Petite chronique archéologique

THE BEGINNINGS OF ALDRICH

The idea that I might have a place in the fine chemical business first came to me while in graduate school at Harvard in 1949. When you needed a research organic in those days, you looked into one catalog, that of Eastman Kodak. If it was in there, you bought it; if not, you made it. The starting material I needed for my last product to complete my research under Prof. Louis Fieser was 2-isopropylphenol, to make 2-isopropyl-naphthoquinone. The Eastman catalog listed 2-isopropylphenol, and so I ordered 500 grams. Six weeks later it still had not come, and I went to see Warren Stockwood in charge of the storeroom at Harvard, and asked his advice. He handed me a sheet of Harvard Chemistry Department notepaper and told me to write to them — « See what happens. » I received a form post card — I wish I had kept it; I would frame it. It simply said that my order had been received and would I please not add to the paperwork; Eastman would ship the material whenever possible. At that point I said to myself, « My gosh, if that is the way the fine chemical business is operated in the United States, maybe I have a place in it ».

On graduation from Harvard, I joined the research laboratories of the Paint Division of the Pittsburgh Plate Glass Company in Milwaukee, and became good friends with the Director of Research, Dr. Howard Gerhart. I asked Howard whether I might not start a tiny division within PPG to make and sell research chemicals, and he just shook his head and said no, that wouldn't fly. He believed Eastman Kodak was so well entrenched that one just could not compete.

I agreed that one could not compete with Kodak, but DPI, the Distillation Products Industries Division of Kodak which sold the fine chemicals offered only about 4,000 products, and there were so many others which would interest research chemists. So a friend of mine, a Milwaukee attorney, Jack E., and I decided to start a company to offer research chemicals. We incorporated on August 17, 1951, with the minimum required capital of \$ 500, each of us putting in \$ 250. We tossed up for the name; I lost the toss. Jack was engaged to a charming girl, Betty Aldrich, and so the company was named the Aldrich Chemical Company. At first, all the paperwork, storage, weighing, labelling, packaging and invoicing was done in Jack's office; later we rented a garage (on Farwell Avenue) on Milwaukee's east side for \$ 25 a month. Our first product was one that I had learned to make while working for my MSc at Queen's University, methyl nitrosoguanidine first made by my professor at Queen's, Arthur F. McKay. We contracted with Dr. McKay and with a small company in Milwaukee to make this for us. MNNG is an excellent precursor for diazomethane. It is a stable crystalline solid melting at 118°, and its great advantage over other precursors is that it yields diazomethane with aqueous alkali rather than with ethanolic alkali, as is the case with other precursors. I had told Prof. Fieser about this compound, and he had every student in Chemistry 20 at Harvard, the

every student in Chemistry 20 at Harvard, the first organic chemistry course, make one batch. I then took all of these batches, crystallized them once from methanol to get rid of all the cigarette butts and bobbypins, and the chemistry department then had a sufficient supply of MNNG to last for the entire year. We had a permanently set-up diazomethane still in my lab so that anyone needing diazomethane could use it. What we didn't know at the time was that MNNG is one of the most powerful mutagenic agents known; that wasn't discovered until a few years later.

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N-methyl-N-nitroso-N'-nitroguanidine for the preparation of Diazomethane is now being distributed for the first time anywhere by the Aldrich Chemical Company.

Diazomethane is an invaluable reagent for the methylation of carboxylic acids, phenols and enols, for the preparation of heterocyclic compounds and in the Arndt-Eistert reaction. It has hitherto been prepared through intermediates which are unstable and strong skin irritants.

Diazomethane can now be prepared most simply by the action of alkali on methyl nitroso nitroguanidine. (cf. McKay JACS 70, 1971 (1948); McKay et al. Can. J. Res., 28, 683 (1950); Organic Chemistry, Fieser and Fieser, 2nd. Ed. 178.

Methyl nitroso nitroguanidine is a crystalline compound, m.p. 118°C, which has been kept in brown bottles at room temperature for over a year without decomposition. The addition of this crystalline compound to a cold 50% aqueous potassium hydroxide solution covered with ether yields diazomethane in 70-90% yield. Numerous experiments have shown that when this ethereal diazomethane solution is distilled and added to an ethereal solution of a pure carboxylic acid, then evaporation of the resulting solution leaves the analytically pure methyl ester of the acid.

N-methyl-N-nitroso-N'-nitroguanidine Prices:

10 gms.	\$ 5.00
25 gms.	10.00
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We shall be pleased to receive your introductory order.

ALDRICH CHEMICAL COMPANY

Figure 1.

The first Aldrich catalog (Fig. 1) was a mimeographed sheet which we sent to some 2,000 research chemists around the country. The mailing list was constructed from the senior authors of organic papers in the JACS and the JOC.

Gradually we added other compounds not listed by Kodak. Catalog No. 2 was again a single mimeographed sheet, but unfortunately I do not have a copy of it. An appeal to readers of the *Aldrichimica Acta* in Volume 17, No. 3, to exchange a fine English 19th century landscape for that single sheet if any customer should chance to find one, was unsuccessful. Sales in the first year were \$ 1,705 and as

we paid no salaries, we actually showed a \$ 20 profit. In the second year sales climbed to \$ 5,400 and reached \$ 15,000 by the third year.

I was very happy in my work at PPG and had also really grown to like the city of Milwaukee. Early in 1954, PPG decided to move its research laboratories from Milwaukee to Springdale, near Pittsburgh, Pennsylvania. In those days, Pittsburgh was not all like it is now; my impression, at least, was that it was really quite an unpleasant and dirty city, and I didn't want to move from Milwaukee. Hence, I told Howard Gerhart that I planned to leave PPG and work full time at Aldrich. He said, « Alfred, you are a very good chemist. You can make a great many things, but you are not a businessman. I am convinced that within a couple of years Aldrich will go bankrupt. When it does, please don't look for another job but come back to PPG; we need you. And in the meantime, will you please consult for us. » This I was happy to do.

Of course, Aldrich had no capital, and neither Jack nor I was in a position to put any money into the company. So we went to a friend, a Milwaukee businessman, and persuaded him to buy 1/3 of the company for \$ 25,000. The agreement was that he would put in \$ 5,000 immediately and then a thousand dollars a month for the next 20 months. To conserve capital, my salary was to drop from the \$ 800 a month I had been making at PPG to \$ 500 a month, and I was not to cash the salary checks for the first six months. Our investor had the option at any time to withdraw his capital in exchange for his stock. After seven months, in 1955 he came to me and said, « Look, Aldrich has been growing nicely, sales are up practically every month, but still, I don't think that the company will ever be worth \$ 75,000 to justify a \$ 25,000 investment for one third, so I want out; please return my money. »

In such decisions, people usually have good reasons and real reasons, and with ordinary human beings these are often quite different. When I pressed him for his real reason, he said, « Well, I was so disappointed in you. You will recall that some weeks ago you had a friend of yours, Prof. Martin Ettliger, visit you and you paid him a consulting fee of \$ 100 without asking my consent. Martin Ettliger had been my good friend since Harvard days. He helped enormously with the publication of papers, with making suggestions for Aldrich, with many chemical matters, and when he visited us, that small gift seemed entirely justifiable. Our investor, of course, was on our board of directors and there was a very tight control of expenses. For instance, the only action of the last board meeting before his departure was to empower me to buy another badly needed, secondhand desk at a cost not to exceed \$ 35! Still, a consulting payment to Martin of only \$ 100 seemed so well-deserved, that I had, quite unthinkingly, not asked for board approval.

We were now in a difficult position. Our investor had put \$ 12,000 into the company and was entitled to receive that back over the next couple of years. Jack, the attorney who set up the company in 1951, had helped a great deal in the early days. But since leaving PPG, I was working 12-14 hours a day, whereas with his law practice, Jack could help very little now. Moreover, every move, including minor purchases, required mutual agreement, making progress and decision making difficult. With the withdrawal of the only real capital, the only source of capital was to be that generated by our own efforts. Under the circumstances, a 50/50 interest between Jack and me did not strike me as fair or workable, and so I went to an old friend, another attorney known for his uprightness and legal wisdom, Harry K.,

and explained the problem. Harry worked out three alternatives and suggested that I submit these to Jack. One was that I would sell to Jack my 50% for \$ 3,000, but then would take the \$ 3,000 to start the Bader Chemical Company. The second was that Jack would sell me his 50% for \$ 10,000 to be paid over two or three years. The third was that Jack sell me 20% of the company for \$ 6,000, so that I would have 70% and he, 30%. Jack did not like any of these alternatives and became very angry. Eventually, he proposed that he would sell me his half for \$ 15,000, to be paid over three years, and I am sorry that he has not spoken to me since:

When I left PPG, Aldrich moved from the garage on Farwell to a thousand square foot laboratory near Capitol Drive in Milwaukee and hired two secretaries and a full time lab technician from PPG, George Skeff, who is still with us at Aldrich. But now there were substantial debts, \$ 12,000 to our former investor and \$ 15,000 to Jack. Sales, however, skyrocketed to \$ 39,000 by that fourth year, and just at about that time we received our first really large order. Du Pont had written to a number of companies asking for quotations for 500 pounds of suberic acid. I had never made suberic acid before, but the preparation seemed straightforward and the starting material, 1,6-hexanediol, was available very inexpensively from Union Carbide. I had no idea how to figure costs of production, but just felt that we couldn't go wrong if we got the order at \$ 38 a pound. And believe it or not, we got that order for delivery by the end of the year. That \$ 19,000 really helped.

It became clear to me very early that we couldn't succeed if we sold only what I knew how to make; we must combine production with resale, particularly of imports. I knew western Europe fairly well, spoke German fluently and French haltingly, so I decided to spend a month or two every year travelling from one country to the other, visiting small and medium-sized chemical companies asking what we might purchase from them. Of course, I knew what was in our own catalog, and I always carried a Kodak catalog with me to check whether the chemicals offered were in the Kodak catalog. If they were, I declined — how could we compete with Kodak — but if they were not, I bought a hundred to two hundred dollars worth to ship to Milwaukee and add to our catalog.

A few years later, an interesting experience changed this policy. An old friend, Prof. John Sheehan at M.I.T., contacted me and urged me to offer a new peptide reagent which he had developed, dicyclohexylcarbodiimide, which was not in the Kodak catalog. The preparation is not particularly easy as it involves a mercuric oxide oxidation and the material is a strong eye and skin irritant. But we listed it, and sales did very nicely. Then one day, when I glanced through the new Kodak catalog, I noticed to my great chagrin that Kodak was now offering DCC at a few pennies per bottle less than ours. Of course I figured that that was the end for that product; no one would buy DCC from Aldrich. But I was totally mistaken: sales kept going up. Then I realized that we could compete with Kodak, and from then on we listed whatever useful products we could buy or make, regardless of the compound's listing in the Kodak catalog.

In the middle fifties, I met another Milwaukee attorney, Marvin Klitsner, who became my very good friend, and is really the man whose wisdom and help were instrumental in building Aldrich. He has remained with us, first as a

director of Aldrich and then of Sigma-Aldrich, and his help is still sought in many major decisions.

By 1958, we had about a dozen people, most of whom are still with us, and we had outgrown the rented laboratory. We purchased an old 27,000 sq. ft. shoe factory building on the near northside, and within three years another much larger building, formerly the headquarters of the Badger Meter Company. I remember how we rattled around first in the old shoe company and then in the Badger Meter building, but within a few years we filled them up. We have never had a year in which our sales or our profits were less than those of the year before, and of course at the beginning we plowed all our earnings back into the business.

Most of our sales were for catalog items, but gradually we began to be involved in more and more custom syntheses, particularly for pharmaceutical companies. Among these, Upjohn was by far our best customer in the early days, and many of the Upjohn chemists became my good personal friends. For years I thought that in time Upjohn would purchase Aldrich. I found out later that a number of the chemists at Upjohn thought so too, but others in management counselled against it because we were, in their view, after all, just a « one-man company. »

In 1962, executives from J. T. Baker visited us and were very blunt in expressing their wishes. They had studied Aldrich and wanted to buy the company for \$ 1.5 million, either in cash or in Richardson-Merrill stock. There were, they explained, two alternatives. We could sell and become part of the great J. T. Baker organization, or not sell, in which case Baker would go into the fine organic chemical business. They had such a wonderful distribution set-up that they were sure that they would quickly capture our entire market. \$ 1.5 million was a lot of money, and we thought about this carefully, but finally said no. Baker did go into the fine organic chemical business, in a rather odd way. They arranged to buy several thousand products from Fluka who only gave them a modest discount, and so in fact Baker could not really compete with us. Some years later they went out of this business, not having done at all well, and when they offered us their stock of several thousand products, we declined.

In 1962, Aldrich's sales reached the first million and by 1965 our total sales and research income reached two million.

By this time, some very able chemists had joined us. Dr. John Biel, director of laboratories at the Lakeside Laboratories in Milwaukee for a number of years, joined us in 1962 to head our research department. We had some 15 chemists, including 7 Ph. D.'s working on various research contracts, principally for pharmaceutical companies and the government. Bernie Edelstein, a graduate chemist from the University of Wisconsin, graduated from the University of Michigan Law School and joined us in 1962. By 1965, many of our chemist friends were asking how they could buy Aldrich stock. We felt that we had such a good record of steadily growing sales and revenues that it was time to go public — not on any grand scale, but simply by offering 100,000 shares of the, by then, total of 600,000 shares to a select list of chemists and friends who had often expressed an interest. We went to a small Milwaukee stockbroker, the Marshall Company, and asked what the minimum commission would be for selling the stock at \$ 10 a share on what they called a best efforts basis. The minimum commission permitted by the S.E.C. was 17 ¢, and so my family and I offered up to 100,000 shares at \$ 10 a share. There were considerable difficulties with

the State of Wisconsin regulatory agency which protested that \$ 10 a share for a company whose earnings were only 30 ¢ a share was very high. Of course we pointed out that the Marshall Company would sell the shares only on a best efforts basis, and finally we did receive permission. What we didn't realize was that when prospective stockholders called the Marshall Company to inquire, the individual stockbrokers were discouraging and suggested that if the buyer wanted to speculate there were very much better stocks in the \$ 10 a share range; at least better in the commission that they would pay to the stockbrokers. As a result we sold very few shares in Milwaukee and only about 16,000 in total around the country, to about 200 chemists and friends who knew us well. After the offering closed, the market generally went down, and the executives at the Marshall Company who really didn't understand our business began to sell the stock short, feeling that the \$ 10 a share had been too high. What they didn't realize, at least not at first, was that all our new stockholders had known the company for some years and had faith in it. In fact, during the first year, only 45 shares were offered by these new stockholders, those owned by an investment club in Ann Arbor which folded. The Marshall Company merrily kept selling stock short — 4,000 shares — until they realized some months later that they couldn't deliver. They then came to me in some panic and pointed out that they had been most helpful in selling the stock and asked if I would please help them now. By that time, their offering of \$ 14 a share had not elicited any sales, and I got them out of their misery by selling them the needed stock at that price.

During the next year, one of the stockbrokers at a much more substantial Milwaukee brokerage house, Mr. William Schield at Robert W. Baird, got to know me well personally and really became intrigued by the company. He persuaded Baird to offer 120,000 shares of Aldrich stock at \$ 23/share (including a commission of \$ 1.45 for Baird), again a sale by my family and me, not the company. The sale did well, and Aldrich stock has never sold below that \$ 23. One of those old shares has now been split into 12 Sigma-Aldrich shares, which in 1987 were traded between \$ 30 and \$ 50 per share.

By the late sixties, it was clear to me that the greatest growth in chemical research lay in biochemistry — the elucidation of the chemistry of life — and we were not biochemists. Organic chemistry seemed to have peaked with Woodward's synthesis of strychnine — Sharpless' chiral epoxidation and Brown's hydroboration were not yet with us. So we started a small biochemical department, with a small, but eye-catching, catalog and began considering a merger with a biochemical company. In Europe, the biochemical companies were very large — companies like Boehringer, Mannheim, that might consider buying Aldrich — but that would not be a true merger. In the U.S. there were three important biochemical companies. Calbiochem had just been purchased by Hoechst, and in my experience large companies usually ruin the entrepreneurial spirit of the smaller company, the spirit which is really the reason for the acquisition. J. T. Baker would have ruined the spirit of Aldrich; Hoechst the spirit of Calbiochem. The second company, Nutritional Biochemicals, had been bought by a very curious company, ICN, which struck me as being a conglomerate acquiring companies here, there and everywhere. For some years, one of their men called me regularly to inquire when we would join their « family of companies », and I just laughed and declined.

The third company, Sigma in St. Louis, was the ablest and most interesting of the lot, presided over by a towering figure, Dan Broida.

Dan was one of the most interesting men I have ever known. On graduation as a chemical engineer, he was employed by Midwest Consultants, a small company owned by two brothers, Aaron Fisher and Bernard Fishlowitz, in St. Louis. Midwest Consultants was the forerunner of the Sigma Chemical Company, set up first to make saccharin and then biochemicals. Dan, Aaron, Bernard and their families each owned about a third of Sigma, at first just a small storefront operation.

Dan was intelligent, handsome, immensely hard working, totally honest, opinionated and disdainful of most Ph. D.'s, calling all and sundry idiots, if they disagreed with him. You could never win an argument with Dan. The love and care of his well-balanced and charming wife, Roma, made being with Dan bearable.

Dan built Sigma into a most singular company where service, purity of products and lowest price in the marketplace were absolute musts. Employees could not leave Sigma at the end of the day until the last order was shipped. Advertisements were shunned; service and product quality must speak for themselves. Dan truly believed that any biochemist who was foolish enough to buy from a competitor deserved what he received.

Sigma placed far greater emphasis on production than Aldrich. In fact, Dan considered suppliers just a necessary evil — if a purchased product sold well, Sigma would in time make it. And Dan treated many suppliers (including Aldrich) disdainfully. Purchased products were often rejected for good reasons, but Dan would not give the reasons to the suppliers, for they might then improve their products and sell the improved products also to competitors! Aldrich, on the other hand, worked very hard to establish good relations with suppliers, and many of these became our good friends. By working with reliable suppliers, we were able to concentrate our efforts at Aldrich on new products. And when requirements for these became so large that Aldrich could no longer handle them, we could go to a supplier-friend with the right equipment, and have our requirements filled. I am sure that our good relations with suppliers was a real eye-opener to Sigma on our merger, as was their insistence on same day service to Aldrich.

Correspondingly, Aldrich had good relations with its competitors, many of whom — like Fluka and Kodak — were also our suppliers and customers. In contrast, Dan refused to sell to Sigma's competitors, and attacked them in the introduction of the Sigma catalog.

I approached Sigma in 1967 to suggest a merger between Sigma, then still family-owned, and Aldrich, now a public

company, and I was quickly rebuffed. Sigma went public through Goldman, Sachs in 1972 — of a total of about 3 million shares, 700,000 were sold to the public at \$ 22 per share. The offering did not do well and the stock price dipped to \$ 11 per share in 1973, partly because of some undeserved bad publicity. Dan's manner caused many competent scientists to leave Sigma over the years, and Bernard Fishlowitz who was competent and very people-oriented died in 1968. Thus, Sigma was very thin in top management, and when the talks were resumed again in 1974, the directors became very interested. Only Dan objected vigorously.

Scientifically, the merger made excellent sense. By 1975 Sigma was the leading supplier of biochemicals, Aldrich of organics. The technical competence in both areas had become important as the two fields became more interrelated. None of our organic competitors had a substantial share in the biochemical market, and none of Sigma's competitors knew as much organic chemistry as Aldrich. To Aldrich stockholders it would open up the greater expansion opportunities afforded by biochemistry as compared with organic chemistry. To Sigma stockholders it was a sensible deal, because the merger gave Sigma organic chemicals know-how which was valuable in the development of many biochemical products as well as a potential for a new balanced management — balance difficult to achieve with Dan alone at the helm.

The valuation of Sigma and Aldrich stock was fairly simple — neither of us had debt, Sigma had long been about twice the size of Aldrich in sales and profits. Each had very conservative accounting policies and there was no doubt — so often present in merger negotiations — that neither had overstated its earnings.

We merged in August of 1975, Aldrich shareholders receiving one third and Sigma two thirds of the new Sigma-Aldrich Corporation stock. There has never been a time when any of our stockholders had reason to regret the merger on economic terms, although it made the personal lives of some of us, certainly of Dan and me, much more difficult. And, of course, our customers have benefitted because now Sigma and Aldrich give better, more balanced service than before the merger.

Dr Alfred Bader
Chairman
SIGMA - ALDRICH CORPORATION

This a chapter taken from
Dr. Bader's autobiography
now in preparation

Business Outlook

Former refugee now multimillionaire

Aldrich Chemicals' Alfred Bader thanks Queen's

By JANICE ARNOLD

KINGSTON, Ont. — A Vienna-born U.S. multimillionaire who arrived on this continent as a frightened 16-year-old prisoner of war thanked his alma mater, Queen's University, for helping him become what he is today.

Alfred Bader, now 62, is head of Milwaukee-based Aldrich Chemicals, one of the leading suppliers of organic chemicals in the world. He earned three degrees at Queen's: a BSc in engineering chemistry in 1945, a BA in history in 1946, and an MSc in chemistry in 1947. Recently, he received his fourth, an honorary Doctor of Laws at the Queen's fall convocation.

In his address, Bader spoke frankly about his first, negative impressions of Canada. Bader went to England in 1938, under the sponsorship of a Mrs. Wolff. In May, 1940, he was interned as an enemy alien, along with many other German and Austrian Jewish refugees, whom England feared might be fifth columnists.

Bader was among those shipped to Canada in July, 1940 and sent to a camp at Ile aux Noix, an island on the Richelieu River in Quebec. He was the youngest among the prisoners.

"My first impressions of Canada were truly mistaken...I thought that Canadians were largely dishonest and uncivilized."

Upon his arrival, the camp commandant "interrogated me carefully, marveling that a youngster of 16 had parachuted to England. When I tried to explain that I was no parachutist but had fled to England and was a Jew, he just laughed and assured me that he did not believe me, and anyway, he didn't

Aldrich in 1951. He never forgot the university over the years. He has endowed Queen's with a prize in Jewish studies and two scholarships. One in engineering is named for Martin Wolff, his surrogate father. The other is

in art history, a lifelong interest. Bader owns a major art collection, specializing in 17th century Dutch works on religious themes. He has donated many valuable old master paintings to the university's Agnes Ether-

ington Art Centre. He has been a member of the board of directors of Queen's for the past 10 years.

Bader remembered at the convocation that he had been a "scholarship" student while at Queen's.

"Very short of cash, I discovered that the university calendar listed the Andrina McCulloch Scholarship for Public Speaking.

"How silly could I get? I had never spoken publicly and spoke with a strong

accent. But \$50 was \$50, so I tried and won."

Today, Aldrich Chemical's annual sales exceed \$100 million, and the company is listed in Fortune as one of the top 1,000 corporations, in the United States.

like Jews either."

Bader was released 18 months later and taken in by the Wolff family in Montreal, relatives of the woman in England. "Having lost his own family, he considered us his family from then on," recalled his foster sister Rosetta Elkin of Montreal, also a Queen's graduate. There were five other daughters in the Wolff family. Besides Elkin, those surviving are Annette Wolff, Rachel Esar and Esther Blausstein, all of Montreal; and Sarah Orkin in England.

"In retrospect, of course, compared to the treatment of Jews in Nazi Europe, the treatment here was paradise. But at the time I didn't have the perspective," Bader said. "Queen's provided that. The great majority of Queen's people — students and academics — were decent and warm-hearted people. That I learned very quickly."

"Queen's taught me that I would be judged as an individual, that I did not have to be a member of the 'in group.' Even an alien Jew would be treated fairly by these Scottish Presbyterianians. At Queen's I gradually lost my shyness and gained self-confidence."

Bader continued his education at Harvard after Queen's and then founded



Alfred Bader

Bank Hapoalim plugs firms into world network

By
PAUL LUNGEN

TORONTO — Finding a niche in the competitive Canadian banking establishment was one of the goals set by the management of Bank Hapoalim (Canada) when it set up shop in 1981.

cess by passing the work on to a number of other branches that specialize in overseas transactions, it's all done in one location and usually the same day, says Druckman.

"We have special banking services that meet the needs of those who deal in international markets," Druckman says.

pleting international business transactions.

Letters of credit outlining payment and the transaction's terms can be teleaxed the same day to any of hundreds of correspondent banks in the Far East, the U.S., Europe or Israel, Druckman says.

And unlike other banks, at Bank Hapoalim all per-

That allows for quicker advice, and more rapid implementation of a customer's orders, Druckman says.

While Bank Hapoalim (Canada) is Israel-owned — its parent company is Bank Hapoalim B.M. with 1985 assets of \$22 billion and subsidiaries in 14 countries outside Israel

loans and interim financing in the construction and real estate businesses. Those still comprise the core of business.

And, it raises offering what Druckman termed "ver- competitive

rates."

Most businesses who make use of the bank's services are based in Toronto and Montreal, Druckman says, and they represent a variety of industrial sectors in the needletrades, con-

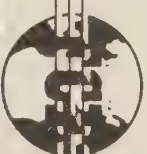
struction, oil industry and exporters, among them.

With 1985 assets of \$155 million and net income of \$367,000, the Canadian operations plans to open a second branch in Montreal in 1987, Druckman says.

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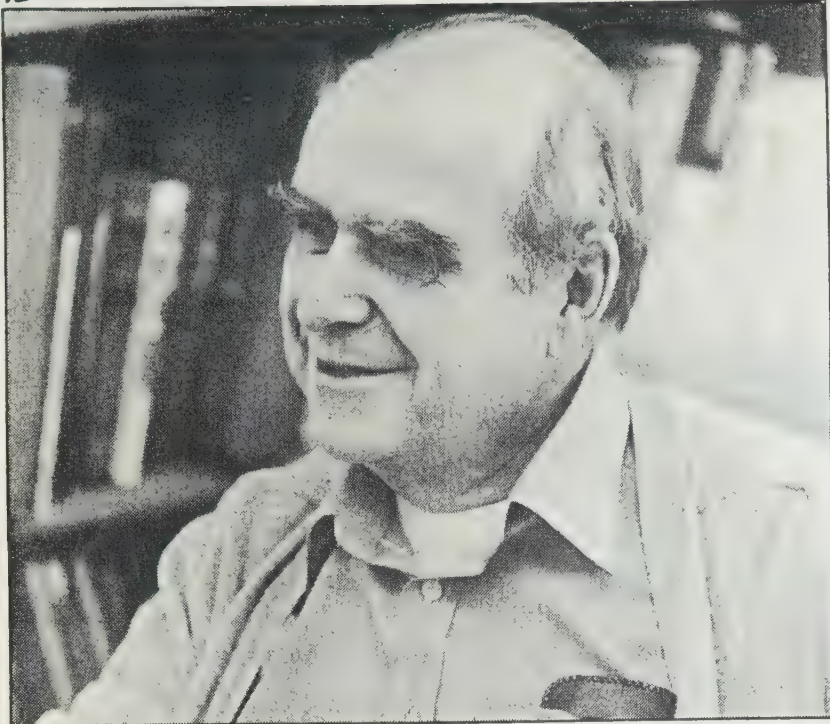
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"MY NEEDS AREN'T that big. I don't consider \$180,000 to be meaningless. It's much more than I spend. Plus, I have a fair income in dividends . . . So don't worry about me," said Alfred Bader, chairman of Sigma-Aldrich Corp., Milwaukee.

But the pay-for-profits phenomenon is not without anomalies. For instance, Farm House Foods Corp., a food wholesaler based at 111 E. Wisconsin Ave., Milwaukee, went from a profit of \$2.2 million in fiscal 1987 to a loss of \$13.5 million in fiscal 1988, which ended April 2. But its chairman, Donald Runge, and secretary, Richard Fisher, still earned hefty pay increases.

Runge's pay increased to \$805,000 from \$683,000, while Fisher's rose to \$737,000 from \$467,000.

But at Sigma-Aldrich Corp., a St. Louis- and Milwaukee-based chemical products company, where earnings increased to \$56.5 million in fiscal 1988, which ended Dec. 31, from \$41.9 million in fiscal 1987, Chairman Alfred Bader earned \$180,000 both years.

"My needs aren't that big," said Bader, who is based at Aldrich Chemical Co. Inc., 1001 W. St. Paul Ave., Milwaukee. "I don't consider \$180,000 to be meaningless. It's much more than I spend. Plus, I have a fair income in dividends. I receive several hundred thousand dollars in dividends, so don't worry about me."

For most executives, however, cash compensation is a big motivational factor. Consequently, special packages have been developed to link performance with pay.

Most of the packages involve some form of subjective goal-setting. Participants are rewarded according to established corporate, divisional or individual objectives.

According to Bassick, Milwaukee-area executives were helped by relatively low levels of expectations in late 1987.

"Nobody guessed that 1988 would be as prosperous as it was," Bassick said. "And once the budget is set, you don't change it during the year. The big jumps were driven by the better-than-expected performance for the year."

Mercer Meidinger-Hansen's Bomblatus said the result-oriented approach is being extended beyond upper management.

"More and more organizations are going to incentives to pay for performance," he said. "And they're going to lower and lower levels."

According to the Mercer Meidinger-Hansen study, 26 percent of all publicly traded companies now provide some form of incentive pay to middle- and lower-level managers.

Applied Power Inc., a manufacturing firm based at 13000 W. Silver Spring Drive, Butler, has extended a substantial

stock option and cash bonus incentive plan to four levels of management.

The firm sets annual and quarterly goals that are tied to before-tax operating profits less 20 percent of net assets. The goals vary from one operating unit to the next, but the objective is the same for all participants.

"We're trying to get human behavior consistent with what our shareholders need," said Robert Foote, Applied Power's chief financial officer. "It seems to work."

Foote said that before the plan was introduced four years ago, the firm's operating performance was "very, very bad." For example, the firm's return on operating capital in 1985 was 5 percent.

Since then, Applied Power has changed course, which Foote attributed in part to the incentive program and an employee stock plan.

After posting a return on operating capital of 19.1 percent in 1988, Applied Power has established a goal of a 20 percent return on operating capital in 1989. If there is a major recession, the goal will be revised to 15 percent.

Applied Power reported a net income of \$15.2 million in fiscal 1988, which ended Aug. 31, compared with a loss of \$1.6 million a year earlier.

Besides forging an employee allegiance to shareholder interests, stock and stock option payments are popular because they put shares in the hands of friendly interests.

"The feeling is that that's a friendlier place than out on the street, where corporate raiders can get at them," Bomblatus said.

He added that tax law changes and the stock market crash, which were expected to shed an unfavorable light on stock compensation, have failed to deter its growing popularity.

When tax law changes were introduced in 1988, it was anticipated that the loss of more favorable capital gains tax rates would remove much of the incentive behind stock option plans. But R. Robert Howard, vice president of finance for Badger Meter Inc., a water-meter-maker based at 4545 W. Brown Deer Road, Brown Deer, said his firm recently expanded its plan to include 45 executives.

"If the stock goes up, they will be rewarded financially," Howard said. "We don't care about capital gains because we don't expect anyone to sell. They're in this for their career."

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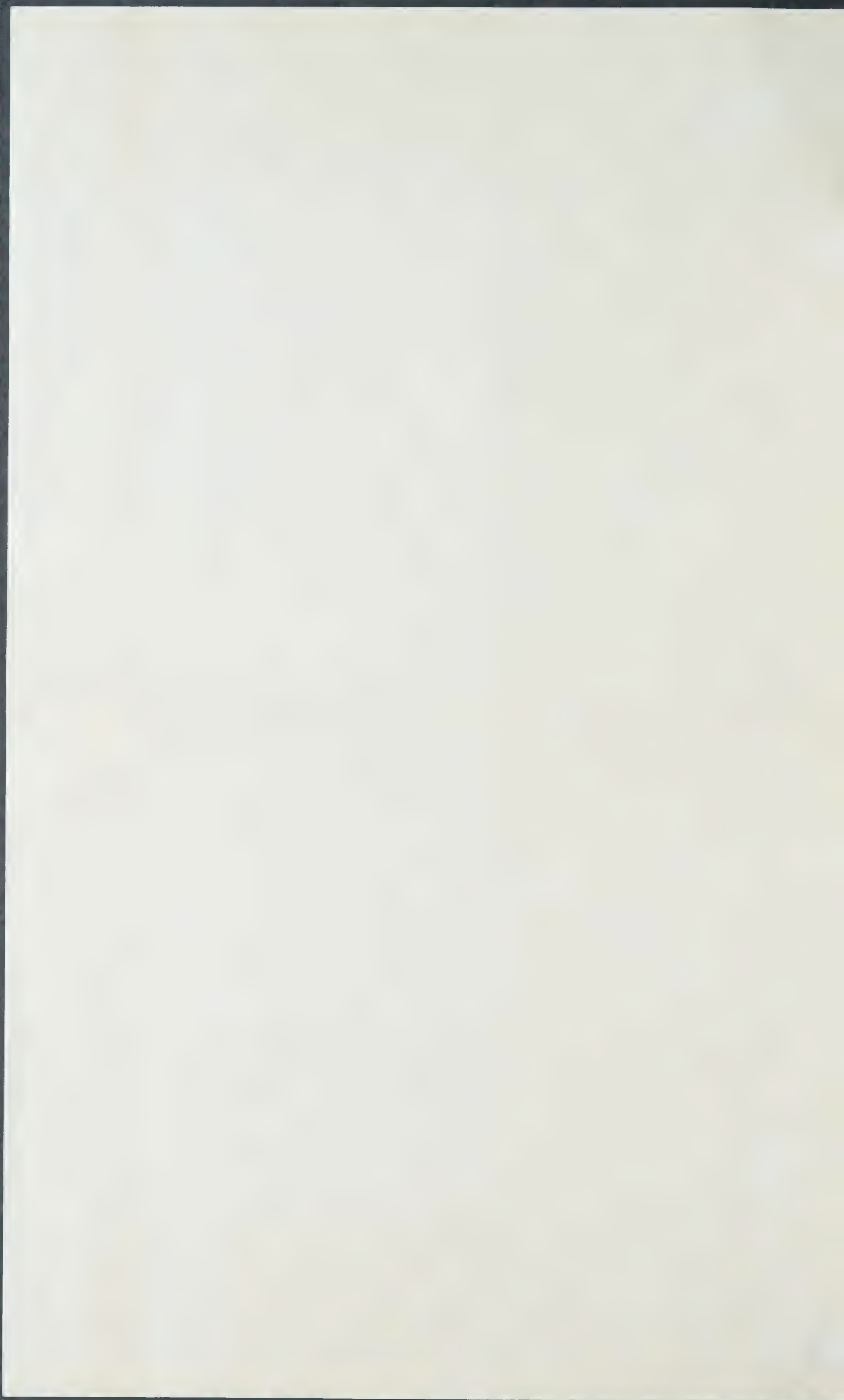
I have the whole article - want more? From Bill Scheidel

They all start the same
The proof is in the building



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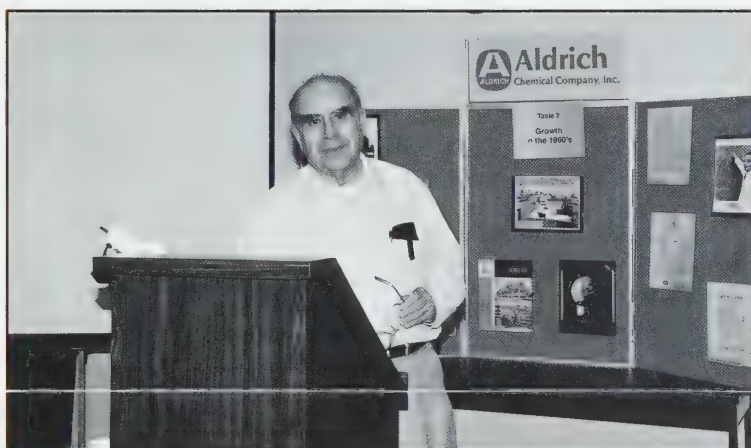


the ALDRICH REPORTER

VOLUME THIRTY, NUMBER NINE
SEPTEMBER 1991

Lecture Celebrates The Adventure Of A Chemist Collector

Dr. Alfred Bader shared his life-long love of old masters' painting at a lecture on the eve of the company's 40th anniversary. Also displayed at this lecture were pictures and memorabilia from the early days of Aldrich. Employees attending were treated to anecdotes and breath-taking slides of the artwork Dr. Bader has discovered and restored over the years.



Congratulations to our founder on the company's 40th anniversary. We wish him many more adventures as a Chemist Collector!

Special thanks and recognition go to the following individuals who assisted in the success of the Exposition: Employee Relations Staff, Marilyn Hassmann, (Chairman's Office) Bev Horick (Purchasing), Peter Hyland (Engineering), Joelle McDaniel (Graphic Services), Dave Fuggiasco, William Paasch and Keith Wallace (Maintenance) and Jeff Spence (Promotions and Publications).

Service Awards Presentations



REMINDER

These events are right around the corner. **October 12th** for Wisconsin and **October 19th** for New Jersey.

Invitations have been mailed. If you believe you should have received an invitation, but haven't yet, contact the Employee Relations Department.

Remember to mark your calendars if you haven't done so already!!

In June of 1990, Aldrich embarked on a "pilot" office paper recycling program in the Administration Building. The initiative was well received and in February of 1991 was expanded to include the 940 W. St. Paul Ave. facility.

In just one year, the program has become a success. In the period of June 1990 through June 1991, over 83,000 lbs. of waste paper was recycled.

During this same period, over 150,000 lbs. of old corrugated

ALDRICH RECYCLING UPDATE

containers were recycled. Aldrich received \$1,500.00 in net income as a result of these combined efforts.

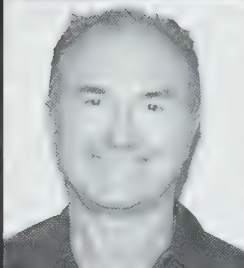
In addition to the income received, Aldrich has realized a significant

cost avoidance through recycling vs. the standard waste disposal route of the landfill.

Over \$12,000 was saved by the diversion of corrugated containers, computer paper, and white office paper, from the Aldrich waste stream.

Your cooperation and support has been the key to the success of Aldrich recycling initiatives which continue to benefit Aldrich and our environment by reducing landfill waste and disposal costs.

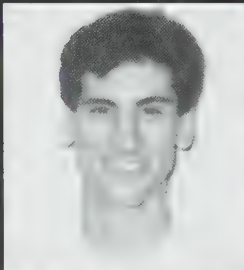
New HIRES



STEPHEN BROGLI



WILLIE DAMON



THOMAS GUNNING

CREDITS

Special thanks to the following people for their contributions to this issue of the Reporter:

..... Wayne Adler
 John Lombardo
 Joe Serketich
 Tom Tallarico
 Ron Winkler
 Jane Witherell
 Design Lori Klinzmann
 Editor Lynn Koch
 Karen Wolf

Please extend a warm welcome to the following new employees who have joined the Aldrich team.

Stephen Brogli (Sheboygan Maintenance & Engineering, Maintenance Person)

Stephen is a member of the EAA, enjoys the outdoors, including boats, horses, and also cars.

Willie Damon (Shipping, Material Handler)

Willie previously worked at Briggs & Stratton. He has earned a 7 degree black belt in karate.

Thomas Gunning (New Jersey, Packer C-2)

Thomas earned his Bachelor of Fine Arts Degree from Wright State University and a Masters Degree from North Carolina. He enjoys the theatre, swimming, baseball, juggling, ballroom and tap dancing.

WEDDING BELLS

Larry Harvey (Packaging) married Cheryl Grant on July 20, 1991 at Anitoch Missionary Church. They honeymooned at the Lake Geneva Club Americana. Congratulations to the newlyweds!

NEW ARRIVALS

Congratulations to the following employees who have recently added on to their families!

Steve Betts (Glass Shop) and his wife Beth are proud parents of Bryon Patrick on August 1, 1991. Bryon weighed 8lbs 1oz and was 21 inches long.

David Bruggink (Maintenance) and his wife Bobbette on the birth of Jessica Amber on July 12, 1991.

Brent Navis (Sheboygan, Packaging) and his wife Jennifer are pleased to announce the birth of Justin Lee on May 24, 1991.

Jeff Schuessler (Sheboygan, Production III) and his wife Jill are proud parents of Jacob Thomas, born on June 13, 1991. Jacob weighed 8lbs 13oz.

BEREAVEMENTS

We are saddened to report the passing away of Aldrich employee **Jerry Holstrom**. Jerry was a Shipping Supervisor at Hope Avenue and had seven years of service with us. Our sincere condolences to his family, friends, and co-workers.

Also, to **Randy Mitschka** (Pilot Plant) whose father has passed away.

500

BOND RECIPIENTS

Congratulations to the following employees. They will receive a \$500 bond for their employee referrals.

Billi Jo Mason
Cust. & Ord. Services

Judy Pruss
Cust. & Ord. Services

Timothy Rossman
Warehouse

Courses Completed

Congratulations to **Cindy Hanke** (Sheboygan, Quality Control) on completing coursework in Organic Chemistry.

ANNIVERSARIES

Stella Ward (<i>Production</i>)	35 years	Ida Dickfoss (<i>Sheb. Packaging</i>)	7 years
Pat Gunther (<i>Graphic Services</i>)	25 years	Jim Downs (<i>Cust. & Order Services</i>)	7 years
Pete Schreiber (<i>Stains & Dyes</i>)	25 years	Dean Llanas (<i>Quality Control</i>)	7 years
Kris Korthoff (<i>Stains & Dyes</i>)	19 years	Brian O'Neill (<i>Flavors & Fragrances</i>)	7 years
Lyle Fox (<i>Sheb. Maint./Eng.</i>)	15 years	Bart Versteegh (<i>Maint./Eng.</i>)	7 years
Margaret Parham (<i>Shipping</i>)	14 years	Tom Haag (<i>Packaging</i>)	6 years
Earl Jackson (<i>Pilot Plant</i>)	13 years	Paul Jorgensen (<i>Data Processing</i>)	6 years
John Wicks (<i>Packaging</i>)	12 years	Nick Jawdosiuk (<i>Stains & Dyes</i>)	6 years
Larry Cooper (<i>Hazard. Waste & Comp.</i>)	11 years	Madeleine Klug (<i>Cust. & Order Services</i>)	6 years
Cynthia Morrow (<i>Maint/Eng.</i>)	10 years	Steve Miller (<i>Bulk Sales</i>)	6 years
Dave Reinmuller (<i>Prod. - Lab</i>)	10 years	Mike Redjinski (<i>Packaging</i>)	6 years
Young Lee (<i>Maint./Eng.</i>)	9 years	John Tally (<i>Packaging</i>)	6 years
Rich Machmueller (<i>Quality Control</i>)	9 years	Ed Waech (<i>Sheb. Prod. II</i>)	6 years
John Neafsy (<i>Sheb. Packaging</i>)	9 years	W.S. Banks (<i>Packaging</i>)	5 years
Abi Rahmani (<i>Packaging</i>)	9 years	Jill Jacobson (<i>Purchasing/Chem. Products</i>)	5 years
Bob Lafond (<i>Z - Area Assembly</i>)	8 years	Bob Roethle (<i>Sheb. Packaging</i>)	5 years
Jill Pallo (<i>Graphic Services</i>)	8 years	Mark Schmitt (<i>Quality Control</i>)	5 years
Joe Porwoll (<i>Production</i>)	8 years		

OCTOBER BIRTHDAYS

SUN	MON	TUE	WED	THU	FRI	SAT
		Marylyn Ward Isotopes 1	Merdis Overton Shipping Barbara Melzer Cust. & Ord. Services 2	Rich Machmueller Quality Control Shari Turzanski Accounting 3	Anthony Bishop Quality Control Mike Redjinski Packaging 4	Amy Burr Sheb. Lab I 5
Dawn Keough Graphic Services Delores Buckner ER 6	Cindy Barton Shipping Herman Camie Bulk Sales Pat Duffy Sheb., Production III Jerry Gensch Sheb. Packaging John Neafsy Sheb. Packaging 7	Tom Hering Sheb. Lab I Tom Haag Packaging 8	Bev Schad Sheb. Packaging 9	Paul Zizelman Sheb. Lab I Julia Barnes Packaging Bonnie Strzyzewski Cust. & Ord. Services 10	11	Kevin Anderson, Sr. Warehouse Jeff Austin Sheb. Maint/Eng. Dolores Jenkins Cust. & Ord. Services Joe Gardetto Data Processing 12
Houston Sanders Pilot Plant Martin Miller Sheb., Production III Jim Zeske Data Processing 13	Dave Bruggink Sheb. Maint/Eng. Brian Fowler Quality Control John Riedmaier Rare Chemicals 14	Jim Gauger Sheb. Maint./Eng. Pat Nylan Cust. & Ord. Services 15	Tony Garrett Maint./Eng. Rosalinde Sanchez Shipping Sherry Liu Inventory Control 16	Dale Passehl Sheb., Production II Dave Yurk Sheb., Production II 17	Brad Balistreri Packaging 18	Ralph Amdt Maint./Eng. 19
20	Mary Armitage Sheboygan QC Ted Schmitt, Jr. Sheb. Production III David Rogers Packaging 21	David Sabol Pilot Plant Mattie Freeman Shipping Anna Rodriguez New Jersey Denise Marciniak Data Processing 22	Ryan Schultz Production - Lab Dale Armitage Sheb. Maint./Eng. Mike Walton Shipping Wendy Madell Cust. & Ord. Services 23	Ronda Merritt Sheb. Maint./Eng. Ray Francisco New Jersey 24	Eric O'Neal Shipping 25	Chuck Alberts Hazardous Waste & Compliance Rosie Malone Packaging Ron Pinchott Accounting 26
Kathy Lukes Promo. & Pubs. 27	Bob Gorzek Operations 28	Gregory Franklin Packaging 29	Mike Matzke Hazardous Waste & Compliance Ronda Merritt Sheb. Maint/Eng. Ronnie Jones Packaging 30	Patti Hammen Sheb., Production III 31		

FOURTH ANNUAL BLOOD DRIVE October 4, 1991

Last year, seventy-four of our fellow employees donated the "gift of life" at the Annual Aldrich Blood Drive. This year we hope to double the participation.

The Blood Center of Southeastern Wisconsin will be at Aldrich on October 4, 1991, from 8:00 A.M. to 4:00 P.M. We will hold the blood drive in the 2nd floor conference room of the Administration Building. If you are interested in becoming a member of the Aldrich Donor Club please contact the Health Services department at ext. 5378, or your supervisor to sign-up for a preferred time slot.

We thank you in advance for your participation on behalf of the hospital patients who directly benefit from your generous donation.



PICNIC RESULTS

The 1991 Picnic Committee recently met to evaluate this year's Annual Family Picnic in Wisconsin, and to help plan for next year.

Although only 23 response forms were returned this year, the Committee decided to plan for next year's picnic at a county park. The details will be decided and communicated by the 1992 Picnic Committee. Watch for announcements on how to participate on the committee.

 **the ALDRICH
REPORTER**

P.O. BOX 355 MILWAUKEE, WI 53201

ADDRESS CORRECTION REQUESTED



TECH TALK

News About Ontario Hydro's
High Technology Projects

October, 1991

Ontario Hydro hosts experts from around the world

New Findings and Ongoing Research Highlighted at Isotope Symposium

Leading members of the international scientific, academic and industrial isotopes communities converged in Toronto in September for the 4th International Symposium on the Synthesis and Applications of Isotopes and Isotopically Labelled Compounds. Twenty-one countries, including Russia, China, Japan, Romania, Hungary, the United States and Canada, were represented with almost 400 registered participants taking part.

Held every three years in a host country under the auspices of the International Isotopes Society (IIS), the Symposium is an important venue for highlighting ongoing research. New findings in isotope production and application are also presented and discussed.

Leading scientists and manufacturers involved in the synthesis and applications of compounds labelled with radioactive isotopes and stable isotopes take advantage of the multi-disciplinary forum to share information and exchange new ideas.

The scientific program included four plenary lecture sessions presented by leading researchers and academics. Fifteen scientific sessions brought international experience to bear on a number of new growth areas and

continued on page 4



Members of the IIS make a formal presentation to the keynote speaker, Dr. Alfred Bader, Chairman of Sigma-Aldrich Ltd.

Stable & Radioactive Isotope Production Technologies Reviewed

Production of radionuclides for medical applications was the primary focus of the session chaired by Drs. Robins and Rolston of Hydro's Research Division and AECL respectively. The commissioning of three new production machines will improve the current ability for cyclotron production of isotopes for radiopharmaceuticals.

However, production of many important reactor isotopes is still

based on a single source in North America. If the Fast Flux Test Facility at Hanford becomes a centre for medical and industrial isotope production, this may be alleviated. The new reactor's ability to produce isotopes was demonstrated in 1989 and current efforts are focused on designing and implementing new isotope production capability.

continued on page 4

Managing Ontario's power system into the next century

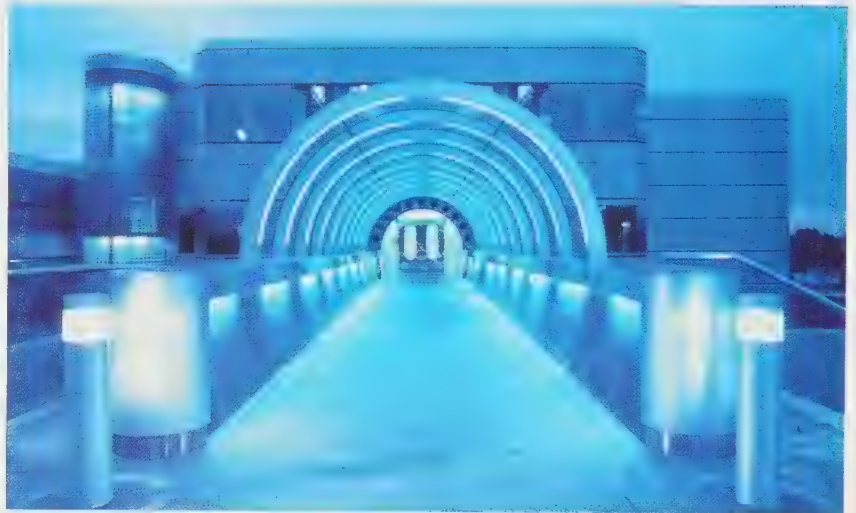
New System Control Centre Focusses on Energy Management Systems

On December 14, 1990, several weeks ahead of schedule, Ontario Hydro declared its new Clarkson System Control Centre (SCC) in service. The Clarkson SCC takes over from Richview as the centre of management and control of Hydro's extensive power system.

The entire project, from design through installation, was managed from within Hydro by a dedicated, highly-skilled 23-person project management group.

The project was extensive, including telecommunications facilities; a new 12,000 m² building and all support systems, such as diesel generators, invertors, batteries; a new distributed computer system, new Man-machine Interface consoles with colour CRTs, computer driven wall-board and printers; as well as facilities for hardware and software maintenance and software development.

Ontario Hydro developed all the functional specifications and requirements for the highly sophisticated SCC. The Clarkson project management team used outside consultants and other in-house expertise as needed. Hydro expertise was key to developing the design requirements for the control centre sub-systems.



The Clarkson System Control Centre, located just west of Toronto in a modernistic concrete and glass building, is the nerve centre for all Ontario Hydro's operational activities.

State-of-the-art technology abounds throughout Clarkson. The computer system uses distributed nodal architecture with an on-line failover scheme and high speed hyperchannels for fast data transfer between nodes. It also incorporates super consoles developed by Hydro to ease the extensive switching required for the multiple nodes and peripherals.

The microwave tower is mounted on insulated footings

and incorporates shielding against electromagnetic interference. Located on top of the tower is a lightning dissipator to prevent lightning from striking the tower. To protect personnel from electric shocks while climbing the tower, the lower section is insulated and the maintenance platform is made of high strength plastic.

The Clarkson Energy Management System (EMS) is the heart of Hydro's power system control. The highly developed system provides operators with an accurate minute-to-minute picture of the bulk electricity system and the status of interconnections with neighbouring power systems.

Using the most up to date EMS software, operators are able to maintain system security, minimize the cost and environmental impact of generation, and control power flows.

Hydro also developed many of the sophisticated software pro-

Every two seconds an updated picture of system conditions is provided to the operator's console and to the Wall Diagram.



The Data Acquisition and Computer System (DACS) gathers status information from all Ontario Hydro generating, transformer and switching stations.

continued on page 3

PRODUCT LICENSING

Horizontal Lifeline More Flexible and Less Expensive

A new device developed by Ontario Hydro's Research Division with funding support from the Construction Safety Association in Ontario (CSAO) will, within a year, make high wire work less expensive and more flexible without sacrificing the safety or security of workers. Andrew Sulowski and Ray McQuarrie of Research Division, working with David Stinson of CSAO, developed an energy absorber for horizontal lifelines using a unique technology called ANRAY.

What makes the ANRAY Lifeline different is the patented energy absorbing component. The ANRAY energy absorber is attached to the anchorage point and connected to the wire rope that runs horizontally along the side of a building roof or along the side of a bridge. A set of ANRAYs are installed at prescribed anchorages over the entire perimeter of the roof or side of the bridge.

The ANRAY device significantly improves the capacity of a horizontal line to absorb the impact of a fall. The horizontal load that must be carried by each anchorage is lessened, reduc-

ing the complexity and cost of the anchorages. Cutting the number of anchorages needed also makes installation less expensive and means significantly increased horizontal flexibility for workers attached by a vertical line to the horizontal lifeline.

In the event of a fall, the ANRAY brakes the impact to allowable limits for the anchorage. A separate, personal shock absorber in the fall arrest system ensures that the force acting on the worker is within the safe and legal limits.

Ontario Hydro has licensed its invention to Surety Manufacturing and Testing Ltd., of Edmon-



The ANRAY energy absorber will add greater flexibility and reduce installation costs for horizontal lifelines.

ton, Alberta. The technology is also being patented in a number of countries. Surety Manufacturing will make the product available direct to purchasers and through distributors in some areas early in 1992 and has plans to make the device available world wide.

Information about ANRAY is available from Surety at 2115 - 91 Avenue, Edmonton, Alberta, Canada T6P 1L1. Telephone: (403) 467-3610 or 1-800-661-3013. FAX (403) 467-1328. Attention: Michael O'Rourke, Product Licensing Agreements.

Ontario Hydro has a long history of developing and modifying existing products and technologies to meet its needs and inventing new ones to satisfy ever-changing demands. Hydro's New Business Ventures (NBV) Division markets new, advanced products, like the ANRAY energy absorber, through product licensing agreements with private sector manufacturing and marketing companies. Six agreements are currently in various stages of negotiation.

Contact: Peter Hinton
(416) 592-4732

continued from page 2

grams in use, such as real time monitoring of the network, network security monitoring and analysis, predictive security analysis, production related functions, and housekeeping functions, such as logs and reports, etc.

The main feature of the EMS is the advanced suite of applications software that are utility-developed to manage and operate the bulk electricity system. Proven by use and constantly

enhanced as needed, the software represents an investment by Ontario Hydro of more than 500 person-years.

With its extensive in-house involvement in designing and building Clarkson, Hydro is uniquely positioned to assist other utilities looking to establish, operate and maintain energy management systems and control centre operations. Hydro can also bring a specialized utility perspective to enhance

the expertise of companies working on utility EMS projects around the world.

Hydro consulting services include: project management, requirement analysis, specification writing, tender evaluation, hardware and software acquisition, software development, installation and training for operation and maintenance staff.

Contact: Loreto Sarracini
(416) 592-5108

New Findings and Ongoing Research Highlighted at International Symposium

continued from page 1

topics requiring an update since the last Symposium.

Dr. Jeffrey Robins of Hydro's Research Division and Dr. John Rolston of AECL jointly chaired a session reviewing a range of stable and radioactive isotope production technologies. A report on the production of radionuclides for medical applications indicated that ability for cyclotron production of isotopes for radio-pharmaceuticals is improving since three new production machines were commissioned.

New Technologies Discussed

The state-of-the-art in isotope separation technology, such as laser, chemical exchange and chromatography methods, were reviewed with findings from a 1990 conference in Tokyo.

The formal and informal exchange of information and ideas was enhanced by 118 poster sessions and a trade show that unveiled the latest products, equipment and instrumentation.

Three years from now, France will be the host location for the 1994 International Isotope Society Symposium.

Contact: *Mike Arnold*
(416) 592-8481



The Ontario Hydro display highlights stable and radioactive isotopes marketed by New Business Ventures Division.

Stable & Radioactive Isotope Production Technologies Reviewed

continued from page 1

In reviewing stable isotope production, heavy isotopes were the focus. Oak Ridge is still using the electromagnetic enriching technology, developed there in the 1940's to produce approximately 230 stable isotopes under a new pricing policy. A summary of the state-of-the-art in isotope separation technology such as laser, chemical exchange and chromatography methods was provided with information from a major conference in Tokyo last fall.

In reviewing light isotopes, production and use of stable isotopes in France were the focus. Here deuterium, carbon-13 and nitrogen-15 are being used to correlate physicochemical parameters of drugs to biological activity and carbon-13 is being used to investigate damage to concrete structures.

*For more information write to Tech Talk:
New Business Ventures Division, Ontario Hydro,
700 University Ave., A14, Toronto, Ontario, Canada M5G 1X6
Telephone: (416) 592-7072
Telex: 06-217786
FAX: (416) 592-8463*

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The Donald F. & Mildred Topp Othmer Library of Chemical History

NEWS

VOLUME 3 ■ NUMBER 2 ■ FALL 1991

Polymer History at AIChE National Meeting in Chicago

Attracted by 314 excellent technical sessions, about five thousand registrants attended the Meeting of the American Institute of Chemical Engineers in Chicago during the week of 11 November 1990.

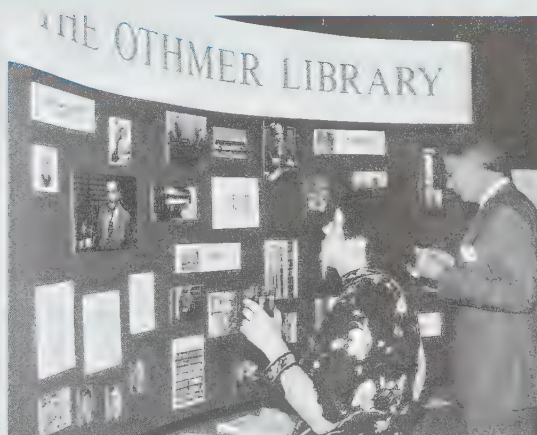
Two well-attended sessions with nine papers were arranged by the History of Chemical Engineering Committee under the title "Perspectives in Polymer Processing." They were organized by A. S. West, chairman of the committee and a member of the NFHC Board of Directors, with Nicholas Peppas of Purdue University serving as vice chairman. The papers surveyed developments in polymer processes and polymer products during the past fifty years.

Under the provocative title "Polypropylene—It Ain't What It Used To Be," Attilio Bisio of Atro Associates pointed out that polypropylene, now the fourth largest selling plastic in America, was involved in a history of competitive developments and applications as well as battles over patent rights.

Joseph Coote of Chem Systems reviewed the development of engineering polymers, starting with nylon 6,6 over forty years ago. Ion exchange technology is alive and well after fifty years, as Carl Kollman of Rohm and Haas Company demonstrated. He described the chemistry and technology of the process and predicted another half century at least of development of new ion-exchange resins.

James Fitzgerald of the Du Pont Fibers Department presented an advanced-materials case study, noting that the discovery, development, and commercialization of aromatic polyamide fibers constituted a classic example of industrial innovation. Translation to commercial reality required a multidisciplinary approach.

"Subterfuge and Patriotism: Styrene at Dow for the World War II Synthetic



The Othmer Library display showed scenes of Don and Mid Othmer's life and work.

Three Societies Host Second Othmer Luncheon

WHAT BEGAN AS A BIRTHDAY PARTY has now become an annual event. On 19 April, the second Othmer Luncheon was held at New York's University Club, under the joint auspices of the American Section of the Société de Chimie Industrielle, The Chemists' Club, and the National Foundation for History of Chemistry.

The guests of honor, Donald F. and Mildred Topp Othmer, were in attendance, greeted by numerous well-wishers from New York and places far removed, representing the various worlds that have felt the Othmers' impact: the chemical industry, chemical engineering, university teaching, and publishing. Don of course enjoys the unique honor of being a former president of The Chemists' Club, the honorary chairman of the Société de Chimie Industrielle (American Section), and a principal supporter of NFHC through its Othmer Library of Chemical History. His triple crown displays his talents as editor, clubman, and bibliophile.

L. John Polite, Jr., chairman of Peridot and president of The Chemists' Club, was the master of ceremonies. Speaking on the theme "Changing Perceptions of Chemical Industry?" were two leaders of the chemical process industries, Elwood P. "Doc" Blanchard, Jr., Vice Chairman of Du Pont, and Herbert D. "Ted" Doan, former president and chief executive officer of The Dow Chemical Company.

Ted Doan, speaking first, told of Dow's weathering of the napalm and Agent Orange storms in the 1960s and 1970s, and of the discovery of mercury's unsuspected environmental problems. Doc Blanchard recalled earlier attacks on the Du Pont company as merchants of death, comparing the experiences of those eras with the train of events surrounding today's responsible care initiative of the Chemical Manufacturers Association. Presentations and discussion made it clear that the chemical process industries have never had it easy, yet they have always responded to public perceptions—whether justified or not—and thereby have grown and prospered.

Continued on page O-3

For more photos see page O-3.

Oral Histories Completed

The NFHC Oral History Program is expanding rapidly. The following oral histories were completed and added to the NFHC archives in 1990, where they are available for scholarly use: **Willard C. Asbury** and **Donald A. Green** (Esso Research veterans, involved in the development of coal hydrogenation and butyl rubber); **Alfred R. Bader** (founder and president of Aldrich Chemical Company; art connoisseur); **William J. Bailey** (University of Maryland; pioneer in the synthesis of specifically oriented polymers); **Stuart W. Churchill** (University of Pennsylvania; chemical engineer noted for work in combustion and heat transfer); **Elizabeth Dyer** (University of Delaware; noted for work on copolymerization); **Sidney M. Edelstein** (founder and chairman of Dexter Chemical Corporation; noted textile chemist, bibliophile, and dyestuffs historian); **Frederick Eirich** (Polytechnic University; pioneer and authority on colloids and rheology); **Paul S. Greer** (Union Carbide and National Science Foundation; important member of War Production Board and Office of Rubber Reserve during World War II); **Gerhard Herzberg** (1971 Nobel laureate in chemistry, for study of geometry of molecules in gases); **J. Franklin Hyde** (Corning Glass, Dow Corning; inventor of silicones); **Donald L. Katz** (University of Michigan; noted for work on heat transfer, properties of hydrocarbons, oil and gas reservoirs); **Jerome Karle** and **Isabella Karle** (Naval Research Laboratory; both highly recognized for work on the structure of matter; Jerome Karle 1985 Nobel laureate in chemistry); **Stephanie Kwolek** (Du Pont; discoverer of spinning liquid crystalline polymer solutions; also noted for work on synthetic fibers, Kevlar); **Frank Mayo** (SRI International; noted for work on synthetic rubber); **Koji Nakanishi** (Columbia University; recipient of 1990 Cope Award, for outstanding achievement in organic chemistry); **James B. Nichols** (Du Pont; noted for use of ultracentrifuge in polymer chemistry); **Roy J. Plunkett** (Du Pont; discoverer of Teflon); **Malcolm E. Pruitt** (Dow Chemical Company; pioneer in ionic polymerization; founder of Council for Chemical Research); **Malcolm Renfrew** (University of Idaho; important contributor to production of Teflon, noted for discoveries in epoxy resins); **John R. Schaeffgen** (Du Pont;

pioneer in work on fibers; associate of Paul Flory); **Harold Scheraga** (Cornell University; pioneer in research on the structure of proteins); **Rudolph Signer** (University of Bern; noted for work on flow birefringence of polymer solutions); **Leo Sternbach** (Hoffman-La Roche; discoverer of Valium and Librium); **Michael Szwarc** (SUNY Syracuse; discoverer of "living" polymers); **Edwin Vandenberg** (Hercules; contributor to polypropylene and polyether chemistry); **Frank H. Westheimer** (Harvard University; 1988 Priestley Medalist, for distinguished services to chemistry); **Harland G. Wood** (Case Western Reserve University; biochemist noted for work on carbon dioxide fixation; recipient of National Medal of Science).

Award for Chemical History Paper

The ACS HIST Division offers the 1992 Outstanding Paper Award for a paper presented at an ACS national meeting and published during 1989-1991 in the Division's *Bulletin for the History of Chemistry*. Details are available from the *Bulletin's* editor, William B. Jensen, Chemistry Department, University of Cincinnati, Cincinnati, OH 45221-0172. The award includes \$100, a certificate, and \$150 worth of books from the D. Reidel catalog.

Records of Chemistry: Combustion or Conservation?

The following excerpts are from Colin A. Russell's Dexter Award address at the Fall 1990 ACS Meeting in Washington, D.C., in which he urged that records be conserved, not burned, so that the history of chemistry will not be distorted. The address will be published in full in the Bulletin for the History of Chemistry. The Dexter Award, sponsored by the Dexter Chemical Corporation, is the highest award of the ACS Division of History of Chemistry.

It has been well said that a culture unaware of its history is like a man without a memory. "Forward, ever forward" may be a good watchword for lemmings; it is hardly so for civilization, and I see no reason why it should be so for chemistry. . . . The large scale rejection of the past amongst chemists—even a contempt for chemical history—is really a phenomenon of our own day. But there are welcome signs of a maturing of attitudes and a return of interest in history of chemistry amongst the chemical profession. . . . Now history cannot exist without records, any more than chemistry can exist without laboratories, so if history is becoming significant in chemistry, records themselves acquire a new importance.

While the importance of chemistry is usually ignored in the teaching of eighteenth- and nineteenth-century history, this is most notably so at precisely the two points where its role was most critical. It is surely incontestable that in its

gift to the early textile industry of soap, chlorine, and dyes, and in its provision of acids for pickling metals, chemistry made the industrial revolution possible. And, secondly, by its provision of gas lighting, fertilizers and food, explosives (not necessarily military), medicine, and much else, chemistry profoundly altered the quality of life for ordinary people, usually for the better. If one asks how the teaching of history could be so blinkered as to exclude such items, one cannot escape one obvious explanation: the sheer unavailability of sources.

Under pressure from environmental lobbies the chemical community has developed a new sensitivity to its public image. At times it has been mercilessly caricatured, and caricatures need exposing. Some of these are about the past, so reliable source material is urgently needed. This is an area in which systematic research has scarcely begun. Yet already evidence has appeared that "green" concerns are not new, that captains of industry were not all uncaring, that their work force was not always exploited. In many areas the history of science has shown the great danger of extrapolating from a few famous but isolated cases to sweeping generalizations. With chemistry it is imperative to explore its records to see just how typical were, for example, the contributions to atmospheric pollution by the Muspratts on Merseyside, or the combined industries of Widnes. Preliminary work suggests we may be in for surprises.

Crystallizing Hamburger: Alfred Bader and the Aldrich Chemical Company, Part II

Part I, which appeared in Beckman Center News 8:1 (Spring 1991), told of Alfred Bader's emigration from Vienna via England and Canada, his early industrial experience, and his work with Louis Fieser at Harvard.

In his work at Harvard on the naphthoquinones Alfred Bader needed 2-isopropylphenol, which was listed in the Kodak catalog. Frustrated because his order had not been filled, Bader sought advice from Warren Stockwood, the stockroom manager. Stockwood supplied a piece of chemistry department stationery and suggested that a letter to Kodak might help. The response was a form postcard that said, "We have your order. Please do not inquire again. You are just adding to our paperwork. When we have it, we will supply it." Bader synthesized the compound himself. Later he found out that Kodak did not make it. "They bought it from Dow, who made it once a year. Then, when Kodak had it, they shipped it. I said to myself, 'If that is the way the fine-chemical business is run in the United States, maybe I have a place in it.'"

But Bader's place in the supplying of fine chemicals was still several years in the future. After receiving his Ph.D. from Harvard in 1950, he was offered an instructorship at the University of New Brunswick, an opportunity that "intrigued me a great deal." He explained this to the former president of Murphy Paint Company, which had been purchased by Pittsburgh Plate Glass (PPG). The company, however, recalling their earlier investment, said, "No. We want you." Bader thus found himself in Milwaukee, where PPG's paint research laboratories were located.

In Milwaukee Bader discovered how to transesterify beta-ketoesters without a catalyst, something previously unknown. Gilbert Stork commented later that this was Bader's most significant chemical contribution. Bader also reasoned that the paint industry needed "new monomers that could be easily and cheaply made." By careful selection of a catalyst he could prepare unsaturated phenols easily, whereas only tars had been reported in the literature. PPG subsequently made a number of pheno-

lic resins that were used in highly resistant can coatings, and a number of patents came out of that work.

Bader's entrepreneurial spirit was developing at PPG. He relates how a Quaker Oats salesman who stopped in Milwaukee said that levulinic acid would become commercially available from furfural. Bader quickly reasoned that he could make a bisphenol from this "nice keto acid" and proceeded to do so the day the levulinic acid arrived. He still proudly displays the one-dollar check he received for the patent. When Johnson Wax approached PPG about buying the patent, Research Director Howard Gerhart asked Bader how much Johnson should be charged. Bader noted that "it was all of two days of work, and if we got \$10,000 we'd be overpaid." But since "they want it badly and they have a lot of money," he suggested, "Why don't you ask them for a million dollars and see what happens." In fact, a contract was signed for that amount, payable over a period of several years.

Even though Bader was quite busy in the laboratory at PPG, he was still interested in making fine chemicals, noting that the list of the only significant U.S. source, Eastman Kodak, did not contain a lot of compounds that chemists might want to use. In 1951 he approached Gerhart with the idea of making such chemicals at PPG. Gerhart rejected the idea, saying, "Your business is making monomers. You're doing a fine job. Keep doing what you're doing." When asked by Bader if he would object to some chemicals being made on the side, Gerhart said simply, "What you do on your own time is your business."

Assuming that Gerhart's loose response could be taken as a "blanket permission," Bader proceeded to establish his own business. Rejecting the use of his own name, he suggested to his attorney, Jack Eisendrath, that they toss a coin for the privilege of naming it. Bader lost, and the company was named for Eisendrath's fiancée, Betty Aldrich. Bader then rented a garage, used mainly for storage, for \$25 a month, and began manufacturing 1-methyl-3-nitro-1-nitrosoguanidine (MNNG; see Part I, p. 9). MNNG was the only product listed in Catalog Number 1 of the Aldrich Chemical Company, and sales in the first year totaled \$1,705. Since no salaries were paid, there was a \$20 profit.

Catalog Number 2, which like its pre-



From the mid 1960s Aldrich catalogs had paintings of old masters on their covers. The first was The Quill Cutter by Rembrandt's student Paulus de Lesire (ca. 1630).

decessor was a single mimeographed page, contained twelve items, and sales rose to \$5,400 for the second year. One of the compounds listed was butadiene epoxide. Bader bought a gallon of it from PPG in Barberton, Ohio, for fifty cents a pound, and repackaged it for his customers. As things developed, Bader says, "It got to be a buying and selling operation, with my doing the bottling and the labeling. It was very much a part-time thing." Bader also packed the shipments and took them to the post office for mailing.

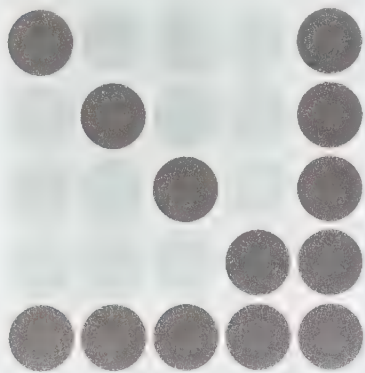
Bader's advertising consisted of simply mailing the one-page fliers to the senior authors of papers in the *Journal of Organic Chemistry* and of organic papers in the *Journal of the American Chemical Society*. His first order, for MNNG, came from Parke-Davis.

In 1954 PPG decided to move its research operations to suburban Pittsburgh. Bader liked Milwaukee too much to move, and he told Howard Gerhart that he would leave PPG and work full-time for Aldrich. Gerhart replied: "Alfred, you are a very good chemist. You can make a great many things, but you are not a businessman. Hence, I am convinced that within a couple of years Aldrich will go bankrupt. When it does, please don't look for another job but come back to PPG; we need you."

Alfred Bader never did go back to PPG, and today the Aldrich Chemical

SATIS 16-19

Science & Technology in Society



History of chemistry in SATIS and Nuffield texts responds to British government edict on science teaching.

concerns scientific explanations from different cultures or times, and how they contribute to our present understanding, as well as the use of evidence and the tentative nature of proof. Finally, at level 10 students are expected to "be able to demonstrate an understanding of the difference in scientific opinion on some topic, either from the past or present, drawn from studying the relevant literature," and also to "relate differences of scientific opinion to the uncertain nature of scientific evidence." Personalities, context, and multiple explanations loom high in these expectations and offer new challenges for professional historians of science and technology to establish purposeful dialogue with teachers.

Chemical History in the Classroom.

During the past decade British teachers have produced numerous contributions to the classroom teaching of the history of the chemical sciences and technologies, and many of these have been reworked to suit the requirements of AT17. Historical topics drawing on chemistry have received the greatest emphasis so far, and, like the discipline itself in the nineteenth century, promise to provide inspiration for contributions in the other sciences.

Appropriate teaching material has already been incorporated into nationally established programs, like the Science and Technology in Society project

(SATIS), set up by the Association for Science Education in September 1984, with John Holman as director. This project helps teachers of thirteen- to sixteen-year-olds to show the social, technological, and everyday relevance of science. Over one hundred teaching units were prepared through collaborative efforts involving experienced teachers as well as experts from universities, industry, and the professions. Each unit is designed to link to a common General Certificate of Education (GCSE, the 10th grade examination) science topic. The units give coverage across the science curriculum and across the range of technological activities, including practical work, simulations, structured discussions, problem solving, role-play, and decision making, to make students of all abilities become fully involved.

Four of the SATIS units (one each by John Holman and Andrew Hunt, two by Anthony Travis) use the history of the chemical sciences. "The Story of Fritz Haber" reviews the life and times of the pioneer of ammonia synthesis; its use of controversial questions and role-play even make it suitable for adaptation as a school play. "The Search for the Magic Bullet" describes how Paul Ehrlich used synthetic dyestuffs and chemical ideas in biological studies and especially in the development of Salvarsan. This unit also introduces the history of health products. "Perkin's Mauve" provides a detailed account of

William Perkin's discovery of aniline purple and its social context; the unit also contains plans for laboratory projects. "High Pressure Chemistry" explains how Carl Bosch scaled up the Haber synthesis; the explanation uses the analogy of a pressure cooker.

The success of the GCSE SATIS units led the Association for Science Education in 1987 to initiate the SATIS 16-19 project, directed by Andrew Hunt. This provides resource material for sixth form (11th and 12th grade) courses up to the Advanced (A) Level, for science, technology and society (STS) programs for general studies, and for technical and vocational education. SATIS 16-19 offers history of chemistry, most notably in Unit 14, "William Perkin: Founder of the Synthetic Dyestuffs Industry" (Hunt), which deals with technology, innovation, and social implications. Unit 17, "Aspirin" (Ken Gadd), illustrates the time scale over which research and development can take place and the changing theoretical context in which this particular drug research occurred. On trial in schools during 1990/91 is a unit concerning the nineteenth-century history of the Channel tunnel project, in which Frederick Abel, the explosives expert, played a prominent role.

The Association for Science Education is also promoting background books on the history of science, including "Teaching History of Science and Technology: Teachers' Handbook" (1987). Anthony Travis describes in one section how the dye industry, high-pressure chemistry, and biotechnology have parts to play in the classroom and how they can be linked.

The importance of experiment has not been neglected in the exercises set for the students. Like role-play, experiment is a powerful means for placing practical work in a meaningful historical context.

Exhibits in Museums. Museums have not been slow in responding to the demands of the National Curriculum, and to AT17 in particular, as participants in a workshop on the history of chemical technology, given at the Edelstein Center in Jerusalem in 1990, had occasion to learn. Robert Bud (Science Museum, London) and Peter Reed (National Galleries & Museums on Merseyside, Liverpool) teamed up to present a joint session that provided well-thought-out

Continued on page B-7



Two-thousand-gallon batch-process vessels in the new Sheboygan, Wisconsin, plant.

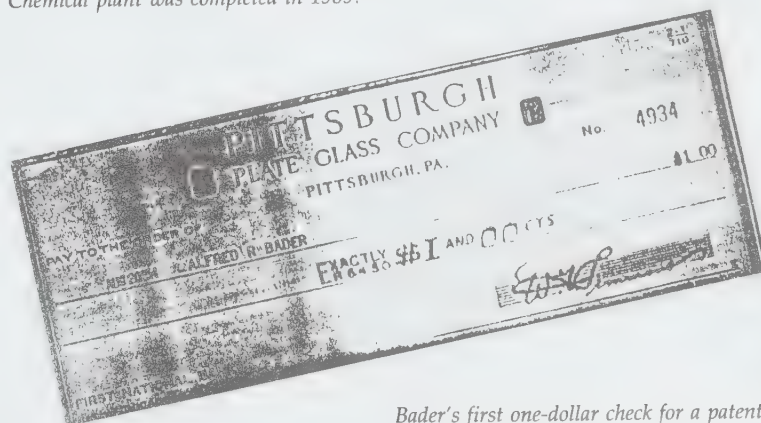


The 450-acre Sheboygan, Wisconsin, Aldrich Chemical plant was completed in 1989.

Company is one of the most highly respected firms of its kind in the world. It is known not only for its fine chemicals and service but for the art of the old masters often found in its publications. Bader's interest in art dates to his childhood, and his continually growing collection has gained considerable recognition. Yet, according to Bader, "in the mid-1960s, when some of our directors suggested that we put an old-master painting on the catalog cover to set us apart, I was against it. What place did an old-master painting have on a chemical catalog? In those days our board of directors really argued about things like that. The vote was three to two for a painting. We put *The Quill Cutter* on the cover. Today we no longer say 'Aldrich' on the outside front cover. If it's a good old-master painting, people know it's Aldrich." That international recognition of fine chemicals and fine art is a lasting testimony to Alfred Bader.

JAMES J. BOHNING

▲ The history of chemical engineering in America might even serve as a model for other engineering disciplines that are struggling to improve manufacturing technologies to better compete with the rest of the world. Ralph Landau and Nathan Rosenberg, in "America's High-Tech Triumph," *American Heritage of Invention and Technology* 6(2) (Fall 1990), p. 63.



Bader's first one-dollar check for a patent.

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Masada Textiles, Sidney M. Edelstein, and a Scud Missile

Shenkar College of Textile Technology and Fashion in Ramat Gam near Tel Aviv, Israel, plans to establish a laboratory for the analysis and identification of ancient dyed textiles for the Middle East region, particularly textiles from important archaeological sites such as those found at Masada. Sister Mary Virginia Orna of the chemistry department of the College of New Rochelle, New York, was asked by Sidney M. Edelstein, Chairman of the Dexter Chemical Corporation, to undertake a feasibility study for the new laboratory that he is now sponsoring. (Dr. Edelstein is a member of the Board of Directors of Shenkar College.) Professor Orna has experience analyzing medieval pigments using state-of-the-art instrumentation. She carried out her mission over Christmas and New Year, visiting Jerusalem and Haifa as well as Masada and other excavation sites.

Sidney Edelstein has also contributed ten ancient wool fragments from the Bar Kochba excavation to Shenkar College, fragments he has already examined in pioneering work undertaken with David Abrams. The pigments of Masada textiles currently in storage at Hebrew University have so far not been analyzed, however. Sister Mary Virginia's feasibility report was positive, as the college already has a dedicated staff engaged in related research, and laboratory, instrumentation, and suitable archival resources are ready for the proposed activities. A few days after her return to the United States, an Iraqi Scud missile landed near Shenkar College, blowing out most of the windows. Unwelcome modern technology was confronting the technologies of the past.

Mary Virginia Orna with chemist and chemical educator David Samuel—formerly of the Weizmann Institute and now President of Shenkar College—at the Glasswork and Museum of Antiquities in Jerusalem.



Woodward Exhibit

An exhibit commemorating the life and chemical achievements of Robert B. Woodward, Nobel laureate, Harvard professor, and head of the Woodward Research Institute of Ciba-Geigy in Basel, Switzerland, is in preparation. The exhibit, "Robert B. Woodward and the Art of Chemical Synthesis," will have a twelve-panel format similar to that of earlier NFHC exhibits, making it suitable for showing throughout this country and abroad.

R. B. Woodward was the consummate master of synthetic organic chemistry. His work has profoundly influenced our understanding of the natural world as well as our ability to produce life-saving pharmaceuticals and to launch today's revolution in biotechnology. He was an artist and architect of molecules, comprehending, in ways that others did not at first grasp, how to utilize new instruments and theories in understanding and re-creating naturally occurring molecules. On a far larger scale Woodward's life can in turn elucidate for us the structure and functioning of twentieth-century science.

The traveling exhibit and brochure on R. B. Woodward will serve several func-

tions. They will recall a great scientist to the many chemists who worked with him or were influenced by him during his lifetime; they will also address younger generations of scientists, often Woodward's intellectual heirs. The exhibit will acquaint students and the general public with a genius of our times, an engaging personality, and a *chemist*—a member of a profession that has, in the public estimation, contributed few candidates to the Hall of Fame of Great Men and Women. By observing Woodward in his social and intellectual context, the audiences will gain a better sense of how science is actually done. Younger viewers will see how they might fit into the picture by joining the great chain of teachers and students that extends into the past and by working to solve problems that are today's fascinating unknowns. For those students who have not yet reached organic chemistry, the exhibit will be an imaginative preview of a subject whose attractions are often overshadowed by its legendary difficulty.

The exhibit is scheduled to open officially in Philadelphia in April 1992, to coincide with the seventy-fifth anniversary of Robert Woodward's birth.

Accompanying the exhibit will be a

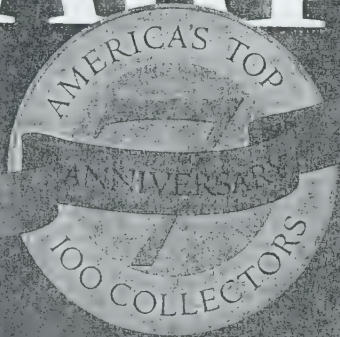
brochure containing much of the material and many of the illustrations from the panels. Mary Ellen Bowden and Theodor Benfey are preparing the brochure text. An advisory committee is assisting in the preparation of the exhibit and brochure; it consists of Derek H. Barton, Texas A & M University; Elkan R. Blout, Harvard Medical School; William von Eggers Doering, Harvard University; David Dolphin, University of British Columbia; Ivan Ernest, Universität Basel; Albert Eschenmoser, Eidgenössische Technische Hochschule, Zurich; Jacques Gesteli, Cerecon AG; Roald Hoffmann (chairman), Cornell University; William S. Johnson, Stanford University; Ewart R. H. Jones, Oxford University; Jean-Marie Lehn, Université Louis Pasteur; William David Ollis, University of Sheffield; Howard E. Simmons, Jr., E. I. du Pont de Nemours & Co., Inc.; Gilbert Stork, Columbia University; Jeffrey L. Sturchio, Merck & Co., Inc.; Henry Wasserman, Yale University; Ernest Wenkert, University of California-San Diego; and Crystal Woodward, Vaucluse, France.

Full details of the opening will be announced in our next issue.

WATCH FOR THE DATE!

MARY BOONE'S NEW DECADE • RALPH LAUREN'S CLASSIC

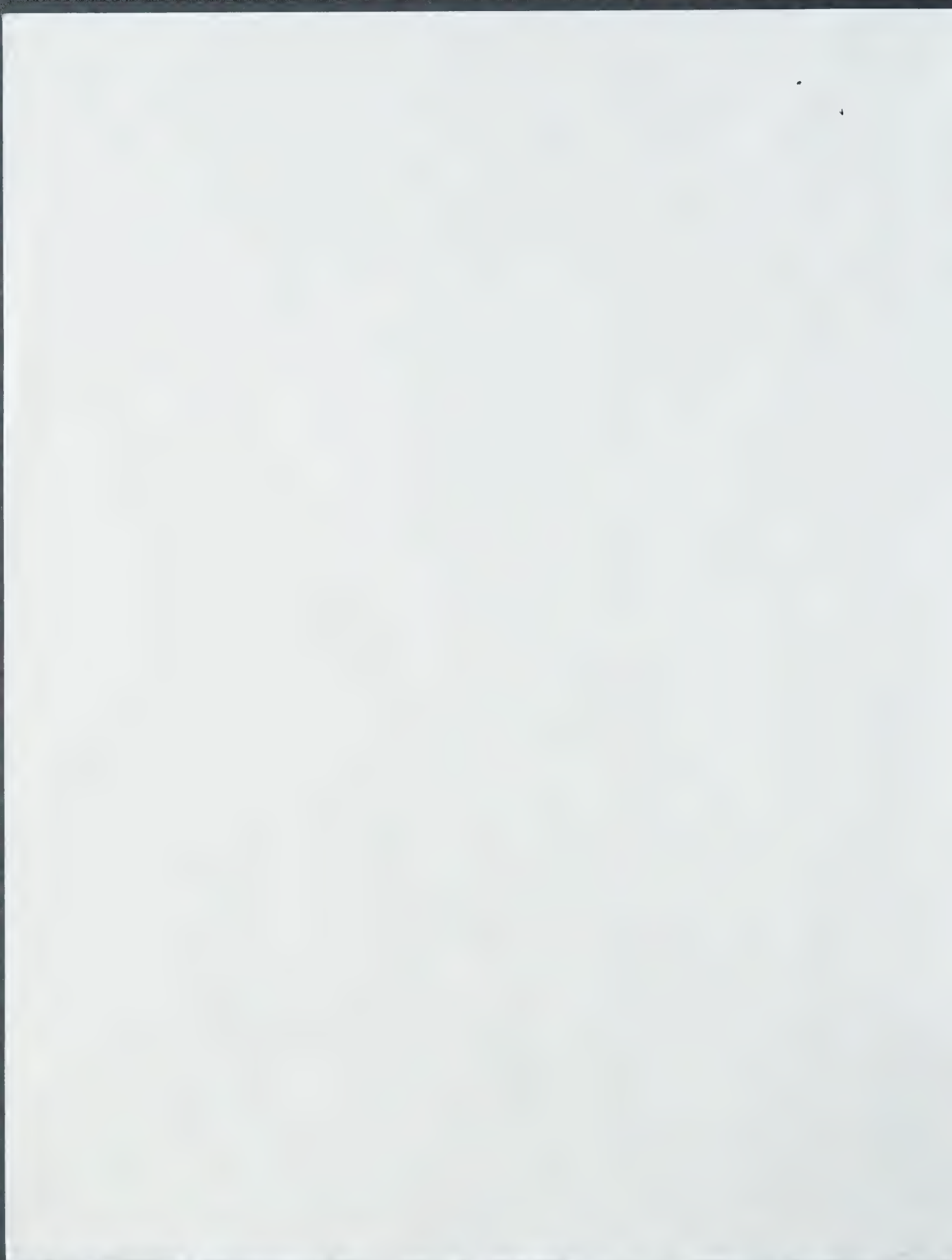
ART & ANTIQUE



*White House
of the Confederacy*

*Piet Mondrian's
Secret Garden*

MARCH 1991 \$3.95



Edward Albee

Montauk, New York / Modern and contemporary art; antiquities
"His collecting is as important to him as his writing," says a dealer of Edward Albee, Pulitzer-prizewinning playwright, in whose Manhattan loft and Montauk house works by Susan Rottenberg, Lee Krasner, Milton Avery, and Louise Nevelson mingle with those of relative unknowns: Albee's eye (and average means) have netted him first-rate works by many artists who moved on to expensive stardom. For twenty years, via his foundation, Albee has sponsored emerging artists such as Dan Christensen, Tony Rosenthal, Barbara Quinn, and Rex Lau. Bettina Burkel and Klaus Illi, German sculptors, were among those able to spend last summer at the Barn, a studio next to Albee's cottage, and to be part of an exhibit curated by Albee with fellow collectors Ed Downe and Elaine Dannheisser (see below). Albee has also "accumulated" European modern art (Kandinsky, Arp, Schwitters), African pottery, and Roman and pre-Columbian pieces. But he's most excited about discoveries, like Mia Westerland Roosen, her sculptures are "exuberantly ugly, cool, and elegant"—rather like, some might say, his own plays.

Walter Annenberg

Palm Springs, California / Nineteenth- and twentieth-century paintings
"I like my irises better" billionaire and former publishing mogul Walter Annenberg said of Monet's Path Through the Irises, hanging in the treasure trove of art he's assembled over four decades at Sunnyslands, his California home. His van Goghs, including Woman Rocking a Cradle (Mine Routine), are better, too. In 1990 Annenberg added a 1939 Braque, The Studio, and a Fanin-Latour still life to Picassos' Au Lapin Agile, bought for \$40.7 million in 1989. These—and fifty-one other masterpieces, including van Goghs, Monets, Renoirs, and Cezannes—are part of last year's National Gallery exhibit, headed for the Met in May. "One of the world's greatest collections," says an expert. Annenberg first saw his new Braque in 1945 and loved it, but felt "too inexperienced" in those days for modern art. "I dreamed about it for years as one of my major mistakes." Not any more. "This is now my family," he says. Annenberg, eighty-three, won't have the collection split up, and various museums are now drooling for the Big Bequest. He is trustee emeritus of the Met, a trustee of the National, and a Philadelphia native who calls California home—but it's anybody's call. Says a curator, "He's a man of grand gestures that are in no way predictable."

Philip Anschutz

Denver, Colorado / Western paintings
"He's like a rabbit, he's all over the place," says a spokeswoman for Philip Anschutz, oil-and-railroad billionaire and reclusive builder of the world's finest collection of western art, part of which recently made a highly successful tour of the Soviet Union. The exhibition will continue to Wichita and Fresno, but it's not known whether it'll contain Anschutz's most recent acquisition, Worthington Whittredge's On the Plains, Cache La Poudre River—the only piece that got his blood boiling this year. In 1960, aged twenty, Anschutz began compiling "a visual history of the American West" out of works by "every artist of quality who painted or influenced it," now totaling 700-odd paintings (pruned from over 800 a couple of years back). While there are no immediate plans for a long-rumored museum, Anschutz does have a wish list, including a Hopper western painted in Santa Fe, a

Twachtman rendition of Yellowstone Falls, and Thomas Hart Benton's The Rocky Mountains. He's been offered at least two of these in the past, but turned them down as too expensive. "He's a notorious penny-pincher," says a dealer, "often pushing for a better deal and then losing out. I'm sure he could shoot himself now, given the appreciation of those pieces."

Alfred Bader

Milwaukee, Wisconsin / Old-master paintings
"Inveterate, encyclopedic, passionate," says a dealer about Bader. "If you're looking for serious, committed people who define their territory and go at it doggedly," adds Getty director John Walsh, "that's Bader." Reached in London—where he takes time off from his Aldrich Chemical Company to go to auctions—Vienna-born Alfred Bader (who began collecting on the installment plan as a Harvard chemistry instructor) is shy at first. "I don't collect much anymore," he says hesitantly, "though I love buying." Asked about his true love, Dutch and Flemish old masters, Dr. Bader warms up. "Well, sure I keep buying. I'd say I get something just about every week." "Just the other day" he got a work by seventeenth-century Flemish master David Ryckaert III, "the most wonderful alchemist picture I've ever seen." More often than not, however, his purchases (a modest "maybe 100 a year") are unidentified, though he's looking for work by Rembrandt's students (he got one, too, beating out dealer Richard Feigen for \$1.2 million at a recent Bonhams sale). "I clean them, then see what I've got. But not every dirty old painting's a great work of art; any collector who tells you he's never made a mistake is either a fool or a liar." Adds the doctor, "Collecting is a sickness."

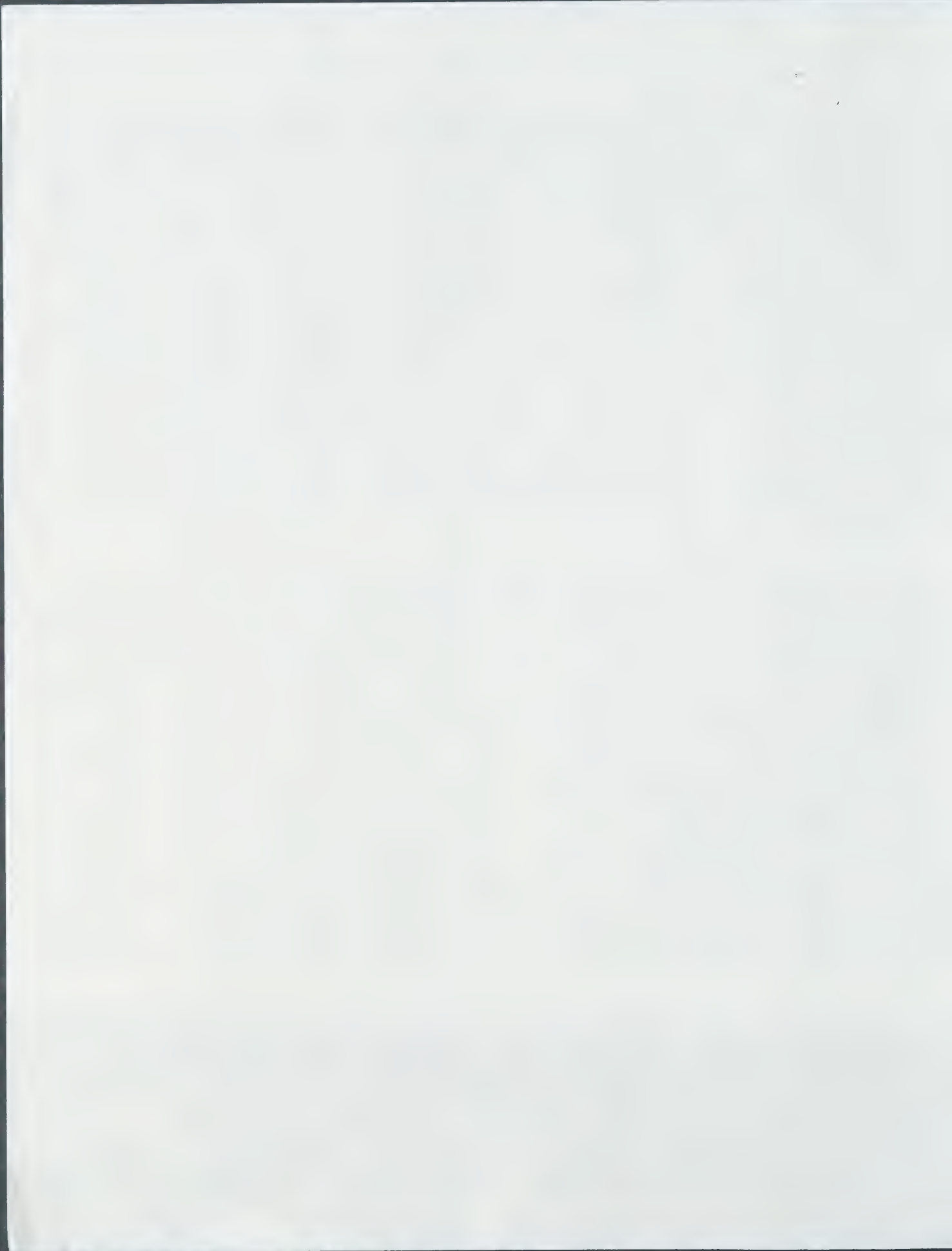
Richard Brown Baker

New York, New York / Contemporary art
Perhaps it's the caution natural to former spookhood (OSS/CIA 1943-48) that makes Richard Brown Baker hesitate "to foresee in any artist the genius of the future." Yet this seventy-six-year-old scion of an old Rhode Island family has been on art's cutting edge since buying Jackson Pollock's Andesque in 1955 and two James Rosenquists in 1962 (one, Flower Garden, is on loan to Moscow's Tretyakov Museum). He buys young art because he's "not overflowing with money," but the diffidence hides an eye for potential that has helped launch or boost the careers of artists now in the stratosphere: Kline, Lichtenstein, Hockney, and, more recently, Robert Arneson and William Beckman. Baker's very up on two younger talents right now, Christopher Wool—he bought his fifth Wool last year—and Randy Dudley, whose "very small, very curious" paintings he likes for their "enigmatic quality." He's generous with the collection—a chunk is on loan to his alma mater and future heir, Yale—and it's been the basis of more than twenty exhibitions since 1959. Baker's paintings are a remarkable record of contemporary art's last forty years, partly because he doesn't like to sell. "When things go out of fashion," says a friend, "Richard still loves them."

Irma and Norman Braman

Philadelphia, Pennsylvania / Modern and contemporary art
Norman Braman's football team, the Philadelphia Eagles, finished the season 10-6, losing the wild-card playoff. Not a bad record, but the Florida czar and his wife, Irma had a better one in the art field, adding to a collec-





currents

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November/December

Message from the Director

Dorothy Farr is owed a large debt of gratitude by all who value the Agnes Etherington Art Centre. From 1 April 1990, for seventeen months she conscientiously oversaw the operations of the Art Centre as Acting Director. At the same time she ably and efficiently continued to perform her innumerable duties as Curator. All of this is the more remarkable in that the same period comprised the intense activities generated by the production of a feasibility study for the expansion of the Art Centre. Warmest thanks, Dorothy, for a heroic job well done.

Phase I and II of the Feasibility Study, undertaken by Brian Arnott Associates, Peter Rose Architect and Arts and Communications Counsellors, have now been released. They have set the agenda for all of us associated with the

Art Centre. Queen's Principal David Smith has asked Associate Curator Michael Bell to devote half of his time to coordinating the capital project. Quick off the mark, Michael has already mapped out a five-year plan to guide us through the entire process. The Advisory Board of the Art Centre is about to be reactivated, to be more responsive to all of the Centre's constituencies; and a new Council of Friends, to operate on a national scale, is about to be formed. Needless to say, these are very exciting times at the Art Centre. The process that former director Robert Swain initiated is entering a new phase - one in which the potential now present in the arts community at Queen's, in Kingston and throughout the region, may be fully realized.

David McTavish

The New Shows

The Bader Collection: European Paintings

5 November - 6 December
New Gallery

*Magnificent Gift -
Momentous Anniversary*

Nationally renowned, the European paintings donated by Dr Alfred and Isabel Bader are a special feature of the Art Centre. This fall the Bader Collection was magnificently enriched by the donation of fifteen more Dutch and Flemish seventeenth-century pictures of major distinction. It is the most important gift ever made by the Baders to the Art Centre. All of the pictures are from the Baders' own collection; some, in fact, have hung on the walls of their Milwaukee home for upwards of twenty years.

Works from the circle of Rembrandt continue to be a special focus of the recent gifts. Two more pictures by Jan Lievens, who worked alongside Rembrandt about 1630, thus join Lievens' *Mary Magdalen*, given by Dr Bader in 1975. Similarly, Govaert Flinck's magnificent *King David* (see illustration) joins the same artist's *Sacrifice of Manoah* (1640), long a



**Govaert Flinck
(1615-1660)**

King David Writing
oil on canvas

Gift of Dr Alfred and
Isabel Bader 1991

favourite at the Art Centre. A number of paintings from the recent gift will be in this exhibition, together with other important paintings previously donated by Dr and Mrs Bader.

The exhibition marks another significant occasion. On 15 November 1941 Alfred Bader, refugee from Austria and prisoner-of-war from Britain, arrived as a first-year student at Queen's. As he recently put it:

"When I was accepted by Queen's in the middle of November 1941, having been turned down by McGill and Toronto, I was scared and shy and selfish. Scared, because I had been told on leaving the camp that I must not tell anyone where I had been and had to report weekly to the local RCMP. Shy, because what could I say to fellow students who told me they had come from Glebe or Lisgar or KCVI – and then asked where had I come from – in the middle of November? And selfish, because I thought one had to be, to survive. Yet, my fellow students in class and

in Collins House, the Science '44 Coop, put up with me. And many of the professors, Jean Royce (the Registrar) and Dr McNeill who introduced me to debating, treated me wonderfully well, as an individual, not as prisoner-of-war No. 156.

This kindness brought me out of my shell and over the years my contacts and interaction with Queen's staff, alumni and students have continued to give me great pleasure.

I have always been interested in art. In the forties, Queen's had neither an art centre nor a department of art history and I am delighted to see the growth of the Agnes Etherington Art Centre and the Department of Art, now among the best in Canada."

Dr Bader's gifts have gone a long way to making the latter claims a reality.

Alfred Bader left Queen's with degrees in chemistry and in history and then went on to take a PhD in chemistry at Harvard. In the early 1950s he founded Aldrich Chemical

Company in Milwaukee, Wisconsin. Today he is Chairman Emeritus of Sigma-Aldrich Corporation. Throughout his life he has combined his professional interests in chemistry with a consuming passion for art, especially for Dutch seventeenth-century painting. His collection of pictures by the circle of Rembrandt is probably the most important in private hands.

Dr Bader is not only a major collector, but also an engaging speaker. To celebrate the fiftieth anniversary of his association with Queen's, he will be here from 14 – 16 November and will give the following illustrated lectures at the Art Centre:

7.30 pm, Thursday 14 November:
Jan Lievens: Out of the Shadow
(free admission)

2 pm, Saturday 16 November:
The Bible through Dutch Eyes
(free admission)

David McTavish

Moving Around the Form:

Inuit Prints and Sculpture from the Permanent Collection

3 November – 23 February
Old Gallery

In the last fifty years the Inuit lifestyle has changed drastically – from nomadic to sedentary – mainly due to the failing fur trade. With little economic opportunity many Inuit were forced to give up hunting, to settle in communities and rely on welfare for survival. In 1948/49 the artist James Houston investigated the feasibility of an Inuit handicraft industry to provide people with a



source of income and to restore their pride in self-sufficiency. The first carvings Houston brought down to Montreal sold very quickly, prompt-

Kananginak Pootoogook (born 1935)

Cape Dorset
Umingmak 1973
stonecut
The John and Mary Robertson
Collection of Inuit Art 1985

ing the Canadian government to provide funds for the encouragement of further artistic production in Northern communities. Art centres called cooperatives were established and many Inuit began producing sculpture, handicrafts and, eventually, prints which were marketed in the South.

The works in this exhibition, based principally on selections from the *John and Mary Robertson Collection of Inuit Art*, include both sculpture and prints produced at several different cooperatives in the Canadian Arctic. Thematically grouped, they explore sculptural and graphic approaches to similar subjects. Despite the different media and techniques used by printmakers and sculptors, a common concern with traditional Inuit themes is expressed.



Inuit art is a popular theme for school tours

Alpha Chi Sigma Affiliates with NFHC

The trustees of the Alpha Chi Sigma Educational Foundation recently voted unanimously to affiliate the fraternity with the National Foundation for History of Chemistry. Alpha Chi Sigma, devoted to the interests of chemists, is the NFHC's eighth affiliate. The affiliation comes after extensive discussion and correspondence between Paul Jones, grand collegiate alchemist of the fraternity, and staff members of the NFHC. Robin Robinette, professional representative, and Gregory Fitzgerald, North-eastern district counselor of Alpha Chi Sigma, represented the fraternity at the spring 1990 meeting of the NFHC Board of Directors.

In recognition of its affiliation, Alpha Chi Sigma presented a complete bound set of eighty volumes of its journal, *The Hexagon*, to the NFHC, at the Kuebler

Continued on page 2



The Beckman Center's Associate Director Lawrence B. Friedman receiving a complete set of *The Hexagon* at Alpha Chi Sigma's annual meeting in Tallahassee, Florida.



Alfred Bader and Gilbert Stork looking for rare chemicals at Columbia University.

Crystallizing Hamburger Alfred Bader and the Aldrich Chemical Company, Part I

IN HIS NATIVE VIENNA, Nazi racial laws forced fourteen-year-old Alfred Robert Bader to drop out of school. He spent six months earning some money buying and selling stamps before he was sent by his family to England. There he was befriended by an "aged and well-to-do" English woman, Sarah Wolff, and began studying at the East Hove Senior School for Boys. In the summer of 1939 he proceeded to Brighton Technical College, having had no previous interest in science.

Less than a year later Bader was caught in Winston Churchill's edict to "collar the lot" (i.e., intern the German refugees). On 12 May 1940, detectives picked up Bader during the Sunday school break at the Middle Street Synagogue in Brighton. He passed through a series of internment camps in England, then landed on 15 July in Canada, where he was sent to camp on the Richelieu River near the American border. Bader described his experiences there in a Beckman Center oral history interview. The camp commandant remarked, "It's amazing that a boy of sixteen would parachute down

Continued on page 8

**JOIN US: 10 APRIL IN THE WEST
19 APRIL IN THE EAST**

See Beckman Center News, p. 11, for the 10 April celebration of the 50th Anniversary of the DU, in Irvine, California
See Ottemer Library News, p. 7, for the 19 April meeting with The Chemists' Club and the Société in New York City

AFFILIATED SOCIETIES:

THE AMERICAN ASSOCIATION FOR CLINICAL CHEMISTRY, INC. ▲ AMERICAN ASSOCIATION OF TEXTILE CHEMISTS AND COLORISTS
AMERICAN SOCIETY FOR BIOCHEMISTRY AND MOLECULAR BIOLOGY ▲ AMERICAN SOCIETY FOR MASS SPECTROMETRY
THE CHEMISTS' CLUB ▲ THE ELECTROCHEMICAL SOCIETY, INC. ▲ SOCIÉTÉ DE CHIMIE INDUSTRIELLE, AMERICAN SECTION

The Arnold and Mabel Beckman Center for the History of Chemistry

THE BECKMAN CENTER is a joint endeavor of the American Chemical Society, the American Institute of Chemical Engineers, and the University of Pennsylvania, established in January 1982 to discover and disseminate information about historical resources and to encourage research, scholarship, and popular writing in the history of the chemical sciences and the chemical process industries.

The aims of the Beckman Center are to develop a program of interviews and to undertake oral histories of major developments in the

modern chemical sciences; to locate historical manuscripts and archival records in the hands of individuals, societies, trade associations, and companies important in the history of chemistry, chemical engineering, and the chemical process industries; to encourage the preservation of these records in appropriate repositories; to publish resource guides and historical materials; to create traveling exhibits; and to make known the achievements of chemical scientists, chemical engineers, and the chemical process industries.

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ALPHA CHI SIGMA—continued from page 1



Award reception and banquet held in August at its 40th Biennial Conclave in Tallahassee, Florida. The John R. Kuebler Award for outstanding service to the fraternity and the profession was presented to Gerard R. Dobson, the immediate past grand editor of the *The Hexagon*.

Published since 1910, *The Hexagon* is an educational and news journal devoted to the interests of the members of Alpha Chi Sigma. It serves the wider chemical profession through articles on the history of alchemy and chemistry.

One of the insignia of the badge and coat of arms of Alpha Chi Sigma contains the figure of a hexagon, the structural symbol of aromatic compounds, together with alchemical symbols of the seven metals of the ancients. Gold, silver, iron, mercury, tin, copper, and lead were associated with the seven heavenly bodies: the Sun, the Moon, Mars, Mercury, Jupiter, Venus, and Saturn. They were also linked with the days of the week, signs of the zodiac, and alchemical processes such as calcination, solution, sublimation, and fermentation.

Today 30,000 men and women chemists are members of Alpha Chi Sigma. The organization's objectives are to bind its members with a tie of true and lasting friendship, to strive for the advancement of chemistry both as a science and as a profession, and to aid its members by every honorable means in the attainment of their ambitions as chemists. Current officers of Alpha Chi Sigma are Paul R. Jones, President (Grand Master Alchemist), Michael Zachmeier, First Vice President (Grand Collegiate Alchemist), Donald E. Green, Second Vice President (Grand Professional Alchemist), and DeWayne Gerber, Third Vice President (Grand Master of Ceremonies). The headquarters are in Indianapolis, Indiana.

LISA KAZANJIAN
Staff

Education Takes Center Stage after May Conference

"The Chemical Sciences in the Modern World," a May 1990 conference organized by the Beckman Center, continues to have powerful repercussions. Particularly encouraging, given the scholarly tenor of the program, have been the swift reactions in the educational arena.

The quick response is especially heartening in light of concerns raised at the conference by William B. Jensen regarding the gulf between scholarly developments and educators eager to report on them. Jensen's remarks were stressed in a detailed report on the conference in *Chemical and Engineering News* (6 August 1990) by Stuart Borman; indeed Borman may have addressed that very issue summarizing the research presented on the history of the chemical industry. Other reports are in preparation. Seymour H. Mauskopf, Duke University, and Mary Ellen Bowden, Beckman Center, will bring the conference findings to the chemical education community in a forthcoming issue of the *Journal of Chemical Education*. An article by Theodor Benfey in the ACS Chemical Education Division *Newsletter* next spring will urge the incorporation of chemical history in chemistry classes for both majors and nonmajors.

Following the conference, NFHC Associate Director Lawrence B. Friedman conferred with officers of the Woodrow Wilson Foundation in Princeton on plans for a four-week workshop analogous to current Woodrow Wilson-Dreyfus programs for high-school science teachers but focusing on the history of the chemical sciences. A shorter pilot workshop is contemplated for summer 1991, and possibly a four-week program in 1992. Friedman also met with an interest group in the history of chemistry at the Chemical Education Bicentennial Conference in Atlanta in August.

The Beckman Center is working with the National Science Foundation-sponsored ChemSource program for high-school teachers on historical material relating to thirty-six chemical topics.

A small group—including Walter Orehowsky of the Philadelphia High School of Engineering and Science, who attended the May conference, his colleague Robert A. Welsh, and Joseph Marlino of PATHS/PRISM—met in August at the Beckman Center to explore



William Jensen, Editor of the *Bulletin for the History of Chemistry*, explores with Alan J. Rocke of Case Western Reserve University and Erwin N. Hiebert of Harvard University ways to increase communication between historians of chemistry and chemical educators.



Nobel Laureate Roald Hoffmann (fifth from right), host of the television series "The World of Chemistry," talked at length with the high school teachers at the Beckman Center Conference.

enrichment programs in chemical history for high-school teachers, especially the pilot workshop next summer.

The conference proceedings are being edited by Seymour Mauskopf for publication.

▲ From a High School Teacher:

"I have never attended any other conference in which I have been so intellectually stimulated or challenged. The ideas presented and the follow-up discussions consistently introduced alternative ways of viewing the nature of science. . . .

"I have tried in both my science seminar and my chemistry classes to use a historical approach to look at the development of ideas. It is in this way that one can begin to gain an understanding of the true nature of science."

John L. Ihde, Wausau West High School, Wisconsin

▲ History of Chemistry to Center Stage?

"In the last ten years, science educators met the challenge of illustrating chemical theory with phenomena that could be presented easily and safely

in the high-school classroom. In the next ten years we can meet the challenge of presenting chemistry in a cultural and historical context. One only has to watch the film *Madame Curie*, directed almost fifty years ago by Mervyn LeRoy, to know that it can be done."

Ruth Rand, Chicago Latin School

▲ The Neglect of Chemistry—The Problem We Face

"Curiously, historians and philosophers of science have largely neglected these major contributions to the foundations of chemistry [Linus Pauling's "The Nature of the Chemical Bond and the Structure of Molecules and Crystals"; Gerhard Herzberg's "Molecular Spectra and Molecular Structure"; E. Bright Wilson's 1941 paper on molecular vibrations; Samuel Glasstone, Keith J. Laidler, and Henry Eyring's "The Theory of Rate Processes"; and Robert S. Mulliken's papers on molecular orbital theory] while giving perhaps excessive attention to the foundations of physics. Thus the *Isis Cumulative*

Continued on page 10

Dyes Are Focus of First Edelstein Technology Workshop



Edelstein workshop participants gather at Dead Sea Chemical Works, Sodom, Israel. From the left, after the security guard and guide: Ernst Homburg, Robert Bud, Gábor Palló, Tony Travis, Michael Chayut, Willem Hornix, Peter Reed, Henk van den Belt, Mrs. Hornix, Peter Morris, an unidentified Edelstein Center helper, Elisabeth Vaupel, and Heinrich Zollinger. Courtesy Eric Elliott.

Four thousand years of the chemical industry in five days: to discuss and to tour the ancient sites at which that history was made was an ambitious undertaking. Yet over two dozen scholars gathered at Jerusalem's Hebrew University from 27 May to 1 June 1990 to do just that, thanks to an international workshop on the history of chemical technology sponsored by the Sidney M. Edelstein Center for the History and Philosophy of Science, Technology and Medicine.

Sidney M. Edelstein's own research and collection in the history of dyestuffs not only have served as the nucleus for the center's operations but also have shown the role of craft traditions within industry, a subject emphasized in several sessions. Demonstrating the similar interests and collaborative efforts of the Edelstein Center and the University of Nijmegen (Netherlands), Ernst Homburg (Nijmegen) described the European madder industry using early technical books from the Edelstein Collection. Tony Travis (Edelstein Center) gave an account of the origins of the synthetic dyestuffs industry, while Willem J. Hornix (Nijmegen) presented a detailed reconstruction of the industrial synthesis of alizarin around 1870. Henk van den Belt (Nijmegen) traced the downfall of La Fuchsine, the largest French manufacturer of synthetic dyestuffs during the late 1860s.

A generation ago, the economic historian David Landes called the technical virtuosity of nineteenth-century dyestuffs manufacture "[without] parallel" and "Imperial Germany's greatest industrial achievement" (*The Unbound Prometheus* [London: Cambridge Univ. Press, 1969], p. 276). Papers at the workshop followed the German industry into other areas of production. Peter Reed (Merseyside Museum, Liverpool) reviewed the close connection between the development of dyes and pharmaceuticals. Peter J. T. Morris of the Open University (UK) suggested that the twentieth-century development of organic chemicals at IG Farben rivaled dyestuffs in terms of economic staying power, while Eric Elliott of the University of Pennsylvania discussed the turn-of-the-century approach to goods manufactured in a colloidal state and the effect on the development of German chemical engineering.

Elisabeth C. Vaupel (Deutsches Museum, Munich) linked the adaptation and accommodation of the Sicilian sulfur monopoly with vacillations and innovations in the nineteenth-century sulfuric acid market. Michael Chayut (Edelstein Center-Beckman Center) examined the origins of polymer technology in the United States.

Returning to dyes, Gábor Palló (Technical University, Budapest) used the career of László Zechmeister to demon-

strate the influence of synthetic and natural dyes on both political thought and chemical research in eastern Europe during the twentieth century. Irving Ziderman (Israel Textile Association) and Otto Elsner (Shenkar Textile College) dealt with problems concerning the identification of Tyrian purple and the biblical blue. The Edelstein Center workshop was probably the first occasion when wool dyed with William Perkin's mauve could be compared with the famed blue and purple colors of antiquity.

The organizer of the workshop, Tony Travis, also arranged a day trip to the Negev and the Dead Sea, including the important mineral saltworks at Sodom.

The conference papers will be published in the *British Journal for the History of Science*.

ERIC ELLIOTT
University of Pennsylvania

ANTHONY S. TRAVIS
Edelstein Center, Jerusalem

Undergraduate education in the sciences must be "broadened to encompass aspects of the history, philosophy, sociology, politics, and economics of science and technology."

—From the AAAS report *The Liberal Art of Science: Agenda for Action* (1990)

MEETINGS

AICHe Spring National Meeting, Houston, Texas, 7–11 April 1991.

Royal Society of Chemistry, 150th Anniversary Annual Chemical Congress, Imperial College, London, 8–12 April 1991.

Includes programs by the RSC Historical Group. Contact Peter Morris, Department of History of Science and Technology, Open University, Walton Hall, Milton Keynes, MK7 6AA, UK.

201st ACS National Meeting, Atlanta, Georgia, 14–19 April 1991.

HIST program chair: Jeffrey L. Sturchio, Merck & Co., Inc., P.O. Box 2000, Rahway, NJ 07065-0900; (201) 594-3981. HIST

Charles C. Price Visits Israel

My first trip to Israel, sponsored by Sidney and Mildred Edelstein, was a remarkable experience. I spent three days at the Hebrew University in Jerusalem, where I attended an international history of chemistry symposium at the Edelstein Center for the History and Philosophy of Science, Technology and Medicine and where I received an honorary fellowship at a splendid luncheon ceremony presided over by President Amnon Pazy.

The Edelsteins also showed me many sights in the rest of Israel: ancient Roman and Crusader ruins, two-thousand-year-old ruins of Jewish communities on the Golan Heights, famous Christian sites from the New Testament, and Masada, the remarkable fortress built by King Herod, where nine hundred Jewish zealots tried to defy the Roman conquerors. We also drove past a massive tank trap at the barbed-wire border with Syria and the UN patrol post there. At probably no other place on earth have so many different cultures and religions flourished for centuries, only to be displaced or destroyed by conquerors from east, west, north, and south. I was pleased to see that the State of Israel allows religious freedom, so that there are active Christian churches as well as Islamic mosques for the more



Sidney M. Edelstein looks on as Charles C. Price, NFHC chairman, is awarded an honorary fellowship from the Hebrew University by Amnon Pazy, the university's president, on the first day of the Edelstein workshop.

than eight hundred thousand Arabs who are Israeli citizens. The latter elect not only local governments in their towns and villages but also Arab members of the Knesset, the Israeli national parliament.

While it is not easy to see how to settle the conflict between Israel and the Arabs, it seems to me that historically the Jews can claim Israel as their homeland as clearly as any others. Israel has been attacked three times, so far unsuccessfully. So long as the situation remains so volatile, I can well understand Israel's reluctance for military reasons to give up the Golan Heights and the West Bank. As a Quaker, I would

add my own feeling that while it is hard to fault the Israelis for self-defense against the Arab states, it might improve the atmosphere if both sides tried a little more to follow the commandment to "love thy neighbor" and to be somewhat more tolerant of dissent. Even a subtle change from either side in this direction might help alter the current impasse.

The major accomplishment of the Israelis in using science and technology to develop their country deserves our admiration and support. If some accommodation for peaceful coexistence with the Arab states could be reached it would benefit all concerned.

CHARLES C. PRICE

symposia include "Chemistry and Science Fiction"; "Michael Faraday, Chemist and Popular Lecturer" (cosponsored by the Division of Chemical Education); "History of Synthetic Fibers"; and "Emil Fischer: One Hundred Years of Carbohydrate Chemistry" (cosponsored by the Division of Carbohydrate Chemistry).

Electrochemical Society National Meeting, Washington, DC, 5-10 May 1991.

ASMS National Meeting, Nashville, Tennessee, 19-24 May 1991.

ASBMB National Meeting, Atlanta, Georgia, 22-25 May 1991.

AACC National Meeting, Washington, DC, 28 July-1 August 1991.

AICHe Summer National Meeting, Pittsburgh, Pennsylvania, 18-21 August 1991.

202nd ACS National Meeting, New York, New York, 25-30 August 1991.

HIST symposia include "History of Steroid Synthesis," organized by Leon Gortler, Chemistry Department, Brooklyn College, Brooklyn, NY 11210, (718) 780-5746; and Jeffrey L. Sturchio (see address above); "A Century of Chemistry in New York (Commemorating the Local Section Centennial)," organized by J. Sharkey, Chemistry Department, Pace University, Pace Plaza, New York, NY 10038, (212) 488-1502; "Chemistry and Crime III—Forensic Methods: Past, Present, and Future," organized by S. M. Gerber, Color Consultants, 70 Hillcrest Road, Martinsville, NJ 08836, (201) 356-4721; and R. Saferstein, New Jersey Forensic Laboratory, P.O. Box 7068, West Trenton, NJ 08825, (609) 882-2000, Ext. 2692; "Social Responsibilities of Scientists" (cosponsored by the Division of Chemical Education); and "True Stories of Small Chemical Busi-

nesses" (cosponsored by the Division of Small Chemical Businesses). Titles of papers are due with session organizers by 1 April 1991. To submit general papers contact the program chairman, Jeffrey L. Sturchio, at the address above.

Electrochemical Society National Meeting, Phoenix, Arizona, 13-18 October 1991. Includes Michael Faraday Bicentennial Symposium.

History of Science Society Annual Meeting, Madison, Wisconsin, 30 October-2 November 1991.

100th Anniversary of the Geneva Conference, Geneva, 21-22 April 1992 (tentative).

Cosponsored by the ACS HIST division. Contact J. G. Traynham, Chemistry Department, Louisiana State University, Baton Rouge, Louisiana, 70803; (504) 388-3459.

Are Chemists Turning to History?

The Washington ACS Meeting

There was a distinctly historical flavor to the two-hundredth national meeting of the American Chemical Society, held in Washington, DC, on 26–31 August 1990. The program cover juxtaposed the Capitol in all its splendor with the simple buildings in Newport, Rhode Island, where the first ACS national meeting was held in August 1890, with forty-three people attending. An exhibit depicted meetings during the intervening years with group photos of attendees, banquet invitations, programs, and meeting badges, ably selected with the help of the Beckman Center's James J. Bohning and the American Philosophical Society's David J. Rhees, formerly of the Center. In his official welcome to the ACS on coming to Washington for its two-hundredth meeting, President George Bush can be forgiven for assuming that the ACS was "established more than two centuries ago."

History also had its due in the sessions. Glenn T. Seaborg was the first speaker in a three-day commemoration of the fiftieth anniversary of the discovery of the transuranium elements. Richard Rhodes, Pulitzer Prize-winning author of *The Making of the Atomic Bomb*, gave a banquet speech entitled "Nuclear Truce—the End of the Cold War."

A symposium on the history of chemistry in federal agencies described the support given by the navy (ONR), air

force (AFOSR), army (OOR, ARO), National Science Foundation, Atomic Energy Commission (now the Nuclear Regulatory Commission), and National Institutes of Health, concluding with Justin W. Collat of the ACS outlining the origin of the ACS Petroleum Research Fund. Glenn Seaborg gave the after-dinner address in his capacity as the former head of the Atomic Energy Commission.

The bicentennial of United States copyright and patent laws was celebrated by a half-day session, "Intellectual Property: Yesterday, Today, and Tomorrow."

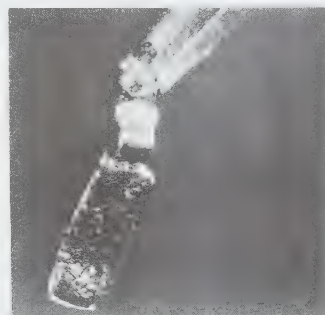
Symposia were also held on revolution and evolution in chemical education; the history of the development, use, and testing of food additives; risk assessment—past, present, and future challenges; and historical information gleanable from stamps, a symposium lavishly illustrated by philatelic displays. At a session on *ChemSource* it was noted that material to be supplied as chemical background information for high-school teachers will include historical information for each of the thirty-six topical units, as well as a section on the history of American chemical education.

Following three half-day sessions honoring the memory of former ACS President William J. Bailey, a reception was held in Marvel Hall of the ACS building, with displays relating to his life and activities prepared by the Chemical Society of Washington and the NFHC's Stephanie A. Morris.

Colin A. Russell of the UK's Open University, this year's winner of the history of chemistry award sponsored by the Dexter Chemical Corporation, pre-



An international team discovers rutherfordium and hahnium: Matti Nurmi, James Harris, Kari Eskola, Glenn T. Seaborg, Pirkko Eskola, and Albert Ghiorso at the Lawrence Berkeley Laboratory in 1970.



Plutonium is weighed for the first time (as an oxide), on 10 September 1942 at the University of Chicago Metallurgical Laboratory.

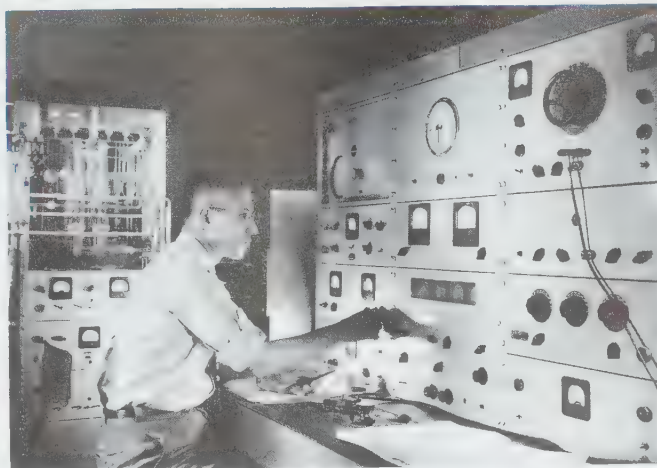
sented his award address, "Records of Chemistry: Combustion or Conservation?" including in his discussion nonwritten records and the industrial archaeology of chemistry.



The Early Days of Mass Spectrometry

In spring 1990 the *Beckman Center News*, in announcing the affiliation of ASMS with NFHC, outlined the beginning of that organization. Some details from an eyewitness may throw a somewhat different light on facets of the early organization of the mass-spectrometry community.

Consolidated Engineering Corporation and the General Electric Company organized annual conferences on mass spectrometry from 1944 to 1951 and from 1949 to 1951 respectively. These conferences were intended primarily for users and potential users of their instruments, but both companies extended invitations to others who expressed interest in attending. There was a good deal of duplication between the two sets of meetings, but some laboratories felt it necessary to send representatives to both to ensure that they did not miss out on anything important. By 1952, both Consolidated and General Electric and the people who had been attending the meetings recognized that this was an untenable and highly inefficient state of affairs and agreed that a new organizational structure was needed under auspices other than those of the instrument manufacturers. E. B. Tucker of Standard Oil Company (Indiana) proposed that we ask the American Society for Testing Materials to establish an E committee on mass spectrometry. This course of action greatly reduced the time and effort needed to set up a new structure and



Seymour Meyerson at the console of a CEC model 21-102 mass spectrometer in 1949.

enabled us to start functioning with a minimum of wheel spinning. The ASTM's central office facilities and organizational expertise were made available to us and made a huge difference.

The E committees of ASTM are intended to advance the art and science of specific fields of interest. Thus Article II of the bylaws of ASTM Committee E-14 on Mass Spectrometry, dated 2 March 1954, reads:

The scope of the committee shall be promotion of knowledge and advancement of the art of mass spectrometry by:

- (a) Coordinating scientific applications and methods of analysis based on mass spectrometry.
- (b) Sponsoring meetings at which scientific papers relative to mass spectrometry may be presented and discussed.
- (c) Standardizing nomenclature relating to mass spectrometry.
- (d) Initiating, sponsoring and reporting

work in the field of mass spectrometry, without prejudice to the jurisdiction of other technical committees over their respective materials.

It is the objective of the committee to encourage participation on the widest possible basis of individuals interested in mass spectrometry, in order to coordinate work and promote the exchange of information in the field. Emphasis will be placed on presentation, at national meetings, of papers on all phases of mass spectrometry, with subsequent publication in the most appropriate medium.

Work on the development of standards of analysis was carried out by various subdivisions and task groups of D committees, especially D-2, the mission of which is defined as the analysis of petroleum products and lubricants. The

Continued on page 8



An "Avocado Luncheon" and Garden Party at the home of Mrs. Queen W. Boardman on Sunset Boulevard, West Hollywood, was the highlight of the 70th ACS National Meeting, held in Los Angeles, California, in August 1975. The hosts for the occasion were Dr. W. L. and Mrs. Hardin and the Avocado Growers of Southern California. Photo courtesy of the University of California, Berkeley.

SPECTROMETRY—continued from page 7

Committee D-2 section concerned with mass spectrometry scheduled its annual meeting to coincide with that of Committee E-14, just as it had earlier with the annual meeting of the Consolidated mass spectrometer group and as it has continued to do with the annual meeting of the ASMS, because mass spectrometrists congregated there. The felt need over these years for standard methods of analysis was not for petrochemicals but for refinery streams and petroleum products, chiefly hydrocarbons. Committee E-14's principal activity was described as the "lively annual meeting of practitioners." After the ASMS came into being and took over sponsorship of the annual meeting of mass spectrometrists, a long-term effort was made to redefine Committee E-14's mission.

During the earlier years the mass spectrometry community consisted largely of people from industry and government laboratories, but by the mid 1960s the representation from academia had increased greatly, and the drive to establish an independent society came largely from the academics. Traditionally, chemists in other specialties had tended to look down on analytical chemists as less than professional, and this condescending attitude was particularly entrenched among academics, who viewed the ASTM as a grubby organization catering to the needs of second-class (analytical) chemists. Many academics felt embarrassed to ask their department heads or deans for authorization and funding to attend a meeting under the auspices of an ASTM committee.

The following illustrates how deeply the attitude was entrenched. At the business meeting of the 1969 annual conference of Committee E-14, when formal action was taken to establish the ASMS, a provision stipulated that the current officers of E-14 would become the first officers of the new society. A nominating committee, of which I was a member, was asked to prepare a slate of candidates for the 1970 meeting. In response to my request for an outline of "the practices that Committee E-14 has followed to insure continuity on the board and an orderly progression from one office to another," Joe Franklin of Humble Oil and Refining Company, who was ASMS president that first year, wrote me in part, "In the past, we have selected our Vice-President for Program from among those with major interests

in fundamental mass spectrometry and chemical physics or physical chemistry. We feel it highly desirable that the chief officers and the one in charge of the program should have a strong interest in the fundamentals since otherwise we might be in the position of deteriorating into a peddler's organization."

In 1969 many mass spectrometrists were apparently unaware of or unprepared to acknowledge the enormous contribution that the ASTM had made to the discipline of mass spectrometry during a crucial period in its development. I would guess that today the vast majority of mass spectrometrists have no notion of the extent to which all of us in this field are indebted to the ASTM.

SEYMOUR MEYERSON

Gary, Indiana
Retired in 1984 from Standard Oil Company (Indiana) (now Amoco Corporation)

July Workshop on the History of Chemistry

The Beckman Center plans to conduct a one-week workshop for fifteen high school chemistry teachers on the history of chemistry, 21–26 July 1991, with emphasis on the historical background of subjects normally taught in a high school course. The workshop will consist of readings and lectures on selected topics in the history of chemistry, small group projects on historical aspects of the chemical sciences, and individual projects. Participants will work together to develop ways of using historical material in their classrooms. The workshop will be led by William B. Jensen, Ralph Edward Oesper Professor of Chemical Education and History of Chemistry at the University of Cincinnati.

Participant expenses, including travel and lodging, are to be paid, and a stipend provided. Academic-year support for individual projects will be available on a competitive basis.

Applicants had to be high school chemistry teachers who have taught for at least three years and are assured of a teaching position in chemistry for 1991–92. Over one hundred requests for application forms were received by the 15 January deadline. If funding is not obtained, applicants will be notified immediately.



The Aldrich chemical company at work.

HAMBURGER—continued from page 1

over England." Bader replied, "I didn't parachute down over England. I'm a Jew; I'm a refugee." "Well," the commander responded, "I don't believe you for a minute, but we don't like Jews either."

It was over a year before Bader was released from the camp, through the efforts of the Jewish community in Montreal, including Sarah Wolff's son, Martin. But during that time Bader excelled in the camp school. He credits his success to the principal, who was an engineer; the fine teachers, one of whom later became a professor at Johns Hopkins; and the lack of distractions, especially girls. It was here that Bader received his first exposure to chemistry, and before he was released in November 1941 he had passed both the junior and the senior matriculation through an arrangement the camp had with McGill University.

Unable to enroll at McGill because its self-imposed quota of Jews was already filled, Bader followed the Wolffs' recommendation and entered Queen's University in Kingston, Ontario, where he received his degree in engineering chemistry in 1945. Why did he decide on

The Donald F. & Mildred Topp Othmer Library of Chemical History

NEWS

VOLUME 3 ■ NUMBER 1 ■ SPRING 1991

Chemical Industry Pioneers Restored

The portraits of David Wesson, inventor of Wesson Oil, and of August E. Eimer of the venerable Eimer and Amend laboratory apparatus company used to hang in the elegant quarters of The Chemists' Club in New York. Two years ago these portraits were loaned with ten others to the National Foundation for History of Chemistry for restoration and safekeeping. Now all have been restored to their original splendor. (See *Othmer Library News*, Summer 1990.)

Two of the paintings came without identification. One we now confidently assert is that of Charles F. McKenna (1861–1930), a founder and president of the American Institute of Chemical Engineers. The name of the other, a most distinguished gentleman who looks as if he had just emerged from a European court reception, still eludes us. Perhaps a reader can remember him and will enlighten us. The remaining portraits are those of Edward G. Acheson, Leo H. Baekeland, Marston T. Bogert, William

Continued on page 2



Can our readers help us identify this distinguished gentleman? The portrait is signed Chartran, 1893.



Of a hundred and fifty living descendants of Herbert H. Dow, a hundred and thirty-five attended the museum's opening ceremonies. Herbert D. "Ted" Doan, grandson of the company's founder, is speaking.

Herbert H. Dow Historical Museum Opens

AT PRECISELY 2:30 P.M. on 14 August 1990 a steam whistle sounded at the Dow Chemical Company plant in Midland, Michigan, marking to the minute the centennial of Herbert H. Dow's arrival in the town. Several miles away more than one thousand people, including 90 percent of Herbert and Grace A. Dow's 150 descendants, had gathered to witness the opening of the Herbert H. Dow Historical Museum, with one of Dow's grandsons, Herbert D. "Ted" Doan, as master of ceremonies, two of Dow's daughters, Margaret G. Towsley and Dorothy D. Arbury, cutting the ceremonial ribbon, and a second grandson, Herbert H. Dow II, participating in the opening exercises.

When the twenty-four-year-old H. H. Dow came to Midland in 1890 with \$100 in cash and a \$275 bank draft, he was intent on using the Michigan brine deposits to produce bromine electrolytically for the photographic and pharmaceutical industries. He rented a drill house and a vat building for \$100 a year and paid \$12 per day to John R. Evens, who owned the adjacent flour mill, so that he could utilize the mill's steam engine by running a rope drive through the mill wall and connecting it to an electrical generator. From these humble beginnings arose the Dow Chemical Company, now a \$17-billion multinational conglomerate and one of the largest chemical companies in the world.

The Herbert H. Dow Historical Museum consists of three newly constructed timber buildings that replicate the original Evens mill, the drill house, and the shed that served as Dow's workshop and laboratory. Visitors to the mill pass through a series of interpretive galleries that depict in considerable detail Dow's life and accomplishments. Using original documents, photographs, and artifacts placed in authentic settings, the tour begins with Midland as it appeared on Dow's arrival. Subsequent galleries include Joseph

Continued on page 3

Giants of Du Pont's Past and Present

The Experimental Station at Du Pont now displays eleven bronze medals, replicas of gold Lavoisier medals for technical achievement. Awarded for the first time on 24 May 1990, the medals honor Du Pont scientists whose innovative research has made lasting contributions to scientific and technological understanding and who, in the words of Du Pont's chairman, Edgar S. Woolard, Jr., also have left "a living legacy of tens of thousands of good jobs, of international business enterprises, of basic human needs met, and of improved living standards for millions of people around the world."

Antoine Laurent Lavoisier taught and guided Du Pont's founder, Éleuthère Irénée du Pont, from 1787 to 1790, and there was thought of calling the American enterprise the Lavoisier Mills.

Posthumous awards honored Elmer Keiser Bolton, who was responsible for converting nylon, neoprene, and Teflon from scientific discoveries to commercial products; Wallace Hume Carothers, of nylon and neoprene fame; William Hale Charch, the inventor of moisture-proof cellophane; Thomas Hamilton Chilton, a pioneer of chemical engineering research, particularly unit operations; Ralph Kingsley Iler, who worked on colloidal silica; and Charles Wyvil Todd, a

NFHC-ACS Book Series Is Launched

An agreement was signed in the fall by the American Chemical Society and the NFHC to publish books in the history of the chemical sciences and technologies. A management committee consisting of Robert H. Marks and Joan Comstock of the ACS and Arnold Thackray and Lawrence B. Friedman of the NFHC will oversee the venture, and the editorial board will be headed by Jeffrey L. Sturchio.

It is planned to begin by reissuing important out-of-print books in the field. Please send your suggestions of possible titles as soon as possible to Theodor Benfey at the National Foundation for History of Chemistry, giving some indication as to who might welcome the reprinting of the books you suggest.



Nathaniel C. Wyeth with some of the Du Pont products he helped bring to fruition. The painting behind him is by his father, artist N. C. Wyeth. Inset: Du Pont's new Lavoisier Medal honors the company's technical giants, past and present.

pioneer of crop-protection chemicals.

Receiving medals in person were Max Frederick Bechtold, the inventor of colloidal silica and scratch-resistant plastics; Abraham Bernard Cohen, who developed commercial imaging systems using photopolymers in electronics and printing; Lawrence "Buck" Curtis, the devel-

oper of tension-leg platforms and other oil-field technologies; Louis Plambeck, Jr., who studied photopolymerization for imaging applications; and Nathaniel Converse Wyeth, the inventor of processes for manufacturing polyester bottles, plastic shotgun shells, and nonwoven fabrics.

PIONEERS—continued from page 1

M. Grosvenor, Charles M. Hall, J. B. Francis Herreshoff, and Edward R. Squibb, and two of Morris Loeb.

A gala viewing of the exhibit was held 9 October preceding the fall meeting of the Board of Directors of the National Foundation for History of Chemistry.

Edward G. Acheson (1856-1931) worked with Thomas Edison on electrification projects before commercializing his own inventions of electric-furnace graphite and Carborundum.

Some of the Chemists' Club portraits in the Esther Klein Gallery of Philadelphia's Science Center. From the left: Charles Hall, Charles McKenna, William Grosvenor, Edward Acheson, Edward Squibb, J. B. Francis Herreshoff, and an as-yet-unidentified chemist.



DOW MUSEUM—continued from page 1

Dow's workshop, where young Herbert spent many hours with his father, Dow's student days at the Case School of Applied Science in Cleveland, his interest in steam engines, his wife Grace's kitchen, his office, and his contributions to chemistry. The tour concludes in a Victorian theater with a brief audiovisual presentation of the Dow Chemical Company's local, national, and global impact.

The drill house and its 46-foot tower contain the handmade wooden pumping machinery used to obtain raw brine from 1,300 feet below the land surface. The brine was kept in a wooden storage tank, faithfully reproduced in the museum with 288 carpenter joints. The small shed includes a replica of Dow's crude electrolysis cells and other laboratory apparatus. It represents the entire manufacturing facilities of the initial Midland Chemical Company.

Modern technology has been carefully used to enhance what appears to be a nineteenth-century setting. The most fascinating feature is a spectral-imagery device: the Dow Museum is the first in the world to use this unusual three-dimensional video presentation, in which a miniature talking Herbert Dow explains his contributions to chemistry.

Great imaginative effort and considerable historical research lie behind the creation of the Herbert H. Dow Historical Museum. Major benefactors include the Herbert H. and Grace A. Dow Foundation, Dorothy Dow Arbury, the Rollin



Margaret Dow Towsley, daughter of Herbert H. Dow, cuts the ribbon at the dedication ceremonies. Her nephew H. D. Doan assists.

M. Gerstacker Foundation, and the Charles J. Strosacker Foundation. Herbert H. Dow once said, "If we can't do it better than it's already being done, then why do it?" This museum certainly follows that philosophy in its representation of an important segment of the history of the American chemical industry.

Owned and operated by the Midland County Historical Society of the Midland Center for the Arts, Inc., the museum is located at 3100 Cook Road, Midland, MI 48640; telephone (517) 832-5319. Hours are Wednesday through Saturday, 10:00 A.M. to 4:00 P.M., and Sunday, 1:00 P.M. to 5:00 P.M. A nominal fee is charged for admission.

JAMES J. BOHNING

AWARDS

Dexter Award Goes to Colin Russell

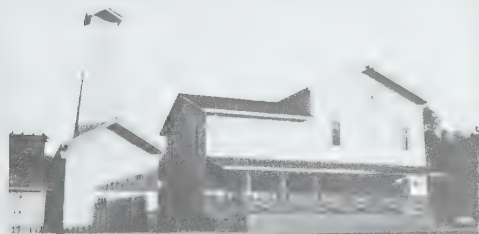
Colin A. Russell of the Open University, Milton Keynes, UK, was the recipient of the ACS History of Chemistry Division's 1990 Dexter Award in History of Chemistry. Colin Russell heads the University's History of Science and Technology Department, which undoubtedly teaches more students than any other such department in the world. He is the author of *Science and Social Change 1700-1900* and, with Peter J. T. Morris, of *Archives of the British Chemical Industry: A Hand List*; he is also a past president of the British Society for the History of Science.

The award was presented by David H. Abrahams of the Dexter Chemical Corporation at a luncheon during the ACS Fall Meeting in Washington, D.C., attended also by Sidney M. Edelstein, the Corporation's Chairman of the Board, and Mildred Edelstein. Colin Russell's address "Records of Chemistry: Combustion or Conservation" will be excerpted in a future issue of the *Beckman Center News* and published in full in the *Bulletin for the History of Chemistry*.

The Dexter Award honors outstanding accomplishment in the history of chemistry. For instructions or to send nominations for the 1992 award (due 1 January 1992) write John A. Heitmann, HIST Secretary, History Department, University of Dayton, Dayton, OH 45469-2265.

Bohning Recognized for History Research

James J. Bohning, who heads the Beckman Center's Oral History Program, received the 1989 Outstanding Paper Award at the Fall 1990 ACS Meeting. His "The 1893 World's Congress of Chemists: A Center of Crystallization in a Molecular Melange" was chosen by the ACS Division of History of Chemistry as the best paper appearing in the 1989 *Bulletin for the History of Chemistry*. Bohning's studies of the early days of the ACS were cited as models of institutional history, as giving attention not only to key personalities but to the scientific and social contexts in which they worked. The award is cosponsored by Kluwer Academic Publishers.



The newly opened Herbert H. Dow Historical Museum replicates the buildings rented by Herbert Dow when he arrived in Midland, Michigan, a hundred years ago.

Early Dow laboratory reconstruction of the Midland Chemical Company, forerunner of the present Dow Chemical Company. Photos courtesy Post Street Archives.

Friedrich Hoffmann as Consultant, ACS Founder, and Editor

In the Othmer Library News, Spring 1990, we reprinted an article published ninety years earlier in Science calling for a national library of chemical history—a dream that, thanks to the generosity of Donald F. and Mildred Topp Othmer, is becoming a reality. Our scant biographical note on the author, Friedrich Hoffmann, occasioned a call from Sabine Knoll Schütze, who is studying Hoffmann as part of her Ph.D. dissertation research at the Institut für Geschichte der Pharmazie in Marburg, Germany.

Hoffmann, a founder of the American Chemical Society and of American pharmacy, a leading editor, and a major figure in launching the American dye industry, is clearly a person about whom much more needs to be known. Sabine Knoll Schütze would greatly appreciate any information our readers might have about Hoffmann, particularly in his relations with specific American dye companies. She can be reached at (212) 582-3107.

Friedrich Hoffmann was born 20 June 1832, at Wriezen on the Oder in Germany, the son of a distinguished theologian and philologist. He attended the Joachimsthal Gymnasium in Berlin and in 1847 began an apprenticeship in pharmacy. Soon he developed a broad interest in science, and he studied in 1855–1856 at the University of Berlin under Heinrich Rose and Eilhard Mitscherlich in chemistry, Heinrich Dove in physics, Otto Berg and Alexander Braun in botany and pharmacognosy, and Christian Ehrenberg in microscopy. The thorough education Hoffmann received during these early years made him stand out later among other well-trained German pharmacists who had an impact on American pharmacy.

Having passed the state examination in pharmacy with highest honors, Hoffmann also studied botany and forestry, and in 1859 he obtained an academic degree at the University of Jena. Some of his class notes, illustrated at times with handsome pen sketches, are preserved at the American Institute for the History of Pharmacy in Madison, Wisconsin. For financial reasons he practiced pharmacy briefly in Berlin, Elberfeld, and elsewhere.

In 1862 the French company Renard Frères et Franc of Lyons, which held the



Friedrich and Marie Hoffmann with their son Otto in the United States, about 1880. Courtesy Joseph W. England Library, Philadelphia College of Pharmacy and Science.

Friedrich Hoffmann (left arrow) at the 1884 Joseph Priestley gathering in Northumberland, Pennsylvania, celebrating the hundredth anniversary of the discovery of oxygen. Hermann Endemann (right arrow) of H. Kohnstamm & Co. was appointed to the Committee on Papers and Publications when the ACS was founded.



patent for aniline red, threatened the infant aniline industry in the United States with destruction by pushing its claimed patent rights. In this emergency the American importers, some hoping to become manufacturers, looked for a chemical expert to assist them. They were fortunate in finding Friedrich Hoffmann, who moved to New York City in 1862 and quickly drafted a report entitled "A Critical Review of the History of Aniline and the Aniline Colors." After successfully completing his duties, of no small importance in the effect they had on the development of the American chemical industry, Hoffmann found that his advice was often sought on analytical and technical matters, especially by chemical companies and several large cotton producers. He became engaged for a time as a teacher of chemistry and chemical analysis in various New York educational institutions, delivered popular scientific lectures, and contributed valuable papers to several literary and pharmaceutical periodicals in the United States and Germany.

One of Hoffmann's major aims was to improve chemical and pharmaceutical knowledge in this country and to set new training standards, so that the

United States would be better able to compete with the thorough European educational system. In 1873 he published *A Manual of Chemical Analysis as Applied to the Examination of Medicinal Chemicals*, which filled an important gap in American pharmaceutical literature. A second (1877) and third (1883) edition followed, the latter prepared in association with Frederick B. Powers. Hoffmann introduced the use of the microscope into American pharmacy, frequently demonstrating its value and applications as a research instrument, especially in the examination of medical drugs and in the detection of adulteration.

During the nineteenth century no clear distinction between pharmacists and chemists had developed in the United States. Hoffmann, with his broad scientific education, was easily regarded as belonging to either profession. Even though he thought of himself mainly as a pharmacist—for several years he operated a pharmacy with great success in Manhattan—he was also a prominent member of the New York chemical community. Being acquainted with the German system of societies, he was well aware of the effect a professional organization would have on the progress of

On 10 April 1876 Charles F. Chandler of the Columbia School of Mines and Health Commissioner of New York City invited John William Draper of New York University to become the first president of the American Chemical Society. Included in the letter was a slate of proposed officers including Friedrich Hoffmann. Courtesy American Chemical Society.

current curriculum nominating committee has presented the following list of officers to be elected at the meeting to be held next week.

President: John W. Draper of New York
Vice Presidents: Dr. J. Lawrence Smith, Philadelphia; Dr. G. A. Smith, Philadelphia; Dr. J. W. Mellor, Philadelphia; Dr. Henry Moton, Philadelphia; Dr. August Wilhelm von Hofmann, New York

School of Mines, Columbia College

Corresponding Secretary: Dr. H. C. Cotton
Reading Secretary: Dr. J. W. Mellor
Treasurer: Dr. A. W. Hall
Chairman of Cabaniss: Dr. J. W. Mellor
Curators: Dr. J. W. Mellor, Dr. J. W. Mellor, Dr. J. W. Mellor

chemistry in the United States. He therefore became one of the founding members of the American Chemical Society in 1876, and was one of the society's curators for the first three years of its existence. In 1881 he was appointed

one of the three chemical experts of the newly created New York State Board of Health, and during his two years of service in this capacity he wrote extended reports on the examination of drugs and chemicals.

His most impressive accomplishment, however, was yet to come. In 1882, having decided to devote his time more exclusively to literary work, he established in New York a new pharmaceutical periodical, the *Pharmazeutische Rundschau*. Written largely in German, it was nevertheless widely known and appreciated in America as well as in Europe, becoming the recognized voice of scientific pharmacy and the constant and uncompromising advocate of the highest ideals. For thirteen years Hoffmann used his editorial knowledge and pen with a power and authority unparalleled by any other pharmaceutical editor in this country.

In 1895 he decided partially to retire and to move back to Germany. He chose Edward Kremers as his editorial successor. After changing the journal's title to *Pharmaceutical Review*, Kremers ran it for another successful thirteen years. Hoffmann died on 30 November 1904 in Berlin.

SABINE KNOLL SCHÜTZE
New York

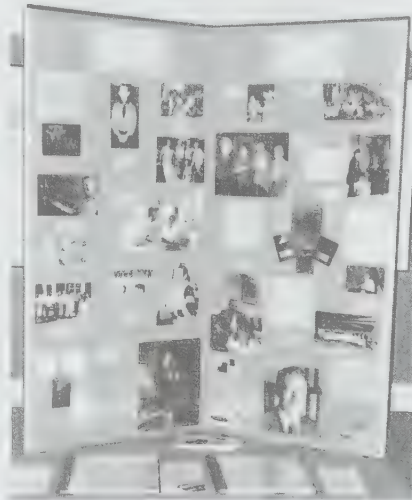
Tribute to William J. Bailey

Family, friends, and former students of William Bailey met for three symposia and a memorial tribute during the August 1990 ACS meetings in Washington, D.C. On the evening of 27 August over six hundred people came to a reception for Mary C. Bailey at Marvel Hall. Mary, her three children and one son-in-law, her sister and brother, and Bill's brother welcomed friends, neighbors, colleagues, and former students. The Baileys had entertained many guests at their annual homecoming parties; this was, perhaps, the last and the biggest such event.

Bill Bailey, an early supporter of NFHC, was interviewed as part of the Polymer Project. A copy of the transcript of this interview and a preliminary guide to his papers (now at the Center) were on display during the reception. Stephanie A. Morris and Thelma McCarthy of NFHC mounted a two-panel exhibit showing highlights of Bill's career. Some guests recognized themselves or their work in the photographs. Bill's softball glove appeared in one photograph illustrating his love of sports. We are grateful to Mary C. Bailey for supplying some of the photographs and for making helpful suggestions during the planning of the exhibit.



William Bailey and NFHC board chair Charles C. Price (seated respectively second and fourth from left) at a meeting of the ACS Advisory Committee to the US Army Chemical Corps, about 1958. The others are as follows. Front row from the left: E. Emmett Reid, H. Fraser Johnstone, Gail M. Dack, and John R. Lacher. Standing: Per K. Frolich, Winfred O. Milligan, Earl P. Stevenson, Harlan Worthley, Vernon H. Cheldelin, Charles G. Overberger, James Defandorf, Harold C. Weber, A. H. Corwin, Carl B. Marquand, Carl F. Graham, W. Conard Fernelius, Leslie Helleman, and Peter A. S. Smith.



The portrayal of William Bailey's life and career evoked numerous joyful memories.

The Trumpet Blast of German Chemistry

*In 1905 three leading German chemists, Emil Fischer, Wilhelm Ostwald, and Walther Nernst, jointly proposed creating an Imperial Chemical Institute to become a center for analytic chemistry "in the widest sense" as a basis for all academic and industrial chemistry. Despite German chemical preeminence, no German university then had a full professorship or institute specifically for analytic chemistry. Fischer and his colleagues could plausibly claim that in this key area Germany might fall behind other nations, including the United States, with its wealth and scientific potential. They formed a "Committee for the Imperial Chemical Institute" and assembled the elite of German chemistry in February 1906 to call for support from industry and the German government. The following excerpt from Jeffrey A. Johnson, *The Kaiser's Chemists: Science and Modernization in Imperial Germany* (Chapel Hill: London: University of North Carolina Press, 1990), describes this gathering. By playing up international competition, the chemists, including Carl Duisberg of the Bayer Dye Corporation, echoed a typical theme of would-be modernizers. A British observer called this rhetoric "the trumpet blast of German chemistry."*

On 21 February 120 men gathered in the great hall of the University of Berlin. Emil Fischer welcomed them in the name of the committee for the Imperial Chemical Institute. In his opening remarks, Fischer pointed out above all that scientific training and research had helped the modern German chemical industry to become virtually independent of foreign imports. Recently, however, the great foundations of North America had made rich donations to research and teaching; the same was not true in Germany, whose chemists lacked time and money for nonroutine work even in the best-supported institutes. The state governments lacked the funds to "close the gap" by setting up academic research laboratories. Besides, the "spirit of our time" did not favor "the establishment of such pure academic institutes," lacking the stimulation either of students or of applied chemistry. Thus: "What Werner von Siemens said of physics twenty-two years ago, when he advocated founding the Imperial Physical and Technical Institute, is equally true . . . of academic chemistry

today. In the future chemistry too must have research institutes which are freed from instructional duties and are so richly equipped that they can also undertake costly experimentation." If Imperial money was available for Imperial institutes for health, physics, and biology, as well as oceanic research or expeditions to the South Pole, why not for the equally valid and valuable science of chemistry?

The following discussion of the plan was dominated by two long, rambling speeches, by Ostwald on the academic arguments for an institute and by Duisberg on the industrial arguments. Together they effectively absorbed over half the time available for debate. Both men stressed the theme that research in schools and factories, however exemplary, could not fully accomplish certain important scientific tasks. Academic institutions could not effectively carry on research that had ceased to be appropriate for doctoral training, or that, like Fischer's projected protein synthesis, was too mechanical, tedious, and boring to attract bright young academic researchers. The dye factories could not do this work either, because they had created their large research staffs primarily to extract profits from "grazed-over" areas, still offering potentially profitable applications but unable to hold scientific interest. No factory would undertake work that might benefit its competitors or chemistry in general—"there we draw the line." Hence, for general research that was unsuitable for academic institutions or the existing technical testing laboratories of the state governments, the industry needed an "impartial" center in which paid specialists could undertake large-scale research "factory-style—if I may so express it," Duisberg added. Or as Ostwald joked, one could "put discoveries and inventions on order, just as one might order a couple of beers"; in each case, the "only question" was when, not if, they would come.

Both speeches concluded by calling on the Imperial government to give science enough funds to ward off the threat of foreign economic competition, especially from North America. Ostwald called the U.S. National Bureau of Standards "an Imperial Chemical Institute, already fully operational." "Standstill is retreat," cried Duisberg, adding ominously that the amounts being spent on chemistry in the United States were on a scale "perhaps never to be available to us." The



Emil Fischer in his laboratory, 1905. Photo courtesy Max Planck Gesellschaft Photo Archive.

chemical industry had so far received very little from the Imperial government in return for its benefits to the German people; hence "the Reich must join in with us. . . . We do not just want to ask, however; rather we also have, I believe, a right to demand."

JEFFREY JOHNSON
Villanova University

Although the Imperial German government rejected the proposed institute, its advocates eventually secured private contributions of more than a million marks (worth more than two million dollars today). That money went to build the Kaiser Wilhelm Institute for Chemistry, opened in 1912 as one of the first two research institutes of the Kaiser Wilhelm Society for the Advancement of the Sciences (succeeded after 1945 by today's Max Planck Society). Under Emil Fischer's scientific leadership the society employed future Nobel laureates like Richard Willstätter, Fritz Haber, Franz Fischer, and Otto Hahn. The scientific achievements of these "Kaiser's Chemists," as well as the economic and (after 1914) military value of their work, exemplify a significant pattern in the development of modern science.

PUBLICATIONS

*The Legacy of Herbert Dow:
Three Books*

E. N. Brandt and Barbara Schettig Brennan. *The Papers of Herbert H. Dow: A Guide for the Scholarly.* Midland, Mich.: Post Street Archives, 1990. 113 pp. \$8.95.

A guide to the collection, from technical papers and photos to gardens and orchards.

Ray H. Boundy and J. Lawrence Amos, editors. *A History of the Dow Chemical Physics Lab: The Freedom to be Creative.* New York/Basel: Marcel Dekker, 1990. 248 pp. \$99.75.

"Part One: Inventors Remember" includes chapters on seawater bromine, high-impact polystyrene, styrofoam, saran, automatic control, and process engineering. "Part Two: Lessons in Lab Management," by Ray Boundy, discusses accountable freedom and the nature of creativity.

Earl L. Warrick. *Forty Years of Firsts: The Recollections of a Dow Corning Pioneer.* New York: McGraw-Hill, 1990. 330 pp. \$29.95.

A creator of commercial silicones recounts the concern of Corning Glass not to be eclipsed by plastics, the hiring of J. Franklin Hyde, the linking of carbon and silicon—and of Dow and Corning—the emergence of Silly Putty, and the growth of this industrial giant from its wartime beginnings.

Books to Note

Biochimica et Biophysica Acta, Volume 1000, 1989. \$58.

To commemorate its publication of one thousand volumes since its inception in 1947, *Biochimica et Biophysica Acta* has devoted Volume 1000 to celebrating the most eminent papers of its past. Thirty-nine papers are reprinted, each with a commentary by one of the authors. Illustrious names appear—among them Christian B. Anfinsen, Melvin Calvin, Britton Chance Erwin Chargaff, Mahlon B. Hoagland, Robert W. Holley, Arthur Kornberg, Jacques Monod, and Severo Ochoa.

THREE-SOCIETY LUNCHEON IN MANHATTAN

On 19 April 1990 The Chemists' Club, the Société de Chimie Industrielle, and the National Foundation for History of Chemistry will hold their second joint luncheon, in Manhattan. Featured speakers are Elwood P. Blanchard, Jr., Vice Chairman of the Board of the Du Pont Company, and Herbert D. Doan, former President of The Dow Chemical Company. The master of ceremonies is L. John Polite of Peridot Inc.

For further details call Lisa Kazanjian at (215) 898-4896; fax (215) 898-3327.



Two pages from Samuel Ruben's notebook, with samples and comments. On the left: "First machine plated paper. . . . This is excellent, practically no electrical resistance." On the right: "First material from automatic plating machine."

Gifts to the Othmer Library

We continue to benefit from the generosity of our readers and friends.

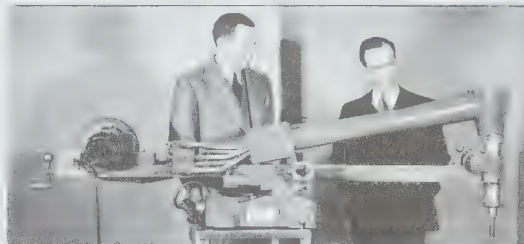
Edith Ballinger Price, the niece of Theodore William Richards, has given us her collection of offprints autographed by her uncle for various family members.

Our affiliate The Electrochemical Society figured in a donation from Sol S. Jaffee, who brought us his collection of the *Journal of the Electrochemical Society* (since 1958), *Electrochemical Technology* (1963–1966), and *Batterien* (Netherlands, 1965) and numerous pieces of commercial literature and other curiosities. At lunch with Center staff, Jaffee talked about his

work at Duracell with the late Samuel Ruben (whose notebooks we have, courtesy of his son Lauren) and told stories of other labs and the early development of storage batteries. He cautioned against combining used and new batteries, a practice that may lead to malfunction.

Aceto Chemical Company and *Chemical Business* have given us useful reference materials documenting chemical engineering and many international business issues, and Wilkes University has given us five older editions of *American Men (and Women) of Science*, which have added greatly to our cast of historical characters.

STEPHANIE MORRIS



Leonard Pool, right, and Carl Anderson early in 1941 with Air Products' first order, an oxygen cutting torch. Courtesy Air Products and Chemicals Inc.

Andrew J. Butrica. *Out of Thin Air: A History of Air Products and Chemicals Inc., 1940–1990.* New York: Praeger, 1990. 319 pp. \$39.95.

Air Products grew out of the vision and drive of one individual, Leonard Pool. In fifty years his precarious project developed into a major multinational corporation. Air Products was a late entrant to an established business, struggling to find market niches, moving into new but

related fields of endeavor, developing human resources, and breaking through to the level where economies of scale and scope would allow a secure future as a major player on a global scale. Today the company is the fourth-largest industrial gas supplier in the world. It is also a major chemical company and a pioneer in the emerging field of environmental and energy systems.

Continued on page 8

PUBLICATIONS—continued from page 7

The history of Air Products will be of value to anyone interested in the gas and chemical industries, business history, entrepreneurial history, and American studies.

Maurice Bursey. *Francis Preston Venable of the University of North Carolina.* Chapel Hill, North Carolina: The Chapel Hill Historical Society, 1989. \$12.

Francis Preston Venable (1856–1934), assisted by William Rand Kenan, Jr., identified acetylene as the gas liberated when calcium carbide reacts with water, thus launching what became the Union Carbide Corporation. Venable's life and career as chemist, historian of chemistry, educator, and university president are engagingly presented in this brief illustrated biography. It gives insight into Venable's graduate studies with Kekulé; the beginnings of chemical laboratory instruction in this country; Venable's part in establishing, along with Edgar Fahs Smith and H. Carrington Bolton the discipline of the history of chemistry in America; and his role, as president of the University of North Carolina, in bringing the university to the forefront of America's research institutions.

William B. Jensen, editor. *Lavoisier and the Chemical Revolution.* Cincinnati: *Bulletin for the History of Chemistry*, Number 5, Winter 1989. \$7.

The *Bulletin for the History of Chemistry*, in its second year and flourishing, has published its first symposium issue. Included are the papers presented at a bicentennial symposium of the ACS History of Chemistry Division in April 1989, which commemorated Lavoisier and the chemical revolution: William A. Smeaton, "The Legacy of Lavoisier"; Arthur L. Donovan, "Lavoisier's Politics"; J. Edmund White, "Scientific Revolutionaries Caught in Political Revolution: Priestley and Lavoisier"; Robert Siegfried, "Lavoisier and the Conservation of Weight Principle"; Frederic L. Holmes, "Lavoisier the Experimentalist"; A. Truman Schwartz, "Instruments of the Revolution: Lavoisier's Apparatus"; Ben B. Chastain, "Books of the Chemical Revolution"; Derek A. Davenport and Kathleen M. Ireland, "The Ingenious, Lively, and Celebrated Mrs. Fulhame and the Dyer's Hand"; and William B. Jensen, "Thomas Duché Mitchell and the Chemistry of Principles." The volume



Lavoisier depicted in the 1874 edition of L. Figuier's *Vies des savants illustres*. An axe has replaced the guillotine.

includes an introduction by Jane A. Miller.

A. Truman Schwartz and John G. McEvoy, editors. *Motion Towards Perfection: The Achievement of Joseph Priestley.* Boston: Skinner House Books, 1990. \$15.95.

A man who made his mark not only on chemistry but also on physics, religion, political theory, philosophy, and education can hardly be adequately described by one author. In celebration of the 250th anniversary of Joseph Priestley's birth in 1733, ten scholars illuminate his remarkable career, the title reflecting his lifelong search for ever-deeper religious understanding. Whereas his espousal of the phlogiston theory of combustion long after most others had abandoned it has been ascribed to irrational dogmatism, Priestley in fact was very open to new insights and asked searching ques-

tions regarding conclusions already drawn.

Schwartz and McEvoy introduce the volume with a discerning nine-page biography of Priestley, which is followed by Robert Schofield's "The Professional Work of an Amateur Chemist," looking at Priestley's major nonscientific texts. Derek Davenport recounts Priestley's years in America, and McEvoy analyzes Priestley's position with respect to the "chemical revolution." Other contributions include a discussion of the caricatures generated by Priestley's controversial life; a portrayal of the significant contributions made by Mary Priestley to her husband's career; a sketch of Priestley's friendships with Benjamin Franklin, Samuel Taylor Coleridge, Benjamin Rush, Thomas Jefferson, and John Adams; and a consideration of his role as citizen, minister, and church historian.

The introduction concludes with Priestley's warning of the dangers inherent in the heedless pursuit of knowledge, the fate of Faust awaiting those who detach science from its moral foundations and theological moorings.

Jeffrey I. Seeman, Editor. *Profiles, Pathways, and Dreams: Autobiographies of Eminent Chemists.* Washington, D.C.: American Chemical Society, 1990/91. 22 vols. \$24.95 each.

The first four volumes of a projected series of reminiscences by chemists, include the following autobiographies: Donald J. Cram, *From Discovery to Design in Organic Chemistry*; Ernest L. Eliel, *From Cologne to Chapel Hill*; Carl Djerassi, *Steroids Made It Possible*; John D. Roberts, *The Right Place at the Right Time*. Excerpts from two of the volumes can be found in earlier issues of the *Beckman Center News*: from Eliel's in Winter 1989 (6:1), and from Roberts' in Summer 1990 (7:2).

Rudolf Vierhaus and Bernhard vom Brocke, editors. *Forschung im Spannungsfeld von Politik und Gesellschaft: Geschichte und Struktur der Kaiser-Wilhelm-/Max-Planck-Gesellschaft aus Anlass ihres 75 jährigen Bestehens.* Stuttgart: Deutsche Verlags-Anstalt, 1990. 98 DM.

This illustrated history contains two sections of particular interest to chemists: Jeffrey A. Johnson's "Vom Plan einer Chemischen Reichsanstalt zum ersten Kaiser-Wilhelm-Institut: Emil Fischer" and Fritz Stern's "Freunde im Widerspruch: Haber und Einstein."

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that field of study? His grandfather had been an engineer, his mother had impressed on him the importance of engineering, and Martin Wolff was an engineer. "I felt that my whole background wanted me to be an engineer," Bader explains, "but I liked chemistry by far the best. Here was a course in engineering chemistry. To the engineers I could say, 'I am in engineering chemistry.' To myself I could say, 'I am in chemistry.'"

While studying at Queen's, Bader worked summers for the Murphy Paint Company. He found that he could quickly formulate a lacquer or varnish based on the customer's description of what was needed, and as a result the company's sales increased significantly. More important, Bader "enjoyed the entrepreneurial aspects. What I liked was the commercial part."

However, Bader admits that "as an undergraduate I was not particularly keen on the lab work. I was not particularly good in the lab." But when he continued on at Queen's for his master's degree, Bader worked intensively with Professor Arthur McKay, who sparked both his interest and his ability in experimental chemistry by working side by side with him in the laboratory. Bader claims he learned more from McKay in that one graduate year than he did in all of his undergraduate days.

Returning to Kingston after Christmas break, Bader found McKay standing in the doorway, saying, "You are a fraud. You are a crook. You will never be able to do research anywhere in the world. You've had it." Aghast at this tirade, Bader asked for an explanation. McKay had repeated Bader's condensation of nitroguanidine with 1,2-propanediamine and had obtained a different result. Bader persuaded McKay to let him repeat his experiment, which gave the same product he had originally reported. Bader's vindication came when closer examination revealed that McKay had used a different bottle of the amine, which turned out to be 1,3-propanediamine, mislabeled by Eastman Kodak. Thus McKay obtained a pyrimidine, while Bader got an imidazolidine.

Bader stayed with McKay, working on the oxidation of linoleic acid and making the eight stereoisomers of 9,10,12,13-tetrahydroxystearic acid. It was the basis of his first paper, published in the *Journal of Organic Chemistry* in 1948. Experiencing "the joy of making compounds" convinced him "that synthetic organic

chemistry was the thing to do." Deciding to continue for his Ph.D., Bader applied to the two schools that he thought "were the best in the world" and was accepted by both: the ETH (Eidgenössische Technische Hochschule) in Zürich and Harvard.

The decision was made financially. The president of Murphy Paint gave Bader \$1,800 towards his graduate tuition, reasoning that Bader would be an even better paint chemist with a Ph.D. than with just a B.S. "That," says Bader, "was a great mistake." Louis Fieser at Harvard offered Bader the Abbott Fellowship, worth \$1,000 a year, and a quarter-time teaching fellowship that paid \$100 a month. By contrast, the ETH told Bader he would have to supply his own funds. Bader agreed to work with Fieser and went to Cambridge in 1947 without knowing anything about other Harvard stalwarts such as Robert Woodward and Gilbert Stork.

In assigning a problem to Bader, Fieser told him: "I've made an interesting observation. This particular quinone, 2-hydroxy-3-cyclohexyl-1,4-naphthoquinone, when dissolved in alkali turns deep red like every hydroxyquinone. Leave that alkali solution overnight and it turns yellow. So clearly there's a rearrangement going on. Figure out what it is."

Bader rarely saw Fieser after that and sometimes instead discussed his problems with Woodward, Stork, and Martin Ettlinger. After a year and a half, in the spring of 1949, Fieser came into the lab and said, "Alfred, incidentally, how are you making out on that problem?" Bader replied, "Well, gee, I think I've solved it." To which Fieser said, "Well, give a seminar." After the seminar Fieser said, "This is very nice indeed. Write it up so that we can have a paper."

In spite of seeing his mentor so little, Bader speaks of his two years at Harvard with great enthusiasm, because of other faculty and students and especially his laboratory activities. He taught everyone how to make diazomethane from 1-

I loved to have crystalline compounds, and in Switzerland some people said that I can even crystallize Swiss cheese.

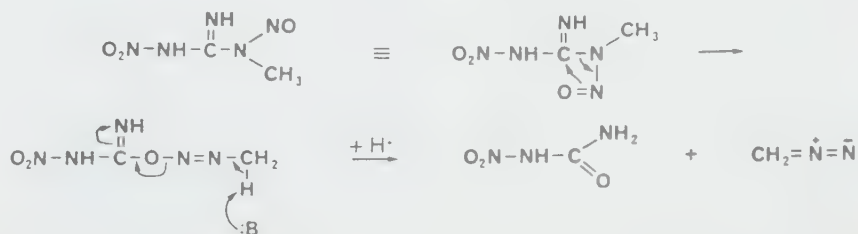
—Leo H. Sternbach, Beckman Center Oral History Interview, 12 March 1986

methyl-3-nitro-1-nitrosoguanidine (MNNG), an outgrowth of his earlier work with McKay on the nitroguanidine condensations. MNNG was a very elegant reagent for diazomethane because it only required reaction with aqueous alkali. McKay was the first to make it, but almost died in the process: as Bader recalls, "He thought the gas coming off was nitrogen!" When Bader told Fieser about it, he was instructed to have every student in Chemistry 20, the elementary organic course, make a batch of MNNG. The result was an annual supply of MNNG for the entire chemistry department. And everyone at Harvard knew that "if you had to use diazomethane, you went to Alfred's lab in Converse 205. There was a still, a bottle of KOH, a bottle of MNNG, everything that was needed to make diazomethane."

Bader claims that he was a "great believer in seed crystals," something that he learned from McKay. "I had what was called Bader's black box. I'd simply gone into the subbasement of Converse and gotten samples of many different solids. I brought them up, had them at the bottom of this box, and I invited anyone with syrups that wouldn't crystallize to set them in, with their name on the beaker. Whether it worked because of the seed crystals or not, how can you tell? But many things crystallized in that box. One of the highest compliments that Fieser ever paid me was when he said, 'Alfred, you could crystallize a hamburger!'"

JAMES J. BOHNING

(To be concluded in the next issue.)



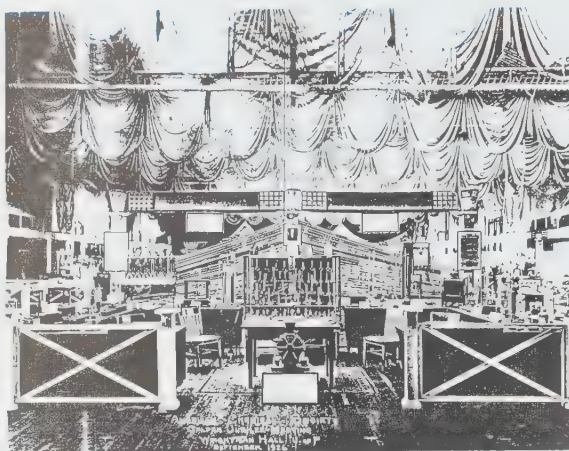
Alfred Bader's diazomethane process.

AT THE CENTER



Paul Lighty, Chemist-Inventor

In late August 1990 the chemist-inventor Paul E. Lighty, who joined us for lunch with his son Richard and Charles A. Emmerich, told us of his lifelong fascination with glass and with ultrahigh-purity materials. He prepared germanium by zone refining and by single-crystal growth for use in computer chips, and he created solid-state electronic devices, glass essentially free of iron, and glass switches with conducting channels operating at high temperatures, as well as devising fiber-optic applications. A former president of the Society for Applied Spectroscopy, Lighty said that his interest in glass goes back at least



Far left: Inventor Paul E. Lighty brought with him a piece of ultrahigh-purity germanium obtained by zone refining when he visited the Beckman Center with his son Richard and Charles A. Emmerich.

Left: An Arthur H. Thomas Co. display at the ACS Golden Jubilee Meeting at the University of Pennsylvania in September 1926.

to his college days, when he solved the chemistry laboratory's shortage of glass rods by preparing them from glass tubing. He spent most of his life with IT&T. After retirement he worked for three years in England, and he holds several patents.

Edward B. Patterson and the Thomas Scientific Company

Edward B. Patterson, Sr., son of J. Edward Patterson, cofounder of the Arthur H. Thomas laboratory supply company, and later its president, was an expert in spectroscopy and became a close friend of Arnold O. Beckman.

When the latter was unable to introduce the Beckman DU spectrophotometer to the academic community at a scheduled appearance at MIT, Patterson did it for him. The Arthur H. Thomas Company (now Thomas Scientific) was the first to market the Beckman pH meter. Prior pH-measuring instruments were far more expensive, as shown in old catalogs. Edward B. Patterson, Jr., the current chief executive officer of Thomas Scientific, has given the Center a 1912 company catalog and, on extended loan, catalogs for 1921, 1931, and 1950. The present *Beckman Center News* editor remembers ordering from the 1950 catalog when he was teaching at Haverford College.

CONFERENCE—continued from page 3

Bibliography, 1976–1985, which lists nearly all publications on the history of science published during this period, has only 5 items on Pauling and 3 on Mulliken, compared to 234 on Einstein, 33 on Bohr, 26 on Heisenberg, 16 on Planck, 15 on Ernest Rutherford, 13 on de Broglie, and 12 on Robert Andrew Millikan."

Stephen G. Brush, "The Most-Cited Physical Sciences Publications in the 1945–1954 Science Citation Index." *Current Contents: Physical, Chemical and Earth Sciences* No. 20 (14 May 1990), 5–17.

▲ Does Chemical Technology Mirror Broader Social and Cultural Patterns?

"Are continuous-flow processes in chemistry an extension of continuous-flow technologies that begin with

large-scale production from the late eighteenth century in the Industrial Revolution (textiles, papermaking, printing, rolling mills)? Is the achievement of the extremes of temperature and pressure that make possible the Haber-Bosch process (and many other reactions) part of a larger scientific and cultural pattern where the limits of the macro and micro levels are being pressed, such as in astronomy, atomic theory, and microscopy? Do chemical architecture and man-made modification of natural substances of the late nineteenth and early twentieth centuries relate to the abandonment of traditional cultural rules, such as those that informed naturalism, perspective, harmony, and grammar? Does the pursuit of human manipulation of the physical world fundamentally relate to changes in art from impressionism to cubism, the emergence of atonal and serial

techniques in early-twentieth-century music, and avant-garde literary styles such as those of Gertrude Stein and T. S. Eliot? Are the radical new directions in chemistry and chemical engineering at the turn of the century a part of broad social and cultural movements that reflect introduction of new methods of control of production of knowledge in business, the professions, and the arts?

"The materials revolution, initiated in the mid to late nineteenth century and so dominant in our own time, may reflect a demand for man-designed and manipulated substances of every kind or be a vehicle for the exercise of professional authority through innovation for the purposes of personal and/or corporate control."

Reese V. Jenkins, Rutgers University, commenting on John K. Smith's conference paper.

FIFTIETH ANNIVERSARY OF THE DU

A symposium to celebrate the Fiftieth Anniversary of the Beckman DU spectrophotometer will take place from 9 a.m. to 2:30 p.m. on 10 April 1991, on the occasion of Dr. Arnold Beckman's ninety-first birthday, at the Beckman Center of the National Academies of Science and Engineering in Irvine, California. Participants include Theodore Brown, Harry Gray, Charles Price, Bo Gunnar Malström, and James Watson.

For further details call Lisa Kazanjian at (215) 898-4896; fax (215) 898-3327.

Council of Friends

The Council of Friends was created in 1986 as a more extensive means by which the Center might draw on and communicate with the varied segments of the chemical community. Members of the Council of Friends are individuals distinguished for their many, diverse contributions to the progress of the chemical sciences and technologies. Each Friend is identified in this list by one principal affiliation, past or present.

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John Dalton Sits for His Portrait

The earliest surviving portrait of John Dalton would appear to be the familiar one by William Allen, an oil painted in 1814 and subsequently widely circulated in engraved form. It depicts the somewhat complacent-looking, forty-eight-year-old philosopher sitting with legs crossed beside a table on which are prominently displayed several charts featuring Dalton's atomic symbols. At least in Manchester, Dalton's principal claim to immortality was already recognized. That there are no earlier portraits is scarcely surprising. Although there had been several visits to London, Edinburgh, and Glasgow, and Parts 1 and 2 of his *New System of Chemical Philosophy* had already been published, Dalton remained an unpretentious, sometimes prickly, far-from-famous provincial.

By 1834 both John Dalton and Manchester had changed. Dalton had been touched by fame and found the experience not unpleasant. In particular, his 1822 visit to Paris—where he had been greeted by P. S. de Laplace, C. L. Berthollet, J. L. Gay-Lussac, L. J. Thénard, P. L. Dulong, and A. M. Ampère—had pleased him immensely. And from 1831 on he had played an active role in the fledgling British Association for the Advancement of Science. Meanwhile Manchester was riding the crest of the Industrial Revolution, reaping the benefits of British expansionism and loudly laying claim to being the second city of the Empire. Civic boosters were no longer willing to settle for mere provincial repute, and many had the brass—in both senses—to cock a snook at London.

As the leading "savant" of the bouyant city and as president of its Literary and Philosophical Society, John Dalton was increasingly subject to adulation bordering on apotheosis—rather to the dismay of some of his Quaker friends. A public testimonial was called for and a public subscription raised. After some debate it was decided "that a sizeable statue of Dr. Dalton in some public situation in town will be an appropriate and eligible mode of testifying and recording the estimation in which he is held by his fellow townsmen and their high opinion of his talents and the importance of his scientific discoveries" (William Charles Henry, *Memoirs of*

Continued on page 12

DALTON—continued from page 11

the Life and Scientific Researches of John Dalton. [London, 1854]).

The fashionable portrait sculptor Francis Chantrey was given the commission. In the spring of 1834 Dalton, accompanied by his first biographer, William Charles Henry, traveled to London to sit for Chantrey. Almost in passing he used the occasion to sign in at the Royal Society, to which he had been elected twelve years previously.

Dalton stayed with G. W. Wood, a friend of long standing who was then the member of Parliament for South Lancashire. An oft-quoted letter now in the Edgar Fahs Smith Collection at the University of Pennsylvania describes the visit:

Next morn, Mrs. Wood walked through the Park with me to Mr. Chantrey's where we found him in expectation of seeing me. He took a profile as large as life by a Camera Lucida, and then sketched a front view of the Face on paper. We took a walk through his rooms and saw Busts and Statues without end.—He then gave me the next day for a holiday and told me I should see my head moulded in Clay on my arrival on Wednesday morning at which time he invited me to breakfast. I went Accordingly and found as he had said a head *apparently* perfect. He said he had not yet touched it, the head having been formed from his drawings by some of his assistants. He set to work to mold and polish a little while I was mostly engaged in reading the Newspaper or conversing with him. On looking right and left he found my Ears were not alike, so that he immediately cut off the left ear of the bust and made a new one more resembling the original. Most of the time I was amusing myself with viewing the Pictures and Statues in the Room. At last he took up a pitcher and blew a little water on my face (I mean the model) and covered my head with a wet cloth and we parted, he having first desired me to bring Dr. Henry and Dr. Philp with me next morn to breakfast.—We went accordingly and found an abundant Table; soon after Dr. Faraday came in and we all went into the working Room for a time. Dr. F. Left soon, but Drs. H. and P. stayed a while to see the operation. After they left Dr. Sims came to see what was doing, and having his carriage with him Mr. Chantrey and I availed ourselves of it to be conveyed into the City. This morning (sixth day) Mrs. Wood was kind enough to walk with me again to Mr. Chantrey's and we spent another hour or two under his directions. At intervals we have a little amusement and instruction



William Allen painted the earliest known portrait of John Dalton in 1814.

with discussions about our respective arts and sciences and how we acquired our knowledge, etc. in which we vie with each other and keep up a lively conversation. I go tomorrow to breakfast with Mr. and Mrs. Chantrey with as many of my friends as I chuse to take along with me.

Chantrey had originally intended to make a plaster cast of Dalton's face, but the subject demurred. As his biographer Henry relates, quoting a letter from a Mr. Ransome:

You may recollect the opinion that prevailed among his friends, that his face was very similar to that of Sir Isaac Newton: and as a proof that this was well-founded, I narrate the following anecdote. . . .

One evening I called upon our venerable friend, whom I found seated as usual, with his cat upon his knee, and his newspaper in hand. After the usual salutation, I espied upon a table close to my chair, a plaster mask, which I took up, and forthwith rallied him upon overcoming his prejudices, and submission to the process, adding, that I was rejoiced to find that he would leave us an accurate copy of his features. "No," he said, "it is not intended for me." I replied, "that if not a cast, it must be an admirable model, intended for him." Again, "No!" Then calling to mind the supposed similarity, I remarked "that it must be either Newton or himself." During the period of my uncertainty he was chuckling and much amused, and then replied, "Yes; it is a cast of Newton's face, which some friend has kindly sent me as a present."



Dalton now sits in Manchester's Town Hall. Courtesy Manchester City Council/ Mike Pilkington.

The preparatory drawings for the statue commission were later part of the Chantrey bequest, and they are now in the National Portrait Gallery in London. One of these shows a fine, strong, Newtonian face, far removed from the sunken-cheeked visage seen in the drawing by William Brockedon (also from 1834), a likeness Dalton claimed "the best that I have seen." Still less flattering is the drawing, bordering on caricature, ascribed to J. Derome and engraved by James Stephenson. Chantrey's statue of John Dalton now stands in Manchester Town Hall alongside that of his former pupil, James Prescott Joule.

Michael Faraday's visit to Chantrey's studio is intriguing. In spite of his modest means, Faraday had made "a liberal contribution" to the Dalton testimonial. That Faraday could not always be so forthcoming is seen in an uncharacteristically blunt note also to be found in the Smith Collection.

R. Institution
31 Jan 1863

Sir

As you do not find my name amongst the Subscribers to the Quêtelet fund you may conclude I do not wish to subscribe to it. The fact is that I have not much to spare and that I have plenty of calls on me more forcible than the testimonial—I think that Testimonials are losing their value because of their number.

Allow me to remind you that one is not called upon by the usages of Society to answer a circular:—and that declining to



Dalton thought this 1834 likeness by William Brockedon the best he had seen. Courtesy National Portrait Gallery, London.

John Dalton
1766 - 1844

*President of the
Linnæan Society, London*

This not very flattering drawing is ascribed to J. Derome, engraved by James Stephenson. Courtesy of E. F. Smith Memorial Collection.

Two of Francis Chantrey's sketches for the statue—the second suggests a likeness to Newton. Courtesy National Portrait Gallery, London.

answer is accepted as a sufficient indication of one's intentions.

I am Sir
Your obed^t Servant
M. Faraday

What, one wonders, did the aging lion and the rising star of British science have to say to each other on the occasion of their studio meeting? Probably little but pleasantries. Surely Faraday did not broach the views on atomic theory he had expressed about this time in a letter now owned by The Chemists' Club, on loan to the Beckman Center.

M. Faraday, R. Institution
June 17, to H. Hopwood
Sir

I have not time to go into your objection to the atomic theory. It would require a view [review?] of what we know of chemical affinity but you will find the difficulty referred to in most accounts of the atomic theory especially in the earlier accounts.

I do not myself adopt the term atomic theory or atom. I do not know what an atom is. The theory of definite proportionals seems to me consistent and [as] the expression of a multitude of facts is as relates to their facts quite true. Whether it be or be not universal is of little consequence to the multitude of useful cases in which it does apply.

The hypothetical views which under the term *atomic theory* have been founded on the theory of definite proportionals I have always held as of very suspicious character.

I am Sir . . .

For Dalton the palpable reality of atoms was the rock on which his view of the physical world rested. For Faraday, that most intuitive of theorists and most practical of experimentalists, there was no need for Daltonian atoms to anchor his lines of force. Dalton's great contribution to science reminds one of the saying of Archilochus made famous by Isaiah Berlin: "The fox knows many things, but the hedgehog knows one big thing." Dalton, together perhaps with Mendeleev, remains the great hedgehog of chemical history.

DEREK DAVENPORT
Purdue University

Sir
I have not time to go into your objection to the atomic theory. It would require a view of what we know of chemical affinity but you will find the difficulty referred to in most accounts of the atomic theory especially in the earlier accounts.
I do not myself adopt the term atomic theory or atom. I do not know what an atom is. The theory of definite proportionals seems to me consistent and as the expression of a multitude of facts is as relates to their facts quite true. Whether it be or be not universal is of little consequence to the multitude of useful cases in which it does apply.
The hypothetical views which under the term atomic theory have been founded on the theory of definite proportionals I have always held as of very suspicious character.
I am Sir . . .
R Institution
June 17

"I do not know what an atom is . . ."
Michael Faraday in a letter owned by the Chemists' Club, on loan to the Beckman Center.

Sonderpostwertzeichen Leopold Gmelin



Chemical Literacy, German Style: Leopold Gmelin

For the two-hundredth birthday on 14 July 1988 of Leopold Gmelin, the compiler of the chemical encyclopedia that bears his name, West Germany not only issued a commemorative stamp but also canceled it on the first-day cover with formulas of no great public significance, CrCl_2 and ZnCrO_4 .

Born on 14 July 1788 in Göttingen, Gmelin published his first survey of chemical developments in three volumes in 1817. He limited his review to inorganic chemistry after 1881, when Friedrich K. Beilstein assumed responsibility for organic compounds. The *Gmelin Handbook of Inorganic Chemistry*, now in its eighth edition and in English since 1981, contains about 570 volumes, with twenty added annually. At times experts outside the Gmelin Institute staff in Frankfurt am Main are called on for contributions, such as Glenn T. Seaborg, who wrote on the history of the transuranic elements. The institute is part of the Max Planck Society for the Advancement of Science. For a videotape about the institute and a reprint of the first edition of its handbook, both produced in celebration of the bicentennial, contact Dimitri R. Stein, American Representative, the Gmelin Institute, 7 Woodland Avenue, Larchmont, NY 10538; (914) 834-8864.

GRANTS AND FELLOWSHIPS

The Edelstein International Fellowship

Applications are invited from established scholars for the 1992–1993 Edelstein International Fellowship in the History of the Chemical Sciences and Technology.

The Edelstein Fellow will be expected to divide his or her time between the Beckman Center for the History of Chemistry in Philadelphia and the Edelstein Center for History and Philosophy of Science, Technology and Medicine in Jerusalem. The major portion of the fellow's time will be devoted to research, but the fellow will also contribute to the work of each center in an appropriate manner. The fellowship period is 1 September 1992 to 30 June 1993; it may be held in conjunction with other research or sabbatical support. A travel allowance is also available.

Letters of application should indicate how Beckman Center and Edelstein Collection resources in the chemical sciences are relevant to the applicant's research; applicants should also enclose a curriculum vitae and the names of three references. Applications must be received by 31 October 1991. Scholars outside North America should write to Dr. Itamar Pitowsky, Director, Edelstein Center for History and Philosophy of Science, Technology and Medicine, Hebrew University, Jerusalem, Israel. North American scholars should write to Dr. Arnold Thackray, Director, Beckman Center for the History of Chemistry, 3401 Walnut Street, Philadelphia, PA 19104-6228, USA.

William H. Brock of the Victorian Studies Centre of the University of Leicester is the Edelstein International Fellow for 1990–1991. Trained in chemistry at University College, London, and in history of science at the University of Leicester, he has published extensively, including *From Protyle to Proton: William Prout and the Nature of Matter 1785–1985* (1985), and, with A. J. Meadows and A. G. Keller, *Great Scientists* (1987). During his year in Philadelphia and Jerusalem, he is preparing "At the Sign of the Hexagon," an illustrated history of chemistry and chemical technology since 1800. He is also carrying out preliminary studies on "Liebig and the British," looking at Liebig's travels in Britain and

his impact on British science, technology, and society. Brock's wife Elvina will accompany him and assist in these studies.

Travel Grants

The National Foundation for History of Chemistry offers small travel grants to enable interested individuals to make use of the research resources of the Beckman Center for the History of Chemistry, the Othmer Library of Chemical History, and associated facilities.

Grants, which may be used for travel, subsistence, and copying costs, will not normally exceed \$500. Applications should include a vita, a one-paragraph statement on the research proposed, a budget, and the addresses and telephone numbers of two references. Deadlines are 1 February for grants to be used April–June; 1 May for July–September; 1 August for October–December; and 1 November for January–March. Applications should be sent to Dr. Mary Ellen Bowden, Assistant Director for Programs, Beckman Center.

Woodward Exhibit

An advisory committee has been formed to assist in the preparation of the Beckman Center's traveling exhibit and accompanying booklet on the life, scientific work, and influence of Nobel Laureate Robert B. Woodward. The committee consists of Derek H. Barton, Texas A & M University; Elkan R. Blout, Harvard Medical School; William von Eggers Doering, Harvard University; David Dolphin, University of British Columbia; Ivan Ernest, Universität Basel; Albert Eschenmoser, ETH, Zurich; Jacques Gosteli, CERECOM AG; Roald Hoffmann (chairman), Cornell University; William Johnson, Stanford University; Ewart R. H. Jones, Oxford University; Jean-Marie Lehn, Université Louis Pasteur; David William Ollis, University of Sheffield; Howard E. Simmons, Jr., E. I. du Pont de Nemours & Co., Inc.; Gilbert Stork, Columbia University; Jeffrey L. Sturchio, Merck & Co., Inc.; and Ernest Wenkert, University of California–San Diego.

BIMOSI Meetings

Susan Lindee Joins Program

The Beckman Center hosted two small-group planning sessions to discuss the history and documentation of the biomolecular sciences. These meetings, part of the Center's BIMOSI (Biomolecular Sciences Initiative) program, funded by a grant from the Andrew W. Mellon Foundation, brought together historians of science and archivists specializing in scientific records. In addition to Center staff, participants at the first meeting included Pnina G. Abir-Am (Harvard University), Frederic L. Holmes (Yale University), Helen W. Samuels (MIT), Darwin Stapleton (Rockefeller Archives), Jeffrey L. Sturchio (Merck & Co., Inc.), and Robert E. Kohler (University of Pennsylvania); participants at the second meeting included Robert M. Cook-Deegan (Georgetown University), Clark Elliott (Harvard University), Peter Hirtle (National Library of Medicine), M. Susan Lindee (University of Pennsylvania; see below), John Parascandola (National Library of Medicine), Spencer Weart (American Institute of Physics), and Seymour H. Mauskopf (Duke University).

The meetings were held to discuss both how to study the biomolecular-science community and how to preserve sufficient documentation of the activities, personalities, and procedures of this community for future generations of scholars. Several areas suggested for



M. Susan Lindee at a BIMOSI planning session, with Seymour H. Mauskopf of Duke University, Robert M. Cook-Deegan of Georgetown University and the NIH, who is studying federal policies with regard to the human genome initiative, and BCHOC Associate Director Lawrence B. Friedman. Looking on are former presidents of the Chemists' Club.

coverage were instrumentation, the human genome initiative, structural chemistry, genetic mapping, the relationship between science and industry, and the social impact of genetic research.

The Beckman Center also hopes to act as a facilitator, conducting a pilot study or "probe" and working with other institutions to document and study other aspects of the broader field of the biomolecular sciences.

As part of the BIMOSI program, M. Susan Lindee has joined the faculty of the University of Pennsylvania's Department of the History and Sociology of Science. Concurrently she serves as

research historian at the Beckman Center.

Susan Lindee's doctorate is from Cornell University, where she worked under Dorothy Nelkin on genetic studies of residents of Hiroshima and Nagasaki. She has taught at the New School for Social Research and at Rutgers, and she received the 1988 Schuman Prize for a paper to appear in *Isis*. For ten years she was a journalist, receiving a number of awards for her writing.

Anyone interested in the BIMOSI project is invited to contact the Center.

STEPHANIE MORRIS

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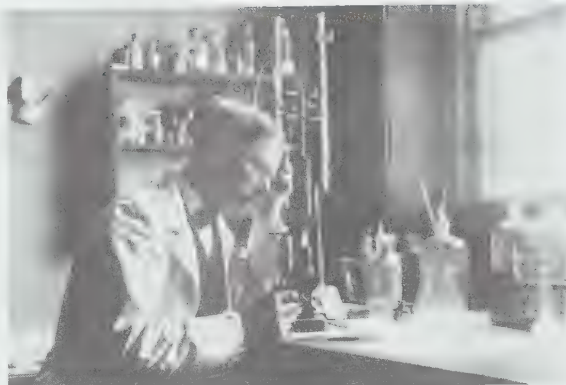
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Clinical Chemistry Conference Holds History Sessions

Otto Folin, clinical biochemist, with Dubosq colorimeter in his Harvard Medical School office, circa 1932. Courtesy AACC Press.



Two history roundtables were part of the XIVth International Congress of Clinical Chemistry held 21–26 July 1990 in San Francisco. Entitled "History of Modern Clinical Chemistry via Biography: Otto Folin as a Model," they were organized and led by Samuel Meites, director of the Clinical Chemistry Laboratory of Children's Hospital, Columbus, Ohio, who received at the meeting the Miles/Ames

Award for outstanding contributions to clinical chemistry. Meites is the author of *Otto Folin: America's First Clinical Biochemist* (Washington, D.C.: AACC Press, 1989) and has for many years chaired the AACC Archives Committee. That committee has now been dissolved in favor of an AACC Division of the History of Clinical Chemistry, whose creation Meites has been asked to oversee.

Meites outlined the extensive research involved in writing a full-length biography and passed out bibliographies for historical studies in clinical chemistry and reprints of his own and others' work.

Haber Learns That Chlorine Is Useless in Snow

Hubert Alyea, during a recent visit, recounted his conversations with Fritz Haber in Berlin in 1930. (He worked as Haber's research fellow.) Haber told Alyea that the first chlorine attack was not at Ypres on the French front in April 1915 but a few months earlier on the Russian front. The cylinders were opened, and the clouds of gas moved eastward over the snow. But before they reached the Russian trenches, they had disappeared: snow and gas had combined to form chlorine hydrate, and the gas was not released until the following spring, when the front was far away.

"Polymers and People" Expands

The Beckman Center's popular traveling exhibit "Polymers and People" has four new panels focusing on plastics, prepared in cooperation with the National Plastics Center and Museum in Leominster, Massachusetts. The panels were designed by Eric Elliott of the University of Pennsylvania.

The expanded exhibit had its first public showing on 22 June 1990 in Leominster, coinciding with the celebration of that city's 250th anniversary.

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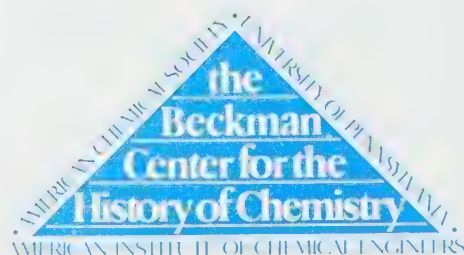
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Journal photo by William J. Lizdas

Student artists Tamu Lawrence (center) and Vanessa Burkett, of the Next Door Foundation Cornerstone Learning Center, spoke with Isabel

Bader at the UWM Art Museum. Bader and her husband, Alfred, loaned works to the exhibit, "Face, Figure and Form."

Creativity and hope

UWM art show combines students' work with pros'

By JAMES AUER

Journal art critic

AN AURA of hope and good feeling hangs over the University of Wisconsin-Milwaukee Art Museum-Vogel Hall, 3253 N. Downer Ave., these days, and the reason is simple:

Art and sociology have been combined in "Face, Figure and Form: Art and the Human Condition," an invitational exhibition that commemorates the Next Door Foundation's 20th year of community service.

The Next Door Foundation is a neighborhood center providing a variety of worthwhile activities — educational, cultural and recreational — for young people in Milwaukee's Westside community.

The current show, organized cooperatively by the foundation, UWM and the Milwaukee Public Schools, represents an effort to bring gifted youngsters in contact with the work of professional painters and sculptors, and with serious art collectors as well.

The result, which runs until March 4, is an odd but beguiling mixture of student work, on the first floor, and professionally executed objects, on loan from private collections, on the second.

As might be expected, the student works are predominantly human-centered rather than formalistic. Intense, introspective, striving, they demonstrate the role that art can play in the process of personal and intellectual growth.

They also suggest the extremely difficult urban environment in which these youngsters — many of them needy and/or "at-risk" — find themselves, and the challenge of developing a workable world view and lifestyle in such circumstances.

Schools represented in the show are the Next Door Foundation's Cornerstone Learning Center, the Milwaukee High School of the Arts, Washington High School, Story Elementary School, North Division High School, Jackie Robinson Middle School and Steuben Middle School.

Upstairs, the work being shown is considerably slicker and more conventional, but no less figure-oriented.

Again, the emphasis — as developed by the show's curator, Prof. Barry Wind — is humanistic rather than formal, narrative rather than issue-centered, at least in terms of materials and processes.

Not unexpectedly, academically trained photo-re-

alists such as Chuck Close and Richard Estes and self-taught primitives such as Pat Thomas, Mose Tolliver and "Prophet" W.J. Blackmon shine in such a context.

Thomas, a Milwaukee "memory painter" whose career developed after she was stricken with polio, is particularly well represented by two joyous Wisconsin scenes, one of a small-town business section, the other of a parade.

Tolliver's late-blooming genius is embodied in his powerful and moving "Black Jesus," put together out of two roughly assembled pieces of painted wood.

Blackmon, of Milwaukee, offers a vigorously simplified, rhythmically composed interpretation of "God's Mountain of Peace," executed in housepaint on wood.

The show's essential nature — a mixture of skill, concern, close observation and accessibility — also provides a hospitable setting for the brilliant technique of such Wisconsin hyper-realists as Aaron Bohrod and John Wilde.

Bohrod's consummate draftsmanship is embodied in two state-of-the-art still-lives, including the wry and witty "One Dozen," built out of eggs and reflected self-portraits and flawlessly realized in oil on gessoed board.

Wilde's wire-sharp "Homage to Philip Otto Runge," also executed in oil, is as magical as the central figure's levitation, and as controlled.

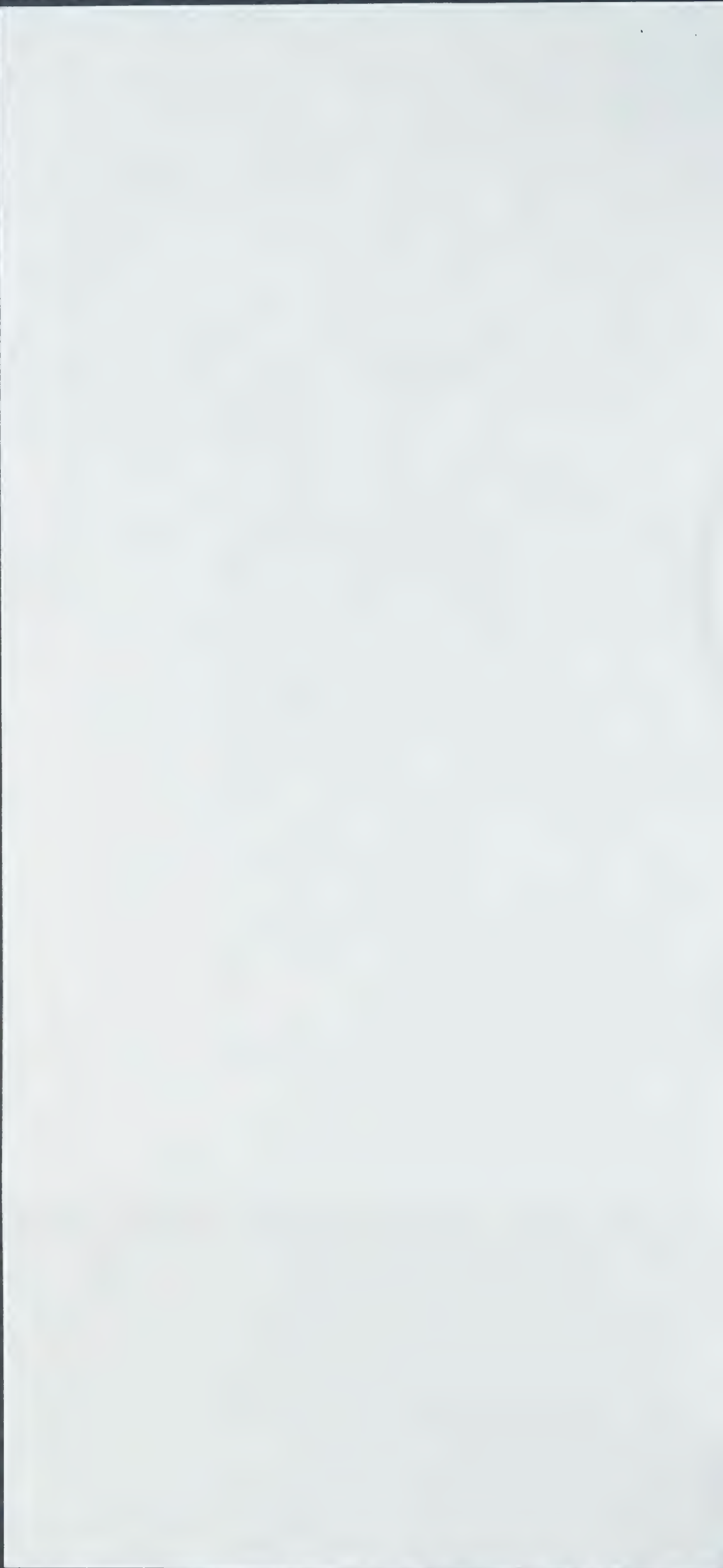
Similarly focused on the human condition are a dynamic self-portrait by the Mexican social realist Jose Clemente Orozco and a strong yet pathetic grouping of women, "Zwei Frauen," executed in bronze by Kathe Kollwitz.

Summing it all up is Duane Hanson's full-scale, three-dimensional "Repairman," so persuasive in attitude and detail that you expect him to burp and complain about his working conditions.

An unrelated but somewhat better knit exhibition can be found near the student show in a small, first-floor gallery. It is "Captured Shadows: 19th-Century Photographs of Rome and the Acropolis of Athens."

Here, depicted largely in albumen prints, are Roman and Athenian architectural survivals as they appeared before the advent of industrial and automotive pollution.

The show's curator, Rolf Achilles, will present a free lecture at 5 p.m. Tuesday, Feb. 6, in the gallery.





face, figure and form

ART AND THE HUMAN CONDITION

UWM Art Museum

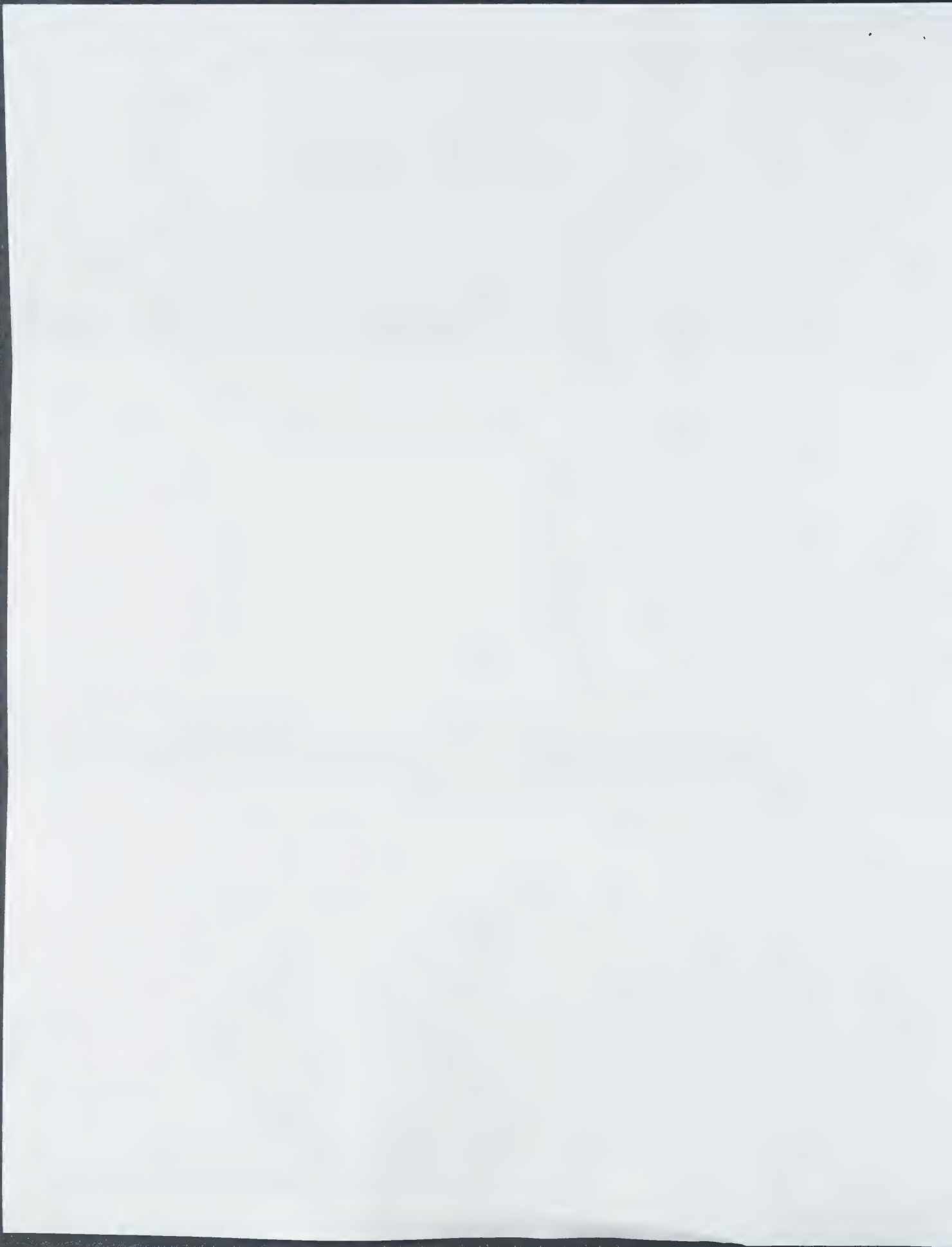
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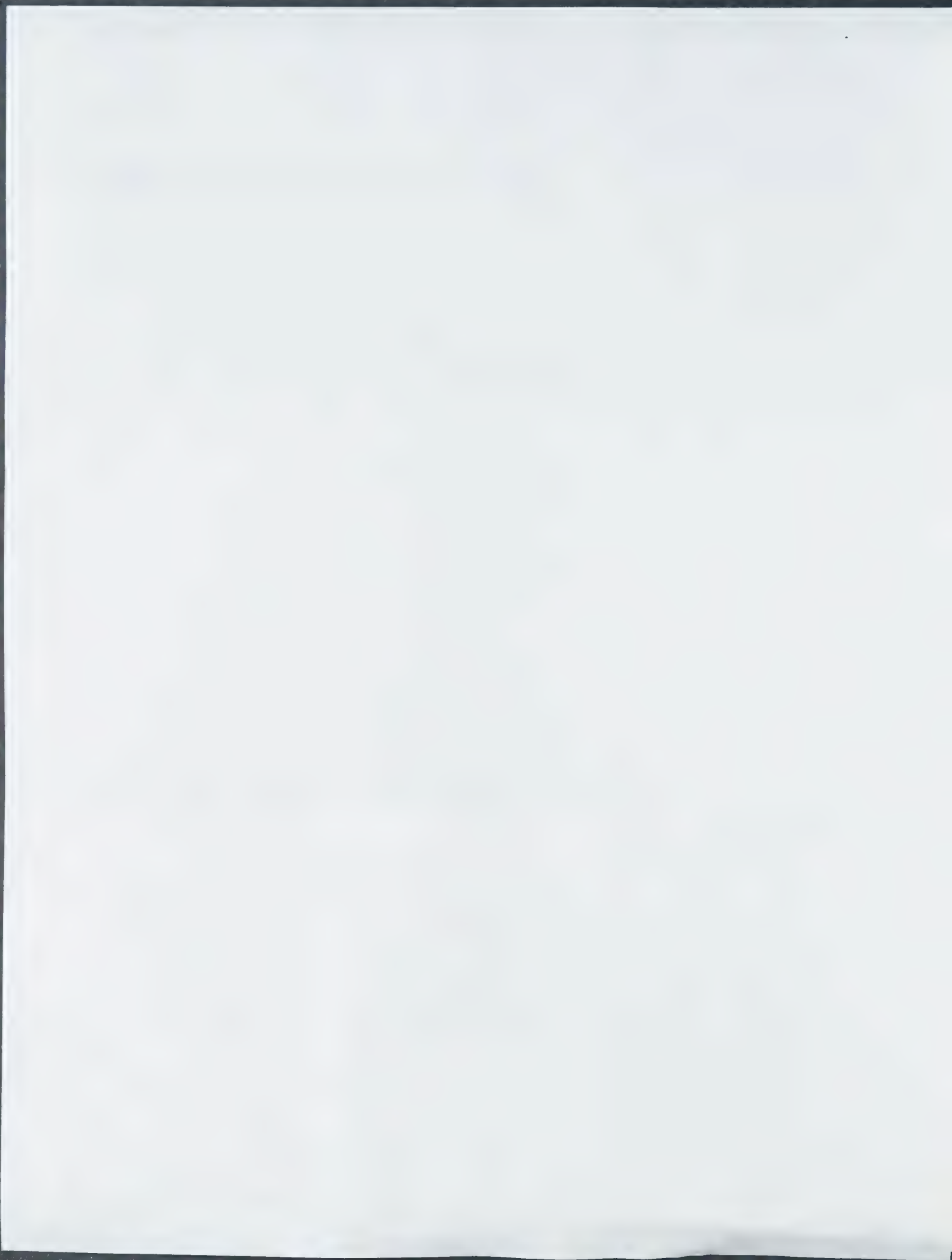
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*Isabel,
You've been
helping us for
many years!
Thanks,
Mary
Conlon*





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The Aldrich Story

John T. Edward, FCIC

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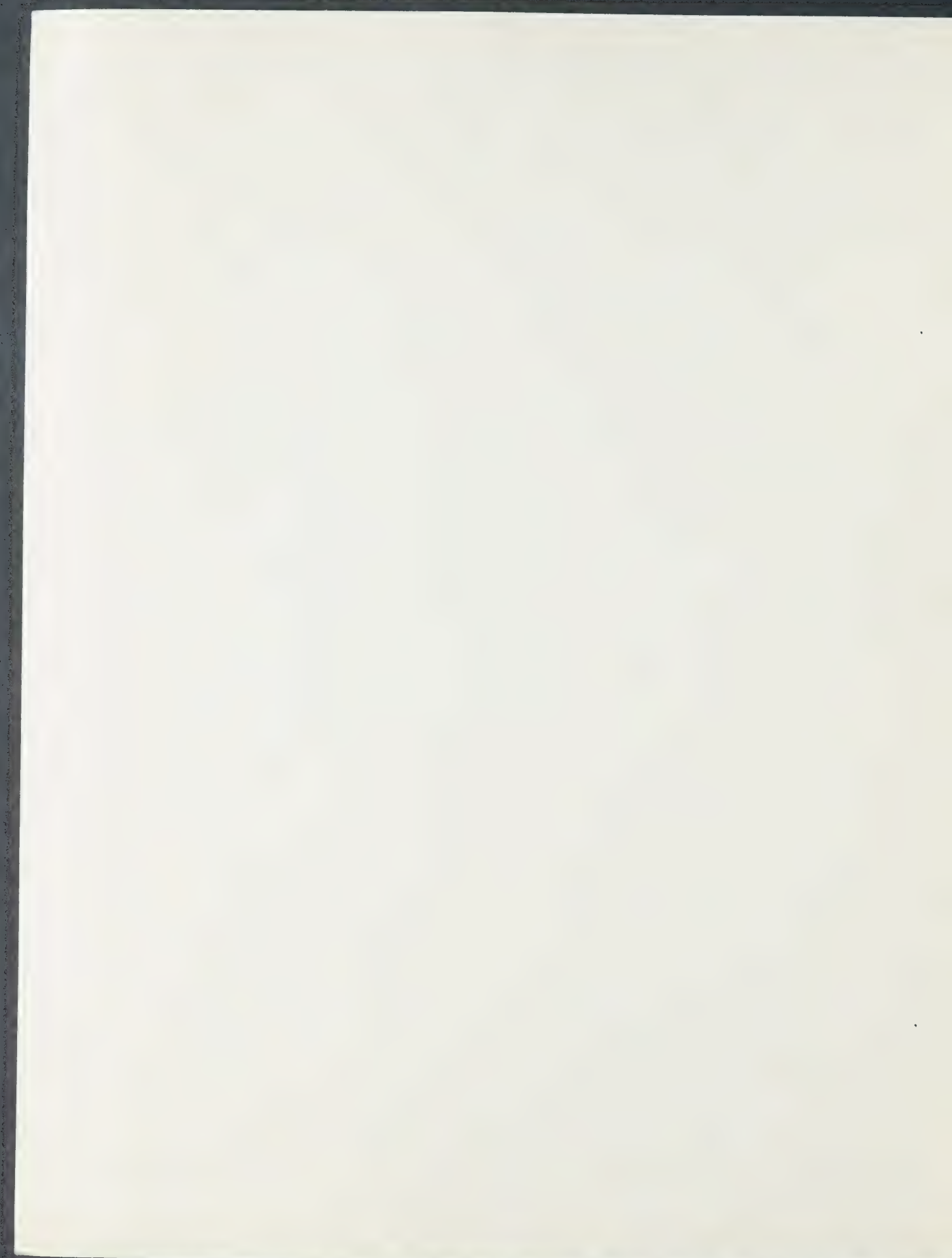
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The Aldrich Story

Arriving as a refugee during the second world war,
Alfred Bader built the world's largest supplier of fine chemicals

John T. Edward, FCIC

R. K. Merton, the sociologist of science, writes of "the seemingly paradoxical character of property [i.e. papers] in the scientific enterprise... The more widely scientists make their intellectual property freely available to others, the more securely it becomes identified as their property... The greatest ambition of a productive scientist is to do the kind of work that will be much used and much esteemed by fellow-scientists best qualified to assess its worth." Hence the urge to publish papers, while scorning the businessman who merely accumulates money. But sometimes the businessman can do more for chemistry than the selfless research scientist, however brilliant and hard-working.

In the past half-century the practical side of research in chemistry has been revolutionized. Fifty years ago physical chemists had to be good glass-blowers, since they made most of their apparatus themselves. Now most physical chemists work with apparatus bought off the shelf, from cheap thermostats to nuclear magnetic resonance machines costing \$500,000.

Fifty years ago organic chemists carried out five or 10-step syntheses starting with simple compounds found in the Eastman Chemical Co. catalogue, which listed 4,000 chemicals. Now, organic chemists routinely carry out 15 and 20 step syntheses, starting with one or more compounds among the more than 50,000 offered by the Aldrich Chemical Company.

Without these chemicals many syntheses would be five or six steps longer, and require perhaps an additional year of work by the graduate student. Furthermore, the research

of many physical chemists depends on examining in a spectrometer, calorimeter, or whatnot, a series of compounds made available by Aldrich which they would have neither the inclination nor the ability to synthesize.

How did Aldrich Chemical Co. come upon the scene? The foresight of a government bureaucrat concerned with planning science? The story is more complex and more interesting.

The story begins with Alfred Bader, born in Vienna in 1924. Bader's father died when he was two weeks old. In 1938 Nazi laws forced him to drop out of school, and he spent six months buying and selling stamps to earn money before being sent by his mother to England. In 1939 he entered Brighton Technical College, but in May 1940 he was picked up by detectives during the Sunday school break at the Middle Street Synagogue in Brighton. This was a time of

alarm in England: Denmark, Norway, the Netherlands, Belgium and now France were being swept up by the German war machine, sometimes assisted by Nazi sympathizers inside the countries. In an act which can be understood only by the panic of the time, on May 12, the British government arrested all German and Austrian males between 16 and 60 years of age living in an area near the coast. From May 16 on, men and women began to be rounded up from other parts of the country. Altogether close to 30,000 refugees were interned.

Canada's future leading citizens

The Canadian government was persuaded to accept custody of 7,000 "dangerous Nazis", and did not realize that the British government had shipped out of the country not only

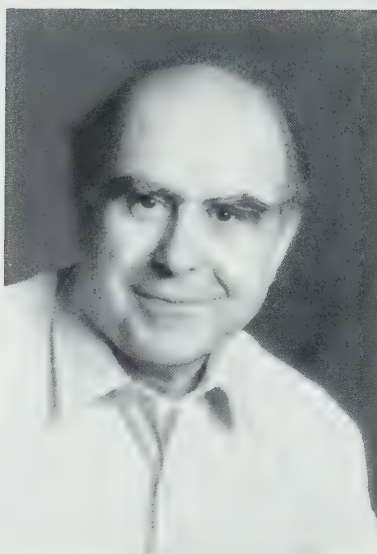


The Aldrich plant at Sheboygan, WI. (There is no picture of the garage in Milwaukee where the company started its operations.)

John T. Edward, FCIC, Emeritus Professor of Chemistry, Department of Chemistry, McGill University.



Alfred Bader in 1951 (left), when Aldrich Chemical Co. was founded, and today.



3,000 prisoners of war and some thousands of German civilians but also, to fill up vacant spaces in the prison ships, many bitterly anti-Nazi refugees. The boats coming to Canada brought perhaps the most impressive group of immigrants ever landed on Canadian soil: 20 or 30 years later many of the refugees would rank among the outstanding academics, artists, and musicians in Canada. The story of their captivity in Canada, of their attempts to have their separate status recognized, and of their eventual release is told in fascinating detail by Eric Koch who himself was brought over on the *Etrick* (*Deemed Suspect*, Methuen Toronto 1980).

Bader arrived in Canada on the *Sobieski*, along with Walter Hirschfeld, later vice-principal of McGill University and Ernest Eliel, President of the American Chemical Society.

The prisoners were sent to various camps: Eliel to one deep in the forests of New Brunswick where he cut wood; Bader to an old fortress on an island on the Richelieu River near Lake Champlain. In every camp the refugees organized themselves into study and cultural groups. International Student Service supplied text books and McGill University allowed the internees to take junior and senior matriculation examinations in June and September of 1941. Bader passed both before being released in November 1941.

He enrolled in engineering chemistry in Queen's University, Kingston, and says that "by my third year in college I had discovered the joys of dating, an expensive pastime, so that by March of that year I was short of cash. Looking through the university calendar, I saw a scholarship in public speaking, \$50. I tried and won. One of the judges, the vice-principal of Queen's University, urged me to join the debating society.....

I joined and that year won the Dominion of Canada debating championship — German accent and wartime notwithstanding."

While studying for his bachelor's degree, Bader worked for two summers with Murphy Paint Company of Montreal and found that he could quickly formulate a lacquer or varnish to meet a customer's needs. He enjoyed working in industry with its entrepreneurial challenges. After graduating in 1945 he worked with Murphy Paint until the summer of 1946. Its president, Harry Thorp, then gave him \$1800, suggesting that he get his PhD and become an even more useful paint chemist. Bader decided to get an MSc first, and went to Queen's to work with A.F. McKay. Bader enjoyed working beside McKay in the laboratory and became a skilled and enthusiastic experimentalist. In 1948, he, with McKay, published his first paper in the *Journal of Organic Chemistry* describing the eight stereoisomers of 9,10,12,13-tetrahydrostearic acid obtainable by oxidizing linoleic acid.

Bader found that he liked making compounds and decided to continue to the PhD. He applied to the two schools he considered best in the world for organic chemistry, Harvard and the ETH in Zurich, and was accepted by both. He chose to go to Harvard because Louis Fieser offered some financial support at Harvard, the ETH none.

Fieser gave Bader a problem in naphthoquinone chemistry and thereafter left him alone — very different from A.F. McKay. However, he enjoyed many discussions with the young members of the department — R.B. Woodward, Gilbert Stork, Martin Etlinger — and graduated with a PhD in two years. During this time he taught everyone in the organic laboratories to make diazo-

methane from 1-methyl-3-nitro-1-nitrosoguanidine (MNNG), a reaction discovered by McKay. Bader had told Fieser about this reaction, and Fieser made the preparation of MNNG an experiment in the undergraduate laboratory course. Bader took all the MNNG prepared by the students, purified it, and put it in a big bottle in his lab, where an apparatus was set up permanently for making diazomethane.

At one stage Fieser wanted Bader to make 2-isopropyl-naphthaquinone from 2-isopropylphenol, and Bader ordered 500 grams of the latter from Eastman. "Six weeks later it still had not come, and I went to see Warren Stockwood who was in charge of the storeroom at Harvard, and asked his advice. He handed me a sheet of Harvard chemistry department notepaper and told me to write to them: "See what happens." I received a form postcard — I wish I had kept it; I would frame it. It simply said that my order had been received and would I please not add to the paperwork; Eastman would ship the material whenever possible. At that point I said to myself, "My gosh, if that is the way the fine chemical business is operated in the United States, maybe I have a place in it."

"On graduation from Harvard, I joined the research laboratories of the Paint Division of the Pittsburgh Plate Glass Company in Milwaukee (which had taken over Murphy Paint Company), and became good friends with the director of research, Dr. Howard Gerhart. I asked Howard whether I might not start a tiny division within PPG to make and sell research chemicals, and he shook his head and said no, that wouldn't fly. He believed Eastman Kodak so well entrenched that one just could not compete."

How Aldrich got its name

Bader and a Milwaukee attorney, Jack Eisendrath, decided to start a company of their own to sell research chemicals not offered by Eastman. They incorporated on August 17, 1951, with the minimum required capital of \$500, each of them putting in \$250. They tossed a coin for the name of the company. Eisendrath won, and named it after his pretty fiancée, Betty Aldrich. They worked in their spare time, doing paperwork, storage, weighing, labelling, packaging and invoicing in Jack's office. Their first offering was MNNG. They added other compounds not listed by Kodak, and moved into a garage rented for \$25 a month. Sales in the first year were \$1705 and, since they drew no salaries, profit was \$20. In the second year sales climbed to \$5400; in the third, to \$15,000.

In 1954 PPG decided to move its research laboratories from Milwaukee to Springdale, near Pittsburgh. Bader liked Milwaukee, and chose to quit PPG to work full time at Aldrich.

Gerhart said then. "Alfred, you are a very good chemist. You can make a great many things but you are not a businessman. I am convinced that within a couple of years, Aldrich will go bankrupt." And he offered to take him back as soon as this happened; in the meantime he kept him on as a consultant.

Neither Bader nor Eisendrath had any money to put into the company, and so they persuaded a friend to buy 33% of the company for \$25,000; \$5,000 immediately, then \$1,000 a month for 20 months. After seven months the friend withdrew his money in a pique over a consulting fee of \$100 that Bader had paid to Martin Ertlinger without consulting him or Eisendrath. The incident highlighted the difficulties of making all decisions in concert with his partners, when they were present little or none of the time. Over several years Bader managed to buy out Eisendrath thus gaining sole control of Aldrich.

The buy-outs were possible (probably only barely possible) because of rising sales, which amounted to \$34,000 in the fourth year. The company moved from the garage to a 1,000 ft² laboratory, and hired two secretaries and a technician, the start of a long period of expansion. Bader decided to combine resale with production to increase his catalogue. He spoke fluent German and passable French, and so started spending a month or two in Europe each year visiting small and medium sized companies and buying chemicals.

The future was biochemistry

Aldrich became the largest supplier of fine chemicals in the world. However, Bader had decided that the area of greatest growth for fine chemicals lay in biochemistry. In 1975, after many difficulties, Aldrich merged with Sigma of St. Louis, the largest supplier of biochemicals in the U.S. In 1990 Sigma-Aldrich was the 80th largest chemical corporation in the U.S. with annual sales of \$440,000,000 (22.6% more than in 1988). The company employs about 4,100 people; about 3,000 in the U.S. and 1,100 in subsidiaries in Switzerland, Belgium, England, France, Germany, Israel, Italy, Japan, and Spain.

Obviously, Bader had to be more than a

good organic chemist to succeed; he needed to have a good sense of finance and to hang in toughly in difficult moments. Bader identified a need and satisfied it. It is hard to exaggerate the quality of his services. He stocks an immense range of chemicals, catalogued by computer, and available in a few days after a telephone call to Milwaukee. He publishes *Aldrichimica Acta*, a quarterly magazine delivered to interested organic chemists without charge, which carries review articles on new reactions as well as notes on new techniques and advertisements for newly-introduced chemicals.

The Aldrich advertisements are unique: my colleague George Just tells me that when he receives his copy of the *Journal of Organic Chemistry*, he first reads the Aldrich advertisement at the back; this is often more important than any article in the journal. No other advertisements teach so much chemistry.

All this comes about because Bader remains an organic chemist. He had a very creditable record of publishing papers while at Harvard and at Pittsburgh Plate Glass, and for many years has been a frequent visitor to labs of active organic chemists, listening to them describe their work, interested in their problems, and (of course) interested in buying any compound they have made in large amounts and which he thinks others might want.

Bader has also become interested in the history of chemistry. At the 199th meeting of the American Chemical Society in Boston in April 1990, he presented a paper in a symposium on Kekule's dreams. This two-day symposium commemorated the 100th anniversary of Kekule's speech to the German Chemical Society in which he revealed for the first time how his ideas on the structure of alkanes and of benzene had come to him in dreams in London and in Ghent. In Boston there were impassioned speeches in support of Kekule's claim to have introduced the idea of structure into chemistry, and others in support of rivals such as Butlerov. Bader pressed with vigor the claims of the Austrian chemist and physicist Loschmidt. Loschmidt's claims can now be assessed more easily because Aldrich has republished his original monograph of 1861 showing a cyclic structure for benzene.

While still a student, Bader became a collector of Dutch paintings of the period of Rembrandt. Many of them are featured on the cover of *Aldrichimica Acta* with brief

essays inside. This started at Harvard, where one day Fieser found him leaving the chemistry department in the middle of the day, and asked him where he was going. He said. "Over to the Fogg (Museum) where Jakob Rosenberg is lecturing on Rembrandt." Fieser replied in mock disgust. "Alfred, you haven't made up your mind whether you want to be a chemist or an art historian". Bader now notes. "Well, some 40 years later I still haven't and I am much happier for it."

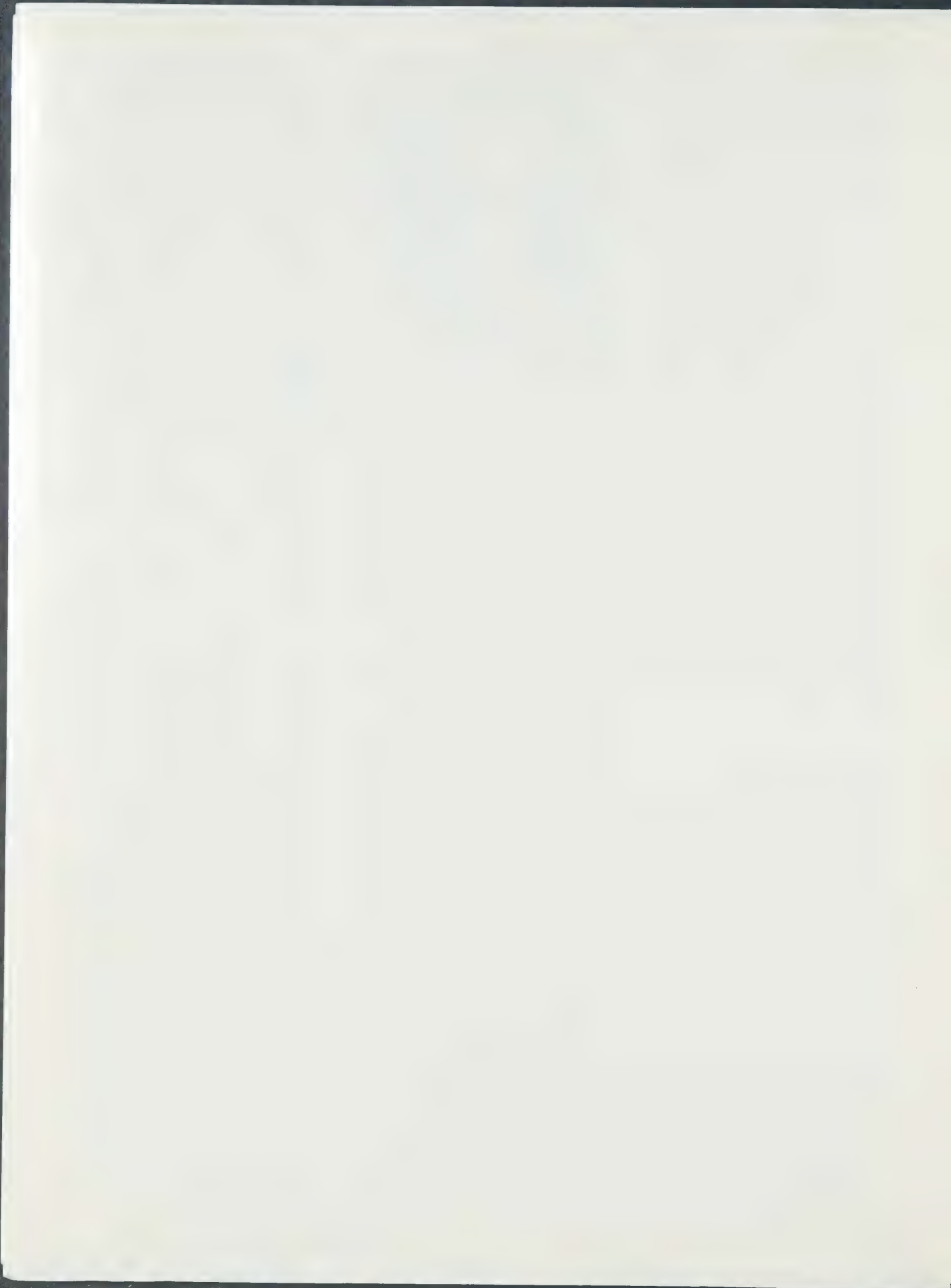
He is a subtle and perceptive critic of Dutch painting, and his gifts to the Agnes Etherington Arts Centre of Queen's University help to make it the finest collection of any university in Canada.

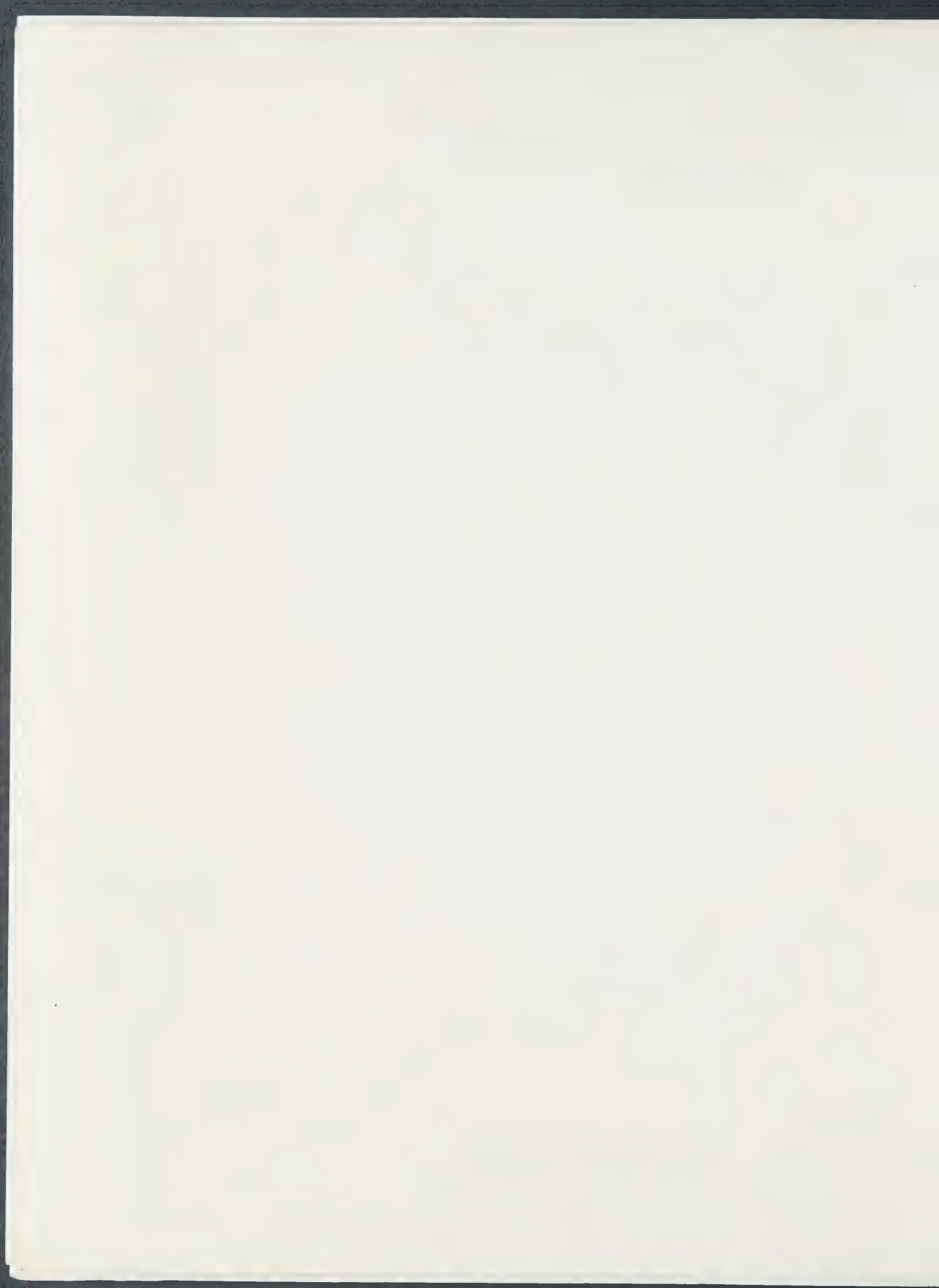
Bader's other interest is the Bible. Although friendly with orthodox neighbours in Vienna, Bader seems to have grown up in a generally non-religious atmosphere, and does not remember looking at a Bible until he was 14. But two years later in Canada, just turned 16 and the youngest prisoner in his internment camp, he had a lot of time to read the Bible. He takes its message seriously enough to have taught Sunday school in a Milwaukee temple for 32 years.

The rise of Sigma-Aldrich is one of the outstanding success stories in a period when such success has been rare in America. It should become a classic case for study in business schools.

But recently the story has taken a curious and unexpected twist. Bader, whose generosity is legendary (he has funded chemical research grants, supported chemistry awards, and made gifts to several universities and other institutions), sold on August 15, 1991, a "call-option" covered by 10,000 shares of his Sigma-Aldrich stock, in order to maximize a gift to Queen's University. However, his successor as chairman of Sigma-Aldrich and the company's chief operating officer claimed that Bader was "betting against the company", and he was not included in the slate of directors scheduled for stockholder approval at the annual meeting in May. It appears that Bader has also lost his unpaid position of Chairman Emeritus.

It is difficult for the layman in financial matters to understand these decisions, but all of us who have benefited from Bader's commitment to organic chemistry must feel a sadness at this apparent termination of his career. But so resourceful and energetic a man may well use his talents in unexpected ways in the years ahead.





Economic indicators go higher

Association issues March data for area

By LEE BERGQUIST
 Sentinel staff writer

The economy of the Milwaukee area continued to gather momentum during March, according to a report Friday by the Metropolitan Milwaukee Association of Commerce.

"Consumers seem to have awakened from their recessionary hibernation," said Bret J. Mayborne, the association's economic research director.

"Strong worker earnings growth and lower interest rates are bolstering consumer confidence."

The report said 11 of 15 economic indicators in March improved from the same time a year ago.

All three housing and real estate indicators rose from 1991. Mortgages recorded in Milwaukee County doubled, and existing home sales and new dwelling permits issued rose strongly.

Mayborne said that rising consumer confidence was evident in the strong real estate market and the increase in big-ticket purchases, including new car sales.

Registration of new cars rose 6.1% to 4,828. That marked the first time back-to-back monthly gains have been recorded since December 1990, he said.

Increased earnings have also helped bolster the economy.

Average weekly pay for manufacturing production workers increased 7.8% to \$535. The Milwaukee-area payroll was \$38.7 million — up 7.3%.

Mayborne said that all of these factors should lead to an improving job picture during the next several months.

The unemployment rate remained relatively low, Mayborne said. The seasonally adjusted rate in March of 4.4% for the Milwaukee area was less than the state average of 4.8% and far below the national average of 7.3%.

ETC sees recovery this year

By CHUCK DOHERTY
 Sentinel staff writer

Waukesha — Electronic Telecommunications Inc. should rebound in 1992 after the recession and the costs of an acquisition combined to reduce 1991 earnings 77%, company executives said Friday.

Although telecommunications companies are among the last to recover from a recession, Jeffrey M. Nigl, vice president and chief financial officer, said Electronic Telecommunications has seen a modest rise in orders.

The company expects earnings to remain somewhat depressed in the second quarter, but to begin surging in the second half of the year, Nigl said at Electronic Telecommunications' annual meeting at Merrill Hills Country Club in Waukesha.

The company, based in Waukesha, earlier reported first-quarter earnings of \$200,000, down from \$270,000 in the comparable period last year. Before recognizing an accounting change in earnings, Electronic Telecommunications earned \$12.6 million in the most recent period.

Dean W. Danner, president and chief operating officer, blamed the continuing decline in earnings primarily on the recession.

For example, a newly acquired unit, Automation Electronics Corp., Dublin, Calif., saw a decline in sales because the company relies heavily on business customers, Danner said.

For the future, he said Electronic Telecommunications continues to look at acquisitions.

"We are always looking for good, value-related companies that would fit ETC and help us grow," Danner said.

"We've made two good acquisitions. We're looking for more."

Spending increases

Washington, D.C. — AP — Single-family housing activity helped push overall construction spending to its highest level in 15 months in March, the government said Friday.

Bader ousted as director of company

Sale of call option said to be reason for action taken by Sigma-Aldrich Corp.

By LARRY SANDLER
 Sentinel staff writer

Alfred R. Bader, the Milwaukee chemist and art collector who helped found Aldrich Chemical Co. Inc., said Friday he is being forced off the board of Aldrich's parent company.

Bader, who had been chairman of Sigma-Aldrich Corp. from 1980 to 1990, is not on the slate of directors nominated for reelection at the St. Louis company's annual meeting Tuesday, the proxy statement for that meeting shows.

Also dropped from the slate is Marvin Klitsner, a former Milwaukee attorney who now lives in Jerusalem.

Reports of Bader's ouster in the St. Louis Post-Dispatch and in Chemical and Engineering News have rallied support for him from

prominent chemists around the world, as reflected in letters received by Bader.

In a letter to his fellow chemists, Bader said he was told by Sigma-Aldrich Chairman Tom Cori that he was being dropped from the board for "betting against the company" by selling a call option on some of his stock in the corporation.

A call option allows the buyer to purchase stock for a specific price by a specific deadline.

Bader said he sold an option to buy 10,000 shares for \$45 a share, with the option itself selling for \$2.625 a share. Then he gave the option shares and the proceeds of the option sale as a gift to his alma mater, Queen's University in Kingston, Ontario.

Because universities usually sell stock immediately upon re-

ceipt, the effect of the option was to enhance the value of the gift, Bader said.

When the option was exercised, the university received the \$450,000 from the sale of the stock, in addition to the \$24,250 from the sale of the option, for a total of \$474,250. Had Bader simply given the university the stock, it would have sold the shares at the market price of about \$41 a share, for a total of \$410,000.

Bader said he did not consider his sale of the option to be a bet

against the company's stock because he still owns nearly 3.6 million shares.

"This is the stated reason," Bader said in an interview. "He (Cori) has never given me the real reason. I'm puzzled. I'm even more puzzled about why the directors allowed it."

However, Bader said he was not planning to fight to stay on the board.

"A proxy fight would be hopeless so we aren't even thinking about it," Bader said.

Several securities analysts said they did not understand the ouster.

"I've been in the business 32 years, and I've never heard of any principle that directors should not deal in options, said David C. Jones, an analyst at Paul & Co., of St. Louis.

Jones said he did not consider a call option a bet against a company's stock, a view echoed by other analysts who asked not to be identified.

In a telephone interview from corporate headquarters in St. Louis, Cori said, "There is no dispute with either Alfred Bader or Marvin Klitsner over the direction or the policies of the company. It's not a business matter. It's a personal matter."

Cori confirmed the decision was linked to the call option, although he would not elaborate.

When pressed, Cori said, "Isn't the ultimate test for a director whether the other directors have confidence in him?"

Cori added, "I'm pretty sad. If you ask me how I feel, I feel awful. This is a sad time for me, because of the contributions of Alfred and Marvin."

New fishing gear



A boy tests the Hydrobike at a trade show in Switzerland. The bike has inflatable cushions, two stabilizer arms and a propeller attached to the rear wheel, and is designed to allow bicycles to cross lakes and move about during floods. Using the bike for fishing is another possibility.

Corporate earnings

Sentinel staff writers

NATIONAL PRESTO

Gains achieved in first quarter

National Presto Industries Inc. has posted first-quarter earnings of \$1.7 million or 63 cents per share, up from \$4.5 million or 61 cents a share the previous year.

Sales advanced to \$24.9 million from \$19.5 million, despite what the Eau Claire manufacturing company described as a tough retail environment.

Melvin S. Cohen, chairman, said National Presto's product introductions for 1992 will include the Pro Tater Twister electric curly cutter and a line of under-the-cabinet can openers.

MODINE

Quarter, year bring records

Excluding patent settlement gains, the Modine Manufacturing Co. had record earnings for the fourth quarter and fiscal year ending March 31.

In the latest three months, the Racine company earned \$7.7 million, or 63 cents per share, on record sales of \$137.2 million. A year earlier, net income was \$2 million or 13 cents a share on sales of \$122.5 million.

Full-year earnings without the settlements were \$26.7 million, an increase of 42%, as sales advanced 9% to \$26.6 million.

With the patent settlements, Modine had net income of \$28 million or \$1.87 per share in the latest fiscal year compared with \$26.5 million or \$2.04 a share the prior year.

OSHKOSH TRUCK

Quarterly net at \$3.2 million

Oshkosh Truck Corp. has reported higher second fiscal quarter earnings and sales, with Chairman R. Eugene Goodson saying the increased revenue came mainly from military shipments to a foreign country.

The Oshkosh company said earnings for the three months ended March 31 were \$3.2 million or 37 cents per share on revenue of \$164.7 million compared with income of \$12,000 on revenue of \$96.1 million for the same period in 1991.

For the six months through March, the company earned \$3.1 million or 59 cents a share on shipments of \$318.4 million. A year earlier, Oshkosh Truck had a loss of \$610,000 or 7 cents a share on volume of \$176.3 million.

Retail slowdown has impact on Oshkosh B'Gosh results

By JEFF COLE
 Sentinel staff writer

Oshkosh — A slow retailing climate hit Oshkosh B'Gosh Inc. in both 1991 and the first quarter of 1992, the company's shareholders were told Friday.

For the first quarter, the apparel manufacturer had net income of \$7.4 million or 51 cents a share on sales of \$102.3 million.

Those results compared with earnings of \$10.1 million or 69 cents a share on sales of \$99.1 million in the first quarter a year earlier.

About 100 shareholders attended the meeting, which was held at the Pioneer Inn.

Because of the extremely slow national retail sales growth in 1991, Oshkosh B'Gosh had to fight hard to maintain its market position, said Charles F. Hyde, chairman of the board and chief executive officer.

Despite the poor climate, we had a 13% increase in sales in 1991," Hyde said. "But the sales increase did come at a cost."

Net income in 1991 was down 14.8%, Hyde said.

For the year, the company earned \$23.5 million on sales of \$262.1 million as against sales of \$232.4 million and net income of \$29.5 million in 1990.

Gain eyed by meter producer

Increased environmental regulation probably will increase demand for Badger Meter Inc. products, the Brown Deer company's chief executive officer said Friday.

President James L. Forbes listed new environmental laws among positive market influences when he spoke to shareholders at the manufacturer's annual meeting at the Milwaukee Club.

Badger Meter manufactures devices that measure and control the flow of liquids and gases, for use in industry and utilities.

In an interview after the meeting, Forbes said implementing the requirements of the federal Clean Air Act and Clean Water Act will cause greater awareness of the need to monitor the flow of water and air.

For example, Forbes said the Clean Water Act will require measurement of storm water runoff from parking lots, which can be done with Badger Meter products.

Badger Meter also produces valves that can regulate the emission of various substances into the air, as required by the Clean Air Act, Forbes said.

"Industry can comply (with the law) and avoid polluting either the air or the water with the aid of Badger Meter products," Forbes said.

Rig count goes higher

Houston, Texas — AP — The nation's oil and gas rig count rose by 11 this week to 634, Baker Hughes Inc. said Friday. The increase came a week after the count plunged by 16 to set a record low of 623 the previous week. The rig count of 639 was set last month and tied two weeks ago. A year ago, the count totaled 855.

Hyde said the lower income was due to higher marketing and administrative expenses, and losses from the company's Assor line of clothing. The company plans to discontinue the line by the end of the year, Hyde said.

Oshkosh B'Gosh has also been hit by the large number of retail bankruptcies, said Douglas W. Hyde, president and chief operating officer, and son of the chairman.

"In 1991, 25% of this country's department stores were operating in bankruptcy," Douglas Hyde said. "At the same time, the chains are getting bigger and wielding more clout."

Oshkosh B'Gosh is seeing more competition for its core children's clothing line from such companies as Lands' End Inc., Dodgeville, and Levi Strauss & Co., San Francisco.

Children's wear is still 85% of the company's business, Douglas Hyde said. He noted that Oshkosh B'Gosh has a strong children's clothing franchise and intends to expand on that.

He said the company will increase its marketing and promotion efforts.

"We intend to exploit all opportunities," Douglas Hyde said. Expanding in such areas as

swim wear and play wear are being considered, he said.

"We are also looking at an expansion into youth wear," Douglas Hyde said.

After several years of sales declines, men's wear seems to be turning around, Douglas Hyde said. Profit for the line was up 7.1% in 1991 and orders for the fall season are up 100%, he said.

The company is targeting international sales and hopes to increase those sales by 20% to 25% in 1992, Douglas Hyde said.

Oshkosh B'Gosh recently completed a marketing study in Japan and wants to expand its existing sales there, he said.

The company is also considering competition for its core children's clothing line from such companies as Lands' End Inc., Dodgeville, and Levi Strauss & Co., San Francisco.

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Business around Wisconsin

■ **Effective Monday, Heritage Printing** at 7400 W. State St., Wauwatosa, and 5235 S. 27th St., Greendale, as well as Toea Typography at 7412 W. State St., are changing their names to CityPress. Company executives said the new name reflects changes in services and capabilities. There will continue to be four Heritage Printing locations in the Milwaukee area.

■ **Fillings with the Securities and Exchange Commission** indicate that the State of Wisconsin Investment Board has raised its stake in Heekin Can Co. Inc., Cincinnati, from 8.0% to 9.5%; reduced its stake in Houghton Mifflin Inc., Boston, to less than 5%; and boosted its stake in CareNetech Inc., Milwaukee, by 1% to 9.8% of 485,000 common shares. The board makes investments on behalf of state employee retirement funds.

■ **The Wisconsin World Trade Center** has published a directory of professional service providers to help businesses interested in global marketing. The directory profiles 33 Wisconsin companies with varied expertise. To obtain a copy of the directory, call Rae DuForc at (414) 274-3840.

■ **Aid Association for Lutherans**, Appleton, said its Triple-A rating for claims-paying ability has been affirmed by Standard & Poor's Corp. AAL is the nation's largest fraternal benefit society in terms of assets — \$9.8 billion — and ordinary life insurance in force — \$61.7 billion.

■ **Career Development Services Inc.**, Whitefish Bay, has agreed to provide support and relocation services for transferred corporate clients of Optics Resource and Career Center, Houston.

■ **Hanson Graphic Inc.**, Milwaukee, has been chosen as the marketing design firm of record for MSI General Corp., Oconomowoc.

Industrial building acquired

The owner of Badger Electric Motor Inc. has purchased a 160,000-square-foot industrial building near Mitchell International Airport for \$500,000 from Precision Machinery Systems, a broker who handled the transaction said Friday.

President Paul Mater of Badger Electric plans to consolidate the operations of three different facilities, which the company has

outgrown. In the acquired building at 5000 S. 2nd St., according to Thomas Rowe, a broker for the James F. Barry Co.

Guy T. Mascari of Barry was the listing broker.

Badger Electric repairs and rebuilds industrial electric motors and transformers.

Precision Machinery has not occupied the building for about a year, Rowe said.

Tornado on the way out

Detroit, Mich. — AP — The Tornado luxury coupe and the Custom Cruiser Wagon are trailing into the sunset.

Oldsmobile said Friday it is ending production this year of the

two models, which were doomed by slow sales. The Tornado was the cutoff was related to expected consolidations of redundant models throughout General Motors Corp.

Dow falls in rumor-filled session

New York, N.Y. — AP — Stock prices closed lower Friday as computerized sell programs kicked into gear and many Wall Street traders trooped home early, anxious about urban riots.

The Dow Jones average of 30 Industrials closed down 23.03 at 3,336.09. For the week, however, the average gained 11.63 points.

Stock prices were narrowly mixed in the morning after traders took profits from the market's recent rise and responded to a report showing low growth in manufacturing activity.

Computer-driven selling hit stocks shortly after noon. Dennis Jarrett, chief market analyst for Kidder Peabody & Co., said the selling started after rumors of rioting related to the Rodney King verdict circulated in Chicago and New York City.

The rumor originated with a stock trader in the New York City Municipal Exchange which, in turn, brought down stock prices in New York City, he said. Despite widespread rumors of unrest, the city was relatively quiet during the day.

Trading volume dropped off in the afternoon as many investors and stock dealers went home early for the weekend. Volume of the New York Stock Exchange came to 177.39 million shares.

Merrill Lynch Inc., Salomon Inc., Chemical Banking Corp., Chase Manhattan Corp. and First Boston Corp. were among the large financial companies that allowed their employees to go home early if they wished.

"People are leaving early, so you don't have full participation in the securities market," said Steven Van Brunt, assistant vice president for

equities trading at Nikko Securities Co. Intern and Inc. The early exit of traders and a liquidity problem, he said, was the primary cause of buyers with cash, steady the market.

The stock market is susceptible to volatile changes when trading volume is light.

Hildegard Zaporski, vice president of the Prudential Securities Co., said of the market's recent rise, "It was a precaution."

UAL Corp. fell 1 1/2% at 122 1/2 after it told securities analysts it expects a loss in the second quarter. Constair International was up 2 1/2% at 43 1/2, but the Tennessee plastics company said it had no explanation for the sudden rise.

Oil service companies did well as oil prices reached their highs for the year. Schlumberger was up 2 1/2% at 64 1/2, and Halliburton was up 1 1/2% at 26 1/2.

Consolidated New York Stock Exchange issues

Symbol	High	Low	Open	Close	Change	Volume	High	Low	Open	Close	Change	Volume
IBM	108 1/4	108 1/4	108 1/4	108 1/4	0	100	108 1/4	108 1/4	108 1/4	108 1/4	0	100
MSFT	34 1/4	34 1/4	34 1/4	34 1/4	0	100	34 1/4	34 1/4	34 1/4	34 1/4	0	100
ORCL	28 1/4	28 1/4	28 1/4	28 1/4	0	100	28 1/4	28 1/4	28 1/4	28 1/4	0	100
INTL	15 1/4	15 1/4	15 1/4	15 1/4	0	100	15 1/4	15 1/4	15 1/4	15 1/4	0	100
EA	12 1/4	12 1/4	12 1/4	12 1/4	0	100	12 1/4	12 1/4	12 1/4	12 1/4	0	100
WDC	11 1/4	11 1/4	11 1/4	11 1/4	0	100	11 1/4	11 1/4	11 1/4	11 1/4	0	100
QCOM	10 1/4	10 1/4	10 1/4	10 1/4	0	100	10 1/4	10 1/4	10 1/4	10 1/4	0	100
ADSK	9 1/4	9 1/4	9 1/4	9 1/4	0	100	9 1/4	9 1/4	9 1/4	9 1/4	0	100
SGS	8 1/4	8 1/4	8 1/4	8 1/4	0	100	8 1/4	8 1/4	8 1/4	8 1/4	0	100
INTL	7 1/4	7 1/4	7 1/4	7 1/4	0	100	7 1/4	7 1/4	7 1/4	7 1/4	0	100
EA	6 1/4	6 1/4	6 1/4	6 1/4	0	100	6 1/4	6 1/4	6 1/4	6 1/4	0	100
WDC	5 1/4	5 1/4	5 1/4	5 1/4	0	100	5 1/4	5 1/4	5 1/4	5 1/4	0	100
QCOM	4 1/4	4 1/4	4 1/4	4 1/4	0	100	4 1/4	4 1/4	4 1/4	4 1/4	0	100
ADSK	3 1/4	3 1/4	3 1/4	3 1/4	0	100	3 1/4	3 1/4	3 1/4	3 1/4	0	100
SGS	2 1/4	2 1/4	2 1/4	2 1/4	0	100	2 1/4	2 1/4	2 1/4	2 1/4	0	100
INTL	1 1/4	1 1/4	1 1/4	1 1/4	0	100	1 1/4	1 1/4	1 1/4	1 1/4	0	100
EA	1 1/4	1 1/4	1 1/4	1 1/4	0	100	1 1/4	1 1/4	1 1/4	1 1/4	0	100
WDC	1 1/4	1 1/4	1 1/4	1 1/4	0	100	1 1/4	1 1/4	1 1/4	1 1/4	0	100
QCOM	1 1/4	1 1/4	1 1/4	1 1/4	0	100	1 1/4	1 1/4	1 1/4	1 1/4	0	100
ADSK	1 1/4	1 1/4	1 1/4	1 1/4	0	100	1 1/4	1 1/4	1 1/4	1 1/4	0	100
SGS	1 1/4	1 1/4	1 1/4	1 1/4	0	100	1 1/4	1 1/4	1 1/4	1 1/4	0	100
INTL	1 1/4	1 1/4	1 1/4	1 1/4	0	100	1 1/4	1 1/4	1 1/4	1 1/4	0	100
EA	1 1/4	1 1/4	1 1/4	1 1/4	0	100	1 1/4	1 1/4	1 1/4	1 1/4	0	100
WDC	1 1/4	1 1/4	1 1/4	1 1/4	0	100	1 1/4	1 1/4	1 1/4	1 1/4	0	100
QCOM	1 1/4	1 1/4	1 1/4	1 1/4	0	100	1 1/4	1 1/4	1 1/4	1 1/4	0	100
ADSK	1 1/4	1 1/4	1 1/4	1 1/4	0	100	1 1/4	1 1/4	1 1/4	1 1/4	0	100
SGS	1 1/4	1 1/4	1 1/4	1 1/4	0	100	1 1/4	1 1/4	1 1/4	1 1/4	0	100
INTL	1 1/4	1 1/4	1 1/4	1 1/4	0	100	1 1/4	1 1/4	1 1/4	1 1/4	0	100
EA	1 1/4	1 1/4	1 1/4	1 1/4	0	100	1 1/4	1 1/4	1 1/4	1 1/4	0	100
WDC	1 1/4	1 1/4	1 1/4	1 1/4	0	100	1 1/4	1 1/4	1 1/4	1 1/4	0	100
QCOM	1 1/4	1 1/4	1 1/4	1 1/4	0	100	1 1/4	1 1/4	1 1/4	1 1/4	0	100
ADSK	1 1/4	1 1/4	1 1/4	1 1/4	0	100	1 1/4	1 1/4	1 1/4	1 1/4	0	100
SGS	1 1/4	1 1/4	1 1/4	1 1/4	0	100	1 1/4	1 1/4	1 1/4	1 1/4	0	100
INTL	1 1/4	1 1/4	1 1/4	1 1/4	0	100	1 1/4	1 1/4	1 1/4	1 1/4	0	100
EA	1 1/4	1 1/4	1 1/4	1 1/4	0	100	1 1/4	1 1/4	1 1/4	1 1/4	0	100
WDC	1 1/4	1 1/4	1 1/4	1 1/4	0	100	1 1/4	1 1/4	1 1/4	1 1/4	0	100
QCOM	1 1/4	1 1/4	1 1/4	1 1/4	0	100	1 1/4	1 1/4	1 1/4	1 1/4	0	100
ADSK	1 1/4	1 1/4	1 1/4	1 1/4	0	100	1 1/4	1 1/4	1 1/4	1 1/4	0	100
SGS	1 1/4	1 1/4	1 1/4	1 1/4	0	100	1 1/4	1 1/4	1 1/4	1 1/4	0	100
INTL	1 1/4	1 1/4	1 1/4	1 1/4	0	100	1 1/4	1 1/4	1 1/4	1 1/4	0	100
EA	1 1/4	1 1/4	1 1/4	1 1/4	0	100	1 1/4	1 1/4	1 1/4	1 1/4	0	100
WDC	1 1/4	1 1/4	1 1/4	1 1/4	0	100	1 1/4	1 1/4	1 1/4	1 1/4	0	100
QCOM	1 1/4	1 1/4	1 1/4	1 1/4	0	100	1 1/4	1 1/4	1 1/4	1 1/4	0	100
ADSK	1 1/4	1 1/4	1 1/4	1 1/4	0	100	1 1/4	1 1/4	1 1/4	1 1/4	0	100
SGS	1 1/4	1 1/4	1 1/4	1 1/4	0	100	1 1/4	1 1/4	1 1/4	1 1/4	0	100
INTL	1 1/4	1 1/4	1 1/4	1 1/4	0	100	1 1/4	1 1/4	1 1/4	1 1/4	0	100
EA	1 1/4	1 1/4	1 1/4	1 1/4	0	100	1 1/4	1 1/4	1 1/4	1 1/4	0	100
WDC	1 1/4	1 1/4	1 1/4	1 1/4	0	100	1 1/4	1 1/4	1 1/4	1 1/4	0	100
QCOM	1 1/4	1 1/4	1 1/4	1 1/4	0	100	1 1/4	1 1/4	1 1/4	1 1/4	0	100
ADSK	1 1/4	1 1/4	1 1/4	1 1/4	0	100	1 1/4	1 1/4	1 1/4	1 1/4	0	100
SGS	1 1/4	1 1/4	1 1/4	1 1/4	0	100	1 1/4	1 1/4	1 1/4	1 1/4	0	100
INTL	1 1/4	1 1/4	1 1/4	1 1/4	0	100	1 1/4	1 1/4	1 1/4	1 1/4	0	100
EA	1 1/4	1 1/4	1 1/4	1 1/4	0	100	1 1/4	1 1/4	1 1/4	1 1/4	0	100
WDC	1 1/4	1 1/4	1 1/4	1 1/4	0	100	1 1/4	1 1/4	1 1/4	1 1/4	0	100
QCOM	1 1/4	1 1/4	1 1/4	1 1/4	0	100	1 1/4	1 1/4	1 1/4	1 1/4	0	100
ADSK	1 1/4	1 1/4	1 1/4	1 1/4	0	100	1 1/4	1 1/4	1 1/4	1 1/4	0	100
SGS	1 1/4	1 1/4	1 1/4	1 1/4	0	100	1 1/4	1 1/4	1 1/4	1 1/4	0	100
INTL	1 1/4	1 1/4	1 1/4	1 1/4	0	100	1 1/4	1 1/4	1 1/4	1 1/4	0	100
EA	1 1/4	1 1/4	1 1/4	1 1/4	0	100	1 1/4	1 1/4	1 1/4	1 1/4	0	100
WDC	1 1/4	1 1/4	1 1/4	1 1/4	0	100	1 1/4	1 1/4	1 1/4	1 1/4	0	100
QCOM	1 1/4	1 1/4	1 1/4	1 1/4	0	100	1 1/4	1 1/4	1 1/4	1 1/4	0	100
ADSK	1 1/4	1 1/4	1 1/4	1 1/4	0	100	1 1/4	1 1/4	1 1/4	1 1/4	0	100
SGS	1 1/4	1 1/4	1 1/4	1 1/4	0	100	1 1/4	1 1/4	1 1/4	1 1/4	0	100
INTL	1 1/4	1 1/4	1 1/4	1 1/4	0	100	1 1/4	1 1/4	1 1/4	1 1/4	0	100
EA	1 1/4	1 1/4	1 1/4	1 1/4	0	100	1 1/4	1 1/4	1 1/4	1 1/4	0	100
WDC	1 1/4	1 1/4	1 1/4	1 1/4	0	100	1 1/4	1 1/4	1 1/4	1 1/4	0	100
QCOM	1 1/4	1 1/4	1 1/4	1 1/4	0	100	1 1/4	1 1/4	1 1/4	1 1/4	0	100
ADSK	1 1/4	1 1/4	1 1/4	1 1/4	0	100	1 1/4	1 1/4	1 1/4	1 1/4	0	100
SGS	1 1/4	1 1/4	1 1/4	1 1/4	0	100	1 1/4	1 1/4	1 1/4	1 1/4	0	100
INTL	1 1/4	1 1/4	1 1/4	1 1/4	0	100	1 1/4	1 1/4	1 1/4	1 1/4	0	100
EA	1 1/4	1 1/4	1 1/4	1 1/4	0	100	1 1/4	1 1/4	1 1/4	1 1/4	0	100
WDC	1 1/4	1 1/4	1 1/4	1 1/4	0	100	1 1/4	1 1/4	1 1/4	1 1/4	0	100
QCOM	1 1/4	1 1/4	1 1/4	1 1/4	0	100	1 1/4	1 1/4	1 1/4	1 1/4	0	100
ADSK	1 1/4	1 1/4	1 1/4	1 1/4	0	100	1 1/4	1 1/4	1 1/4	1 1/4	0	100
SGS	1 1/4	1 1/4	1 1/4	1 1/4	0	100	1 1/4	1 1/4	1 1/4	1 1/4	0	100
INTL	1 1/4	1 1/4	1 1/4	1 1/4	0	100	1 1/4	1 1/4	1 1/4	1 1/4	0	100
EA	1 1/4	1 1/4	1 1/4	1 1/4	0	100	1 1/4	1 1/4	1 1/4	1 1/4	0	100
WDC	1 1/4	1 1/4	1 1/4	1 1/4	0	100	1 1/4	1 1/4	1 1/4	1 1/4	0	100
QCOM	1 1/4	1 1/4	1 1/4	1 1/4	0	100	1 1/4	1 1/4	1 1/4	1 1/4	0	100
ADSK	1 1/4	1 1/4	1 1/4	1 1/4	0	100	1 1/4	1 1/4	1 1/4	1 1/4	0	100
SGS	1 1/4	1 1/4	1 1/4	1 1/4	0	100	1 1/4	1 1/4	1 1/4	1 1/4	0	100
INTL	1 1/4	1 1/4	1 1/4	1 1/4	0	100	1 1/4	1 1/4	1 1/4	1 1/4	0	100
EA	1 1/4	1 1/4	1 1/4	1 1/4	0	100	1 1/4	1 1/4	1 1/4	1 1/4	0	100
WDC	1 1/4	1 1/4	1 1/4	1 1/4	0	100	1 1/4	1 1/4	1 1/4	1 1/4	0	100
QCOM	1 1/4	1 1/4	1 1/4	1 1/4	0	100	1 1/4	1 1/4	1 1/4	1 1/4	0	100
ADSK	1 1/4	1 1/4	1 1/4	1 1/4	0	100	1 1/4	1 1/4	1 1/4	1 1/4	0	100
SGS	1 1/4	1 1/4	1 1/4	1 1/4	0	100	1 1/4	1 1/4	1 1/4	1 1/4	0	100
INTL	1 1/4	1 1/4	1 1/4	1 1/4	0	100	1 1/4	1 1/4	1 1/4	1 1/4	0	100
EA	1 1/4	1 1/4	1 1/4	1 1/4	0	100	1 1/4	1 1/4	1 1/4	1 1/4	0	100
WDC	1 1/4	1 1/4	1 1/4	1 1/4	0	100	1 1/4	1 1/4	1 1/4	1 1/4	0	100
QCOM	1 1/4	1 1/4	1 1/4	1 1/4	0	100	1 1/4	1 1/4	1 1/4	1 1/4	0	100
ADSK	1 1/4	1 1/4	1 1/4	1 1/4	0	100	1 1/4	1 1/4	1 1/4	1 1/4	0	100
SGS	1 1/4	1 1/4	1 1/4	1 1/4	0	100	1 1/4	1 1/4	1 1/4	1 1/4	0	100
INTL	1 1/4	1 1/4	1 1/4	1 1/4	0	100	1 1/4	1 1/4	1 1/4	1 1/4	0	100
EA	1 1/4	1 1/4	1 1/4	1 1/4	0	100	1					

Jews mark their escape as children from Nazi terror

By Marion Finlay
Special to The Star

LONDON — Almost 50 years ago, Alfred Bader sailed from Britain to Canada.

Unlike most immigrants heading for a new life on the other side of the ocean, the 16-year-old Bader was absolutely miserable.

He was a prisoner who hadn't committed a crime. Yet he was to spend a year and a half of World War II interned at Fort Lennox, Que., on Lake Champlain.

This is the 50th anniversary of Bader's arrival in England in 1939 as a member of the *Kindertransporte* (children's transport). He was one of close to 10,000, mostly Jewish children, evacuated from Nazi Germany and Austria to Britain on the eve of World War II. A number, among them Bader, moved on to Canada.

Survivors of the group held a reunion here last month to commemorate their odyssey.

Pleading mothers

The children's journey was set in motion by the events of Nov. 9, 1938 — the *Kristallnacht*, or Night of the Broken Glass, when synagogues were burned, Jewish shops looted and Jews beaten up in the streets. The violence convinced many in Britain that there was no future for German and Austrian Jews under the Nazis.

On Nov. 21, 1938, the British prime minister, Neville Chamberlain, announced that 10,000 children — 9,732 made it to Britain before the fighting intervened — would be offered refuge. But the asylum extended only to the children; their parents and elder brothers and sisters had to stay behind. Most of them died in the gas chambers.

There were heart-rending scenes in Berlin as mothers pleaded with the people organizing the evacuation to take their children," recalls Bianca Gordon, who was 17 at the time. She was one of the oldest of 600 children travelling on the second shipment out of Germany on Dec. 13, 1938.

"We could take only one piece of

hand luggage and were told to meet at dawn at Berlin's train station," says Gordon, now a psychoanalyst who practises a few streets away from where another refugee from the Nazis, Sigmond Freud, had his consulting room.

Sitting in her comfortable Hampstead office, she tells her story lucidly and without visible emotion. Except when she describes her farewell to her mother: "The Nazis wouldn't let the mothers on to the train platform to say goodbye to their children. After all the senseless pain they had inflicted, this petty cruelty was unbearable."

Bewildered and frightened, the children travelled through Germany to the Dutch border where they were greeted by women and children bearing food and gifts. After a stormy winter boat ride across the English Channel, they were taken to a camp to await families willing to foster the German-speaking refugees.

Gordon, both of whose parents died in concentration camps, says she was lucky with the family chosen to foster her — a clergyman and his wife who believed that taking in a Jewish child was the Christian thing to do.

Another *Kindertransporte* member, Ron Baker, born Rudi Aschheim, was not so fortunate. He arrived at the age of 8 on one of the last transports, in May of 1940.

He had been evacuated from Berlin to Amsterdam in 1938 and when the Germans invaded Holland, he managed to board an old Chinese cargo boat along with some 80 other children. After 10 days of being repeatedly bombed by the Germans, the barge arrived in Liverpool. Baker lived with the other children for several months in a church hall until the night his name was called out.

"I was driven away by these people I literally couldn't talk to," he says. "They didn't speak German and I didn't speak English. I had no idea that the Bakers were to be my foster parents. That night and virtually every night for several months I sobbed myself to sleep for

hours on end."

At school he was placed in a class for mentally disabled youngsters and wasn't able to make friends until he did the age-old thing: beat up the school bully.

Now a professor of social work, teaching a course at Oxford University next year on the refugee experience, he says: "I feel that I've come full circle. I now am going to get in touch with other members of the *Kindertransporte* to see how they've coped. There has been very little research into refugees; why some people can deal with it and others can't. When you consider that there are an estimated 12 million refugees worldwide, it's an important subject."

The number who went to Canada, either as foster children or as internees, is not known, as records

from the time vary from scarce to non-existent. During the panic of 1940, when the German army was smashing its way through France, German-born males aged between 16 and 65, whether refugees or known Nazis, were interned in Britain as enemy aliens. Many, like Alfred Bader, where shipped to Canada.

"I was the youngest of the group held at Fort Lennox," he recalls. "I remember the major who was in charge of the camp saying, 'You look a bit young to have parachuted into England as a German agent.' And I said, 'Actually I was a Jewish refugee.' And he said, 'Well that's okay then; we don't like Jews either.'"

"Fortunately the schooling was very good. After a year and a half at Fort Lennox, a man from West-

pointed. But occasionally a whoop of recognition would go up followed by hugs and tears and introductions to friends and family.

In the auditorium, a moving commemorative concert was held. "We decided to have a concert as a tribute to the men and women of all denominations who helped us," says Bianca Gordon, the event's organizer. "When you think that over 1 million children died in the concentration camps, 9,732 saved is a very small number. Yet, of all the countries in the world — and the number that Canada — and the U.S. took in was pitiful — it was a tremendous effort on the part of the British people."

□ Marion Finlay is a freelance writer based in London.

Hugs and tears

Last month, Bader, Gordon and Baker got together for the first time in the lobby of the Royal Festival Hall on the banks of the Thames. Along with about 750 other members of the *Kindertransporte*, they milled about peering at one another's name tags hoping to spot someone familiar.

Most often, they were disap-



FLIGHT TO FREEDOM: German Jewish children arrive in England in 1939. The infamous "Kristallnacht," the orgy of violence against Jews that swept Germany on Nov. 9, 1938, had prompted the British to offer the youngsters refuge.

THE TIMES OF LONDON

Was MID guilty of infanticide or making abortion mistake?

By Royal Ford
Special to The Star

PHILADELPHIA — The problem with the abortion was that it was not conclusive. The baby seemed to cling to life, gasping and twitching in a bedpan on a scale in a tiny room off a busy hospital corridor.

The problem after this unexpected live birth, according to the judge's ruling, was that the doctor did nothing to keep the baby alive.

What is clear is that Baby Girl Smith, of 32 weeks' gestation, 3 pounds 9 ounces and 17 inches long at birth, is dead. And that Dr. Joseph Melnick, a 67-year-old obstetrician, will be sentenced on Sept. 19 on an infanticide conviction that carries a maximum prison sentence of 3½ to 7 years.

What is unclear, because there are reasoned arguments from many sides, is where this case fits in the American debate on abortion: whether the Pennsylvania Abortion Control Act criminalizes what some doctors are calling a medical mistake; and whether the judge was wrong in ruling that the baby was born alive in the first place.

The characters in the case include a 13-year-old girl who was seeking her second abortion within 10 months; a doctor approaching retirement whose personal life would reel, whose practice would be destroyed and whose life savings would be wiped out; an assistant district attorney who calls herself a proponent of abortion rights but says that, at some point, the rights of the baby have to be considered; an army of doctors who testified with equal conviction that yes, this baby was born alive, and yes, this baby was born dead; and a grandmother who said that she saw the baby in the pan — and that if the baby had moved she would have taken the baby home with her.

Pennsylvania's Abortion Control Act is considered one of the most stringent in the United States. It is an intricately woven net, torn frequently by adverse court rulings but mended relentlessly by a legislature eager to limit abortions.

Melnick agreed to do an abortion on the teen-ager after she and her mother told him she was 4½ months pregnant. Melnick said a physical exam he performed indicated she was less than 20 weeks pregnant. He did not do an ultrasound test — a big mistake, other doctors say.

So on Sept. 12, 1984, after a dose of prologudin, a drug commonly used to induce abortion,



DR. JOSEPH MELNICK: Philadelphia obstetrician, 67, could be sentenced to up to seven years in prison next month.

Baby Girl Smith was delivered at about 9:30 p.m. at West Park Hospital.

"The baby appeared like a doll. It just didn't have any life. It was listless and flaccid, and it certainly did not breathe, and it didn't cry," Melnick would testify in his defence. "I was very certain that the baby was stillborn."

The nurse who carried the baby from the operating room to a small room where aborted fetuses are weighed before being taken to the morgue did not disagree with him.

But Pearl Reznick did. About 10:30 p.m., Reznick, the nursing supervisor, wandered into the room where the baby was still on the scale.

"I saw the baby lying on the scale. It was cyanotic, the head, and the upper chest was very cyanotic," she said in court. Cyanosis is the bluish coloration of the skin caused by a lack of oxygen.

"The back was arched, the head was drawn back, eyes were closed and the arms were limp, hanging. And then I saw it take a gasp." Other doctors were summoned. Reznick said

she heard a heart flickering "very, very" faintly at 20 beats per minute. Melnick listened and said he heard nothing. Three other doctors listened; two said they heard a heartbeat, the third did not.

By 11 p.m., after the baby had been taken to the emergency room, all agreed she was dead.

Another hospital nurse informed the state. Melnick was arrested and charged with murder, involuntary manslaughter, abortion after viability and infanticide. The first two charges were dismissed in preliminary hearings. The latter charges, part of the Abortion Control Act, went to trial. The viability count was thrown out. The judge said the state could not prove the doctor knew he was aborting a viable fetus. That left infanticide, a charge that the doctor withheld proper treatment from a baby born alive.

In Pennsylvania, "born alive" means that "the human being was completely expelled or extracted from her or his mother and after such separation breathed or showed evidence of any of the following: beating of the heart, pulsation of the umbilical cord, definite movement of voluntary muscles or any brain-wave activity."

The defence maintained that the definition is too broad and fails to take into account cardiac or respiratory movements that are not indicative of life. A definition offered by the American College of Obstetricians and Gynecologists is virtually the same as the language used in Pennsylvania, but it contains a qualifier the defence considers crucial: "Heartbeats are to be distinguished from several transient cardiac contractions; respirations are to be distinguished from fleeting respiratory efforts or gasps."

And so came the trial, with medical experts putting their reputations on the line. Consider what some had to say:

- Dr. Robert Starvis, a neonatal intensive-care specialist: "There's no evidence that supports this baby having been born alive."
- Obstetrician Ronald Bolognese: "The physician did not provide adequate resuscitation."
- Pathologist Cyril Wecht: "In my opinion, this was a stillbirth (without) an actual heartbeat of life."

After 13 weeks of detailed testimony, Judge Lynn Abraham told Melnick: "You have been found guilty beyond a reasonable doubt of the crimes charged."

BOSTON GLOBE

Arab informer flees to Jewish settlement to escape avengers

By Daniel Williams
Special to The Star

KIRYAT ARBA, Israeli-occupied West Bank — "When you stop giving milk, they throw you away," M. said as he contemplated his plight as a petty informer in danger.

"My friends in the security forces haven't helped me at all. I'm burned."

M., an Arab from the village of Sliwan near Jerusalem, is on the run. Branded as a collaborator, he says he is being pursued by three Palestinian Muslim extremists who want to kill him. He cannot return to his home, where relatives and neighbors condemn him as a traitor.

Without support from the police, he has taken refuge here in the most militant of the Jewish settlements on the West Bank. But he wants to quit his double life and convert to Judaism, become Israeli in body and soul, and change his name and the names of his seven children to Hebrew versions.

Brutal campaign

"I do not feel Arab any more," M., 31, said as he adjusted his *kippa*, the traditional Jewish skullcap, worn at a tilt on his head.

His story opens a rare window on to the seamy world of collaboration, a subject of deadly significance these days in Israel, where informers in the service of the Shin Bet, the domestic intelligence service, are at the centre of military efforts to put down the Arab uprising in the occupied West Bank and Gaza Strip.

Palestinians have responded by undertaking a brutal campaign of vengeance against suspected collaborators. Nationalist activists call the assaults "cleaning the Palestinian

household" of those who have sold out to an alien power.

But Israeli officials say the victims are guilty only of wanting to live in harmony with their Jewish neighbors and of rejecting the uncompromising rhetoric of extremists.

The Israelis threatened to avenge attacks on informers and began to hunt Palestinian activists suspected of leading attacks on collaborators. Some informers fled into Israel for protection, while others took refuge on army bases and in police stations. Still others, like M., were left to fend for themselves.

M.'s troubles began 10 years ago, when he was working for the Jerusalem police. He nabbed a purse snatcher in broad daylight and turned him over to police. Immediately, he became the target of threats.

One day, when he was lifting weights at an Arab health club, he was seen by a Muslim cleric. M. left and the cleric switched a light on and off — a signal to assassins.

At least two gunmen followed M. up a street. Someone fired a shot, and M. was hit in the stomach by a fragmentation bullet. The scars mark his belly in spirals.

Months later, police arrested the gunman, M. testified against them and they were sentenced to life in prison. "They begged me for mercy, but I couldn't sleep while they were at large."

M. then heard that residents of Kiryat Arba had taken an interest in the fate of collaborators, and the family took refuge there.

He is studying the Bible and hoping to convert. "I go to see the rabbis. They tell me to study more. They think I am not sincere."

LOS ANGELES TIMES

→

Sigma-Aldrich board, the best that can be said is that the affairs of men are frequently not open to rational discussion, and this appears to be such a case.

Despite the sadness, it is time to acknowledge the enormously important contributions that Bader made to organic chemistry. These are not only through his frequent visits to our laboratories with his wife, Isabel, asking 'What can we do better?', but also for his part in the creation of Sigma-Aldrich, which has led to the ready availability of so many important reagents and starting materials.

His benefactions to chemistry have been often crucial in helping those who are not the most privileged members of the community. Last, but by no means least, it is a pleasure to acknowledge the friendship that he has shown to the chemical community. I hope that we will be privileged to continue to hear his words of wisdom.

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From R. A. Raphael, professor of organic chemistry and Prof S. V. Ley

The Talking Point *The Sigma-Aldrich affair* certainly highlights the sense of shock felt by organic chemists worldwide on the expulsion of Alfred Bader from Sigma-Aldrich. When we first heard about this we felt so concerned that we both wrote to Dr Cori, chief executive officer of Sigma-Aldrich and had long telephone conversations with him. Then, together with John Emsley, we had a lengthy personal meeting with him in an attempt to effect a reconciliation.

We emphasised repeatedly the undeniable facts. Bader was the prime generator of Sigma-Aldrich's present position as the leading supplier of research chemicals. By his worldwide ambassadorial role as a highly effective personal publiciser for the

firm and his enthusiastic and generous customer participation, he built up a highly effective symbiosis that has greatly benefited both chemistry and the company. His post-retirement dismissal as an unpaid roving ambassador for the company on a trivial pretext is an astounding self-inflicted wound to Sigma-Aldrich.

Unfortunately, such opinions and arguments seemed to carry no weight with Cori when we met him. He remarked that we could not make adequate judgements as we were not apprised of the full facts of the case. When we asked what these 'full facts' were, he replied that they were confidential and could not be divulged! In such a Catch 22 situation we have sadly come to the conclusion that it seems almost impossible to modify Cori's hard-line intransigence.

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Bader support

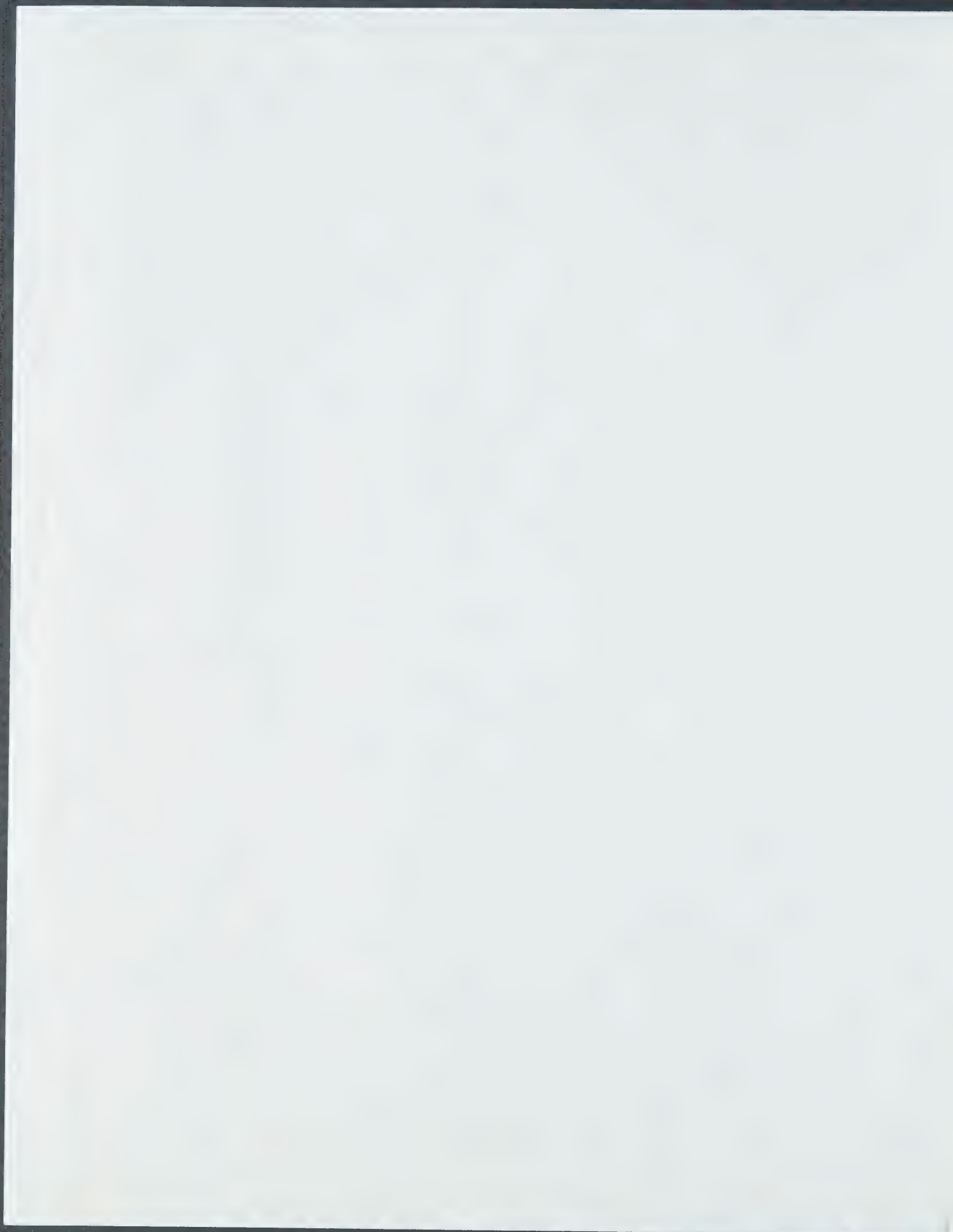
From R. J. H. Clark, Sir William Ramsay Professor and head, department of chemistry and Prof A. G. Davies

Alfred Bader's many friends in British universities will be distressed to read of the circumstances under which Sigma-Aldrich have dispensed with his services (J. Emsley, *Chem. Br.*, 1992, 28, 496). We have all benefited from his generosity, either directly or indirectly, through his endowment of awards in universities and the Royal Society of Chemistry. One only has to work for a few weeks in a country where Sigma-Aldrich does not have a base to appreciate that Bader himself deserves a medal for his services to chemistry. It is particularly sad that this generosity should apparently have led to his expulsion from the company.

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From Dr Dudley H. Williams

The sad end to Alfred Bader's career with Sigma-Aldrich is appropriately summarised in your Talking Point. I can only add that on the basis of the available evidence, Bader appears to have behaved in the civilised and warm manner that has always been evident in our meetings. As for the role of the





*It should be fine once we've
cured the rising damp.*

[With apologies to cartoonist Tom Johnston]

Every time you reach for an Aldrich catalogue or read their *Aldrichimica Acta* and admire the old master on the front cover spare a thought for an old friend of the Mole's: Bexhill-resident **Alfred Bader** and his charming wife **Isabel**. They are currently paying their customary visit to Britain and while they are here they live modestly in their seaside bungalow (municipal tax band C) while touring the country buying the odd castle, Rembrandt painting, and other works of art. Alfred is best known in chemistry circles for his philanthropic gestures towards young chemists and for the company, Aldrich-Sigma which he built up from nothing and from which he was cruelly ousted by a boardroom coup. Despite this Alfred still takes a paternal interest in his old company and finds some of their recent gimmicks rather 'tacky' such as charging \$79 for the catalogue of their Sigma-Aldrich Library of rare chemicals. (Once upon a time it was called the Alfred Bader Library.)

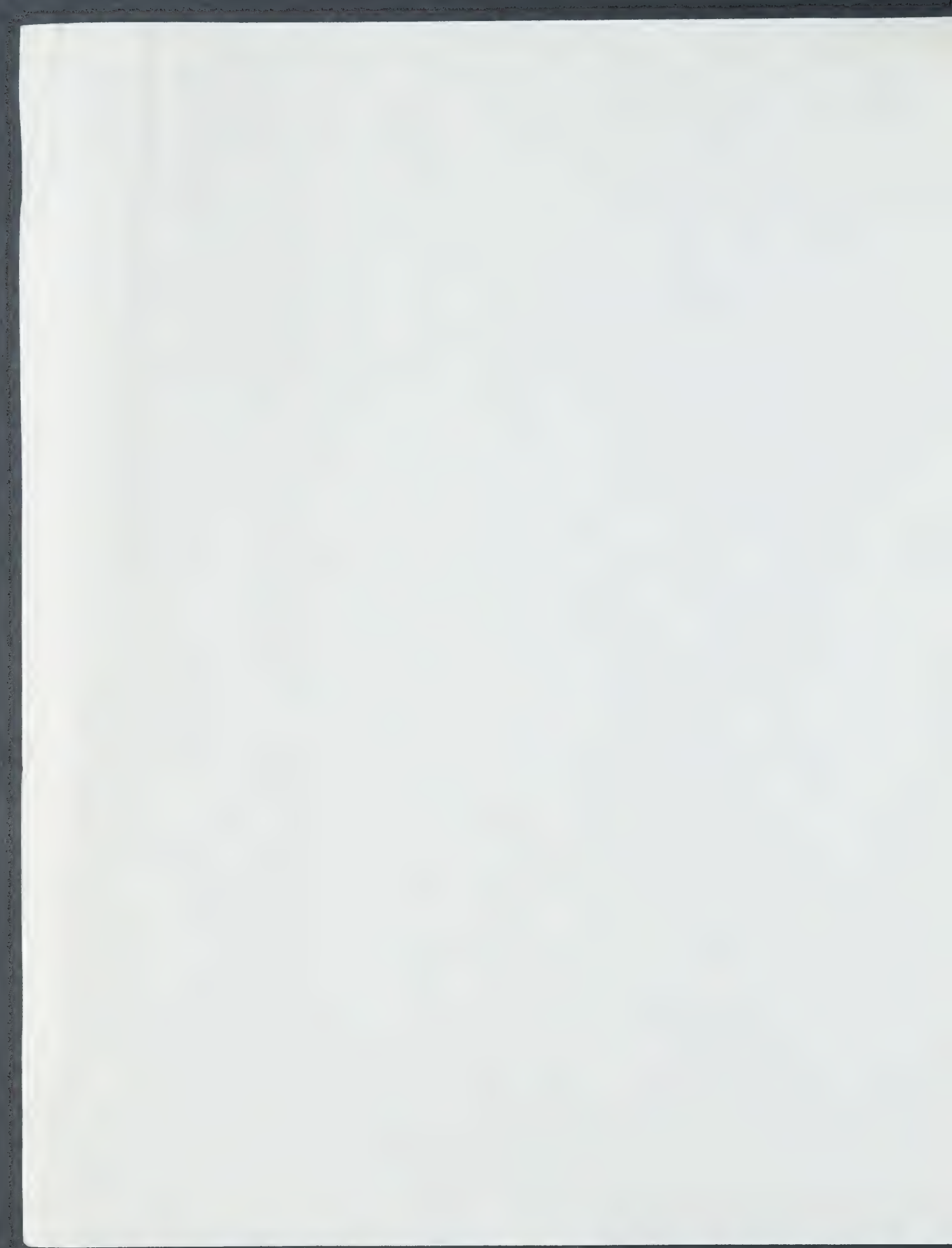
As the Mole was walking up and down the City Road the other day who should he bump into but his old friend and fellow-Northerner **Robert Richardson** looking as though he had just found a fiver and lost a tenner. And in a way he had. The fiver was Robert's prestigious post as Chairman of the Crime Writers' Association, the lost tenner was that

his recent novel *The Hand of Strange Children** had been shortlisted for crime novel of the year but had narrowly missed first prize. "It might have seemed a bit suspicious if I'd won during my chairman's year," said a modest Robert. "Clearly I would never have tried to influence the judges, but people have such suspicious minds," he added as he headed towards King's Cross to catch the train to Boroughbridge in Yorkshire, there to address the local crime buffs. Still you can't win 'em all, and Robert is now writing his eighth novel, which should appear next year. He has just written an original Sherlock Holmes story to be serialised in *The Independent on Sunday* this Christmas. Described by one critic as "sharp, witty and with a sure feel for brooding menace," Robert is being pressed by the Mole to help our recruitment drive - by setting his next murder mystery in the chemistry dept at IC. He has been invited to inspect the staff and choose a suitable victim. Suggestions please to the *CDN* office.

[* Published by Gollancz at £14.99, and a paperback edition will appear in 1994.]

Atten-shun! I bet you didn't know that among our second year undergrads is fair-haired **Patrick Mullin** who regularly trains with Dad's Army at a secret rendez-vous in Kent. Patrick was spotted one day in full battledress abseiling down a multistorey car park in Canterbury. It was while the Mole was getting over the shock, in the *Five Bells* in East Brabourne, that he also learnt about another of Patrick's exploits in defence of Queen and Country. It is at the *Five Bells* that Quest International carries out its selection tests for its sponsored studentships for IC. The final round of these tests includes eating a whole portion of the deadly dessert called death-by-chocolate - on top of a hearty dinner. Of course Patrick passed this test and came to IC, but even he failed to beat the record of ex-IC **David Sandham** who is now doing his postdoc at Colorado State University. David managed to down *two* helpings of this delicious low-calorie confection. Future applicants for Quest studentships please note.

Everywhere you go in the dept these days you fall over Americans. Sometimes you even fall over them sleeping in the street. Which is how the Mole stumbled into fair-haired **Jeff**



The Master buyer of Milwaukee



Dr Alfred Bader in front of Herstmonceux Castle, a recent purchase

A leading American businessman-chemist has become a major force in the Old Master field — reselling one Rembrandt to the Rijksmuseum

BY GERALDINE NORMAN

"I'M BEGINNING to feel itchy," Dr Alfred Bader told me when he called at my flat to be interviewed. "I haven't bought a picture since yesterday." The small American chemist from Milwaukee with spry, ebullient enthusiasm and a heavy briefcase (full of papers relating to his activities as a picture buyer), has bought around 200 paintings a year for the last 30 years. Old Masters are his favourites, especially Dutch and Flemish, but he rarely spends more than \$50,000 a time. Some pictures he keeps, some he sells and some he gives away to museums.

But last year he was ignominiously sacked as unpaid chairman emeritus of the company he founded in 1951 and he now feels free to sell company stock and buy on a more lavish scale. As a result, he is becoming a major force in the Old Master market. His first multi-million indulgences have included a Rembrandt, a Rubens — and a medieval castle.

Last July he spent £4,18m on a Rembrandt portrait of the Renoustrant minister Johannes Uytenboer which Lord Rosebery had sent to Sotheby's, he sold it on to the Rijksmuseum in Amsterdam in December for \$10m. The Dutch press explosively criticised his profit margin, claiming that the museum should have bought the Rembrandt

at Sotheby's for itself. At Christie's sale last December he spent £1,045,000 on a Rubens *Extinction* which he has recently sold at another comfortable profit to the Getty Museum in Malibu, California.

And last Sunday he cut a tricolour ribbon with a sword — three times, for the convenience of press photographers — on the bridge that spans the moat at Herstmonceux Castle in Sussex. "When I first saw Savills' advertisement, I asked my wife if she would like a castle," he told me. "Too many rooms to clean, she replied." Undaunted, Bader got in touch with his old university and asked if they would like one. He has ended up giving Queen's University at Kingston, Ontario, £5m to buy it and do it up. Until five years ago Herstmonceux and its park housed the Royal Greenwich Observatory. Queen's is planning to turn it into a centre for European studies.

Most Americans are bored by art made before about 1870, but Alfred Bader is an American by adoption. His mother was Czech and his father was Hungarian, though he was born in Vienna in 1924 and lived there with his aunt — his father died two weeks after his birth — until Hitler's shadow began to fall across the imperial city. When he was 14 he took advantage of a British

offer to give Jewish children a safe home; he attended East Hill School, then Brighton Technical College. But in 1940 Winston Churchill decided to round up all enemy aliens in the 16-60 age bracket and Bader found himself deported to an internment camp in Canada.

After sitting matriculation exams at the camp, he was accepted by Queen's University where at last he began to feel welcomed and wanted. Bader has been showering the university with presents ever since: scholarships, endowments, more than 100 Old Master paintings and

finally a medieval castle in Sussex home; he attended East Hill School, then Brighton Technical College. But in 1940 Winston Churchill decided to round up all enemy aliens in the 16-60 age bracket and Bader found himself deported to an internment camp in Canada.

In 1951 Bader and a Milwaukee attorney friend founded a company called Aldrich. The first year's sales amounted to \$1,700 with a \$20 profit but Bader was a brilliant chemist and the company prospered. In 1975 he merged with a larger group called Sigma from St Louis and became first president, then chairman of Sigma-Aldrich, whose sales topped \$440m in 1990. He retired and became chairman emeritus in 1991. The cover of the company's catalogue and its quarterly magazine, *Aldrichimica Acta*, always sported an

Old Master from Bader's collection. He parted with the company because of a "call option" he sold in August 1991 on 10,000 Sigma-Aldrich shares he was giving to Queen's University. The board claimed that selling an option amounted to "betting against the company" and sacked him. While Bader was outraged and deeply hurt, he has clearly enjoyed his new freedom to sell shares and play with the money.

He has been officially "dealing" since 1961 when his attorney pointed out that he was making so much money buying and selling pictures





that he had better register for tax purposes. But "Alfred Bader Fine Arts" was run from home until last year. The dealership is now housed in a suite in the Astor Hotel in downtown Milwaukee, near the lake. It handles pictures worth up to \$20,000 or so; local buyers don't often go beyond that. On his big-time deals, Bader works in partnership with the New York dealer Otto Nauman.

Both a dealer and collector Bader's prime interest lies in Biblical

He buys beautiful paintings, then plays art detective

scenes, history paintings and portraits — a broadly unfashionable taste. He discovered the Bible in his retirement camp and has taught Sunday school in Milwaukee for more than 30 years. Beyond that, he looks for what he calls "quality." He buys paintings which have not been securely attributed to any known artist because they are beautiful; he then gets down to work as an art detective to try to find the name of the artist — but is not too concerned if he fails, since he bought the picture for its intrinsic quality.

Bader also loves to buy a dirty picture and clean it, betting that there is something good underneath. Thus the paintings he has given to Queen's University include a hotch-potch of styles and minor names — but they are worth many millions of pounds and teach the viewer a lot about the technical skill of Old Masters.

In the London Old Masters sales in July he spent £11,500 on Philipps on a double portrait attributed to a minor German master active around 1550. Bader believes it is Flemish and dates from around 1560. He left a bid

of £52,000 on an interior by the Rembrandt pupil Peter Verelst which Sotheby's had estimated at £12,000-16,000. He then lost it to Richard Green, the London dealer, who bid £54,000. At Christie's he hoped for a Paul Bri landscape covered with country house dirt from the Wrotham Park collection but was left the underbidder when it sold for £551,500 to Bernheimer, a Munich dealer.

He had similar hopes for a Roman view by Vanvitelli, which he ran to double estimate; but he bowed out and let his competitor have it at £331,500. In the event, he only got one picture at Christie's: *A Young Scholar in his Study* by a Rembrandt pupil called Heyman Dallaeir, which cost him £13,800.

Rembrandt, his contemporaries and his pupils are Bader's consuming passion — this particular pupil was not yet represented in his collection. The first big price he paid at auction was \$39,000 at Sotheby's New York four years ago for a Jan Lievens *Portrait of Rembrandt's Mother*. The first time he paid over a million was for last year's Rembrandt portrait.

In his eyes, this year's greatest coup^h has been the purchase of a portrait of *An elderly bearded Man, Half length* at Christie's in April for around £35,000; it was estimated at £60,000-£80,000 but left unsold. Bader bought it after the sale.

Christie's had attributed the painting "Circle of Rembrandt" and Bader considers it a wonderful picture, perhaps by a very gifted Rembrandt pupil. "I tried to buy it when it was catalogued as a genuine Rembrandt in the Ericsson sale of 1961. I bid up to \$60,000 for it but it made \$180,000," he says. It has recently been rejected by the Rembrandt Research Project, a group of Dutch academics who have tried to sort out what Rembrandt painted and what he did not. "The Rembrandt Research Project is a great benefactor of the private collector," he laughs.

Last year's coup: Bader bought Rembrandt's *Portrait of Johannes Deylingsoort* (above) for £43,800 and sold it to the Rijksmuseum, Amsterdam, for \$39m. He thinks this year's is buying *An elderly bearded Man, Half length* (top right) — not a Rembrandt, but a wonderful picture — for about £35,000

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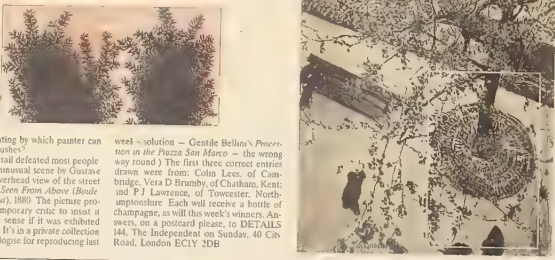
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COMPETITION
DETAILS No 144



IN WHICH painting by which painter can you find these bushes?
Last week's detail deflected most people. It came from an unusual scene by Gustave Courbet, an overhead view of the street called *Bois et Vues From Above (Bois vu de 4 Étages)* (1869). The picture provoked one contemporary critic to insist it would only make sense if it was exhibited on the floor. It's in a private collection in Paris. (We apologise for reproducing last

week's solution — Gentile Bellini's *Procession in the Piazza San Marco* — the wrong way round.) The first three correct entries were from: Colin Lees, of Chatham, Kent; Vera D. Runby, of Tewkesbury, Northamptonshire. Each will receive a bottle of champagne, as will this week's winners. Answers, on a postcard please, to DETAILS 144, The Independent on Sunday, 40 Chin Road, London EC1Y 2DB



INDEX

By ROWLAND MORGAN

- Increase in world population expected by 2000 **1,000,000,000**
- Number of times that 4.1 million miles of baking foil thrown away by Americans every year would wrap round the planet **164**
- Kopecs bought by a US dollar in 1987 **60**
- In mid-1993 **120,000**
- Schedule D tax uncollected and written off in 1982 **£52,763,000**
- In 1992 **£703,422,000**
- Percentage of university professors who are women **3**
- Percentage of UK labour-force's growth to 2006 that will be women **80**
- Households homeless in Manchester in 1979 **3,370**
- In 1992 **14,120**
- British taxpayer support for Indonesia's out-leasing South Sumatra Geological Survey **£2,260,000**
- For Indonesian libraries **£75,000**
- Percentage of university professors who are still single **screen 48**
- Number of Berlin clubs planned to be powered by rapeseed oil **20**
- Wars world-wide per year in the 1950s **12**
- In the 1970s **32**
- In the 1980s **40**
- In 1992 **52**

Sources: UNCED; RMI *British Alcan Massachusetts Department of Environmental Management; Nature; Bid; Treasury; ibid; THE; Dept of Employment (projected); DOE; ibid; Overseas Development Agency; ibid; Common Advertising Association; Mayor of Berlin; Hamburg University; ibid; ibid; ibid.*

CHES

By MARK LEVITT

WOOD GREEN went this year's National Club Championship thanks to an exciting win by Mark Levitt in a game full of surprises from move one.

White: D Collier (British & Ciffen) Black: M Levitt (Wood Green)



- 1. e4** e5
- 2. e4 Nf6
- 3. Ne3 e5 d4 e5 f5 e4 Bg7 e6 Bg6 e6
- 4. Not knowing what to make of his usual smash move, I decided not to castle until he did. I was afraid of an

attack with h4 and h5
7. Nge2 e6 6. 0-0-0-9. Bg5 h6 Bg2 h5
This looks loosening, but I liked the freedom it gave for my pieces
10. d3 e4 h2 Bc4 Nee3 12. Qc1 Na2
13. ... Kf7 is fine, but I thought it better to chase his bishop back to e3 first. Then I noticed that the bishop might have a better move

14. Bd5!

Now I realised that I was in trouble. Then I saw that all the rest of my team seemed to be losing or drawing. There is no time for it. ... Nd5 15. Nd5 Kf7, because 16. Nc7! wins the rook on a8 or knight on a5
17. Ne8 Kf7 Bb8 Nee3 16. Nd5 Bg6 14. ... Bg5 15. Bg5 Nee3 Kf7
My hopes now lay in my opponent's time shortage — he had only 45 minutes left to reach move 40. All the same, if he had now played 19. b3, followed by Qc3 and Ra2, my prospects would have been slim
19. f4? Rb2 20. Bb1 Qh4
My first thought was 20. ... Bc5 21. Nd5 Qb4, but it disrupts this by flicking in 21. b6+! With the piece sacrifice I figured I knew I was back in the game. He must take it since 22. h3 gxf3 22. e5? Bc5 23. Nd5 Qb4+ is very healthy for Black
21. b6? Qb2+ 22. Kf2 b6? 23. Ne3

N6

My main worry was that his king might escape to b1, so when I saw no clear winning plan, I decided to improve the position of my knight and keep an eye on c2 from d4
24. Ke1 Nd4 25. Ne4!
After 25. Kd2! it is difficult for Black. The king is hard to get at on d3
25. ... Qd3+ 26. Rd2! (see diagram)
This is another mistake: fatal. 26. Nf2 is much better. My first thought now was 26. ... Rh4+ 27. Nh1 Rb8h, threatening e4g4, Kc1 and Rh4 mate, but he can defend everything with 28. Nc4! Then I saw how to gain a vital move
28. ... Rb8! 27. Ne3
27. Qd2 would have lost to 27. ... Rh4+ 28. Nh1 Ne2+
27. ... Rh4+ 28. Nh1 Rb8h! 29. Ne2 Rf1+ 30. Kc1 Kd1+ 31. Ng1 Qd3+
My opponent looked up and smiled before making his next move
32. Re2 Qe2 mate.

BRIDGE

By ALAN HIRON

IN TOURNAMENT play a number of pairs use "Strong Club" systems, in which an opening bid of One Club suggests 16 or more points, but has nothing to do with their holding in clubs. Masters go well if the opponents do not intervene, but a drawback occurs when the strong hand ends by defending, for it is then marked with most of the missing high cards

Game 411: Dealer East

North		East	
♠ 2		♠ A K Q J 3	
♥ 5 7		♥ K 5 4	
♦ A K J 7 6		♦ Q 5	
♣ Q 5			
West		South	
♠ 9 8 7		♠ 6 5	
♥ A 2		♥ A Q J 10	
♦ ♠ 6 4 3		♦ K 7	

East, following his announced method, opened One Club and South overcalled with One Heart After a pass by West, North raised to game and West led the nine of spades against Four Hearts

East did his best when he won with the queen and followed with two more rounds of spades, forcing diamond to ruff. He could judge that his partner held very little and at least, by declaring dummy in this way, he made it impossible for declarer to establish dummy's diamonds with one of the clubs. He led the table with the third round of trumps

It was a good try, but unfortunately declarer won this three of diamonds. Declarer ruff the position the third spade on the table, he led a club to his hand and followed with five of diamonds. He led the table with the third round of trumps

East, anticipating a throw-in if he bared his ace of spades, nonchalantly discarded his last two spades and this three of diamonds. Declarer ruff the position accurately, however, and played off dummy's top diamonds with one of the clubs. A card which had been marked after his revealing opening bid was just in time — if East had been able to open with a perfection One Spade, declarer might easily have taken a losing diamond finesse

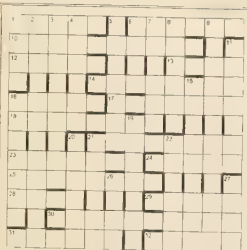
BEELZEBUB PRIZE CROSSWORD No 182

ACROSS

- 1 Training priest has the ultimate in energy, very rarely (5)
- 6 Odds on contemporary people having to get married (6)
- 10 Exposure to sun needed before a crop in its ruined (6)
- 12 Post's design in silent death (5)
- 13 Two minutes, say, in Mastermind (4)
- 14 With sun getting right in cows keep scratching in Down (6)
- 16 Fish bearing soft roe (5)
- 17 It has a star + a cut and a certain way (7)
- 18 Ancient grief to bare in new form for Holy Week services (8)
- 21 Where barrel is put, even now, to mar (8)
- 23 Club turns in which one performing is wild youngster (7, hyphenated)
- 24 Wolf, say, will be around nest of pheasants (5)
- 25 Daring lay-off, legal chair's put as a clever way (x)
- 28 Row that is apparent in curbed transactions (4)
- 29 Home abroad has revolutionary general issue facility (5)
- 30 Criminal of the French Connection disappeared, we're told (10)
- 31 Little space to put weight on? That leaves a memory trace! (6)
- 32 Bumping Beelzebub's concealed a letter! (5)

DOWN

- 1 It's gone since being in training (4)
- 2 Each insect quickly did — record male going before midday! (12)
- 3 Knotted rope for lassoing birds, right for grabber (9)
- 4 Get corn and milk mixture down? Not to be contained! (6)
- 5 Light carriage bearing someone unknown, vehicle with rubbish exterior (7, hyphenated)
- 6 Activity I observed on board steamer (4)
- 7 Operating illegally results in chaos, to a degree (6)
- 8 Given assignment, many sport (14)
- 9 They are used on hair in sport clubs (12, hyphenated)
- 11 Artist appears outside for hanging, having produced a dash? (7)
- 15 Meat gets can become well-trimmed shapes (9)
- 16 Stately composition displaying a persistent method of writing (7)
- 18 Top quality pancakes that are filled with dash! (7)
- 20 One making you more urbane around beginning of night? (6)
- 21 Black after, but in religion, order is blue (Downs) (6)
- 22 What's spoken in religious order is futile, in a wall way (6)
- 25 It's briefly on edge, in balance (4)
- 27 Dead old type, half missing, is decaying tube number (4)



ACROSS
1. PRIEST 2. BUTTERFLY 3. BEE 4. BEEHIVE 5. WOLF 6. MARRIAGE 7. COW 8. BARRICADE 9. HAT 10. SUNBURN 11. HANGING 12. POST 13. MINUTE 14. SCRATCHING 15. MESS 16. FISH 17. STAR 18. BEREAVEMENT 19. BARREL 20. MESS 21. CLUB 22. MESS 23. CLUB 24. WOLF 25. DARING 26. WOLF 27. WOLF

DOWN
1. BEE 2. BUTTERFLY 3. BEE 4. BEEHIVE 5. WOLF 6. MARRIAGE 7. COW 8. BARRICADE 9. HAT 10. SUNBURN 11. HANGING 12. POST 13. MINUTE 14. SCRATCHING 15. MESS 16. FISH 17. STAR 18. BEREAVEMENT 19. BARREL 20. MESS 21. CLUB 22. MESS 23. CLUB 24. WOLF 25. DARING 26. WOLF 27. WOLF

Winners of Beelzebub Crossword No 179: John Warker, Newcastle-Upon-Tyne; M. P. Westwood, Asea Baines, Hazley; Don Fyfe, Wickham; Ken Kelly; P. L. M. J. Cronin, Newcastle; D. M. Howard, Sutton-on-Sea

ETCETERA

COMPETITION

DETAILS No 144



IN WHICH painting by which painter can you find these bushes?

Last week's detail deflected most people from an unusual scene by Gustave Caillebotte, an overhead view of the street called *Road and Seen From Above (Boulevard Va d'En Haut)*, 1880. The picture provoked one contemporary critic to insist it would only make sense if it was exhibited by on the floor. It's in a private collection in Paris. (We apologise for reproducing last

week's solution — Gentile Bellini's *Procession in the Piazza San Marco* — the wrong way round.) The first three correct entries drawn were from Colin Lees, of Cambridge; Vera D Brumby, of Chatham, Kent and P J Lawrence, of Towcester, Northamptonshire. Each will receive a bottle of champagne, as will this week's winners. Answers, on a postcard please, to DETAILS 144, The Independent, on Sunday, 40 City Road, London EC1Y 2DB



CHESS

By MARK LEVITT

WOOD GREEN won this year's National Club Championship thanks to an exciting win by Mark Levitt, in a game full of surprises from move one

White: D Collier (Bristol & Clifton) Black: M Levitt (Wood Green)



1. d4 d6

A player should not be surprised by his own first move, but this one shocked me. I mean to open 1. d4 Nf6 2. c4 d6, but got ahead of myself.

2. c4 Nf6

I was relieved to be back on course. 3. Nc3 e5 d5 g6 5. e4 Bg7 6. Bxb3 e5

Not knowing what to make of his unusual sixth move, I decided not to castle until he did. I was afraid of an

attack with B4 and b5

7. Nge2 a6 8. 0-0 0-0 9. Bg5 h6 10. Bd2 b7

This looks loose, but I filled the freedom it gave for my pieces. 11. d4 dxc3 12. Bxc4 Nxc3 13. Qc1 Nc5?

13... Kf7 is fine, but I thought at first to chase his bishop back to d3 better. Then I noticed that the bishop might have a better move

14. Bd5?

Now I realised that I was in trouble. Then I saw that all the rest of my team seemed to be losing or drawing. There is no time for 14... Nc6 15. Nxd5 16. Nxd5

14... Rb8 15. Bxb6 Nxd6 16. Nxd6 Bc7 17. Nc3 Kf7 18. Bg7 Kc6?

My hopes now lay in my opponent's time shortage — he had only 45 minutes left to reach move 40. All the same, if he had now played 15. f6, followed by Qc3 and Rxd1, my prospects would have been slim.

19. Rf7! Rxd1 20. f5 Qh4?

My first thought was 20... Bxd5 21. Nxd5 Qh4, but he disrupts this by queening in 21... f6 + 1. With the piece sacrifice played I knew I was back in the game. He must take it since 21... h5 g6?

22. exf5 Bxd5 23. Nxd5 Qh4 + is very healthy for Black. 24. f6e6 Qh2 + 22. Kf7 f6e6 23. Ne3

Ne6

My main worry was that his king might escape to b1, so when I saw no clear winning plan, I decided to improve the position of my knight and keep an eye on c2 from d4.

24. Ke1 Na25. Nc4! After 24. Nf7 it is difficult for Black. The king is hard to get on at d3 25... Qd4 + 26. Bc2? (see diagram)

And this mistake is fatal. 26. Nc2 is unclear. My first thought now was 26... Rf1 + 27. Nf1 Bb8, threatening Rf1 + and Rf1 mate, but he can defend everything with 28. Nc3

Then I saw how to gain a vital move. 26... Rb6! 27. Nc3

27. Qc2 would have lost to 27... Rf1 + 28. Nf1 Nc2 + 27... Rf1 + 28. Nf1 Rcb2 29. Ne2 Rf1 + 30. Ke1 Rf1 + 31. Ng1 Qd4 + before making his next move

32. Re2 Qe2, mate.

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- In 1992: 52

Sources: UNCED, RMI, British Alcan Massachusetts Department of Environmental Management, Nature, Debt, Treasury, Ibad, THESE, Dept of Employment protection, D&E, Ibad, Overseas Development Agency, Ibad, Cinema Advertising Association, Mayor of Berlin, Hamburg University, Ibad, Ibad, Ibad.

BRIDGE

By ALAN HIRON

IN TOURNAMENT play a number of pairs use "Strong Club" systems, in which an opening bid of One Club suggests 16 or more points, but has nothing to do with their holding in clubs. Matters go so far that the opponents do not intervene, but a drawback occurs when the strong hand ends by defending, for it is then marked with most of the missing high cards

BEEZLEBUB PRIZE CROSSWORD No 182

ACROSS

- 1 Training priest has the ultimate in energy, being very lively (5)
- 2 Cudd on contemptible people having to get married (6)
- 30 Exposure to sun needed before a crop of it's named (10)
- 12 Poet's disgrace in silent death (5)
- 13 Two minutes, say, in Mastermind! (4)
- 14 With sun getting right in cows keep scratching in Devon (8)
- 16 Fish bearing soft rose (5)
- 17 If there's a star i + when cut a certain way (7)
- 18 Ancient gift to be in a new form for Holy Week service (6)
- 21 Where barrel is put, even now, to mature (8)
- 23 Club turns in those one performing is wild youngster (7, hyphenated)
- 24 Wolf, say, will be around nest of pheasant (5)
- 25 During lay-off, legal claim's put in a clever way (8)
- 26 Row that is apparent in curtailed transactions (4)
- 29 Home abroad his revolutionary general rose facility (5)
- 30 Criminal of the French Connection disappeared, we're told (10)
- 31 Little space to put weight on? That leaves a memory trace! (6)
- 32 Bouncing Beelzebub's concealed a letter! (5)

DOWN

- 1 It's gone since being in tramping (4)
- 2 Such insects quickly die — record made going before mummy! (12)
- 3 Knotted rope for lassoing buck, right for grabber (9)
- 4 Get corn and milk, mature down? Not to be consumed! (6)
- 5 Light carriage bearing someone unknown, vehicle with rubbish exterior (7, hyphenated)
- 6 Actively I observed on board steamer (4)
- 7 Operating illegally results in chaos, to a degree (6)
- 8 Given assignment, many spread (6)
- 9 They are used on hair in sport clubs (12, hyphenated)
- 10 Artist appears outside for hanging having produced a dub (7)
- 15 Near pairs can become well-trimmed shapes (9)
- 16 Stately composition displaying a persistent method of writing (7)
- 17 Top quality panakes that are filled with skill (7)
- 20 One making you more irritable around beginning of night! (6)
- 21 Black after bit of sun, it generally has blue flowers (6)
- 22 What's spoken in religious order is fiddle, in a small way (6)
- 23 It's briefly on edge, in balance (4)
- 27 Dead end type, half missing, is decay ing like timber (4)



ACROSS
1 GARDEN
2 GARDEN
3 GARDEN
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5 GARDEN
6 GARDEN
7 GARDEN
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DOWN
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32 GARDEN

Winners of Beelzebub competition for 1979: Julian Worster, Newcas-le-Walk, Co. Down; Martin, Ann Nelson, Kilsby, Don Roberts-Williams, Kilsby; P L & M J Croxall, Newcastle; D M Howard, Sutton on Sea

Game all; dealer East

North
♠ 2
♥ K 5 4
♦ A K J 7 6
♣ Q 8 5

West
♠ 8 7
♥ 7 2
♦ 9 5 2
♣ 10 4 3

East
♠ A K Q J 3
♥ 8
♦ Q J 10 3
♣ A 10

South
♠ A 5
♥ A Q J 10
♦ 4
♣ K 7 2

East, following his announced method, opened One Club, and South followed with One Heart. After a pass by West, North raised to game and West led the nine of spades against Four Hearts.

East did his best when he won with the queen and followed with two more rounds of spades, forcing dummy to ruff. He could judge that his partner held very little and as it was a long, long dummy in this way, he made it impossible for declarer to establish dummy's diamonds with one ruff and reach the table with the third round of trumps.

It was a good try, but unfortunately declarer was also well aware that West held nothing. After ruffing the third spade on the table, he led a club to his king and followed with five rounds of trumps.

East anticipated this and followed with a game of clubs, nonchalantly discarded his last two spades and the three of diamonds. Declarer read the position accurately, however, and put ruff and discard to diamonds to drop East's queen — a card with which he was marked after his revealing opening bid.

Just then, if East had been dealt an opening with a pedestrian One Spade, declarer might easily have taken a long diamond finesse.



Last year's coup: Bader bought Rembrandt's *Portrait of Johannes Uytenbogaert* (above) for \$4.8 million and sold it to the Rijksmuseum, Amsterdam, for \$10 million. He thinks this year's is buying an elderly bearded man, *Half length top right* — not a Rembrandt, but a wonderful picture — for about \$25,000.

that he had better register for tax purposes. But "Alfred Bader Fine Arts" was run from home until last year. The dealership is now housed in a suite in the Astor Hotel in downtown Milwaukee, near the lake. It handles pictures worth up to \$20,000 or so; local buyers don't often go beyond that. On his big-time deals, Bader works in partnership with the New York dealer Otto Nausman.

Both a dealer and collector Bader's prime interest lies in Biblical

He buys beautiful paintings, then plays art detective

scenes, history paintings and portraits — a broadly unrefined taste, he discovered the Bible in his internment camp and has taught Sunday school in Milwaukee for more than 30 years. Beyond that, he looks for what he calls "quality." He buys paintings which, have not been securely attributed to any known artist because they are beautiful, he then gets down to work as an art detective to try to find the name of the artist — but is not too concerned if he fails, since he bought the picture for its intrinsic quality.

Bader also loves to buy a dirty picture and clean it, betting that there is something good underneath. Thus the paintings he has given to Queen's University include a hotch-potch of styles and minor names — but they are worth many millions of pounds and teach the viewer a lot about the technical skill of Old Masters.

In the London Old Master sales in July he spent \$1,500 at Phillips on a double portrait attributed to a minor German master active around 1550. Bader believes it is Flemish and dates from around 1500. He left a bid

of \$2,000 on an interior by the Rembrandt pupil Peter Verelst which Sotheby's had estimated at \$2,000-\$16,000. He then lost it to Richard Green, the London dealer, who bid \$54,000. At Christie's, he hoped for a Paul Brill landscape covered with country house dirt found in the Wrotham Park collection but was left the underbidder when it sold for \$251,500 to Bernheimer, a Munich dealer.

He had similar hopes for a Roman view by Vanvitelli, which he ran to double estimate, but he bowed out and let his competitor have it at \$31,500. In the event, he only got one picture at Christie's, *A Young Scholar in his Study* by a Rembrandt pupil called Heyman Dullaert, which cost him \$13,800.

Rembrandt, his contemporaries and his pupils are Bader's consuming passion — this particular pupil was not yet represented in his collection. The first big price he paid at auction was \$319,000 at Sotheby's New York four years ago for a Jan Lievens *Portrait of Rembrandt's Mother*. The first time he paid over a million was for his year's Rembrandt portrait.

In his eyes, this year's greatest "coup" has been the purchase of a portrait of *An elderly bearded man, Half length at Christ's* in April for around \$35,000; it was estimated at \$60,000-\$80,000 but left unsold. Bader bought it after the sale.

Christie's had attributed the painting "Circle of Rembrandt" and Bader considers it a wonderful picture, perhaps by a very gifted Rembrandt pupil. "I tried to buy it when it was catalogued as a genuine Rembrandt in the Erickson sale of 1991. I bid up to \$60,000 for it but it made \$70,000," he says. It has recently been re-attributed by the Rembrandt Research Project, a group of Dutch academics who have tried to sort out what Rembrandt painted and what he did not. "The Rembrandt Research Project is a great benefactor of the private collector," he laughs. □

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The Master buyer of Milwaukee



Dr Alfred Bader in front of Herstmonceux Castle, a recent purchase

A leading American businessman-chemist has become a major force in the Old Master field — reselling one Rembrandt to the Rijksmuseum

BY GERALDINE NORMAN

"I'M BEGINNING to feel itchy," Dr Alfred Bader told me when he called at my flat to be interviewed. "I haven't bought a picture since yesterday." The small American chemist from Milwaukee with specs, ebullient enthusiasm and a heavy briefcase (full of papers relating to his activities as a picture buyer), has bought around 200 paintings a year for the last 30 years. Old Masters are his favourites, especially Dutch and Flemish, but he rarely spends more than \$50,000 a time. Some pictures he keeps, some he sells and some he gives away to museums.

But last year he was ignominiously sacked as unpaid chairman emeritus of the company he founded in 1951 and he now feels free to sell company stock and buy on a more lavish scale. As a result, he is becoming a major force in the Old Master market. His first multi-million indulgences have included a Rembrandt, a Rubens — and a medieval castle.

Last July he spent £4.18m on a Rembrandt portrait of the Remonstrant minister Johannes Uytenboogaert which Lord Rosebery had sent to Sotheby's; he sold it on to the Rijksmuseum in Amsterdam in December for \$10m. The Dutch press explosively criticised his profit margin, claiming that the museum should have bought the Rembrandt

at Sotheby's for itself. At Christie's sale last December he spent £1,045,000 on a Rubens *Entombment* which he has recently sold at another comfortable profit to the Getty Museum in Malibu, California.

And last Sunday he cut a tricolour ribbon with a sword — three times, for the convenience of press photographers — on the bridge that spans the moat at Herstmonceux Castle in Sussex. "When I first saw Savills' advertisement, I asked my wife if she would like a castle," he told me. "Too many rooms to clean, she replied." Undaunted, Bader got in touch with his old university and asked if they would like one. He has ended up giving Queen's University at Kingston, Ontario, £6m to buy it and do it up. Until five years ago Herstmonceux and its park housed the Royal Greenwich Observatory. Queen's is planning to turn it into a centre for European studies.

Most Americans are bored by art made before about 1870, but Alfred Bader is an American by adoption, not by birth. His father was Czech and his mother Hungarian, though he was born in Vienna in 1924 and lived there with his aunt — his father died two weeks after his birth — until Hitler's shadow began to fall across the imperial city. When he was 14 he took advantage of a British



offer to give Jewish children a safe home; he attended East Hove School, then Brighton Technical College. But in 1940 Winston Churchill decided to round up all enemy aliens in the 16-60 age bracket and Bader found himself deported to an internment camp in Canada.

After sitting matriculation exams at the camp, he was accepted by Queen's University where at last he began to feel welcomed and wanted. Bader has been showering the university with presents ever since: scholarships, endowments, more than 100 Old Master paintings and

finally a medieval castle in Sussex.

In 1951 Bader and a Milwaukee attorney friend founded a company called Aldrich. The first year's sales amounted to \$1,705 with a \$20 profit, but Bader was a brilliant chemist and the company prospered. In 1975 he merged with a larger group called Sigma from St Louis and became first president, then chairman of Sigma-Aldrich, whose sales topped \$440m in 1990. He retired and became chairman emeritus in 1991. The cover of the company's catalogue and its quarterly magazine, *Aldrichimica Acta*, always sported an

Old Master from Bader's collection.

He parted with the company because of a "call option" he sold in August 1991 on 10,000 Sigma-Aldrich shares he was giving to Queen's University. The board claimed that selling an option amounted to "betting against the company" and sacked him. While Bader was outraged and deeply hurt, he has clearly enjoyed his new freedom to sell shares and play with the money.

He has been officially "dealing" since 1961 when his attorney pointed out that he was making so much money buying and selling pictures

OLD MASTER



that he had better register for tax purposes. But "Alfred Bader Fine Arts" was run from home until last year. The dealership is now housed in a suite in the Astor Hotel in downtown Milwaukee, near the lake. It handles pictures worth up to \$20,000 or so; local buyers don't often go beyond that. On his big-time deals, Bader works in partnership with the New York dealer Otto Nauman.

Both as dealer and collector Bader's prime interest lies in Biblical

He buys beautiful paintings, then plays art detective

scenes, history paintings and portraits — a broadly unfashionable taste: he discovered the Bible in his internment camp and has taught Sunday school in Milwaukee for more than 30 years. Beyond that, he looks for what he calls "quality". He buys paintings which have not been securely attributed to any known artist because they are beautiful; he then gets down to work as an art detective to try to find the name of the artist — but is not too concerned if he fails, since he bought the picture for its intrinsic quality.

Bader also loves to buy a dirty picture and clean it, betting that there is something good underneath. Thus the paintings he has given to Queen's University include a hotch-potch of styles and minor names — but they are worth many millions of pounds and teach the viewer a lot about the technical skill of Old Masters.

In the London Old Master sales in July he spent £11,500 at Phillips on a double portrait attributed to a minor German master active around 1550; Bader believes it is Flemish and dates from around 1500. He left a bid

of £52,000 on an interior by the Rembrandt pupil Peter Verelst which Sotheby's had estimated at £12,000-£16,000. He then lost it to Richard Green, the London dealer, who bid £54,000. At Christie's he hoped for a Paul Brill landscape covered with country house dirt from the Wrotham Park collection but was left the underbidder when it sold for £551,500 to Bernheimer, a Munich dealer.

He had similar hopes for a Roman view by Vanvitelli, which he ran to double estimate; but he bowed out and let his competitor have it at £331,500. In the event, he only got one picture at Christie's, *A Young Scholar in his Study* by a Rembrandt pupil called Heyman Dullaert, which cost him £13,800.

Rembrandt, his contemporaries and his pupils are Bader's consuming passion — this particular pupil was not yet represented in his collection. The first big price he paid at auction was \$319,000 at Sotheby's New York four years ago for a Jan Lievens *Portrait of Rembrandt's Mother*. The first time he paid over a million was for last year's Rembrandt portrait.

In his eyes, this year's greatest "coup" has been the purchase of a portrait of *An elderly bearded Man, Half length* at Christie's in April for around £35,000; it was estimated at £60,000-£80,000 but left unsold. Bader bought it after the sale.

Christie's had attributed the painting "Circle of Rembrandt" and Bader considers it a wonderful picture, perhaps by a very gifted Rembrandt pupil. "I tried to buy it when it was catalogued as a genuine Rembrandt in the Erickson sale of 1961. I bid up to \$60,000 for it but it made \$180,000," he says. It has recently been rejected by the Rembrandt Research Project, a group of Dutch academics who have tried to sort out what Rembrandt painted and what he did not. "The Rembrandt Research Project is a great benefactor of the private collector," he laughs. □

Last year's coup: Bader bought Rembrandt's *Portrait of Johannes Uytenbogaert* (above) for £4.18m and sold it to the Rijksmuseum, Amsterdam, for \$10m. He thinks this year's is buying *An elderly bearded Man, Half length* (top right) — not a Rembrandt, but a wonderful picture — for about £35,000

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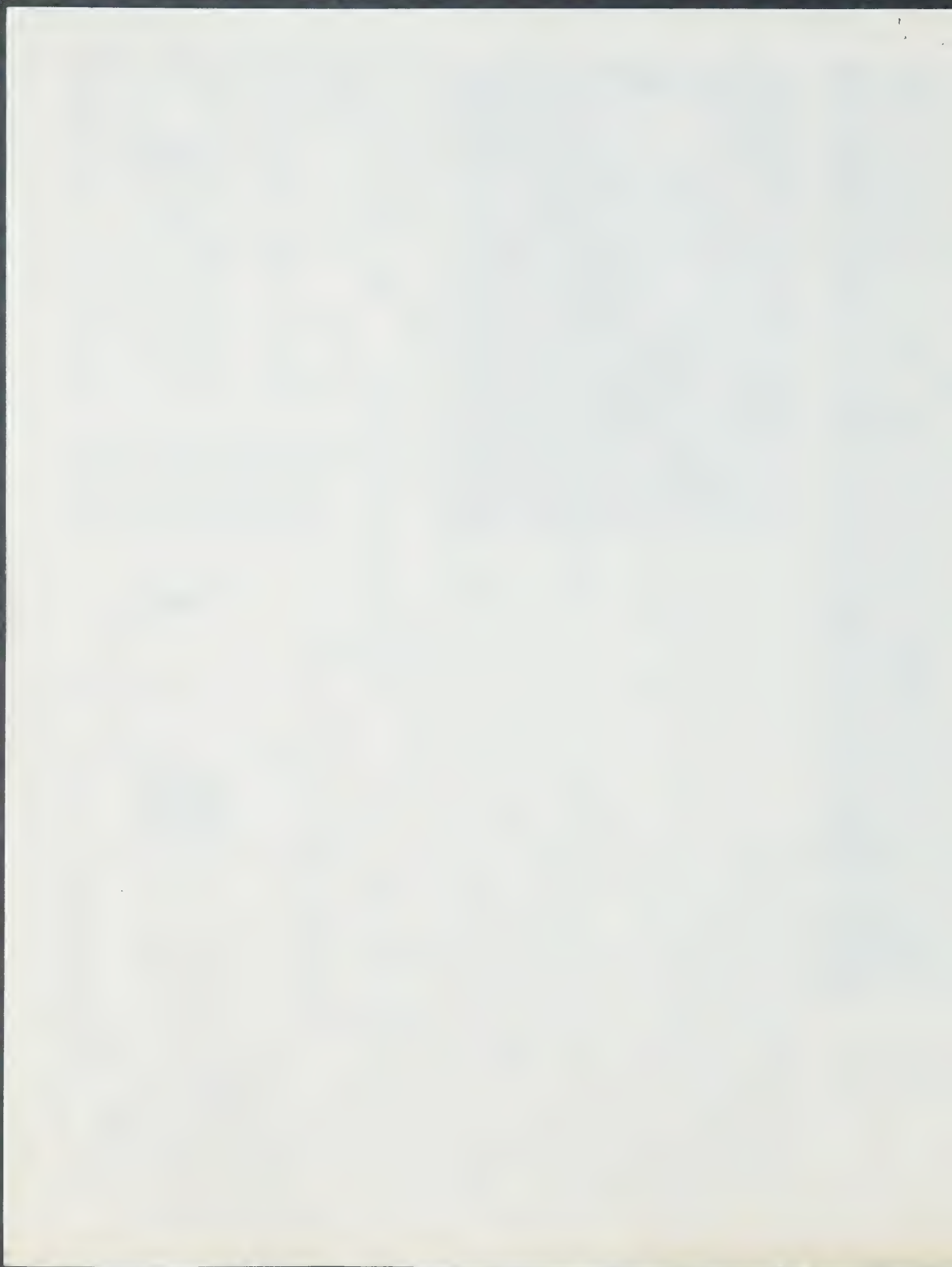
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Portrait of a connoisseur chemist

'Millionaire philanthropist' is a journalistic cliché, but it accurately describes Alfred Bader, one of the best-loved figures in the chemical community. His is a classic rags-to-riches story—or, rather, riches-to-rags-to-riches. It is also the story of a Jewish boy who escaped the turmoil of 1930s' Central Europe and started a new life in the New World.

Bader was born in Vienna in 1924, the son of a Jewish father of Czech origin, while his mother was the daughter of an ancient family of Catholic Hungarian counts. His mother's family had practically disowned her when she married, but a fortnight after Alfred was born his father died and his mother allowed her husband's sister, a wealthy widow, to adopt the baby.

The boy grew up in Vienna, just a few houses from where his later hero Loschmidt had been a schoolteacher in the 19th century. He went to the local schools, where another future chemist, Carl Djerassi, was a year ahead of him. But life was getting harder: by the late 1930s his aunt's fortune had been eaten away by inflation and poor investments, and she was penniless. At 14 Alfred was dealing in stamps to make money for food. Worse still, the rise of the Nazis threatened war and genocide.

After the anti-Jewish demonstrations of *Kristallnacht* in November 1938, the British government offered 10 000 entry visas to Jewish children who had no relatives outside Austria and Germany. Bader's adoptive mother put him on the list and he was among the first boatload to arrive.

He ended up in Hove, Sussex, where an old lady paid for a local family to give him

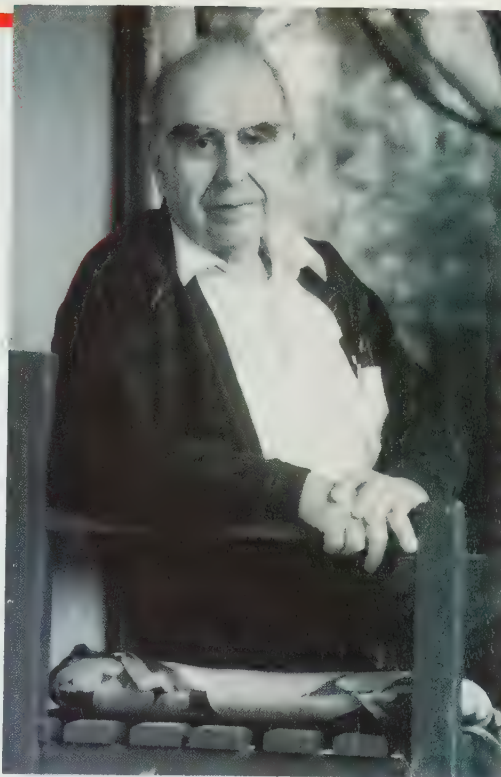
board and lodging. He went to East Hove Senior School for Boys, down by the gasworks, and despite his initially rudimentary English he was placed in the A stream and was even made a prefect—'my first honour', he recalls. From there he went on to Brighton Technical College.

A prisoner of sorts

But with the fall of France in May 1940 the government became worried about possible spies among the refugees who had fled Nazi Europe, and so rounded them up into internment camps. 'In point of fact', Bader says, 'I don't think that a single one of them turned out to be a Nazi fifth columnist, though one of them, Klaus Fuchs, became a real spy for the Soviet Union'. Despite his youth, Bader was included in the round up and after sojourns in camps at Huyton and on the Isle of Man he was shipped to Canada (narrowly missing being sunk by U-boats). There the internees were kept in a disused fort on the US border.

Despite the primitive conditions and the attitude of their Canadian guards, who at first genuinely believed that they were spies who had parachuted into England, the Jewish internees were well treated. Young Bader attended a camp school set up by some of the academics. The student internees took the matriculation exams for McGill University and did well.

Once again Bader benefited from the



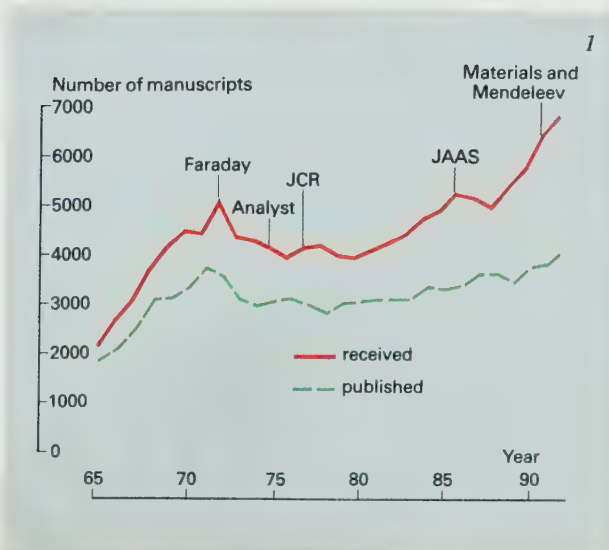
Fred Langenhagen/Wirtschafts Woche

spontaneous kindness of somebody he had never met. A social worker got word about the boy to a neighbour who happened to be the son of his benefactress in Hove. This man offered to take the boy in, so Bader was one of the first internees to be released. Immediately he applied to McGill—and it turned him down. So did the University of Toronto. But Queen's University, in Kingston, Ontario, accepted him.

'Queen's was the first place I was treated as an equal', Bader says; it explains his legendary generosity to the university. Queen's was a small and somewhat elitist university at the time—it has a reputation for turning out future cabinet ministers—but it was a very tolerant place.

Bader read engineering chemistry and in his summer vacations he worked at the Murphy Paint Co in Montreal, formulating

continued overleaf



Corrigenda: Due to an error at the typesetters, Figs 1 and 2 of the Talking Point Journals: *the heart of the RSC* (*Chem. Br.*, 1993, 29, 843) appeared without axes or legends. The corrected figures appear below. In addition, Professor Monty Frey is chairman of the RSC Journals Management Committee and not as printed.

Fig 1. Total manuscripts received and published 1965-92.
Fig 2. Overall rejection rates 1977-92.



lacquers, varnishes and paints. Upon graduation the company offered him a permanent job. 'It was a super job, and lucky timing, because vinyl finishes had just been developed'. This meant that paintmakers could offer enamels with previously unheard-of baking schedules. Bader would visit the customers with the salesmen, listen to their needs, and go back and formulate something for them. It taught him to listen to the customer.

He both worked hard and 'had a ball', so he was surprised to be called in by the president, Harry Thorpe, and asked to leave. He protested, and Thorpe said that although every salesman wanted him, 'think what you could do with a PhD'. 'This was complete nonsense, of course', Bader says, but the company gave him \$1800 to get his PhD and then come back. First he went to Queen's for a year to get an MSc, then he applied to what he considered the two best graduate schools: Harvard and ETH Zurich. Both accepted him, but Harvard offered a fellowship and some part time teaching, so that was where he went.

His supervisor was Louis Fieser (of 'Fieser and Fieser' textbook fame), but he hardly ever saw him. 'On a Saturday morning he gave me a problem: "This hydroxyquinone gives—as every hydroxyquinone does—a deep red solution in alkali. But let it stand overnight and it turns yellow. Find out what happens"'. A year and a half later he came into my lab and said "Alfred, how's that problem?" I said that I thought I'd solved it. "Good. Give a seminar"'. But the lack of supervision did not matter. Bader was surrounded by brilliant young researchers like Robert Woodward and Gilbert Stork, who were always prepared to help and became close friends.

The million dollar patent

Bader got his PhD in two years and was offered an academic post at New Brunswick, but he felt an obligation to return to his employer. By now Murphy

Paint had been taken over by the Pittsburgh Plate Glass Co (PPG) and all the paint research was concentrated in Milwaukee. That city has been Bader's main home ever since.

PPG's so-called research department was mainly a paint formulation lab at the time, but Bader was encouraged to strike out on his own projects. He felt that the key was to make new monomers from cheap starting materials such as phenol and dienes. The literature suggested that this would not work, but Bader studied the simple cases of phenol, butadiene, isoprene and cyclopentadiene and found that by controlling the catalyst he could make them work. PPG used the monomers and Bader moved on to look at reactions such as laevulinic acid with phenol, which worked very well indeed. 'We took out a patent and I published it as a note in *J. Am. Chem. Soc.* One day the director of research told me that Johnson Wax wanted to buy the patent, and asked how much he should ask for it. I said "This was two days' work. If you get \$10000 you'll be amply paid. But, if they really want it—ask for a million and see what happens"'. Johnson Wax really did want it and PPG got its \$1m.

Taking on the big boys

Although his research was going well, Bader was not satisfied. He suggested that he could use his lab's spare capacity to make small quantities of research chemicals for sale. The director of research said 'Alfred, it won't fly. Nobody, absolutely nobody, can compete with Eastman Kodak'. Nevertheless he let Bader start his own little company, working evenings and weekends.

'A friend of mine, an attorney named Jack Eisendrath, knew how to set up companies. We each put in \$250 capital and we tossed for the name. I lost. He was engaged to a charming Quaker girl from Philadelphia, Betty Aldrich, and so it was named the Aldrich Chemical Company. Our first

catalogue was one sheet with one compound: methylnitrosanitroguanidine. It happened to be just about the most carcinogenic compound there is, but we didn't know it at the time—for some years every student in organic chemistry at Harvard made it! Years later a doctor doing research on the effects of nitrosamines approached Bader and asked him to take a medical. Five years later he followed it up again. He could not understand why Bader and the people at Eastman Kodak who had made batches of similar nitrosamines were still so well. 'I said, "Doctor, that's your problem"'.'

At first Aldrich was a purely part time operation. Sales rose: \$5400 in year two; \$15000 in year three. Then PPG moved the research laboratories to Pittsburgh. Bader did not want to move, so he struck out on his own, doing some part time teaching to supplement his income. But the business continued to grow.

Building strong bonds

Early on he devised a method of working that he maintained until last year. Reasoning that '90 per cent of the best academic research in the world is done in 10 per cent of the universities', he began touring the top research universities in North America and Europe. He would learn about the new compounds they were making, and what they needed, and every evening he wrote a long report to his colleagues in Milwaukee describing his findings. Sometimes researchers would show him manuscripts they had submitted for publication and he would try to ensure that the new compounds were available as soon as they were published—sometimes Aldrich was able to take an advertisement in the same issue.

He became a familiar figure in chemistry departments, getting to know people personally, following their careers. He would talk to the research students: 'Gilbert Stork's students would all be on the sixth floor of Chandler at Columbia University;

Sir Roger Fiennes obtained a licence to build a castle at his manor of Herstmonceux in 1441. The castle was restored in the early 20th century and housed the Royal Greenwich Observatory until 1987. The Baders' gift has allowed Queen's University to buy it as a European campus. (Photo courtesy of Savills.)



two years later they would be postdocs at the ETH, say, and I would see them there, and two years further on they would be assistant professors at somewhere like the University of Iowa. It was these links that helped us to get new compounds'.

Supplier to stockroom

Nor did he neglect to cultivate the stockroom managers, who actually bought the chemicals and were invaluable contacts. 'Sure, I slept in a different bed each night, but so what? We went to the major universities—you can't be everywhere. But you established personal relationships. You can say that (a) it's an ego trip and (b) it's selfish because it helps the company with new products, but it's also such a pure pleasure and such fine give and take'.

Bader built up similarly close relations with Aldrich's suppliers. In the early days particularly, the company's production capacity was small and it bought in 95 per cent of its products (today it has a 500 acre site and makes 40 per cent of its own products, some on tonnage scales). Bader built links with smaller, specialist suppliers, many of them in the UK—Aldrich had contracts with Coalite for coal tar-derived compounds as early as 1952. Some of the products have blossomed from research compounds in the Aldrich catalogue into major tonnage contracts for the suppliers. At one point Aldrich accounted for 1 per cent of UK overseas sales of chemicals—a remarkable figure given the tiny quantities involved in most cases.

Aldrich even launched its own journal, *Aldrichimica Acta*, containing many papers by winners of the awards that Bader had established at different institutions. Its covers became its trademark, depicting old master paintings from Bader's growing collection. These were unrelated to chemistry, but the decision to put art on the cover of the journal and the catalogue (against Bader's instincts) created a distinctive image for the company. By 1965 sales had reached \$2m pa and Aldrich stock had gone public.

Doubling the impact

In 1967 Bader approached Sigma, a St Louis-based catalogue firm specialising in biochemicals. Sigma, Bader reasoned, although larger than Aldrich, had a complementary range; he suggested a merger. 'The response was "get outa here" and I was almost physically thrown out!'. However, after a disappointing stock market listing in 1972, Sigma reconsidered and the merged firm Sigma-Aldrich came into existence in August 1975.

The merger brought together two very different cultures. Dan Broida, boss of Sigma, did not have much time for academics: to him many of them were 'idiots'. Bader, on the other hand, had built Aldrich on his extensive academic contacts. Sigma would make a chemical, and if an academic inventor had a patent on it—well, let him sue. Aldrich, by contrast, offered a royalty whether the academic had a patent or not. (Bader reasons that it is cheaper to pay the inventor to teach you how to make the compound than to repeat the development work yourself.)

Nevertheless, the harder-nosed Sigma

had things to teach Aldrich. For instance, same-day order fulfilment was almost a religion, whereas Aldrich had been happy if the product went out within a couple of days. The same applied to purity. Aldrich would accept a 97 per cent pure compound with a yellowish colour; Sigma insisted on it being 99 per cent and white, even if the price was 3–4 times higher. The synergy between the companies worked well.

When Bader retired in 1991, Sigma-Aldrich's sales exceeded \$500m pa. He intended to remain as chairman emeritus

and continue travelling the world's labs on the company's behalf until he dropped. However, his successor, Tom Cori, had him thrown off the board following a dispute over his gift of shares to Queen's University. A board member who supported Bader was also ousted.

The news that the new regime at Sigma-Aldrich had forced Bader from the board became a *cause célèbre* in the chemical community, with Bader supporters writing letters of protest to the chemistry press (*Chem. Br.*, 1992, 28, 496; 779). Bader was very bitter, but now he has begun to see a silver lining. No longer constrained by board membership, he is free to sell stock in the company to fund his philanthropic interests.

Bader's endowments began in 1948, when he used a bequest from his Montreal benefactor, Martin Wolff, to set up a prize at Queen's University. Since then he has endowed many Bader prizes, fellowships and chairs related to his twin interests in chemistry and art. He has founded the RSC's Alfred Bader and Josef Loschmidt awards, he has given Imperial College generous funds to assist Czech students to study chemistry in London, and many British academics are grateful for grants he gave them to help their research. (Bader believes that relatively small amounts of funding go further in the UK, which makes it cost effective to support chemists here.) Along the way he has also picked up honours himself, such as the symposium held in his honour at Harvard earlier this year.

From paint to paintings

Bader bought his first piece of art, a drawing, as a boy in Vienna. Later, in Canada, he commissioned an artist in the internment camp to paint his portrait to send to his adoptive mother. (She died in a Nazi concentration camp and never received it.) He began collecting seriously while at Harvard, when lesser old masters were little regarded and could be picked up relatively cheaply. He has always been interested in history—



Rembrandt's Portrait of Johannes Uytenbogaert, which Bader sold to the Rijksmuseum. (Photo courtesy of Sotheby's.)

he even took a history BA extramurally while working at Murphy Paint—and speculates that perhaps his training as a paint chemist sharpened his interest in paintings and in picture restoration. Over the past 40 years he has built up a formidable collection, specialising in Dutch 17th century paintings by pupils of Rembrandt. His knowledge of art is widely recognised: twice he has served as guest curator for exhibitions at the Milwaukee Art Museum, including *The detective's eye: investigating the old masters* which he and his wife assembled in 1989.

Art endowments

In the 1950s he established the first of several scholarships at Queen's. Later he provided a fund—now standing at over \$1m—to allow art history students to come to Europe to study. 'Supposing that somebody at Queen's is interested in Canaletto, or Tiepolo, he should be able to study for a few months in Venice. Or if he is interested in Rembrandt pupils, to study in Amsterdam or Leiden'. He has given funds to other universities for this, and he has recently endowed a chair in Dutch art history at Queen's. Many of his paintings hang in museums around the US, but he plans to leave most of his collection to Queen's—provided it builds an art museum (he and his family have given \$2m of seed money).

Bader has always dealt in pictures as well as simply collecting, and his greatest coups in the art world have occurred since his split with Sigma-Aldrich left him free to sell shares and raise the level of his activities. Last year a Rembrandt came up for auction in London, and Bader and his associate Otto Naumann decided to bid for it. They secured the painting for £3.8m, which was considerably below the maximum they had set for themselves. Within days they were approached by the Rijksmuseum in Amsterdam, which desperately wanted the painting but had had insufficient funds with which to bid. They hammered out a deal by which the museum would be given time to

raise \$10m—enough to cover Bader's costs, the auctioneer's fee and the tax, and also leave him with a reasonable profit. 'It's such a feather in my cap, to buy a major Rembrandt and sell it to the Rijksmuseum. How many chemists do that?' Bader chuckles.

Since then he has bought a Rubens *Entombment*—'ghastly, bloody, but a wonderful work of art', as he describes it. It was an auction lot at Christie's with a low reserve but Bader was sure that it was all Rubens, and not just a studio work with a few touches of the master. The Getty Museum agreed, and has since bought it from him.

A few of Bader's 17th century paintings are of alchemical scenes, but these are relatively uncommon. He is currently researching a 19th century painting of a chemical experiment that he bought recently, which he believes may depict Brande and Faraday synthesising Prussian blue. Bader's historical interests extend to the history of chemistry as well. A paper by William Wiswesser on Josef Loschmidt in *Aldrichimica Acta* sparked his interest in the Viennese schoolteacher, and his researches in collaboration with Christian Noe led to a lively controversy earlier this year (*Chem. Br.*, 1993, 29, 126; 401; 675).

This summer Bader completed what he regards as his greatest coup. He and his wife have a house in Bexhill-on-Sea where they live when in the UK. Last summer he saw that the nearby castle at Herstmonceux was for sale. Until the late 1980s it was the base of the Royal Greenwich Observatory. Then it was sold to a developer, which went into receivership, and the bank, Guinness Mahon, had been trying to sell this unusual asset for some time. Bader's wife joked that it would have too many rooms to clean, but they went along to view the property 'for a lark'. They realised that the castle and its outbuildings would make a magnificent campus for Queen's University.

The first problem was to convince the estate agents that they were not another couple of timewasters (he says that he was glad they did not ask for his address—the little house in Bexhill falls into Council Tax band C). He told them to get a credit reference from Sotheby's—whose auctioneers had just sold him a Rembrandt!

A campus in a castle

Then began a tough round of negotiations. Queen's welcomed the idea of a European base, but quite reasonably asked Bader to give them a large sum to begin converting the estate. The Baders' gift to Queen's came to £6m—considerably less than the government had been paid by the developer. In July this year several thousand local people crowded into the castle's grounds for a 'medieval pageant and summer fayre' celebrating the official reopening of the grounds to the public.

Bader constantly refers to 'we'. In his travels around the world visiting universities and suppliers during the past 11 years he has always been accompanied by his wife Isabel—he jokes that she knows more chemists than any woman alive.

Endowments and gifts have always been a family concern. His first wife, Helen, worked for many years with Alzheimer's patients and was very supportive of Jewish education, children at risk and organisations such as the Legal Aid Society. The Helen Bader Foundation, established in her will, is headed by their younger son and now employs eight people 'studying requests for financial assistance and attempting to make real differences in the areas of Helen's particular interests', he explains.

Alfred and Isabel's wills (like that of his first wife) leave everything to charitable foundations. 'We want to help in North America, Britain and Israel; we want to help Queen's, and we want to help chemistry', he says. Bader also wants to help Czech chemists—'Czechs are victims of geography', he laments, 'yet they have a fine reputation in chemistry'.

Disarmingly, Bader will tell you that he's on an ego trip. 'We would like to spend the money while we're still alive. If I hadn't been dismissed from Sigma-Aldrich many of these silver linings would not have come about. Why shouldn't we enjoy some of this in our lifetimes?' Chemists around the world who have benefited from the Baders' friendship will not begrudge them that pleasure.

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ONE ON ONE by Paul Schliesmann / Photos by Jack Chiang

The Baders: Free-form philanthropists

'The opportunity isn't every day that there's a castle you could possibly offer. It's a lovely castle and around the corner from our little house in Sussex down the road. With Alfred's being in Hove there are lots of connections'

Since Alfred Bader, along with wife Isabel, bought Herstmonceux Castle in England for Queen's University last year, *The Whig-Standard* has been sporadically piecing together Mr. Bader's personal history. Fortunately, he is now working on his autobiography. When that work is complete, it will chronicle a remarkable tale of a person swept about by the tides of history – at times an unfortunate victim of global circumstance but an eventual survivor of heroic proportions.

Bader is best known to Kingstonians and the Queen's community as the Herstmonceux benefactor, the donor of more than 120 Old Masters paintings, and a generous financial contributor to the university's art and chemistry departments. Other schools in other countries benefit from the Baders' generosity, but none to the extent that Queen's has.

All this because, as a young Austrian refugee from the Nazis during the Second World War, he eventually wound up at Queen's – the first Canadian university to accept him for studies despite the fact he was Jewish and an alien during bitter wartime.

After studying chemistry at Queen's and Harvard University, Bader went on to build the hugely successful Aldrich Chemical Co. out of Milwaukee, going head-to-head with Kodak in the 1950s in the production and sales of research chemicals. In 1975, he merged with Sigma to form Sigma-Aldrich, three years ago listed as the 80th largest chemical company in the U.S. with annual sales of \$440 million.

Alfred Bader has demonstrated considerable business acumen. What makes him so unusual is that the apparently innate corporate sensibility has blossomed from the talents of a keen chemist's mind. He is respected worldwide for his research and development in the field of research chemicals.

Though unceremoniously dumped from the Sigma-Aldrich board of directors two years ago (another one of those potentially tragic downturns in his life) Bader still holds almost three million shares in the company.



Herstmonceux Castle is only one of many gifts given to Queen's University by alumnus Alfred Bader and his wife, Isabel. Their visit to Kingston last week marked the 50th anniversary of Alfred's release from internment, his acceptance at Queen's – and Isabel's birthday

Little wonder he can indulge his lifelong passion for Dutch masters paintings, as well as other works that catch his fancy. Case in point: Last summer, Bader bought a Rembrandt portrait for approximately \$8.5 million Cdn. Five months later he sold the same painting to the Rijksmuseum in Amsterdam for more than \$20 million.

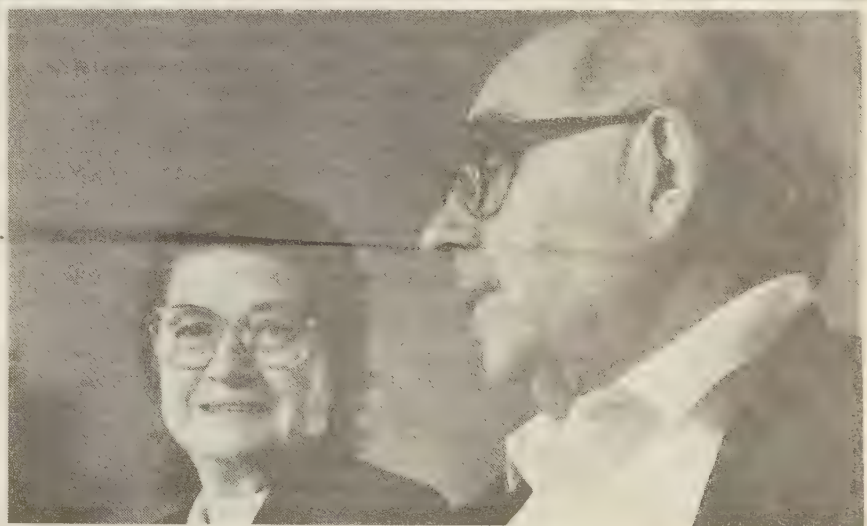
But every cloud has a potentially silver lining for Alfred Bader and the expulsion from Sigma-Aldrich has only freed the couple to travel the globe in a state of free-form philanthropy.

Alfred and Isabel Bader deal in sums of money most of us find difficult to comprehend. Yet when it comes to dreaming about winning a few measly million dollars in a public lottery, we all know how we would hypothetically pamper ourselves.

The Baders, for all their incredible wealth, live frugally and are proud of the fact. Their personal expenses amount to about \$30,000 US a year.

When they stroll about Queen's campus on their annual November visits, Isabel Bader in her sensible laced-up shoes and Alfred peering through thick glasses from under a floppy, well-worn blue hat, the bystander would detect no sign of the tremendous wealth they possess. The Baders, a loving couple just past retirement age, wear the mantle of riches lightly and with great humility.

Last Sunday morning, both of them sat



for a 45-minute interview in the dining room of Summerhill, the principal's residence at Queen's, while Jack Chiang took photos. This is the transcript from that meeting.

I'd like to start out by asking you how it feels being back at Queen's. I understand there's an anniversary coming up for you, Mr. Bader, on Tuesday [Nov.2].

A: The anniversary actually is Nov. 15 when I came to Queen's in 1941. On Nov. 2 I was released from internment camp but a much more important anniversary is Isabel's birthday. That's tomorrow [Nov. 1].

Would it be an embarrassing question to ask how old you will be?

I: No, on this birthday I'll be 67.

How old are you sir?

A: I am 69.

I: My sister lives in Ottawa and her birthday is Oct. 25 so we try if possible to be here in Canada for a number of reasons: because it's the time Alfred came here and we share our birthdays together.

So that is a very special date for you.

A: Any time we come to Queen's is a special occasion for me. I still love being here.

Would you perhaps take us back to that time when you were released from the camp and made your way down here.

A: I was very scared. You know I was in the camp at the point where Lake Champlain and the Richelieu River merge and the camp commandant thought we were Nazis. I was the youngest fellow there, having just turned 16, and he said, "How come you parachuted into England?" I said, "I'm a Jew; I'm a refugee." And he cut us short and said, "I don't believe you for a minute. We don't like Jews here either. It doesn't matter."

And for the first few weeks all the people in the internment camp, except for myself, had come from central Germany, were largely from the farming communities and they were a fairly tough-looking bunch. And they thought we were Nazis and then finally in August of '40 the camp commandant wrote the Jewish community council in Montreal saying, "We have a number, 273

young men here, who are alleging to be Jews. Could you please send a member of your clergy to look into this." And of course the old rabbi they sent out had no difficulty knowing they we indeed were Jews.

What was the test?

A: It was just before the fast day, the ninth day of Ab, which commemorates the destruction of the temple. And it's a very sad period for Orthodox Jews. In that camp we also built an ark for a Torah. The rabbi, an old man by the name of Hirsch Cohen, sat down on the ground of the internment camp and wept. And of course from then on the Jewish community tried to help.

And by a bit of luck I picked up – let me backtrack. Back in England, an old lady, a woman in her 80s, in Hove [near Herstmonceux], paid a pound and a shilling, a guinea a week, to me for my room and board. And she would tell me, I was a kid of 14, she would tell me about her son in Montreal and his wife and six daughters and I couldn't care less – I was just a young boy.

I: That's all she ever talked about.

A: You had to shout into her ear trumpet. And she was telling me about her son and family in Montreal. When we came to this internment camp, we had no newspaper and we had no radios but occasionally newspapers would blow over from the guards; a newspaper would blow in, and we would collect it and take turns reading it. And there, one day, in August of '40, I read the obituary [in the *Montreal Gazette*] of Mrs. Martin Wolff, survived by her husband and daughters. And the penny dropped. This was the family of the old lady who had paid for my keep in Hove.

And so I wrote to him. The letter never got there. The censors wouldn't let any letters go through that weren't in answer to a letter. I wrote to him, "I am here. Your mother looked after me. Can't you help? Get me out of here." And then the Jewish community sent in a social worker, Mrs. Robinson, and she interviewed many of us and asked each the same question: "Do you have anybody who you know in Canada?" And I told her the story about Martin Wolff. She said, "Martin Wolff, why he lives right close to me; I know him well."

I: They put the two in contact.

A: And the next year he tried to get me out of the camp. There was a man in Canadian immigration, his name was Blair, who deeply resented anybody coming out of the camp. He was very much against any of us being released. But I was one of the first. It was on Nov. 2, 1941.

Now actually a year and a half in the camp did me a world of good because I left school when I was 14 and when I came to England I went to the lowest kind of school, the East Hove Senior School for Boys, where kids left at 14 or 15 to become greengrocers' assistants or what have you. So I didn't have a good education.

I: Well, he left school because Jews were not allowed to go to school after the age of 14. So that's why he had left Vienna. And then he went to the boys' school in Hove because he spoke no English. So there was no point in putting him into a grammar school where they couldn't assess what he could do. So that's why he went there. But at the

end of the year the headmaster realized that he was a better quality academically than most of the students who were there and put on his report card this boy would benefit from further education. That's when he went to the Brighton Technical School.

A: Anyway, in the camp we had an excellent school. A very good school headed by one of the chief engineers with Siemens. A man who taught me chemistry later became a professor at Johns Hopkins. And of course we had no girls to distract us. You know, a year and a half studying.

I studied the Bible and I studied for junior and senior matriculation and got excellent marks in everything but German because the professor of German was a bureaucrat and the International Student Service had supplied us with all the books needed for the matriculation except the books in German. And after all we all spoke German and we all got lousy marks in German because the examination question was, "Why did Otto do this?" And I wrote an essay saying, "Well Otto might have done it for this reason or for that reason (in German, of course) but I don't know because I haven't read the book." [laughs].

Anyway, so I came out on Nov. 2 and the next day applied to McGill. And McGill turned me down. And then I applied to the University of Toronto. And the University of Toronto turned me down.

But one of Martin Wolff's daughters had come to Queen's and Martin Wolff had a civil engineer professor friend, Prof. Low, and so that daughter wrote to the registrar and Martin Wolff wrote to the professor of civil engineering and I was accepted.

And the first day here it was a scary day. Really wet. Nov. 15 I went in to see Jean Royce and paid my tuition and then went over to Gordon Hall chemistry to pick up all the equipment for the lab and the lab manager, a fellow by the name of Hyland, said to me, "Have you paid your fees yet?" And I said yes. He says, "Highway robbery. You don't have the chance of a snowball in hell passing the first year coming here on Nov. 15. Get your money back and come back next September." I was scared. But you know, Jean Royce, she introduced me to the secretary of the faculty of science, Prof. Jackson, and he seemed like a very nice person. So I didn't get my money back and I stayed.

I: Well, he worked hard too. He wasn't allowed to tell anybody where he had come from. They told him when he left the camp not to mention where he had come from and you can't get into much social contact and conversation with the other students. You know, you come in the middle of the year or halfway through the year and everyone's saying, "Well, I come from this place," and Alfred wasn't allowed to say, so he wasn't able to get into conversations.

A: And I had to report to the RCMP every week ... and after a while you just go in and wave ...

I: And say "I'm still here."

Fifty-two years later, here you are, coming back to Queen's.

A: I came back two years ago for a real celebration. There were lots of speeches and dinners, what have you.

I: Well, you've been coming back regularly, irregularly ever since because you often came back to the reunions and that sort of thing.

A: And of course I took the time to establish a prize, the Martin Wolff prize. It began when Martin Wolff died. Martin Wolff died of a heart attack in 1948. He left me a thousand dollars and the balance of his estate to his five surviving daughters. He left me a thousand dollars and I took it and established a prize for civil engineering. I think one of the great pleasures we have had over the last few years was a student wrote to me, four or five years ago, to say, "I've just won the Martin Wolff prize in civil engineering and was particularly happy because my father won this also some 30 years ago."

And it all came from that thousand dollars that he left to you?

A: Well, you know, Queen's has very good scholarship schemes for investing. In fact, we were just studying the various funds they have here. But in those days ... Today, what's a thousand dollars? In 1948, it was a lot.

I: And by 1948 Alfred was at Harvard. He had a teaching fellowship and the best thing to do with this money was to put it into the prize.

A: We live very frugally.

Yes – I'd like to touch on that a little later. How and where do you spend your time?

A: We spend 89 days each year in England. We can't spend more time because if we spend more time we have to pay British tax.

I: I pay British tax.

A: You do, but I would have to pay British tax on American income. So we spend three months.

I: And then we spend some time on the continent. This summer we spent only three weeks but normally we are on the continent five or five and a half weeks. Sometimes six.

Doing what?

A: Well, visiting chemists, looking for paintings and we have become very involved trying to help Czechs. The Czech republic is a very good country and you know they're victims of geography. They were too close to the Nazis. They were invaded by the Russians. They had 40 years of Communist rule.

What are you doing there?

A: Trying to inquire how can we help; and we have established four fellowships for Czech chemists to come over to the States and to England, to universities, to get their PhD. We have established a fellowship for Czech art historians to go abroad and study art history in any country of their choice. We helped establish an award for the best organic chemist. We are discussing setting up a chair in chemistry. You know, they are good people. Naturally, once we know what will be studied at Herstmonceux we will have Czech students come to Herstmonceux.

I: Yes, because it's important that it be a variety of students from not only across Canada with other Canadian universities

taking part in the scheme but also foreign countries too.

A: What Isabel worries about, I'm sure it won't happen, is that a bunch of Ontario students go to Herstmonceux and live there just with each other and then come back knowing little about England, which won't happen.

I: I don't exactly worry about it but it is something I wouldn't be happy to have happen. I don't think the people who are arranging the courses will want that either.

A: But to come back to November of '41, the people at Queen's treated me unbelievably well. I was just talking yesterday evening to Chuck Campling the professor now retired here from Queen's. His father-in-law Norman Miller had helped me a great deal and also invited me to his Christmas dinner. And to be treated like that. You see, when I was in Vienna there was an enormous amount of hatred. There were signs: "Entrance to dogs and Jews forbidden." And I came here and they didn't care if I was a Jew. They didn't care I might be considered an enemy alien, which I wasn't. [Laughs.]

The things that you've done for Queen's, the chairs, the scholarships and now Herstmonceux, is this an attempt to repay these small kindnesses?

A: No. We can't take it with us ... Why shouldn't we enjoy it in our lifetime?

I: And the opportunity isn't every day that there's a castle you could possibly offer. It's a lovely castle and around the corner from our little house in Sussex down the road. With Alfred's being in Hove there are lots of connections. The Canadians were in that area. Canadians were stationed in Bexhill during the war. You know there's lots of things that seemed ideal. So it was just a question of whether the university felt they could possibly make use of it after David [Smith] and the various people saw it.

A: You left out the most important ingredient of it: this was a real bargain. [Laughs.]

I: It's true.

You won't tell us the price?

A: I will explain that. I'll give you the background.

When the British government and the Royal British observatory sold it, they [developers] paid eight million pounds. There was enormous uproar. How could you give a castle away like that for only eight million pounds? And the fellow who bought it put in another eight million pounds to make plans for a five-star hotel, and time-sharing units, and a golf course.

I: And he purchased lots of land nearby as well. The original land that went with the castle plus extra because they needed that for their development scheme. And so they got up to an extra eight million that they had spent. But that £16 million they had spent and they were unable to get permission for this development. There was tremendous uproar in the area because many people considered Herstmonceux their castle and to turn it into a thing like that in a rural area was a horrible idea and there was a preservation society started up and so on. And they [the developers] simply couldn't get permission.

A: Anyway, the bank [Guinness Mahon and Co. Ltd.] had loaned them £16 million, and that bank was taken over by the Bank of Yokohama. And here they owned the castle and they advertised in the *Times* [of London] it was now for sale for five million pounds.

I: We knew something of the background because of course we were in Bexhill so often. So we knew it indeed was a bargain.

A: Furthermore, if someone offers you a castle for five million pounds, as sure as God makes sour apples you can buy it for less. [Laughs.]

I: This is the businessman, here.

In December we will be able to find out all the costs?

A: We know all that. Let me explain.

First of all, when we came back in July [of 1992] I called David Smith and said, "Would you be interested in a castle?" Now he knew me well enough not to say, "Well, this is crazy." But you know, I could just see him saying, "What would I do with a blooming castle?" He didn't say it.

Then, as luck would have it – it's amazing how many people were involved in helping us – you have a Member of Parliament here by the name of Peter Milliken and he was going over to England and France for the Dieppe celebrations. And so David Smith asked him, saying, "You know, this fellow Bader, I would dismiss it if it wasn't for the fact that Bader has already helped us and he's probably serious. Go and have a look at the castle." And so Peter Milliken went to see the castle and came back and reported, "Yeh, it's quite a place." And then David Smith went over in October.

And then we came here in November of last year and David Smith explained very carefully, "We just can't accept the castle. It will after all take a lot of money to bring it up to speed. But if you would agree to give us an additional two million dollars beyond the cost of the castle then we can accept it."

We are now in our 60s, so I insisted that the Queen's attorney should draw up the contract binding our estates. After all, if there was a plane, crash or whatever then Queen's would have these funds with the provision that if for any reason Queen's couldn't get the permission they would use the six million pounds for something else.

And then I came over in November and I visited with the real estate agent – very, you know, posh firm.

I: Now the coming over is, we went over to London. We were over in England, not here.

A: In the first hour, they really had only one question: "How can we make certain that if you offer, make that offer, that you actually pay?" Because they had had a number of people come and made what looked like serious offers.

I: They had some people who actually moved into the castle.

A: I said, "Look, you're around the corner from Sotheby's. Just in July I bought a Rembrandt. Ask them whether I paid." It was more than what the castle was likely to cost. I presume they did. It's obvious they [Sotheby's] said, "Yes, Bader paid for it." By that time I was close to having sold it [the

*'If someone offers you
a castle for five million
pounds, as sure as God
makes sour apples
you can buy it for less'*

– Alfred Bader

Rembrandt] again and then they got us into negotiations with the bank Guinness Mahon. And what we have is a man negotiating with us who is a very likable guy, Dr. Jeffrey Cooper, and he obviously wanted to sell us the castle and we had a two-day negotiation and the second day was Dec. 9 and at the end of the day we had an agreement. Dr. Cooper called his secretary.

I dictated the agreement and then he bounced it off the president of the bank and the Bank of Yokohama and he said, "Yes, we can sign, provided we don't tell anyone what the price of the castle really is." Of course, they have to show a substantial loss and they didn't want to publicize the loss.

And then lawyers took over. It took nine months to get all the filing permissions. Queen's signed the exchange of the contract in August. I have said many times since: children and castles take nine months. Nine months and a 68-page agreement which the lawyers drew up. They kept all of the provisions intact except that the confidentiality of the purchase price terminates with Dec. 21 of this year.

Let me say this: after all, any businessman coming in who knows that the asking price is five [million pounds] would first offer 3.6 – my first offer. Three-point-six because I knew Queen's would be getting six million pounds and this would leave a little over two million required to refurbish – begin the refurbishing. Two million pounds would not be enough. And 3.6 because in Hebrew *Chai* is 18 and many Jews give to charity in increments of 18 and that two of us, twice 18, is 3.6. So we offered 3.6 million pounds and within an hour it was clear they weren't turning down 3.6 because it's so little, but because they didn't want to show so large a loss in one year.

What they wanted to do is to structure the deal to sell the castle with much of the land and then sell some of the land in options. That's what we ended up doing.

How wealthy are you?

A: I don't know because it depends on what Sigma-Aldrich stock is valued at. It is a stock in bio-technology. I was kicked out of the company forcibly at the end of '91.

Hostile takeover?

A: No, no, my successor didn't like what I was doing.

I: That's really why we're in a position to go ahead and sell the shares. The money to purchase the Rembrandt came from selling shares. And the money for the castle came from the selling of shares.

So you still have stock in the company?

A: We have about 2.9 million shares.

And the trading value yesterday?

A: For the last six months it fluctuated between 45 and 50.

Dollars per share.

A: But I don't sit there and say every day, "what is 2.9 million times 50."

How do you feel then when people call you a wealthy industrialist?

A: Well, there is no question that we are wealthy. There is no question that I am an industrialist. I mean, I spend my time three ways: about a third of the time writing my autobiography; and then working on a book on Biblical art; a third of my time continuing to trying to help chemists in the Czech republic and in the world and I've invested in number of small chemical companies trying to help them out.

And I deal in paintings. I buy about 200 paintings a year and tried to buy one on Friday morning by bidding by phone to London. But I didn't get it; I underbid.

Your approach to art, and collecting and studying – it's almost a scientific kind of approach that you take. And I don't mean that in a cold way but you're trying to identify painters.

A: But not technically. The cleaning of paintings and restoration of paintings which is done by restorers, not by me, is scientific. But I look at paintings, and I've looked at paintings all my life. I'd be happy to give you an article that just appeared in the *Independent* in London which describes what I do. If you take the time to read that. ...

But can you describe your approach to art for artistic reasons.

A: I like to find unidentified paintings of great quality. If you come to my talk on Tuesday called the Detective's Eye where I picked a number of paintings [and talk about] what happened in cleaning. And the talk I am giving at Queen's is a talk I've not given before. I've picked mainly paintings that are known to Queen's. We've given so far 120 Old Masters. The key question then to ask yourself, and an important question, is whether our collection of paintings could come here. That's a question of space. At the moment it simply doesn't have the space. Now we've given them two million dollars as seed money for a new art museum.

I: Well, for an extension. In fact, that's what Daniel's [his younger son] latest contribution was for, it wasn't for the chair. It was for the extension.

What are your roles when you're out hunting down Old Masters? Do you split up the duties?

A: Yes, we look at paintings.

I: Alfred is really the one who finds the paintings. From time to time I might call something to his attention that he hasn't noticed.

Do you share his taste?

I: Yes, I think I do.

You said earlier that you get a lot of pleasure from spending money the way you've done here at Queen's. You

mentioned also that you live frugally. Why?

Why not live up to the wealth you own?

I: We really wouldn't enjoy that. We both feel uncomfortable checking into a place where it's expensive to stay, with waiters flapping about. We just don't enjoy it.

A: We usually have breakfast at McDonald's.

I: When we are travelling in Europe breakfast is often provided. It comes with the hotel. But if there isn't when we're here, I don't normally have breakfast anyway, and if we're in California, for instance, I usually have a bag of oranges and maybe a muffin or so. Alfred needs coffee in the morning. And so the best thing is to get on the road and call into the nearest McDonald's and Alfred gets coffee, I get decaf, and we get a package of milk and that's it. If we need something I sometimes have an English muffin just the way it is.

A: But when I travel in Europe I know the train schedule and we, say, try to be in Vienna one day and then in Basel the next day. We take night trains and we get the second-class couchette which is very inexpensive. It is much cheaper sleeping on the train.

I: We travel overnight on the train and save one night's accommodation and these, these habits, I suppose, came about because to begin with Alfred had next to nothing. And starting up the company when he left PPG [Pittsburgh Plate Glass] trying to make Aldrich fly he really had nothing. He couldn't cash his pay cheques because there was no money. So for six months he didn't even receive a pay cheque. He couldn't cash it.

And so, on the early trips it was a question of getting by with the very least expense possible.

A: I no longer want to have a hotel room in England where you have to go outside the room to go to the bathroom.

I: I said to Alfred at one stage, 'Sorry, but we have to go up one star so we have our own indoor accommodation.' You don't want to have to go down the hall.

A: You don't want to have to go down the hall and hope the loo isn't taken. I like a shower.

This is a statement about society and what people's expectations are?

I: We're not worried about making a statement to other people. It's just that that's the way we're most happy. And why throw your money about when somebody else could use it or you could use it yourself for something substantial.

A: Isabel is a good cook. No meal is a good meal unless there are four vegetables. I am uncomfortable going to a restaurant where you have to pay \$20 for a dinner. I have a good suit which I will be wearing tonight.

I: You have more than one good suit.

A: Well, how many good suits do I have with me?

P: I don't think you answered my very first question: how does it feel to be back here?

A: I always enjoy coming here. It's memory lane. I walk through the Douglas Library, the chemistry building, a very wet walk. And I remember how scared I was. □

Paul Schliesmann is a *Whig-Standard* staff writer.

LEST WE FORGET by Waldo E. Smith



Members of the Royal Canadian Medical Corps evacuate wounded from the beach, Dieppe, 1942

Dieppe: An army chaplain remembers

The following account of the Dieppe raid is taken from What Time the Tempest, An Army Chaplain's story, by Waldo E. Smith.

We went to Newhaven by night and drove on to our TLCs (Tank Landing Craft) as darkness gave place to grey dawn, August 18th. That day we lay in harbor under the familiar canvas top. After nightfall the troop trains came, sliding out of the darkness. The infantry swarmed out and followed their guides. These regiments had been mobilized in autumn, 1939 and had gone overseas in the summer of 1940. The men were well trained, fit and keen. Two regiments were from the West, the South Saskatchewan and the Winnipeg Camerons. From Ontario were the Essex Scottish, Royal Hamilton Light Infantry, and the Royal Regiment (Toronto). We had as well the Fusiliers Montreal (FMR). Down the ladders came detachments for the TLCs, provost, medicals and some French com-

'Our own tank landing craft had now turned away from the shore and I kept headphones on, listening to the last hour and a half. I cannot find words for the pathos of it. There were our friends with the net closing on them'

mandos. The flying weather was right, the moon would soon be up. There was no difficulty about wind. This was it!

Ship by ship the convoy put to sea. The regimental sergeant major rounded up the boys in our craft for a little service. We gathered forward of the first tank. I stood under the narrow gallery deck where a light could not be seen from above and read from the sixth chapter of Paul's letter to the Ephesians while Ian Allison held his flashlight over the page:

"Finally, my brethren, be strong in the Lord and in the power of his might. Put on the whole armor of God, that ye may be able to stand against the wiles of

the devil.

For we wrestle not against flesh and blood, but against principalities, against powers, against the rulers of the darkness of this world, against spiritual wickedness in high places.

Wherefore take unto you the whole armor of God, that ye may be able to withstand in the evil day, and having done all, to stand. Stand, therefore, having your loins girt about with truth and having on the breastplate of righteousness."

Then a few words about our bringing a sign of deliverance to the captive people of Europe, then prayer.

By now our convoy had all put out to sea with our escort of destroyers. High above us the bright moon had put out into the sky with its escort of stars.

We were awake at four because zero hour was 0450. Our own aircraft were overhead now. We could not see our bombers but their bombs were bursting ahead some miles distant. What I took at first to be sparks from the funnels of TLCs ahead was really anti-aircraft tracer from German shore batteries at our extreme right. Unfortunately the commando that was to do the same to the battery on our extreme left ran into a German naval convoy in the darkness and the ensuing shooting alerted the enemy on shore. However, although unable to overpower the battery, they took positions for sniping and neutralized it. The worst result of the accidental sea encounter was the warning of the enemy guarding the eastern cliff where the Royal Regiment was to land. These men were to attack from the rear the guns on the east cliff at Dieppe.

Das abenteuerliche Leben des Alfred

Er ist in den USA zum reichen Superboß geworden.
Dann wurde er aus dem eigenen Unternehmen gefeuert.
Jetzt schreibt der Wiener Milliardär Alfred Bader seine Memoiren.

Seine Augen unter den mächtigen Brauen strahlen Milde aus, seine Stimme ist weich, eben wie die eines alten Mannes.

Wer ihm das erste Mal gegenübertritt, kann unmöglich ahnen, was er zu erzählen hat. Der gebürtige Wiener und 69jährige Auslandsösterreicher Alfred Bader sieht auf den ersten Blick so friedlich und harmlos aus wie ein emeritierter Postbeamter.

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Der sparsame Milliardär. Mit seiner schrulligen Art ist er in den USA groß geworden. Ein Mann, der in Europa nur ganz selten mit dem Flugzeug reist, weil er die hohen Tarife für Wucher hält, der prinzipiell nie Geld für ein Hotelzimmer mit Bad ausgeben will, sondern immer nur nach dem kleinsten Raum mit Waschgelegenheit verlangt. So ein spartanisch lebender Sonderling hat es in seinem amerikanischen Chemieunternehmen, der „Sigma Aldrich Corp.“, in den letzten Jahren immerhin auf Gewinne von jährlich mehr als 80 Millionen Dollar (zirka 900 Millionen Schilling) und Umsätze von über 600 Millionen Dollar gebracht. Bis seine 4000 Mitarbeiter mit ansehen mußten, wie er letztlich von seinem geschäftlichen Ziehsohn aus dem eigenen Unternehmen hinausgeworfen wurde.

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Und auch die Methoden der Machtergreifung in den Unternehmen sind für dieses Land typisch. In den amerikanischen Medien als „The Sigma Aldrich Affair“ breit ausgewalzt, erinnert die Story ein wenig an so sagenumwobene Firmengeschichten wie jene von Apple Computer in Kalifornien. Auch Steve Jobs begann in einer Garage, machte Apple langsam groß und holte sich später den Pepsi-Cola-Manager John Sculley ins Haus. Ergebnis: Jobs wurde hinausgeschmissen.

Nur, in diesem Fall traf es einen Wiener – der ein noch abenteuerlicheres Leben hinter sich hat als etwa der Apple-Gründer Jobs.

Die abenteuerliche Flucht. Alfred Bader wurde 1924 als Sohn jüdischer Eltern in Wien geboren. Seine Mutter überredete ihn 1938, nach England zu flüchten. 1940 wurden jedoch in England Flüchtlinge aus Nazi-Deutschland interniert. Auch Bader landete in einem Lager und wurde noch dazu auf geheimnisvolle Weise nach Kanada verschleppt.

Dort gelang es ihm und zwanzig anderen Flüchtlingen, an der Queen's University in Kingston, Ontario, Chemie zu studieren. Jahre danach machte er seine Doktorarbeit in Biochemie



Widersacher Tom Cori und Alfred Bader

an der renommierten Universität in Harvard.

Bis Mitte der fünfziger Jahre hatte Bader in Milwaukee im Bundesstaat Wisconsin einen durchaus gut dotierten Job in der Chemiebranche. Doch 1951 gründete er zusammen mit seinem Freund, dem Rechtsanwalt Jack Eisendraht, und einem Kapital von 500 Dollar ein eigenes Unternehmen, zunächst nur als Wochenendbeschäftigung. Im ersten Jahr machte die Aldrich Chemical Company mit einer Garage als Firmensitz stolze 1705 Dollar Umsatz und einen Ge-

winn von 20 Dollar. Im zweiten Jahr waren es schon 5400 Dollar Umsatz und im dritten Jahr 15.000. Bader spezialisierte sich von Anfang an auf organische Chemieprodukte, eine Sparte, in der damals Kodak auf dem Weltmarkt fast eine Monopolstellung hatte.

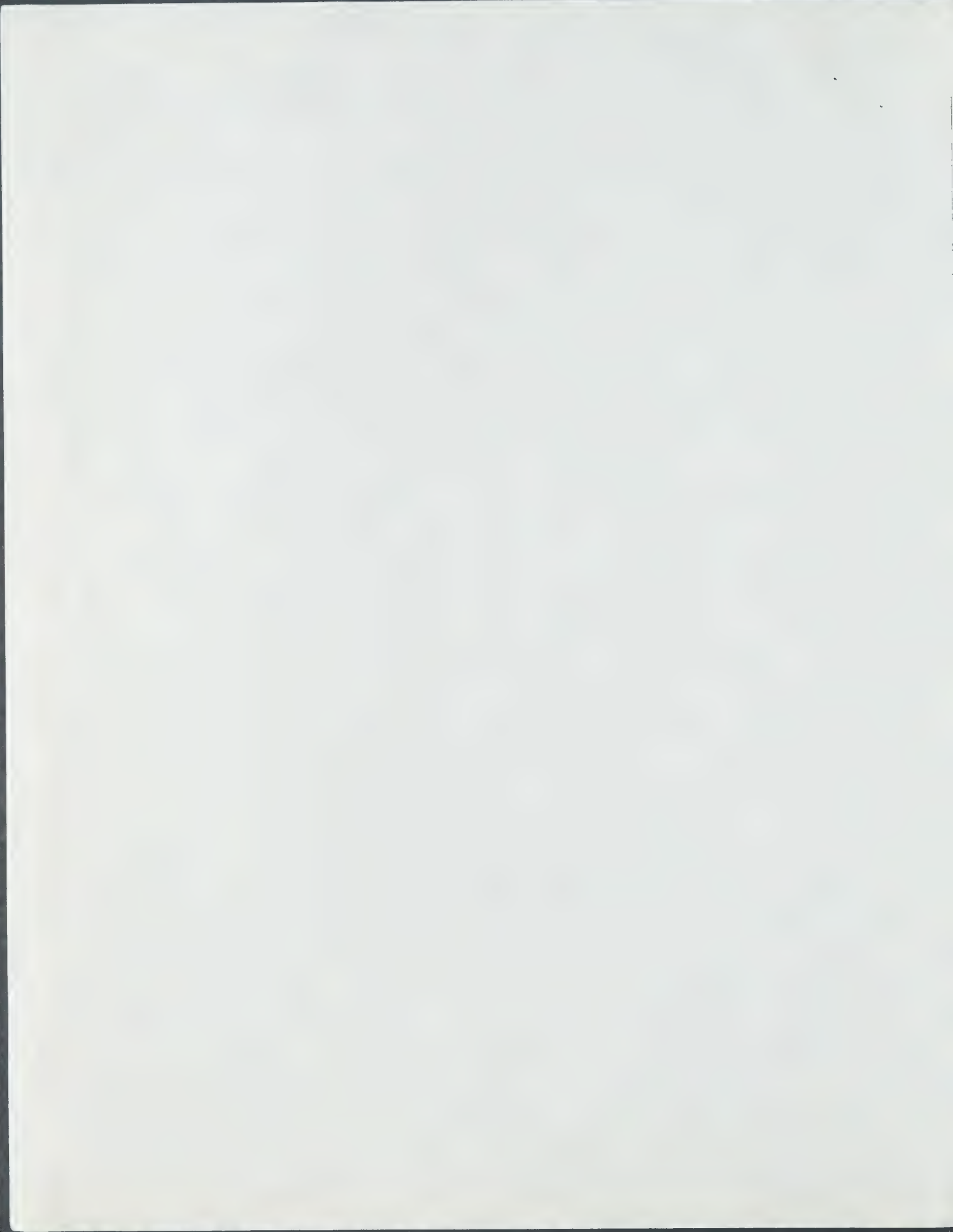
Der sagenhafte Aufstieg. 1954 kaufte Bader seinem Partner die Hälfte ab, hängte seinen Job in Milwaukee an den Nagel und widmete sich nur mehr seinem Unternehmen. Schon damals machten einige Produkte Baders in der Welt der Chemiker Furore. Paul Löw Beer, ein Wiener Chemiker, der Bader seit rund 20 Jahren kennt, erinnert sich: „Er hatte immer ein ausgeprägtes Gespür für neue Substanzen, mit denen er später dann ein enormes Geschäft machte. In der Chemie ist das selten. Da gibt es Millionen Substanzen, die alle kaum einen Marktwert haben.“

Weil der Laden jährlich durchschnittlich um 15 bis 20 Prozent mehr Umsatz machte, ging Bader 1965 an die Börse. Alles schien bestens.

1975 kam es dann zum entscheidenden Punkt im Leben des Alfred Bader. Er entschloß sich zur Fusion mit der Sigma Chemical Company in St. Louis, Missouri. Damit betrat automatisch ein Herr die Bühne, der etwas später noch gehörig von sich reden machen sollte: Tom Cori, dessen Eltern beide den Nobelpreis für Biochemie erhalten hatten und von dem Bader damals begeistert war. „Cori und ich arbeiteten Tag und Nacht“, erzählt Bader, „für das Unternehmen war das gut, wir wurden immer größer und größer.“

Doch obwohl Sigma doppelt so groß war wie Aldrich, war auch nach der Fusion immer nur von Alfred Baders Unternehmen die Rede. Er war es schließlich, der die Kontakte zu den Biochemikern auf der ganzen Welt pflegte, der sich in den Forschungsabteilungen der Universitäten viele Freunde machte, der seine Kunden auch als Chairman höchstpersönlich besuchte und der mit den selber erforschten Produkten, so der Chemiker Löw Beer, „sicherlich für 50 Prozent des Umsatzes sorgte. Man kannte eben nur Bader, von Cori war nie die Rede.“

Sigma Aldrich wurde in den achtziger Jahren praktisch zum weltweiten Monopolanbieter für bestimmte Grundsubstanzen organischer Chemieprodukte. Kodak war aus diesem Markt längst verschwunden. Dieser Erfolg war untrennbar mit dem Namen Bader verbunden. Obwohl Tom Cori 1983 von Bader sogar zum Chief Executive gemacht wurde, war es nach außen hin nie Coris Unternehmen. Bader erzählte seinen Chemiker-Freunden nach seinem Rausschmiß das ewige Trauma des Tom Cori: „50 Jahre lang sagte man ihm, er sei der Sohn von zwei Nobelpreisträgern. Danach hieß



Bader

es, er sei der Nachfolger von Alfred Bader."

Das schien für Tom Cori eine schwere Last.

So extrem sparsam Bader privat lebt, so großzügig ging er stets mit jenen um, denen er seinen geschäftlichen Erfolg und seine Karriere verdankte. Bader schenkte etwa laufend langjährigen Mitarbeitern Aktien aus seinem Privatbesitz, ebenso wie jener Universität in Kanada, die ihn als Flüchtling studieren ließ. „Tom Cori“, so Bader, „waren diese Geschenke immer ein Dorn im Auge.“

Im November 1991 kam es zum Eklat. Bader hat für seine demnächst erscheinenden Memoiren minutiös jene 17 Minuten in einem Londoner Hotel beschrieben, in denen ihm von Tom Cori in wenigen Sätzen mitgeteilt wurde, er müsse sein Aufsichtsratsmandat und den Titel Chairman emeritus, eine Art Aufsichtsrat in Ruhestand, zurücklegen. Bader: „Ich hatte überhaupt keine Ahnung, was er von mir wollte, ich hatte mit allem gerechnet, aber das ...“

Bader hatte nicht die Aktienmehrheit, deshalb konnte das Board of Directors (entspricht einem Aufsichtsrat) mit sieben zu zwei Stimmen die Absetzung beschließen. Bader: „Die wurden von Cori alle unter Druck gesetzt, denn er hat später auch jene hinausgeworfen, die auf meiner Seite waren.“

Cori warf Bader vor, er hätte gegen das Unternehmen gehandelt und spekuliert. Der Rauschmiß sei notwendig gewesen. Doch laut Bader hatte sich alles so zugetragen: Er wollte wieder einmal seiner kanadischen Universität Aktien schenken, ließ sich aber diesmal von seinem Sohn einen Tip geben. Die Aktienkurse von Sigma Aldrich standen bei 45 Dollar pro Aktie. Baders Sohn meinte, er solle Optionen verschenken, denn der Wert der Aktien werde, wie in der Vergangenheit, sicherlich noch steigen. Dadurch würde die Uni noch zusätzlich profitieren.

Der konstruierte Vorwurf. Tatsächlich stiegen die Aktien auf 47 Dollar das Stück. Insgesamt betrug der zusätzliche Gewinn für die Uni 50.000 Dollar. Doch Cori argumentierte, wer mit Optionen auf Aktien seines eigenen Unternehmens handle, der kann nur mit einem Kursverfall spekulieren. „Völliger Unsinn“, meint Bader, „Cori wußte nur zu gut, daß die Optionen als Geschenk gemeint waren. Er wollte mich einfach loswerden, meinen Namen auslöschen.“

Tatsächlich fällt auf: Tom Cori ließ anschließend die profitträchtigsten Produkte unter dem Titel „Alfred Bader Rare Chemicals“ völlig umbenennen, sodaß der Name Bader aus der Firma endgültig verschwand. Cori nahm zu dieser Affaire in der Öffentlichkeit nie Stellung und tut es auch heute nicht.



Aldrich-Gründer Bader: „Cori wollte meinen Namen auslöschen“

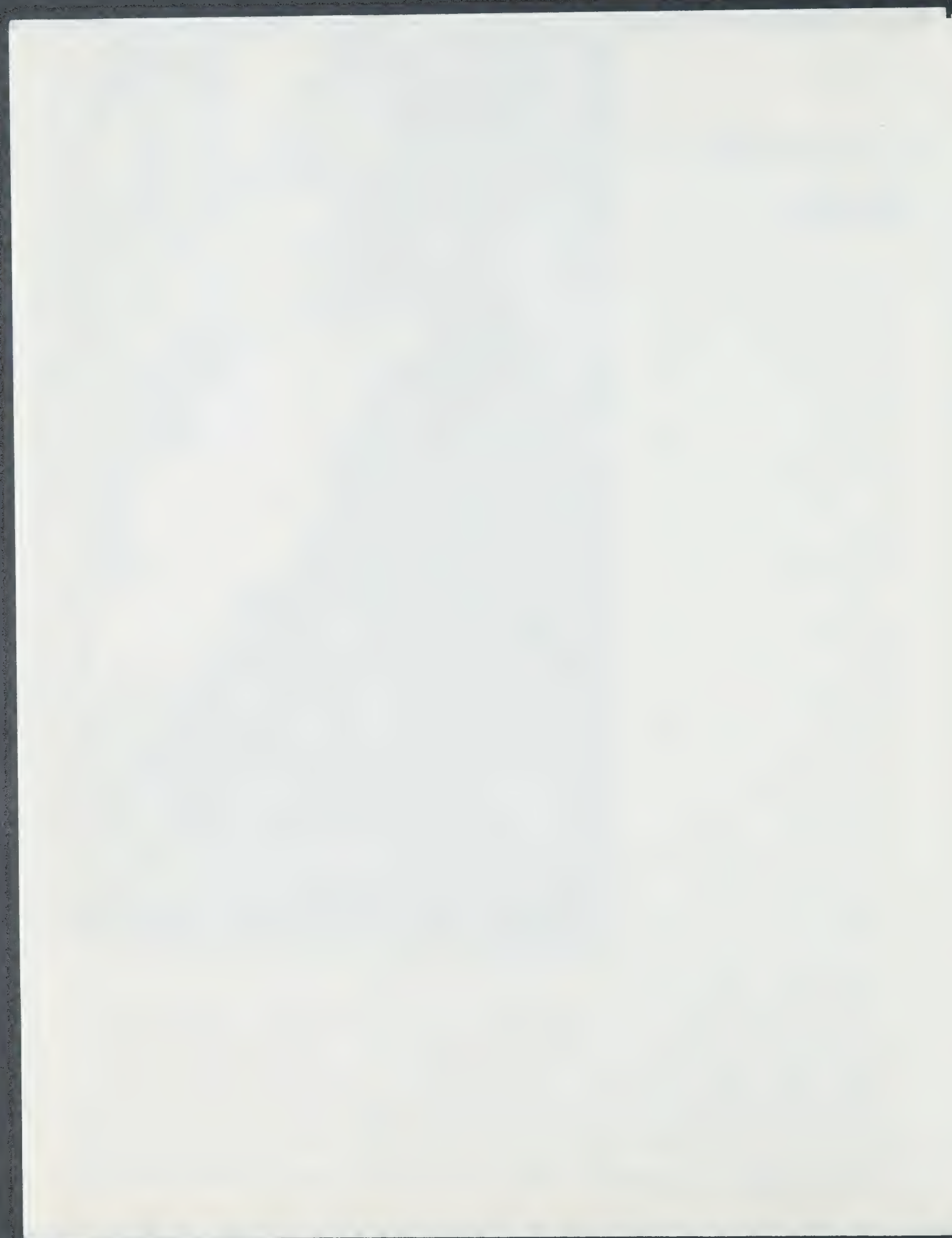
Baders Freunde schwören indessen, der Mann hätte die Sache mit den Aktien gewiß in bester Absicht geplant. Bader sei vermögend genug, besitze heute drei Millionen Aktien von Sigma Aldrich und hätte nebenbei einen höchst lukrativen Bilderhandel mit Werken alter Meister, darunter Rubens und Rembrandts, aufgezogen. Solche Tricks hätte er nicht nötig. Und auch seine Dankbarkeit gegenüber der kanadischen Universität scheint glaubwürdig. Nach seiner Trennung von seinem Lebenswerk, kaufte Bader in England ein

prachtvolles Schloß um rund 16 Millionen Pfund. Nicht für sich, sondern eben für die Queen's University in Ontario zu Ausbildungszwecken.

Zunächst reagierte der Universitätsleiter eher geschockt und meinte: „Wie sollen wir für die Erhaltung eines solchen Gebäudes sorgen, das kostet doch ein Vermögen?“

„Ich konnte den Mann beruhigen“, lacht Bader „ich hab' ihm versprochen, auch das zu übernehmen.“

Herbert E. Hacker ●



A BRIEF HISTORY OF THE AGNES ETHERINGTON ART CENTRE

Throughout 1983, the Agnes Etherington Art Centre will celebrate twenty-five years as a public gallery in the occupation of presenting exhibitions, teaching, and accumulating a Permanent Collection of significant artworks worthy of display and preservation in the public trust.

When the Agnes Etherington Art Centre opened in late 1957 with André Biéler as its first Director, it was intended to provide Queen's University, the City of Kingston, and the surrounding region of eastern Ontario with a means for cultural enrichment by the presentation of art in a sympathetic setting.

The seeds of the present gallery were sown in 1926 with the formation of the Kingston Art and Music Club, of which Mrs. Agnes Etherington (1880-1954) was a driving force. This organization, and the Kingston Art Association which succeeded it, worked to stimulate interest and activity in the arts within the community by organizing local exhibitions and art classes and also by obtaining a Carnegie Foundation Grant from 1933 to 1936 for Montreal artist Goodridge Roberts to live in Kingston to teach painting classes to children in the school system and to interested adults. He provided a lecture series for students at Queen's University. Finally in 1936, Agnes Etherington arranged to finance instruction in Fine Arts at Queen's University and André Biéler came to Queen's as resident artist. He continued the community teaching begun by Goodridge Roberts. Mrs. Etherington was the administrator of a trust, bequeathed by her brother Captain George Taylor Richardson (1886-1916), for the purpose of stimulating an interest in art and music among the people of Kingston and among the students of Queen's University. Working closely with André Biéler, she pursued a number of projects for the University, and in the final years of her life, drew up plans to bequeath her house on University Avenue to Queen's for use as an art centre.

The house, which the University received in 1956, had been built in 1879 by Mrs. Etherington's parents, George and Agnes Richardson. Mrs. Etherington had redesigned it from High Victorian to a Georgian style in the mid 1920's, and had decorated it with antiques and furnishings of considerable elegance. In a gesture typical of the family's ongoing concern for the Art Centre, Mrs. Muriel Richardson, Agnes Etherington's sister-in-law, provided funds for the renovation of areas of the house into exhibition galleries in 1956.

As early as 1940, paintings had been purchased for Queen's University by an alumnae group, the Queen's Art Foundation, in anticipation of the day that Queen's would have an art gallery. The Segsworth Bequest of 1944 had augmented this nucleus substantially with paintings and prints. In 1957, these items formed the Permanent Collection of the new Art Centre, along with other items accumulated at the University. Notable was the Constantine Collection of Inuit ivories purchased for the University by Mrs. Etherington in 1930. The subsequent growth of the Art Centre speaks well for the quality of its programming, but also for the fact that it fulfilled a need within the community. Extensions to the building were completed in 1962, 1975 and 1978.

In 1962, a major collection of artworks was donated by Samuel and Ayala Zacks. This gift of outstanding works by contemporary Canadian artists provided the foundation for a comprehensive collection of historical and contemporary Canadian art. In 1967, Queen's alumnus, Dr. Alfred Bader initiated an ongoing and farsighted donation of European paintings which at the present time numbers nearly fifty items. The Bader Collection emphasizes Dutch and Flemish 17th century painting, but overall is gradually forming a balanced European collection which distinguishes the Art Centre among other galleries of its size in this country. Outstanding works have also come to the collection from the Douglas Duncan Bequest in 1970, and with the financial assistance of the George Taylor Richardson and the Chancellor Richardson Memorial Funds of Queen's University. The Permanent Collection has attracted individual gifts from numerous public-spirited individuals. The financial assistance over the past decade from the Canada Council, Wintario and the Art Centre's own Gallery Association has aided greatly in the collecting of Canadian art.

Pandem with the growth of the collection has been the development of exhibition and education programming. In the past decade, the Agnes Etherington Art Centre has organized major exhibitions in the area of Canadian art for circulation nationally, and on occasion, abroad. One thinks of the Daniel Fowler, William Brymner and J. W. Beatty exhibitions, the recent Maurice Cullen exhibition, Robin Collyer, and Other Realities: The Legacy of Surrealism in Canadian Art to name only a few. Last March a Canadian tapestry exhibition, which was organized by the Art Centre at the request of External Affairs, was hung for the opening of the Barbican Centre in London, England. The National Museums of Canada has done much in the financial support of these undertakings.

The Art Centre traditionally has been active in the field of art education and contains a programme of studio classes, lecture series, concerts, films and tours. This year 6,000 elementary and secondary school students are booked to visit the Art Centre as part of the education programme for schools in the region.

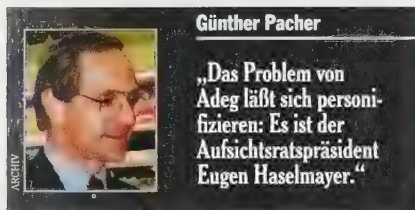
At the present time, the Art Centre contains six exhibition galleries with a total square footage of 7,318 and presents about thirty exhibitions annually. The Permanent Collection numbers in excess of 3,000 items.

Dorothy Farr
January 1983

Austria Investment Bank AG (früher VIP Bank).

Loyalität machte sich vorerst bezahlt: Pacher wurde in den folgenden Jahren zum starken Mann der Adeg aufgebaut und in den Vorstand nach Wien berufen. Dort konnte er seine Ideen verwirklichen: So waren etwa die „Contra“-Verbrauchermärkte seine Erfindung. Die Läden mit 400 bis 600 Quadratmetern stehen auf der grünen Wiese und ködern Kunden mit Billigpreisen. Die Adeg-Aktiv-Linie (größere Geschäfte mit einem umfassenden Produktangebot) trägt ebenfalls seine Handschrift. Mitteregger: „Diesen Märkten gehört die Zukunft.“

Die Perspektiven der kleinen und mittelständischen Adeg-Kaufleute ist hingegen weniger erfolgsversprechend. „Wenn man sich nur die Bilanz anschaut, sind vielleicht die meisten Betriebe positiv. Betriebswirtschaftlich arbeiten aber viele negativ. Die Leute leben von der Substanz, das kann auf die Dauer nicht gut sein“, konstatiert Aufsichtsrats-Vize Kuno Riedmann. 70 Adeg-Kaufleute zogen 1992 die Konsequenz und sperr-



ten zu. „200 bis 300 unserer Geschäfte sind unrentabel“, mutmaßt Mitteregger.

In der AG (Cash & Carry, Großhandel) wurde 1992 das positive Betriebsergebnis durch die hohen Zinsaufwendungen von 111 Millionen aufgeessen. Daher weist die Dachorganisation ein negatives Ergebnis der gewöhnlichen Geschäftstätigkeit von zwölf Millionen aus.

Ungesetzliche Forderungen. Der Abgang Pachers war nicht unvermeidlich. Er stellte Bedingungen für seinen Verbleib: Information des Aufsichtsrates durch den Vorstand (nicht durch den Aufsichtsratschef), Mitspracherecht des Vorstandes bei der Bestellung neuer Kollegen, Festlegung einer Geschäftspolitik, die der Vorstand ohne Einmischung des Aufsichtsrates durchziehen kann. Pacher: „Meine Forderungen waren normaler Standard jeder AG.“

Wie die Gremien reagiert haben, ist unklar. „Die Forderungen von Doktor Pacher waren unerfüllbar und ungesetzlich“, faßt Riedmann die Reaktion seiner Kollegen zusammen. Die Interpretation von Vorstandssprecher Mitteregger hingegen sieht ganz anders aus: „Wir hatten nichts gegen seine Forderungen, aber der Aufsichtsrat war nicht beschlußfähig.“

Die Schwierigkeiten mit Aufsichtsratspräsident Eugen Haselmayer sieht einer der verbleibenden Vorstände pragmatisch: „Der Mann ist 61 – daher ist absehbar, daß er in Pension geht. Wäre er 43, müßte man das Problem vielleicht anders lösen.“

Eva Mühlberger●



CREDIT LYONNAIS BANK (Austria) AG

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HAT EINE GRUPPE FREIER AKTIONÄRE DER

BRÜDER REININGHAUS BRAUEREI - AKTIENGESELLSCHAFT

BEI DER VERTEIDIGUNG IHRER INTERESSEN ANLÄSSLICH DER ÜBERNAHME EINER KONTROLLIERENDEN BETEILIGUNG AN DER BRÜDER REININGHAUS BRAUEREI-AG UND DER GÖSSER BRAUEREI-AG DURCH DIE ÖSTERREICHISCHE BRAU-BETEILIGUNGS-AG,

BEI DER NEUORDNUNG DES BRAU-AG/STEIRERBRAUKONZERNS, DIE VON DER AKTIONÄRSGRUPPE WESENTLICH MITGESTALTET WURDE, UND BEI DER SCHAFFUNG DER BRAU-UNION GÖSS-REININGHAUS ÖSTERREICHISCHE BRAU-AG, SOWIE

BEIM ERWERB EINER BETEILIGUNG AN DER ÖSTERREICHISCHEN BRAU-BETEILIGUNGS-AG

BERATEN UND VERTRETEN.

WIEN, IM JUNI 1993

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Und auch die Methoden der Machtergreifung in den Unternehmen sind für dieses Land typisch. In den amerikanischen Medien als „The Sigma Aldrich Affair“ breit ausgewalzt, erinnert die Story ein wenig an so sagemumwobene Firmengeschichten wie jene von Apple Computer in Kalifornien. Auch Steve Jobs begann in einer Garage, machte Apple langsam groß und holte sich später den Pepsi-Cola-Manager John Sculley ins Haus. Ergebnis: Jobs wurde hinausgeschmissen.

Nur, in diesem Fall traf es einen Wiener – der ein noch abenteuerlicheres Leben hinter sich hat als etwa der Apple-Gründer Jobs.

Die abenteuerliche Flucht. Alfred Bader wurde 1924 als Sohn jüdischer Eltern in Wien geboren. Seine Mutter überredete ihn 1938, nach England zu flüchten. 1940 wurden jedoch in England Flüchtlinge aus Nazi-Deutschland interniert. Auch Bader landete in einem Lager und wurde noch dazu auf geheimnisvolle Weise nach Kanada verschleppt.

Dort gelang es ihm und zwanzig anderen Flüchtlingen, an der Queen's University in Kingston, Ontario, Chemie zu studieren. Jahre danach machte er seine Doktorarbeit in Biochemie



Widersacher Tom Cori und Alfred Bader

an der renommierten Universität in Harvard.

Bis Mitte der fünfziger Jahre hatte Bader in Milwaukee im Bundesstaat Wisconsin einen durchaus gut dotierten Job in der Chemiebranche. Doch 1951 gründete er zusammen mit seinem Freund, dem Rechtsanwalt Jack Eisendraht, und einem Kapital von 500 Dollar ein eigenes Unternehmen, zunächst nur als Wochenendbeschäftigung. Im ersten Jahr machte die Aldrich Chemical Company mit einer Garage als Firmensitz stolze 1705 Dollar Umsatz und einen Ge-

winn von 20 Dollar. Im zweiten Jahr waren es schon 5400 Dollar Umsatz und im dritten Jahr 15.000. Bader spezialisierte sich von Anfang an auf organische Chemieprodukte, eine Sparte, in der damals Kodak auf dem Weltmarkt fast eine Monopolstellung hatte.

Der sagenhafte Aufstieg. 1954 kaufte Bader seinem Partner die Hälfte ab, hängte seinen Job in Milwaukee an den Nagel und widmete sich nur mehr seinem Unternehmen. Schon damals machten einige Produkte Baders in der Welt der Chemiker Furore. Paul Löw Beer, ein Wiener Chemiker, der Bader seit rund 20 Jahren kennt, erinnert sich: „Er hatte immer ein ausgeprägtes Gespür für neue Substanzen, mit denen er später dann ein enormes Geschäft machte. In der Chemie ist das selten. Da gibt es Millionen Substanzen, die alle kaum einen Marktwert haben.“

Weil der Laden jährlich durchschnittlich um 15 bis 20 Prozent mehr Umsatz machte, ging Bader 1965 an die Börse. Alles schien bestens.

1975 kam es dann zum entscheidenden Punkt im Leben des Alfred Bader. Er entschloß sich zur Fusion mit der Sigma Chemical Company in St. Louis, Missouri. Damit betrat automatisch ein Herr die Bühne, der etwas später noch gehörig von sich reden machen sollte: Tom Cori, dessen Eltern beide den Nobelpreis für Biochemie erhalten hatten und von dem Bader damals begeistert war. „Cori und ich arbeiteten Tag und Nacht“, erzählt Bader, „für das Unternehmen war das gut, wir wurden immer größer und größer.“

Doch obwohl Sigma doppelt so groß war wie Aldrich, war auch nach der Fusion immer nur von Alfred Baders Unternehmen die Rede. Er war es schließlich, der die Kontakte zu den Biochemikern auf der ganzen Welt pflegte, der sich in den Forschungsabteilungen der Universitäten viele Freunde machte, der seine Kunden auch als Chairman höchstpersönlich besuchte und der mit den selber erforschten Produkten, so der Chemiker Löw Beer, „sicherlich für 50 Prozent des Umsatzes sorgte. Man kannte eben nur Bader, von Cori war nie die Rede.“

Sigma Aldrich wurde in den achtziger Jahren praktisch zum weltweiten Monopolanbieter für bestimmte Grundsubstanzen organischer Chemieprodukte. Kodak war aus diesem Markt längst verschwunden. Dieser Erfolg war untrennbar mit dem Namen Bader verbunden. Obwohl Tom Cori 1983 von Bader sogar zum Chief Executive gemacht wurde, war es nach außen hin nie Coris Unternehmen. Bader erzählte seinen Chemiker-Freunden nach seinem Rausschmiß das ewige Trauma des Tom Cori: „50 Jahre lang sagte man ihm, er sei der Sohn von zwei Nobelpreisträgern. Danach hieß

Bader

es, er sei der Nachfolger von Alfred Bader.“

Das schien für Tom Cori eine schwere Last.

So extrem sparsam Bader privat lebt, so großzügig ging er stets mit jenen um, denen er seinen geschäftlichen Erfolg und seine Karriere verdankte. Bader schenkte etwa laufend langjährigen Mitarbeitern Aktien aus seinem Privatbesitz, ebenso wie jener Universität in Kanada, die ihn als Flüchtling studieren ließ. „Tom Cori“, so Bader, „waren diese Geschenke immer ein Dorn im Auge.“

Im November 1991 kam es zum Eklat. Bader hat für seine demnächst erscheinenden Memoiren minutiös jene 17 Minuten in einem Londoner Hotel beschrieben, in denen ihm von Tom Cori in wenigen Sätzen mitgeteilt wurde, er müsse sein Aufsichtsratsmandat und den Titel Chairman emeritus, eine Art Aufsichtsrat in Ruhestand, zurücklegen. Bader: „Ich hatte überhaupt keine Ahnung, was er von mir wollte, ich hatte mit allem gerechnet, aber das ...“

Bader hatte nicht die Aktienmehrheit, deshalb konnte das Board of Directors (entspricht einem Aufsichtsrat) mit sieben zu zwei Stimmen die Absetzung beschließen. Bader: „Die wurden von Cori alle unter Druck gesetzt, denn er hat später auch jene hinausgeworfen, die auf meiner Seite waren.“

Cori warf Bader vor, er hätte gegen das Unternehmen gehandelt und spekuliert. Der Rauschmiß sei notwendig gewesen. Doch laut Bader hatte sich alles so zugetragen: Er wollte wieder einmal seiner kanadischen Universität Aktien schenken, ließ sich aber diesmal von seinem Sohn einen Tip geben. Die Aktienkurse von Sigma Aldrich standen bei 45 Dollar pro Aktie. Baders Sohn meinte, er solle Optionen verschenken, denn der Wert der Aktien werde, wie in der Vergangenheit, sicherlich noch steigen. Dadurch würde die Uni noch zusätzlich profitieren.

Der konstruierte Vorwurf. Tatsächlich stiegen die Aktien auf 47 Dollar das Stück. Insgesamt betrug der zusätzliche Gewinn für die Uni 50.000 Dollar. Doch Cori argumentierte, wer mit Optionen auf Aktien seines eigenen Unternehmens handle, der kann nur mit einem Kursverfall spekulieren. „Völliger Unsinn“, meint Bader, „Cori wußte nur zu gut, daß die Optionen als Geschenk gemeint waren. Er wollte mich einfach loswerden, meinen Namen auslöschen.“

Tatsächlich fällt auf: Tom Cori ließ anschließend die profitträchtigsten Produkte unter dem Titel „Alfred Bader Rare Chemicals“ völlig umbenennen, sodaß der Name Bader aus der Firma endgültig verschwand. Cori nahm zu dieser Affaire in der Öffentlichkeit nie Stellung und tut es auch heute nicht.



Aldrich-Gründer Bader: „Cori wollte meinen Namen auslöschen“

Baders Freunde schwören indessen, der Mann hätte die Sache mit den Aktien gewiß in bester Absicht geplant. Bader sei vermögend genug, besitze heute drei Millionen Aktien von Sigma Aldrich und hätte nebenbei einen höchst lukrativen Bilderhandel mit Werken alter Meister, darunter Rubens und Rembrandts, aufgezogen. Solche Tricks hätte er nicht nötig. Und auch seine Dankbarkeit gegenüber der kanadischen Universität scheint glaubwürdig. Nach seiner Trennung von seinem Lebenswerk, kaufte Bader in England ein

prachtvolles Schloß um rund 16 Millionen Pfund. Nicht für sich, sondern eben für die Queen's University in Ontario zu Ausbildungszwecken.

Zunächst reagierte der Universitätsleiter eher geschockt und meinte: „Wie sollen wir für die Erhaltung eines solchen Gebäudes sorgen, das kostet doch ein Vermögen?“

„Ich konnte den Mann beruhigen“, lächelt Bader „ich hab' ihm versprochen, auch das zu übernehmen.“

Herbert E. Hacker ●



Erfolg

Hinter Schloß und Riegel

Die Eremitage in St. Petersburg, der Berliner Palast der Republik oder die Strafanstalt Stein – die Zylinderschlösser des Wiener EVVA-Werks sind weltweit der Alptraum jedes Panzerknackers. Den Weg in die EG feilt ein 82jähriger zurecht.

Graue Panther sehen anders aus. Nikolaus Bujas, ständig auf dem Sprung, quirlig und geschäftig, gleicht eher einem jungen Tiger. Rastlos hetzt er durch das Büro, plaudert über Technik & Innovation, erzählt von der Erweiterung seines Betriebes, philosophiert über die Herausforderungen des gemeinsamen Marktes. „Ich habe immer Phantasie gehabt, nie aber Illusionen“, sagt Bujas. Und eilt zur nächsten Konferenz.

Nikolaus Bujas, Mitinhaber und Geschäftsführer des Zylinderschloßherstellers EVVA, wird im Dezember 83 Jahre alt. Ans Leisertreten oder gar Aufhören denkt der drahtige Unternehmer aber ebensowenig wie ein Fisch an eine Fahrradtour. „Warum soll ich, mir macht das Arbeiten ja unheimlich Spaß“, erklärt Bujas knapp.

Dort, wo ungleich Jüngere ständig vom Gestern reden, kreisen Bujas Gedanken um das

Übermorgen. Und während anderswo vergleichsweise Erfolglose laut ihre Fähigkeiten und Leistungen hervorstreichen, redet Bujas leise von Glück und Zufall.

Fortune allein kann es jedoch nicht gewesen sein. Das „EVVA-Werk, Spezialerzeugung von Zylinder- und Sicherheitsschlössern GmbH & Co KG.“, so der etwas sperrige Firmenwortlaut, präsentiert sich heute als internationalisiertes Unternehmen mit einem Gruppenumsatz von rund 740 Millionen Schilling. 480 Mitarbeiter produzieren in Österreich, den Niederlanden, im westdeutschen Krefeld sowie in Berlin und Leipzig Zylinderschlösser und Schließanlagen für die ganze Welt. Ob die Eremitage in St. Petersburg oder die Wiener UNO-City, eine Brauerei in Samoa, der Queen Alia Airport Hangar in Amman, die Oesterreichische Nationalbank, die Strafanstalt Stein

oder das Wiener AKH – die Schlüssel mit den vier Buchstaben sperren auf allen Kontinenten.

Kontinuierlich zweistellige Umsatzzuwächse und ein Cash-flow „jenseits der 25 Prozent“ (Bujas) lassen den Besitzerclan – das Unternehmen steht im Eigentum der Familien Bujas und Berlage – ruhig schlafen. Vertrauen genießt EVVA – das Kürzel steht für Erfindungs-, Versuchs- und Verwertungsanstalt – auch bei den heimischen Kreditinstituten, dokumentiert durch Genußscheine der Eco-Fonds, des Z-Beteiligungsfonds und der Beteiligungsfinanzierungs-AG.

Schweizer Käse. Selbst der Geschäftsführer des gewichtigsten heimischen Konkurrenten, der in Herzogenburg ansässigen Grundmann Schließtechnik GmbH, ringt sich „Lob und Anerkennung“ ab. „Dem Unternehmen gebührt große Achtung“, formuliert Walter Blesl schmalzlippig. „EVVA ist sehr innovativ und zudem erfolgreich in der Markterschließung.“ Wenngleich, wie Blesl vorsichtig anmerkt, das „Verhältnis zwischen EVVA und Grundmann seit Jahrzehnten nicht von bester Zusammenarbeit geprägt“ sei.

Was Blesl derart zurückhaltend umschreibt, ist in Wahrheit ein handfester Konflikt mit tiefen

GREAT SUMMER READING: RICHLER LOOKS BACK, FRASER LOOKS AT BLACK

SATURDAY *night*

Canada's Magazine

July/August 1994

MORDECAI RICHLER

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SATURDAY *night*

July/August 1994 Volume 109/Number 6/Whole number 3763/Established 1887

DIARY **Basic Black**

Well, here's one "ignorant, lazy, opinionated, intellectually dishonest and inadequately supervised journalist" who's grateful for the input *by John Fraser*

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ACADEME **Dr. Fabrikant's Solution**

The events leading up to the bloody rampage that left four Concordia professors dead have raised more than just academic questions *by Morris Wolfe*

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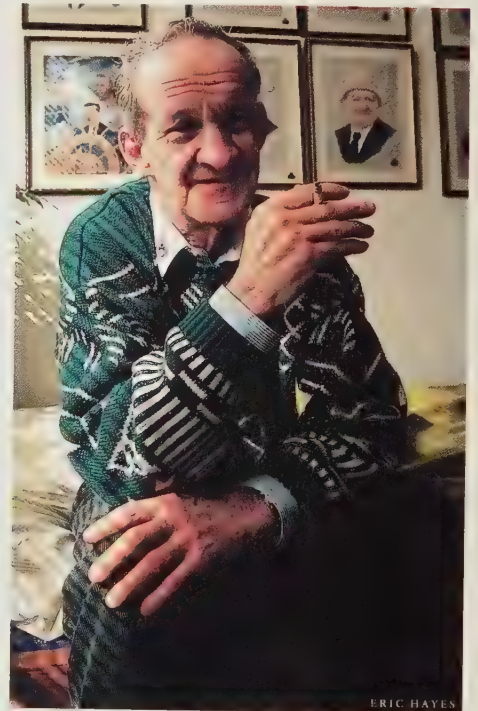
Kingston's famous university has always been an ivory tower. Now, thanks to a generous alumnus, it's got the dungeons to match *by Sandra Martin*

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28 Jimmy's the same guy he was when he won \$500,000 except a little poorer



JOHN REEVES

18 Queen's University has a new problem: how to prevent students from throwing beer bottles into the moat

FOLLOW-UP **The Second Chance of Jimmy Cohoon** He went from being broke to winning the lottery to going broke again, all in eleven weeks. So what does Canada's most famous bum do for an encore? *by Sean O'Malley*

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COVER PHOTOGRAPH OF MORDECAI RICHLER: CRAIG SAMUEL

committee unanimously approved the departmental recommendation; they had no reason not to. But the administration, in the person of Sheinin, turned it down on the ground that there was no such formal rank.

In the spring of 1990, Actions Structurantes gave the go-ahead for the three new tenure-track positions. In September, Osman recommended that Fabrikant be given one of them. He noted Fabrikant's impressive research record and his favourable student evaluations. Seshadri Sankar said he would support the appointment with the understanding that Fabrikant's research would be in a field relevant to CONCAVE. The department personnel committee approved the recommendation.

Although everything Fabrikant wanted was within his grasp, he was terrified that he would be denied again. It was at this point that he tried — unsuccessfully — to get a gun permit. He began calling Rose Sheinin's office, making veiled threats to her staff. When she came home one night, she found a message on her answering machine from Fabrikant, saying, "You know who I am and you know what is going to happen."

The ante had clearly been raised. Sheinin was already concerned enough about Fabrikant to have been doing some homework. In August, she had consulted Concordia's legal counsel about the procedures involved in dismissing someone who did not yet have tenure. She was informed that a written record of complaints, warnings, and discussions with the employee needed to be on file. She was also told that Concordia could not exercise its normal right to discipline people if its criteria for imposing discipline weren't clear, or hadn't been communicated to its employees. The same thing was true if the university overlooked rule violations, or permitted a course of misconduct to continue. By not taking action in the case of Fabrikant, the legal counsel wrote, the university could be seen to have "tacitly tolerated [his] disruptive behaviour." The disciplinary procedures set out in Concordia's collective agreement, Sheinin was told, meant the university could dismiss an employee after two written warnings. She assumed that all it would take was two letters from her.

Sheinin had also met with Warren Steiner, the consultant psychiatrist. He told her what he'd told MacKenzie and Haines. Fabrikant had a personality disorder; he needed clear boundaries. No-one at Concordia had ever told him, "You can't behave this way." Sheinin asked whether Fabrikant's behaviour would change. Why should it? Steiner replied. It works. Was it possible someone like Fabrikant could become vio-

lent, Sheinin asked. Unlikely, said Steiner.

Sheinin responded to Fabrikant's most recent threats with a strongly worded letter: "... the frequency of [your] telephone calls, the tone which you use, your warnings that you intend to tape record... conversations, etc. are totally unacceptable. The veiled threats conveyed through my staff and through Grendon Haines must stop immediately [or] I will be left with no alternative than to seek protection through the University's policies concerning discipline." This was the first time anyone at Concordia had dealt with Fabrikant so firmly. And in writing, Fabrikant apologized to Sheinin through Grendon Haines, saying he regretted his dysfunctional behaviour.

Sheinin then met with the senior members of the mechanical-engineering department and attempted to persuade them to reverse their recommendation; she wanted them to document Fabrikant's abusive behaviour. They demurred. She had the impression his unpredictability spooked them. And Sheinin's poking her nose into the almost-all-male world of engineering annoyed them. No woman, even if she was the vice-rector academic, was going to tell them what to do. Fabrikant's behaviour shouldn't be a factor in getting a tenure-track job, they said. Osman insisted that

giving Fabrikant what he wanted would "bring out the best in him," and he made it clear that if Sheinin attempted to overturn the department's recommendation he would make use of Concordia's grievance procedures to oppose her.

On November 16, 1990, Sheinin sent a memo to the rector, Patrick Kenniff, reporting on her meeting with the departmental members. "All members of faculty were adamant that Dr. Fabrikant was an asset," she wrote Kenniff, but "none of them wanted to work with or near him." She herself was convinced, she said, that "whatever problems we have been presented with by Dr. Fabrikant will continue.... My gut feelings tell me that he should not be taken onto the full-time faculty." Nonetheless, she wrote, she wasn't prepared to take on the mechanical-engineering department.

Before becoming rector in 1984, Kenniff had been a deputy minister in the Quebec government. Hired by Concordia's Board of Governors because he was well connected and would help raise the university's profile, he was seen and heard in all the right places. But he did not run a particularly tight or happy ship. Though he seemed to be off campus more than he was on, he had trouble delegating authority. His first vice-rector academic, Francis Whyte, quit the▶

*She thinks she's got me pegged.
That she can predict my every move.
Maybe, just maybe, she'll guess
she's getting a diamond.
She'll never predict this.*

DeBeers

*For that special birthday.
Diamonds beyond all her expectations.*

A diamond's forever

Fabrikant

university in frustration before the end of his term.

If Sheinin was hoping for support from Kenniff, she didn't get it. So she settled for telling the department that if it hired Fabrikant, he was their problem. She added a rider to Fabrikant's contract. He would have to wait three years before he could be considered for tenure. His new contract would run two years, until June, 1992, at \$59,677 a year; the possibility of extension would come up for review in the fall of 1991.

In the spring of 1991, the department personnel committee awarded Fabrikant a merit increase, the highest of anyone in the department, in recognition of the excellence of his work as a teacher and researcher. He responded by making fresh demands: he asked Osman for a four-month paid leave to accept a \$4,500-a-month fellowship in France. The request was denied on the grounds that it contravened university policy. He couldn't be paid twice, but he could, if he wished, take a leave of absence. In July, he informed Seshadri Sankar that he'd been awarded a \$10,000 grant by NASA, which could eventually lead to a much larger grant. He wanted to drop all his work for CONCAVE to devote his time to his new project, this despite his contractual agreement to do research relevant to CONCAVE. In early October, he asked Osman for permission to use a \$7,000 research grant he'd received from the internal granting system of the university to purchase a release from his teaching responsibilities given the demands of his research work. This, in the circumstances, was outrageous. Osman called Fabrikant to say his request violated both university and federal regulations. Research funds had to be used for research. "Are you trying to scare me?" Fabrikant replied. "I am not scared. I wrote a letter and I want a written reply."

Fabrikant's petty insolence cost him a major ally — only weeks away from having his appointment reviewed. Osman wrote a stiff note informing him that what he was proposing was in fact illegal and upped the ante by requesting a detailed report on his future teaching goals. Fabrikant responded, saying he'd been told that Tom Sankar had once bought a release from teaching, and demanded an apology. He reminded Osman of the merit award he'd recently been given and went on to say that he planned to be on sabbatical the following year. (The university didn't believe he was entitled to one.) Osman went through Fabrikant's file and found minor discrepancies in his résumés. He asked Fabrikant for proof of his academic qualifications. Fabrikant responded with *(Continued on page 56)* ▶

POSTCARD

Queen's and the Castle

Lots of university graduates give cash donations to their alma mater. Alfred Bader sent his a castle

Snuggled tightly into a basin on the Sussex Downs on the south coast of England since before Gutenberg set up his printing press or Columbus set sail from Spain, the moated castle of Herstmonceux has passed through more owners than a cat has lives. In its most recent incarnation, Herstmonceux has been given to Queen's University in Kingston, Ontario, by a mysterious alumnus named Alfred Bader. He reportedly paid £4-million (\$8-million) for the property and threw in another £2-million for renovations. What kind of person spends \$12-million on a castle, only to give it away? The answer is as labyrinthine as the castle, and every bit as haunted by ghosts.

Last July Queen's celebrated its benefactor and his far-flung bequest by holding a Bursary Ball at the castle and by opening the grounds the next day for a "Medieval Pageant and Family Fayre." On the eve of the ball, I set off in a hired car from coastal Newhaven to drive the fifteen miles to Herstmonceux for a tour of "the hidden castle," as the locals call it. Ninety minutes later I was still roaring past signposts, careering around war memorials, and brushing by clumps of rainbow-coloured hydrangeas, frantically scanning the horizon for a glimpse of turret. Finally, I came upon the discreetly marked driveway that courses through Herstmonceux Park. There were thickets of trees, a herd of tame deer, and rolling lawns, but still no turrets. And then, over a rise and there it was, the epitome of romance.

A Romanesque bridge crosses a wet moat leading to the entrance portals. The main building, which was constructed mostly of brick in 1441, evokes a scaled-down Hampton Court, although it predates that royal palace by nearly seventy-

five years. Four looming towers mark the corners, and, for good measure, there are battlements, a dungeon, a central courtyard, and two ghosts — one of each sex. "The Grey Lady" is said to be Grace Naylor, a young woman who may have been starved to death in 1727 in one of the towers by her wicked governess. The other (usually) headless apparition is a drummer who beats a ghostly tattoo along the southern battlements. He may have been summoned as a hex by Victorian smugglers who stored contraband in Herstmonceux.

Behind the massive crenellated castle, there is a grassy ditch, or dry moat, that gives way to a two-levelled walled garden that has yew hedges, flagged walks, a radiant herbaceous border, and sumptuous rose gardens. Elsewhere in the grounds are an avenue of sweet chestnut trees some 300 years old, two ornamental lakes, and a Georgian folly. From the front, the folly has the proportions of a stately two-storey house; in fact it is no more than two skinny rooms deep, as though it had been squished like an accordion.

Even more incongruous are the six domed freestanding telescopes, sprinkled on the site like giant lawn ornaments, which date from one of the castle's previous incarnations ▶

by Sandra Martin



Queen's and the Castle

as the home of the Royal Greenwich Observatory. The Admiralty bought Herstmonceux in 1946 and over the next decade moved in its telescopes, away from the smoggy, polluted skies of Greenwich, and constructed a stout 70,000-square-foot office and laboratory complex to accommodate observatory staff. By 1987, even bucolic Herstmonceux was too populated for the Royal Observatory and the castle was sold to a gentleman known locally as "James the Builder," for £8-million. Alas, James himself came a cropper and went bankrupt. Amid scurrilous rumours of Japanese theme parks and low-income-housing estates corrupting the site, Savills – the English estate agents – and Sotheby's International Realty put Herstmonceux on the market in July, 1992.

"Castle for Sale – five million pounds – Big Bargain," is the way Alfred Bader remembers the Savills ad in *The Times*. He and his wife, Isabel, were travelling by train from an auction in London to their home in Sussex when Alfred turned to Isabel and asked, whimsically, "Would you like a castle?" She looked across at the listing, recognized it as Herstmonceux, and said, "Well, no, there are too many rooms to clean." But Alfred was intrigued, and so they made an appointment to see the castle "for a lark." Wandering around, Alfred realized that a 140-room moated castle on a 500-acre site wasn't the ideal retirement cottage for a couple of their modest tastes. However, he did think that it "might be wonderful" for Queen's. Why, one might well ask.

Bader is convinced that Canadians are too insular, that they are not "citizens of the world." What he saw in Herstmonceux, or rather in the office building left behind by the Royal Greenwich Observatory, were premises that could easily be converted into a dormitory for two or three hundred students from Kingston. By providing Queen's with a campus on the southeast coast of England, the Baders were hoping to nudge Queen's undergraduates gently out of

Not Free. There was no such gesture.

When Bader phoned Queen's, he was delicately asked whether they couldn't have the money instead: "It was the castle or nothing"

Kingston and into Europe – at least for a term – for the very simple reason that so often you have to go away to see where you are from.

Alfred Bader was born in Vienna in 1924 to a Jewish father and a Catholic mother. His father died when he was two weeks old and his mother (who later, according to Bader, married a "nasty character who was a Nazi") allowed little Alfred to be raised by his dead father's sister. After *Kristallnacht* on November 9, 1938, the British government offered 10,000 visas to Jewish children (aged twelve to sixteen) who had no relatives outside the German Reich. Bader's adoptive mother got him a visa and put him on a train to England, early in December, 1938. He was fourteen years old. He knew nobody and he spoke only schoolboy English. He never saw either mother again.

Bader told me this awful story on the morning of the ball, sitting in a panelled anteroom overlooking the gnarled chestnuts. I arrived first for our appointment and, as I waited in the empty castle, I peeped out the window and watched him approach feeling like a conspirator in an Elizabethan drama. Short and pear-shaped, dressed in a loose-fitting navy jacket, tan trousers, and a beige fedora, he walked ponderously towards me. He has a weary, wrinkled face, as ancient and wise as an elephant's, and ferocious brows that hood inquisitive brown eyes. In conversation, his voice was so soft

and his story so riveting that listening was exhausting.

After he arrived in England, an old lady named Mrs. Wolff in Hove, near Brighton, sponsored Bader by contributing a guinea a week towards his room and board while he attended the East Hove Senior School for Boys. She also invited him periodically for tea, but it never occurred to her that he might want or need some pocket money – a tiny thoughtlessness that still hasn't been erased from Bader's memory. Alfred's school days were truncated fourteen months later when the Nazis rampaged through Belgium, Holland, and France in the spring of 1940 and headed for the Channel. The British were so afraid of a German invasion that Prime Minister Winston Churchill rounded up all male German and Austrian

nationals between sixteen and sixty living on the southeast coast and interned them as enemy aliens. Bader was one of them.

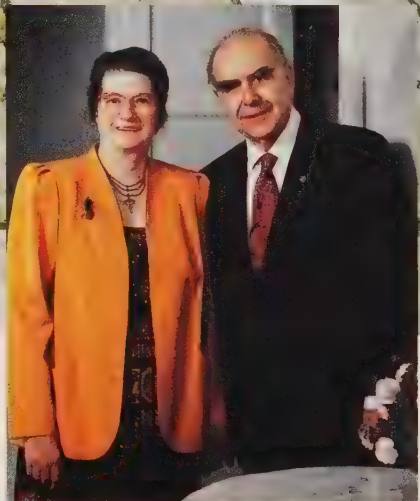
In July thousands were transported like felons of old to the colonies. "There were five ships," he recalled. "Three went

to Canada, one went to Australia, and one sank." He arrived in Quebec in July, 1940, and was sent to an internment camp near Sherbrooke on the Île-aux-Noix. The camp commandant looked Bader over and observed that he was young to have parachuted into England as a Nazi spy. When Alfred replied that he was a Jew who had fled to England, the commandant laughed and said he didn't believe it and anyway *he* didn't like Jews either.

One day a newspaper blew over the barbed-wire fence into the camp and Alfred read it avidly, as much to improve his English as to augment his knowledge of current events. In the obituary column he read a death notice for a Mrs. Wolff, who was survived by her husband, Martin, in Montreal and a mother-in-law who turned out to be Bader's benefactor, old Mrs. Wolff in Hove. He recognized the name and remembered Mrs. Wolff talking about her granddaughters in Canada. Bader started writing to Martin Wolff and eventually one of the letters made it past the camp censors. The Wolff family happily "inherited" the teenage Bader and began working on getting him released from the camp. In the meantime, Bader had written Quebec's junior and senior matriculation examinations. He passed handily, earning, as he recalls, first-class marks in everything but his native German, and that only because the International Students' Service had refused to send him the set text out of fear that giving a



Palace without the malice: Why did Alfred Bader buy an English castle for \$12-million, then give it to Queen's? Well, for starters, his wife thought it would be hard to clean



German novel to an enemy alien would violate Canada's War Measures Act! The Wolffs then helped him to apply for admission to McGill University.

Despite his exemplary grades, Bader had trouble getting into university. He says McGill refused him entry because of its Jewish quota – which was not revoked until the mid-1950s. Then the Wolffs had Bader apply to the University of Toronto. This august institution turned him down as well – not because he was a Jew, they explained carefully, but because he was an internee and might infiltrate and sabotage their war efforts. Finally, one of Wolff's daughters, a student at Queen's, suggested Alfred apply there. He did, and was accepted. Released from the camp on November 2, 1941, he arrived in Kingston thirteen days later.

Bader loved Queen's and was a tremendous success there. He earned a Bachelor of Science degree in engineering chemistry, working in the summers at the Murphy Paint Company in Montreal. After graduation, he joined the company full time. Eighteen months later, his boss gave him \$1,600 and told him to go and get a doctorate. "I figured I should brush up and get a master's first," Bader said, so he headed back to Queen's, which offered him a research fellowship of \$100 a month. From Queen's he went to Harvard for his doctorate in chemistry.

After Harvard, Bader went to work in Milwaukee for the Pittsburgh Plate Glass Company, which had bought out the Murphy Paint Company. Pittsburgh wasn't doing enough pure research to suit Bader and so he began mixing chemicals in his garage in his spare time. That led to the Aldrich Chemical Company, which Bader and a local attorney, Jack Eisendrath, founded in 1951 and named – in the absence of a more inspiring moniker – after Jack's fiancée, Betty Aldrich. In the middle 1950s, Bader bought out his partner and then in 1975 he merged with the Sigma Chemical Company to create Sigma-Aldrich, still the world's foremost supplier of high-quality chemicals. Fifty years after he had arrived at Queen's as a penniless alien, Bader had 3,600,000 shares in Sigma-Aldrich, shares the New York-based Value-Line Investment Survey calculated were then worth forty dollars (U.S.) each.

Over the years Bader has served on the board of trustees of Queen's, endowed chairs in chemistry and art history, and donated more than 100 mainly seventeenth-century Dutch and Flemish paintings from his private collection. On November 15, 1991, he marked the fiftieth anniversary of his arrival at Queen's with a \$2-million gift consisting of \$1.5-million and 10,000 shares in Sigma-Aldrich. Instead of simply giving ▶

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Queen's and the Castle

the university the Sigma-Aldrich shares outright, which at the time were trading for forty-one dollars (U.S.) and rising, Bader sold an option on Queen's behalf. As a result, the university received a total of \$470,000 for the shares, or an extra \$60,000, a dollop of icing on the November 15 celebrations.

Five days later, the pleasure went mouldy when Dr. Tom Cori, who had succeeded Bader when he retired as CEO of Sigma-Aldrich, insisted Bader resign his honorary position as chairman emeritus because he had "bet against the company" by selling the option. Bader was indignant and Cori was obdurate. When a new slate of directors was approved at the company's annual meeting in May, 1992, Bader's name was missing. Bader was devastated, many others were outraged. Articles and letters condemning Cori began appearing in industry journals such as *Chemistry in Britain*, *Canadian Chemical News*, and *Chemical and Engineering News*. Bader himself wrote letters to clients roaring against the calumny that he had betrayed his own company. Cori kept silent, other than to tell *Chemical and Engineering News* that Bader had agreed to retire in 1991 and to continue working "in a consultant role during a transition period" until December 31, 1991. It was time, Cori seemed to be saying, for the old man to step down and if he wasn't going to go quietly, he was going to be shoved out of the way. It was a shabby end to a long and glorious career.

The spring of 1992 was bleak. Bader took solace in his wife, Isabel, a woman whose only flaw was that she was a graduate of Queen's rival, the University of Toronto. Bader had met her in 1949 aboard a ship sailing from Quebec City to Liverpool. "I was immediately attracted to her wonderful freckles," he remembers. It took him nine days to propose and then she turned him down because of that old bugaboo: different religions. Isabel stayed in England, where she worked as a teacher and established a local drama school near Herstmonceux in Sussex. Bader went to Milwaukee, married, and had two children. In the middle seventies Bader and Isabel, who had never married, met again; he was determined not to lose her once more, even though she refused to have any kind of relationship with a married man. Eventually, Bader's first wife, Helen, realizing how miserable he was, offered him a divorce. They divided everything down the middle, even to sharing the lawyer, who charged them \$150 for helping them effect what must be the most amicable of split-ups. Bader and Isabel were married in 1982, a

little more than thirty years after he had first proposed. A decade later they still twinkle with happiness.

After the humiliation of being ousted from the board of Sigma-Aldrich, Bader had no compunction about liberating some of his shares to buy himself a Rembrandt and his alma mater a castle. For him, Queen's is much more than an entry on his curriculum vitae. It changed his life and it made him "feel like a human being." Giving something back is vital to him. Besides, Queen's never asks, as Bader is fond of saying. What he has offered in Herstmonceux is as much a challenge as a gift. He wants the 152-year-old liberal-arts university to transcend the small-town confines of Kingston, Ontario, and ply its academic wares in the international marketplace. He's willing to provide the base, but Queen's must do the rest. That's what Queen's did for him fifty years ago, and he is grateful in ways only a multimillionaire can express.

As a boy of fourteen, Bader was frogmarched into the reality of international politics. That has affected the way he sees life. "Canada has been an enormous disappointment," he told me, "because of its bureaucracy and, of course, because of the enmity between the French and English. That's been just a total waste of emotion." The Canada that Bader saw when he was dumped here in 1940 had the potential, he felt, of becoming the greatest country in the world. "So much of it has been frittered away," he said sadly. He paused and then perked up to say, "And yet, Queen's is such a wonderful place."

But what would any cash-strapped Canadian post-secondary institution – even a university named Queen's – want with a castle, other than as a storehouse for doty, tenured professors? When Alfred Bader telephoned Queen's principal, David Smith, late in the summer of 1992 to talk about the castle, Smith's immediate response was to ask (delicately) whether they couldn't have the money instead. "He made it very clear," Smith said, "that it was the castle or nothing." He had "no wish to foist it on us if it was to be an albatross." Smith added quickly, but he wanted to know whether we "could use it to advance Queen's academic work."

Smith struck a committee of professors and students to determine whether Herstmonceux made economic sense for Queen's. "That was a strict condition," Smith said. "Things were so tight that we could not undertake this initiative if it drew on our operating budget in any way." Smith made his own reconnaissance mission in November, 1992. What struck him immediately was that even though Herstmonceux is ▶

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ABSOLUT FREEDOM.

by/par Alain Pilon

Queen's and the Castle

ineffably rural, it is located strategically within commuting distance of London, next door to Brighton and the University of Sussex, and reasonably close to Europe – the new Channel Tunnel entrance is forty-five miles away.

As he walked through the astronomers' office building, Smith realized how solid it was and how easily it could be converted into a student residence. Suddenly the project seemed much more feasible and he saw what Alfred Bader had perceived on his visit to the castle months earlier: Herstmonceux could be the vehicle to provide Queen's students with an international perspective and a satellite campus with easy access to the Continent.

Queen's sees the market for such a programme as the roughly 100,000 second- and third-year social-sciences and humanities students across the country. Smith hopes to attract 750 of them annually in three groups of 250 spread over the three academic terms, filling up the summer schedule with commercial and professional bookings and conferences. The students will earn credits for Queen's courses that will be transferable to their own academic institutions. "Having a castle sounds luxurious," David Smith said with a smile, "but there is nothing frivolous about Herstmonceux. It is not a luxury place to go and relax."

That much was obvious at the Bursary Ball, where guests were served with a buffet of ham salad – the catering facilities didn't yet run to hot food. The next day, we were back again for the fête, a community crowd-pleaser featuring jousts by the Medieval Combat Society, an assortment of strolling minstrels, longbowmen, falconry exhibits, hot-air balloons, and the ubiquitous pony rides, cricket, and croquet.

I skirted the falconry exhibition and crept through the hedges to the folly. On the way back, I slipped into the castle, in search of a less-trafficked loo, and there in the courtyard was Alfred Bader, wearing his familiar loose-fitting navy jacket and beige fedora. I smiled and waved. As he approached, he reached into his pocket, extracted an After Eight mint, and proffered it.

They were the same mints that we had had at the Bursary Ball the night before. Did he scoop them off the table in an unconscious reversion to his hungry days as an internee, or did he have his own supply? I couldn't ask. I munched the mint and when we said goodbye he pressed another into my hand. To refuse would be uncharitable. He wandered off, dispensing nods and mints in equal measure, as he made his way around the courtyard. The man just can't stop giving things away. ■

"My great luck was that I came to Canada at a time when there had never been another harpsichordist here." Greta Kraus is sitting in the living room of the Toronto house that has been her home for all but the first few years after she fled her native Vienna in 1938. All around her are the books, keyboard instruments, printed and recorded music, paintings, photographs, and *objets d'art* that mark an extraordinary career. Small and slender, with a thin face and prominent nose, she looks quietly elegant even though she is wearing trousers. In recent years Kraus, who will be eighty-seven in August, has been subject to frequent bone breaks and cracks, but she still moves swiftly and speaks in an intense, Viennese-accented pianissimo punctuated – she's moved on to discussing the merits and limitations of certain well-known musicians – by sudden dramatic fortissimos.

In Canada, Greta Kraus is the uncontested doyenne of the early-music revival in general, and harpsichord playing in particular, but her accomplishments go far beyond the baroque repertoire. She has coached Canadian singers not only in baroque orato-

She Shall Have Music

rios but in romantic German opera and lieder, and twentieth-century works. The composer R. Murray Schafer studied with her, and so did the keyboard artists Douglas Bodle, Elizabeth Keenan, Patrick Wedd, and Valerie Weeks and the singers Elizabeth Benson Guy, Mary Morrison, Gary Relyea, Roxolana Roslak, and Teresa Stratas. Countless other musicians have come to her for advice, and few if any of them would accept Kraus's theory that her value to Canadian music would have been slighter had the competition been stronger when she arrived on these shores.

"What attracts everyone is her complete

immersion in the music; she finds things that others search for but can't find," says soprano Lois Marshall. "She certainly has more of that ability than anyone else in this city and, I would venture to say, than anyone else in this country or in North America. Even a pianist of the stature of Murray Perahia hangs on Greta's every word."

Kraus's contribution to Canadian music was recognized in October, 1990, when she was appointed to the Order of Canada.

by Harvey Sachs



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Alfred Bader To Receive 1995 Parsons Award

Ernest L. Carpenter,
C&EN Washington

Alfred Bader, the organic chemist of almost legendary status who made a fortune from founding and nurturing Aldrich Chemical Co. in Milwaukee, has been selected by the American Chemical Society to receive its 1995 Charles Lathrop Parsons Award.

Unlike most ACS awards, which recognize scientific accomplishments, the Parsons Award recognizes outstanding public service by a member of ACS. In Bader's case, the award honors his wide-ranging impact on the chemical profession and the chemical community, not only through Aldrich's service of providing thousands of unusual chemicals for research, but also through his many personal contributions to establish research grants, education programs, and awards in several countries.

At age 70, Bader remains the same fascinating mixture of ego, modesty, and almost boundless energy that has characterized his career for decades. He describes himself as an entrepreneur, a wheeler-dealer. "But I want to help others. Nothing I do is for show; it is all reality." Although a millionaire many times over, Bader says he and his wife, Isabel, have "a very modest lifestyle."

What does he regard as his greatest accomplishment? "Building Aldrich," he replies without hesitating. "I am very satisfied about what it has done for chemists—it has saved them so much work in synthesizing thousands of chemicals," he says, referring to chemical intermediates that chemists could obtain from Aldrich rather than take the time to synthesize them.

Bader's career at Aldrich spanned 41 years, beginning in 1951, when he and a friend started the company in a garage, and ending unexpectedly two years ago, when the board of directors forced him to leave. Bader served as chairman of the board of Sigma-Aldrich (Aldrich merged with Sigma Chemical



Photo by Fred Langenhagen/Wirtschafts Woche

Alfred and Isabel Bader

Co. in 1975) from 1980 to 1991, when he officially retired. Following his retirement, the company agreed to let him remain on the board in an unpaid position and granted him the title of chairman emeritus. In that position, he expected to be an "ambassador" and consultant for the company, doing what he had done for years—paying personal visits to chemists and their labs around the world, obtaining ideas for new chemicals that Aldrich could sell to researchers.

However, less than a year later, the board had a change of heart after Bader sold a "call option" on 10,000 shares of Sigma-Aldrich stock (of 3.6 million he owned). Bader intended the call option to maximize a gift to his alma mater, Queen's University in Kingston, Ontario. But the Sigma-Aldrich board, led by the new chairman Tom Cori, claimed that

Bader's action amounted to "betting against the company," and it insisted that he "was no longer fit to work for the company," forcing him off the board and out of the company's service (C&EN, April 6, 1992, page 39).

At the time, Bader was incensed at the board's decision, insisting that he had done nothing wrong. But, in the two years since then, Bader, although obviously still bitter about his abrupt separation from Sigma-Aldrich, has begun to see a "silver lining" in his situation. For one, he says, it has freed up more time for another love of his, dealing in art—especially old Dutch paintings. And it has given him freedom to sell Sigma-Aldrich shares—and, of course, use the proceeds for his philanthropic interests. Since leaving Sigma-Aldrich, in fact, he has purchased for millions of dollars a Rembrandt painting, a Rubens, and a medieval castle in England.

Bader's interest in art goes back to his childhood, but he started collecting paintings seriously while working on his doctorate in chemistry at Harvard when, he says, "lesser old masters could be obtained relatively cheaply." Over the past four decades, he has amassed an impressive collection. Some of his acquisitions are for sale in his art gallery where he now maintains an office—a suite of rooms in Milwaukee's Astor Hotel. But most of the paintings—literally hundreds of them—he has bestowed on the rest of the world through favored guardians such as Queen's University Agnes Etherington Art Centre, the Milwaukee Art Museum, the Allen Memorial Art Center at Oberlin College, Minneapolis Institute of Arts, and Harvard's Fogg Art Museum, among many others.

As for his famous acquisitions, he purchased the Rembrandt painting—"Portrait of Johannes Uytenbogaert"—at Sotheby's in London in 1992 and a few months later sold the painting for \$10 million to the Rijksmuseum in Amsterdam, which houses the largest collection of Rembrandts in the world. He ad-

PARSONS AWARD

mits to making a tidy profit on the deal. "How many other chemists can say they sold a Rembrandt?" Bader asks proudly.

Bader purchased the Rubens painting, "Entombment," at a Christie's auction in London at the end of 1992 and last year sold it to the Getty Museum in Malibu, Calif.

His greatest coup, Bader says, was the acquisition of Herstmonceux Castle, in Sussex, England, last year. He and his wife own a house nearby, where they live while in the U.K. During a visit there last year, he noted that the castle was for sale, and he and Isabel looked at the property "for a lark," he says. They realized that the castle and grounds "would make a wonderful campus for Queen's University." After consulting with Queen's, he negotiated the price and gave Queen's the funds to buy the castle and begin the conversion of the property, which until the late 1980s was the base for the Royal Greenwich Observatory. He says the new campus "adds a new dimension to life at Queen's." It intends to use the castle as a center of studies in European politics, economics, law, and art.

Commenting on the challenge of what he can do for an encore, Bader says that "with Isabel's vision, and if the Lord gives us time, we will find other great things to do with our money, which we do not want to use for ourselves and cannot take with us."

Lest one think that Bader spends all his time "wheeling and dealing" with paintings, he reckons he spends only about a third of his time doing that. He says he spends another third or so of the time working on two books—an autobiography, which he undertook at the persistent urging of several friends and which he intends to complete later this year, and an encyclopedic work of Biblical subjects treated by Dutch painters in the 17th century.

Another "special project" that occupies considerable time is helping small chemical companies and chemistry students in the Czech Republic. Bader, whose father was of Czech origin, advises the companies on, among other things, what chemical products to make, such as hair dyes and pharmaceutical intermediates. He has set up a number of fellowships for Czech chem-

istry students to do doctoral research in the U.S. and U.K. and also funded other awards within the republic. He has funded similar fellowships for art history students.

Indeed, ACS itself has benefited a number of times from Bader's generosity. For instance, he endowed ACS's Alfred Bader Award in Bioinorganic or Bioorganic Chemistry. And, recently, he and his family granted the society funding to expand the Project SEED program to include a second summer of chemistry lab experience, an expansion he is convinced is much more useful to young students than the single-summer concept.

Bader's generosity to chemists and particular institutions may be explained in part from episodes in his personal his-

tory, along with several thousand other refugees.

Held for 16 months at an internment camp in eastern Canada, Bader was taken in by a member of the same family that befriended him in England, and he immediately applied to attend McGill University but was turned down. The same for the University of Toronto. However, Queen's University in Kingston accepted him. "It was the first place I was treated as an equal," Bader says.

At Queen's, Bader says, he obtained a B.S. degree in engineering chemistry, a B.A. in history, an M.S. in organic chemistry, "and a love for synthesizing chemicals." In the summers during this period, he also worked as a chemist for Murphy Paint Co. in Montreal, formulating paints and varnishes. The company nearly insisted

that he leave to obtain a Ph.D. degree and even gave him a small grant to do so. Bader chose Harvard for his doctorate education, where he rubbed shoulders with brilliant chemists like Gilbert Stork and Robert Woodward, who became his fast friends.

After receiving his Ph.D. degree in chemistry two years later, Bader felt obligated to return to Murphy Paint, which had been acquired by Pittsburgh Plate Glass (PPG). PPG had just consolidated all its paint research in Milwaukee.

Relocating to Milwaukee, Bader helped guide PPG's paint research into new areas based on new monomers. Despite his accomplishments, though, he was

not satisfied. He tried unsuccessfully to convince the company to let him use some of his spare lab space to make and sell small quantities of research chemicals. Undaunted by PPG's refusal, Bader and an attorney friend decided in 1951 to start a company to sell research chemicals, which they operated in the evenings and on weekends in a garage. To name the fledgling firm, the two partners tossed a coin. The attorney won, and named it after his fiancée, Betty Aldrich. And thus Aldrich Chemical was born.

When PPG moved its research labs to Pittsburgh three years later, Bader didn't want to move there, so he remained in Milwaukee, which has been his primary hometown ever since.

He developed a unique style of working that eventually endeared him to customers and colleagues throughout the



Bader poses in his "friends gallery"—signed photos and mementos from around the world.

tory. Bader was born in 1924 in Vienna to a Hungarian mother and a Jewish father. His father died two weeks after Alfred was born, and the father's sister, a wealthy widow, was allowed to adopt young Alfred.

By the time he was 14, his aunt's fortune had been depleted. Because of the growing Nazi menace in that region, Bader was sent to England to live with strangers under a British program allowing entry visas for Jewish children. He finished high school there and started at Brighton Technical College. But in 1940, because of fear that Nazi sympathizers might aid the German war effort, the British government imprisoned as enemy aliens all German and Austrian males in the country between the ages of 16 and 60. Bader was caught up in this web and was shipped off to Canada as

chemical community: He visited top academic research labs across North America and Europe, learning about the chemicals that Aldrich could supply—at a modest cost—that would reduce chemists' time in conducting their research.

During the course of these visits, he became familiar with the careers of many researchers. When he saw a need for funding to continue what he regarded as important research, he would make a small no-strings-attached grant to the researcher. "They were small grants," Bader says, "a few thousand dollars." Many such grants have been made by him around the world, some to chemists who have become well known.

In the mid-sixties, with Aldrich's sales more than \$2 million and its stock being traded publicly, it was clear to Bader that the greatest growth in chemical research lay in biochemistry. So he began considering a merger with a biochemical producer, the ablest and most interesting of which, Bader says, was Sigma Chemical Co. in St. Louis. Sigma initially rebuffed a merger proposal, but it finally agreed in 1975.

With the greatly enhanced catalog of chemicals, and with an emphasis on fast filling of orders and high-purity compounds, Sigma-Aldrich grew to one of the world's preeminent suppliers of custom chemicals and fine organics and inorganics. Its sales in 1993 totaled more than \$739 million.

Over the years, Bader's enthusiasm for chemistry and passion for art have made him a much-sought-after lecturer for societies and universities around the world, including ACS Speaker Tours. His favorite topics include the chemistry of art restoration, the Bible as represented by the Dutch masters, and the history of chemistry, particularly of his 19th century hero, Josef Loschmidt, an Austrian chemist who Bader regards as the father of molecular modeling.

Bader's contributions to science, industry, and art have been recognized over the years in many ways. For instance, he has been presented honorary doctorates from several prestigious universities, selected as Honorary Fellow of the British Royal Society of Chemistry, and, most recently, honored by a special symposium sponsored by Harvard's chemistry department. Yet, as noted by one of his friends, the distinction of the Parsons Award serves as an appropriate capstone to all these honors. □

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ACS Honors Its 50-Year Members

Below is a list of 50-year members being honored by local sections and the national society this year. Each member is to receive a certificate, a special pin, and a permanent badge entitling the member to free registration at all national and regional meetings.

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William Bandaruk
Costa Mesa, Calif.

Mario D. Banus
Beaufort, S.C.

Kenneth M. Barclay
Woodland Hills, Calif.

Conrad B. Bare
Coopersburg, Pa.

Emile Baros
Wayne, N.J.

L. D. Barrett
Cleveland Heights, Ohio

Lawrence S. Bartell
Ann Arbor, Mich.

Robert Earl Baskey
Jefferson, Ohio

George H. Batt
Hanalei, Hawaii

Frederick W. Bauer
Wayne, N.J.

Richard G. Bauman
Berea, Ohio

C. Thomas Bean
Ashland, Ky.

Lamoyne D. Bearden
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Lloyd W. Beck
Versailles, Ky.

Roland A. Beck
Whittier, Calif.

Paul Bedoukian
Wilton, Conn.

Allan R. A. Beeber
Portsmouth, R.I.

Nathan Beitsch
Baltimore

Edward L. Bennett
Berkeley, Calif.

Arthur J. Benson
Alhambra, Calif.

Marc Beretz
Strasbourg, France

Norman N. Bernstein
Milwaukee

Clark G. Berry
Arlington, Va.

Karl H. Beyer Jr.
Penlynn, Pa.

Wilbur C. Bigelow
Ann Arbor, Mich.

Jordan Birger
Brookline, Mass.

Carl W. Bjorklund
Los Alamos, N.M.

Mary Grace Blair
Tulsa, Okla.

Robert H. Blaker
Wilmington, Del.

Harry N. Blakeslee Jr.
Barrington, Ill.

Konrad Bloch
Boston

Harold P. Bodenstab
Wilmington, Del.

John C. Boesch Jr.
Mooresville, N.C.

G. Norris Bollenback Jr.
Washington, D.C.

William T. Booth Jr.
Phoenix

Cyrus M. Bosworth
Waldoboro, Me.

Robert S. Bowman
Pittsburgh

Myron H. Boyer
La Jolla, Calif.

Paul D. Boyer
Los Angeles

Donato J. Broacco
Concord, Mass.

Thomas R. Braddock
Wellsville, N.Y.

H. Leon Bradlow
Hollis, N.Y.

Mark R. Braford
Indianapolis

W. F. A. Brandenburg
Vero Beach, Fla.

Warren John Brehm
Wilmington, Del.

Joseph N. Breton
State College, Pa.

Willard F. Brickell
Shreveport, La.

Milton J. Bromberg
Lake Charles, La.

Richard J. Brouns
Richland, Wash.

Alexander Brown
Stonington, Conn.

Elizabeth E. Brown
Littleton, Colo.

William E. Browning Jr.
Boston

George J. Bryan
Colton, Calif.

Francis Buchwalter
Fort Lee, N.J.

Marion Burg
Wilmington, Del.

James P. Burlingham
State College, Pa.

John J. Burns
Nutley, N.J.

W. Herbert Burrows
Atlanta

Albert J. Byer
Jamesburg, N.J.

Charles H. Byrne
Bluff Point, N.Y.

Louis Caldarelli
Santa Fe Springs, Calif.

Ross L. Calhoun
Prairie Village, Kan.

Joseph E. Callen
Cortez, Fla.

Alfred A. Camilli
Marquette, Mich.

John R. Cann
Denver

Peter J. Canterino
Towaco, N.J.

Wendell T. Caraway
Flint, Mich.

Charles R. Carder Jr.
South Charleston, W.Va.

Ralph E. Carey
Salt Lake City

Daniel J. Carlick
Livingston, N.J.

Robert E. Carlin
Perrysburg, Ohio

William H. Carr Jr.
Williston, S.C.

Robert D. Carver
Cincinnati

Peter F. Casella
Lewiston, N.Y.

Florence D. Catone
Lakeport, Calif.

Robert R. Chambers
Studio City, Calif.

Douglas Scott Chapin
Estes Park, Colo.

Daren Chenkin
Lakehurst, N.J.

Max E. Chilcote
Tonawanda, N.Y.

Roger M. Christenson
Gainesville, Fla.

Anthony R. Ciuffreda
Colonia, N.J.

Charles A. Clark
Cleveland

Charles Austin Clark
Binghamton, N.Y.

OBITUARIES

Franz Bader, Arts Figure In D.C., Dies

By J.Y. Smith
Washington Post Staff Writer

Franz Bader, 90, a retired art gallery and bookstore owner and a major figure in the Washington art world for nearly half a century, died yesterday at George Washington University Hospital. He had heart ailments.

A Jewish refugee from Nazi Europe, a businessman who loved beauty, a mentor of artists and writers, a photographer of subjects ranging from what he called tourist shots taken on world travels to abstractions from his own back yard, Mr. Bader also was an inventor of the Washington art scene.

When he moved to the city from his native Vienna, Austria, in 1939, there were three galleries exhibiting modern art. The first was the Corcoran Gallery of Art, the second was the Phillips Collection and the third was the Whyte bookshop and gallery.

Mr. Bader went to work at the Whyte for \$25 a week. Later he became a partner. In 1952, he established a gallery and bookstore under his own name at 17th and G streets NW. It has since moved many times. By the time he retired in 1986, there were perhaps 135 galleries in the Washington area.

But Mr. Bader was the first to show the work of such subsequently famous local artists as Gene Davis, Lee Weiss, Alma Thomas and Kenneth Noland. He also showed the work of Grandma Moses and the etchings of Gunter Grass.

While still with the Whyte, he introduced Washington to Eskimo art and described it in an interview in 1983 as "the last great folk art—their life is changing so, with TV and all." And he was the first gallery owner here to show Ethiopian artifacts and folk art from Haiti.

Invitations to the receptions he gave when his gallery opened new shows were highly prized. He also gave parties for writers when they came to town, including the likes of Dylan Thomas, Aldous Huxley and Robert Graves.

"I could have sold cars," he said. "Or flour. I could have been rich, so I would have enough money to buy some of the stuff I had in my own gallery. But I wanted to work in beauty. That was more important than the money."

Mr. Bader's father was in the wholesale flour trade in Austria. The young Bader studied at the University of Vienna and then went to work at Wallishouser, the oldest bookstore in the Austrian capital.

In 1938, Germany absorbed Austria in the Anschluss, and the Nazis arrived in Vienna with a vengeance. Mr. Bader decided to emigrate.

"It was not a hard decision to make," he said. "As a Jew in Vienna, I can't sit on a park bench. I can't go in a restaurant or coffee shop or a movie. I was detained once for several hours. I was a witness to Kristallnacht (when Nazi hooligans smashed the windows to Jewish shops and committed other outrages in cities throughout Germany). After that it was only a question of where can you go."

He tried unsuccessfully to go to Britain or Australia, but eventually got visas to the United States for himself and his wife.

In his book trade Mr. Bader always carried a number of German books, not because he loved Germans—his father died in the Auschwitz extermination camp—but in order to know them.

"If you know one another, then you respect one another and the hatred can't be as bad," he explained. "People compliment me on this attitude and say how wonderful it is, but it is not wonderful. It is natural. It is only sad that not more people do it."

Mr. Bader's first wife, Antonia, died in 1967. At the age of 67, he married Virginia F. Bader, and they became world travelers, ranging from the Amazon to Africa to Central Asia. Mr. Bader took photographs along the way as well as in Washington, and he had shows of his work at the Phillips Gallery, the Addison-Ripley Gallery and elsewhere.

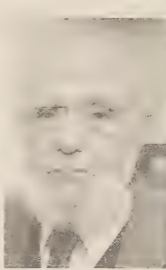
When he retired, Mr. Bader sold his business to two longtime employees.

Survivors include his wife, who lives in Washington.

THOMAS WESLEY MOORE Navy Accountant

Thomas Wesley Moore, 75, a retired accountant with the Navy Department, died Sept. 12 at the Liff Nursing Home in Vienna. He had pseudobulbar palsy, a disease of the nervous system.

Mr. Moore, a resident of Falls Church, was born in Jacksonville, Fla. He grew up in Arlington and graduated from Washington-Lee High School. He served in the Navy during World War II. After the war, he went to work at the Navy Department as an accountant. He retired about 1976.



FRANZ BADER

He was a member of the Arlington Baptist Church.

His wife, Mae T. Moore, died in April 1994. Survivors include two children, Sally M. Link of Littleton, Colo., and Thomas W. Moore Jr. of Bartlett, Tenn.; two sisters, Sarah Burns of Arlington and Betty Holton of Grand View, Mo.; and seven grandchildren.

TOMMY J. BRADSHAW Computer Executive

Tommy J. Bradshaw, 61, who was president and chief executive officer of the old TAB computer company of Alexandria and who had lived in the Washington area from 1974 to 1986, died of cancer Sept. 9 at his home in High Falls, N.Y.

He was TAB president and CEO from 1974 to 1984. The company did computer programming for data storage and retrieval problems for government agencies such as the Bureau of Mines and the State Department.

Mr. Bradshaw, a Texas native and Navy veteran, was a graduate of the University of Washington. Before coming here, he had worked in the computer industry in the Pacific northwest.

His marriages to Shirley and then Judy Bradshaw both ended in divorce.

Survivors include his companion, Mimi Labourdette of High Falls, a son from his first marriage, Keenan, of Arlington; a half-brother, Roger Wilson of Fort Worth, Tex.; and a grandchild.

IN MEMORIAM

BUSH, KEVIN L.
In loving memory of our dear son KEVIN L. BUSH who died suddenly at 27 and is laid to rest September 14, 1994.
As days go on and years go by
Our memory of you will never die
Dorothy, Parents, Dorothy and Marjorie

COLLINS, PHYLLIS C.
We re mother grandmother daughter sister and a friend who departed this life two years ago September 14, 1994. You always made a difference in our lives and we miss you so much.

JOHNSON, JOHN W.
In loving memory of my husband who departed this life two years ago September 13, 1992. He was a wonderful, wonderful, wonderful husband I will never forget.
YOUR LOVING WIFE, JOYCE

UPRIGHT, JOHN FREDERICK
In memory of our beloved grandson on his 21st birthday. John dear, we always keep you in our hearts. We love and miss you. So God bless your precious grandson.
Your Grandmother

WOOD, BERNADETTE S.
In loving memory of BERNADETTE S. WOOD. A loving wife, sister and dear friend. Even at 70 years you live on in our hearts.
Love, PEGGY

DEATH NOTICES

ALLEN CLAUDE
On Monday, September 12, 1994, at Washington, DC, Claudine King (nee Allen) George, nee Claude A. and Fred L. Allen, a loving wife, mother and grandmother, died at the age of 82. She is survived by 3 sons, 1 child and 2 great grandchildren. Her funeral, great-grand funeral and friends may call at DEVOU, FUNERAL HOME, 2227 Massachusetts Avenue, N.W., Washington, D.C. 20008, September 16, 10:00 a.m. to 1:00 p.m. and 7 to 9 p.m. Mass. of Christian Burial will be offered at the Church of the Holy Spirit, 3310 Massachusetts Ave., N.W., on Friday, September 16 at 9:30 a.m. Interment Arlington National Cemetery.

COLN FUNERAL HOME 3401 Broomfield Ave., Brentwood, MD on Saturday, September 17 from 12 noon to 1 p.m. where burial will be performed following at 1 p.m. Entombment at the Lincoln Cemetery, Mount Airy, MD.

BABBINGTON PAUL X
On Tuesday, September 13, 1994 Paul X. Babbington, 74, of Washington, D.C. passed peacefully at his home. He was the son of Suzanne Dunning Babbington and the late Babbington. He was also a member of the Episcopal Church and a member of the Washington, D.C. Chapter of the Boy Scouts of America. He is survived by his wife, Suzanne, and two children, Paul and Suzanne. His funeral will be held at 11:00 a.m. on Friday, September 16, at the Church of the Holy Spirit, 3310 Massachusetts Ave., N.W., Washington, D.C. Interment will be at the Arlington National Cemetery.

BARNARD, VIVIAN EDNA RAGAN (1909-1994)
On Wednesday, September 14, 1994, Mrs. Vivian Edna Ragan, nee Barnard, 84, of Washington, D.C. passed peacefully at her home. She was the wife of the late Mr. Ragan. She is survived by her daughter, Mrs. Margaret Anne Ragan, and her son, Mr. Leo Ragan. Her funeral will be held at 11:00 a.m. on Friday, September 16, at the Church of the Holy Spirit, 3310 Massachusetts Ave., N.W., Washington, D.C. Interment will be at the Arlington National Cemetery.

BOWMAN MARY B.
On September 10, 1994 at Washington, D.C. Mrs. Mary B. Bowman, nee Water, 80, passed peacefully at her home. She was the wife of the late Mr. Bowman. She is survived by her daughter, Mrs. Leo Water, and her son, Mr. Leo Water. Her funeral will be held at 11:00 a.m. on Friday, September 16, at the Church of the Holy Spirit, 3310 Massachusetts Ave., N.W., Washington, D.C. Interment will be at the Arlington National Cemetery.

BAITT, MAURICE
On Thursday, September 8, 1994, He is survived by two daughters, Maureen Bitt and Anne Marie Hamilton, one son, Maurice Bitt, two granddaughters, one daughter, Barbara Bitt, one son, Gordon Pearson and Robert Bitt, one grandchild, Brian Bitt. His funeral will be held at 11:00 a.m. on Friday, September 16, at the Church of the Holy Spirit, 3310 Massachusetts Ave., N.W., Washington, D.C. Interment will be at the Arlington National Cemetery.

BURNEY, SANIELLE MARIA
On Friday, September 9, 1994, Beloved wife of Anthony, Anne Lavender, Tonya Cheryl, Rachel and Shirley, and daughter of Tonya, Bernice, and Robert, Sr. & Mrs. C. B. Burrey, Sr. devoted wife of Andrew J. Burrey, Sr. and a devoted friend and mother. She is survived by her children, Tonya, Rachel, Shirley, Bernice, and Robert, Sr. Her funeral will be held at 11:00 a.m. on Friday, September 16, at the Church of the Holy Spirit, 3310 Massachusetts Ave., N.W., Washington, D.C. Interment will be at the Arlington National Cemetery.

BURTON, LONNIE A.
On Tuesday, September 13, 1994, the devoted husband of Betty Burton, nee Burton, who was born in the District of Columbia, died at the age of 82. He is survived by his wife, Betty, and three children, William, Robert, and Ronald. He is also survived by seven grandchildren, including James, Terry, and Susan. His funeral will be held at 11:00 a.m. on Friday, September 16, at the Church of the Holy Spirit, 3310 Massachusetts Ave., N.W., Washington, D.C. Interment will be at the Arlington National Cemetery.

BUTLER, LONNIE G.
On Tuesday, September 13, 1994, LONNIE G. BUTLER, of Washington, DC, beloved mother of James H. Butler, nee Butler, who was born in the District of Columbia, died at the age of 82. She is survived by her husband, James H. Butler, and three children, William, Robert, and Ronald. She is also survived by seven grandchildren, including James, Terry, and Susan. Her funeral will be held at 11:00 a.m. on Friday, September 16, at the Church of the Holy Spirit, 3310 Massachusetts Ave., N.W., Washington, D.C. Interment will be at the Arlington National Cemetery.

Wilder Said to Be Ready To Quit U.S. Senate Race

WILDER, From D1

devastated by the results. Another personal friend said he had been called by an aide and urged to reach Wilder at home tonight.

Wilder first canceled an appearance at a health care conference at Roanoke College this afternoon, saying an emergency had arisen in Richmond. He then decided to forgo the rest of his schedule, although he will keep a commitment to lay a wreath at a slave memorial at Mount Vernon on Saturday, Conley said.

Asked if Wilder might throw his support to Robb, his longtime rival in the Democratic Party, Conley said, "I'll tell you unequivocally he won't endorse Chuck Robb tomorrow. You can put that in your paper."

Wilder has been reeling in recent weeks after defections of several leading Virginia blacks to the Robb camp, including his close friend, U.S. Rep. Robert C. Scott. And one of the two polls announced today indicated that Robb was winning a majority of black votes.

In the Mason-Dixon survey, Robb is on top at 33 percent, followed by North at 28 percent, Coleman at 15 percent and Wilder at 12 percent.

The VCU survey shows North with 34 percent, Robb 31 percent, Wilder 13 percent and Coleman 10 percent.

VCU political scientist Robert D. Holsworth said the difference in the two polls may result from the answers provided by African American voters, who make up about 18 percent of the electorate. In the Mason-Dixon poll, a plurality of blacks favored Robb over Wilder, whose term as the nation's first elected black governor ended in January, while the VCU poll has Wilder capturing a majority of black votes.

Although some analysts had expected Wilder to move up into contention because of the Hampden-Sydney College debate last week, Roanoke College political scientist Harry Wilson was not surprised by his continued poor showing in the polls.

"He tore everyone else down, but



L. DOUGLAS WILDER

... preparing to end bid for Senate

he didn't give anyone a reason to vote for him," Wilson said.

Should he pull out now, it would be an apropos ending to Wilder's on-again, off-again Senate campaign.

He first declared his intention to take on Robb in June 1993, making the announcement on a relatively obscure D.C. cable television show. But for the next six months, Wilder did virtually no politicking and built no campaign organization. Rumors swirled that he was quitting the race; in an interview just before he left office as governor in January, he vehemently denied that he would.

The next day, however, Wilder did just that during his final address to the legislature: "I will not seek the nomination of my party for the United States Senate in 1994, nor will I be a candidate for that office."

By May, though, Wilder had decided he would run as an independent and had begun to gather the thousands of petitions necessary to get his name on the November ballot.

As recently as last week, he had vehemently disavowed rumors that he was once again considering dropping out.

Staff writers Peter Baker and Kent Jenkins Jr. contributed to this report.

Library Vote Draws Protest

LIBRARY, From D1

Savage's proposal does not specify who would choose what books would be restricted. He provided no examples of books that he would consider for the special sections, but he said classic literature would remain in the general collection.

The measure, if given final approval, would be among the most restrictive in the country, according to representatives from the American Civil Liberties Union and the American Library Association.

Fairfax Library Board Chairman Herbert A. Doyle Jr., from the Providence District, opposed Savage's proposal, saying it would violate the library's basic mission and its adherence to the library bill of rights, which prohibits age-based restrictions.

"Libraries are repositories of information of all types, some of it unpleasant and disturbing to certain individuals," Doyle said. "Materials should not be proscribed or removed because of a particular group's disapproval."

The chairman of the 10-member policy committee, Mark D. Sickles, from the Lee District, said he opposed restricting access and would consider debate on the proposal "a colossal waste of time."

Over the last two years, the Library Board has three times rejected motions to ban or limit access to the gay-oriented Washington Blade newspaper, which has been distributed for free in the county's 22 libraries since late 1992.

Conservative activists—led by Springfield resident Karen Jo Gounaud—argued it encouraged children to pursue what the activists consider an immoral and unhealthy lifestyle.

The county's Board of Supervisors earlier this summer, responding to pressure by Gounaud's group, eliminated the seat of one library board member who had consistently voted against restrictions on the newspaper. A board member who has voted against restrictions was absent last night, giving the conservatives the majority.

Gounaud asked her supporters to stay away from last night's library board meeting to avoid a confrontation. Before the meeting, Gounaud said she is convinced she represents a majority of Fairfax residents.

"They portray us as outsiders, trying to impose our values on the community. That is a lie. They are the ones with the D.C. license plates," Gounaud said.

Welder's Family Clings to Memories

Audrey, at the family's condominium and tried to let happy memories break through their grief.

The good memories were plenty: The 24-year-old Kay Andrea Robinson recalled that she still insisted her father tie her running shoes "because he had a special way of doing it." He would make Debbie-Ann Robinson, 19, blush by joking with sales clerks when they went to the mall. Audrey Robinson said that just last Thursday her husband, with whom she was getting back together after a separation, bought Tina Turner's latest CD for her.

Kay Andrea Robinson described her father as a "49-year-young man in a 24-year-old body." Debbie wrote a poem eulogizing Robinson for the "memories too special to forget, of the love you've always given."

But now the memories bring tears and the echoing question of "why?" to the close-knit family that moved here from Jamaica in 1986 to escape their homeland's faltering economy and to pursue higher education opportunities for the children.

"The question is still in my mind, why did they shoot to kill?" Kay Andrea Robinson said as she sat in the condominium, with photo albums scattered around the carpeted floor.

The family has another memory that will haunt them as much as the

good ones comfort. It is the videotape played on television news Tuesday night that showed their father doing his best not to provoke the men who held up his McDonald's. "The guy jumped over the counter, and stuck a gun into father's side," said Kay Andrea Robinson. "I saw dad open the register and he took the money out and gave it to him and he stepped back."

"That's no way for my dad to die," she said, sobbing. "I never got to say goodbye. I never got to say that I loved him."

The family said that Robinson never complained about the restaurant work, although he was college-educated and certified as a teacher in the English-style Jamaican school system.

"My dad was a very humble man," Debbie said, "and he realized that when you are an immigrant to another country, it's by any means necessary. His primary concern was putting shelter over our heads and food on the table. He would sell the shirt off his back to put a smile on our faces."

Just over a month ago, Robinson received a 14-karat gold McDonald's arch in honor of his five years with the company.

Staff writers Jon Jeter and Wendy Melillo contributed to this report.

Appreciation*Franz Bader, in Soft Focus*

The Gallery of a Life of Trial, Tears and Triumph

By Sarah Booth Conroy
Washington Post Staff Writer

Reprinted from yesterday's late editions

Putting together an exhibit of images of Franz Bader, who died Wednesday a few days short of his 91st birthday, I would begin with him in his rather cramped gallery on a byway of Pennsylvania Avenue. In the middle was Franz, his great white beard giving him the look of an Old Testament prophet. On the walls were paintings by his newest discovery. And every square foot was crowded with people, many of whom came to be seen as much as to see. One child, admiring Bader's beard, asked if he was God. He wasn't, but he was in his own way a creator—of enthusiasm and appreciation for artists and authors. To creativity, he once said, he gave his greatest respect.

Franz's favorite compliment was the one Peter Milton inscribed on an original print for him: "For Franz, who was the first." Franz indeed gave Milton his first one-man show. Franz Bader Gallery was one of the earliest to show modern art in Washington.

He spread his mantle of admiration and promotion over other artists as well: Grandma Moses, Sam Gilliam, Tomayo, Lee Weiss, Alma Thomas, Alice Acheson, Marjorie Phillips, Bert Schmutzhart and H.I. Gates among them. He gave a chance to many others—even second shows to artists who sold not a painting at their first. At Christmastime, Franz always had a group show, "so all my artists would have a little money for the holidays."

Another picture that hangs in my mind is of Franz and Virginia Bader's salons. After almost every opening—and on numerous occasions with less cause—they would invite the lucky to their house for wine and cheese, sliced meats, chewy bread and potato salad. The company was as rich—cultural attaches from every embassy in town, art collectors, artists, museum curators, all people who loved to look and loved to talk. There was always plenty of both to be done.

The picture I remember in which Franz really glows was at the shows of his photographs—his own art—at the Phillips Collection, the Austrian Embassy, the Addison-Ripley Gallery. Franz had always taken pictures, but in his "third life," as he liked to call it, photography became his primary focus.

When he, at 67, married Virginia Forman, she introduced him to the far corners of the world. He took along his camera and made not

only pictures of fierce animals in Africa and the rain forests of the Amazon but also abstractions—rocks, reflections and patterns in the sand. He used to call himself "a primitive photographer."

On his 80th birthday, he ascended high above the Earth in a balloon to photograph the United States. His photograph of a Saturn 5 rocket shooting off into space hangs in the National Air and Space Museum.

Franz Bader was born in Austria in 1903, when all Europe danced to the waltz of Viennese creativity in art, in music, in design. He was a small boy when Kaiser Franz Josef ruled, shopkeepers "kissed the hands" of their clients and writers spent endless hours over a single cup in the coffeehouses.

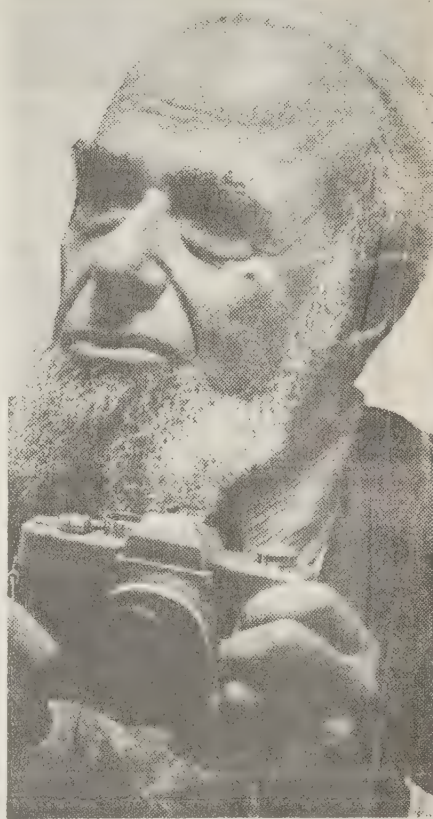
His grandfather gave him 50 volumes of classics at his bar mitzvah. And Franz, who all his life loved to read, forsook his father's flour business and apprenticed himself to the oldest bookstore in Vienna, where the kaiser himself shopped.

Franz had bought a partnership in the business when *Kristallnacht*—the night of attacks on Jewish shops and houses in 1938—shattered the Viennese life. Franz didn't have the required four Aryan sponsors, so he lost his bookstore. He and his wife wrote to all the Baders in the New York phone book, asking for their help in coming to America. A kindly soul agreed to sponsor him, but he had to have a job first. Just before Franz and his first wife gave up, a U.S. Embassy officer told him of a new bookstore opening in Washington, with an opening for a bookseller.

Franz said they could take only \$25 out of Austria and a bottle of rum, given by his mother. The rum was taken by a guard at the border. And by the time they reached New York, he had to ask James Wythe, the bookstore owner, to advance the fare to Washington.

With that in mind comes the most poignant picture I have of Franz. The Austrian Embassy, at last, was able to obtain for him a great honor, a medal with a certificate signed by President Kurt Waldheim. A great reception was planned in the grand salon of the embassy here. All the cultural leaders and Austrian-born Americans would come.

But when Franz learned that Waldheim would bestow the award, he remembered his family members who had been lost in the Holocaust. And the man who appreciated recognition and awards said he could not accept an honor from hands he believed had served the Nazis.



THE WASHINGTON POST
Gallery founder Franz Bader in 1977: To creativity he gave his greatest respect.

To his credit, then-Ambassador Fredrich Hoess understood. Franz was given a great award on this very day in 1988, the end of the Jewish high holidays, a few days short of his 85th birthday. The certificate was signed by Hans Tuppy, an Austrian cabinet minister whose father, like Bader's, died at Nazi hands.

The ceremony of atonement made some salt their wine with tears. Bader's homeland paid tribute to the life he had made for himself in the Diaspora, and the greatness of spirit that allowed him to be a human chain of art between the land of his birth and the country of his refuge. Franz, his voice still sweet like *Schlagobers*, the whipped cream of Viennese coffeehouse conversation, said:

"I was 15 years old when the First World War ended. As a result of the war and the end of the empire, everything was dark. But there was an atmosphere of intellectual excitement and ferment. . . . There was much life in the coffeehouses, little theaters and cabarets. I was a product of those times . . . lucky to have come of age in such an atmosphere."

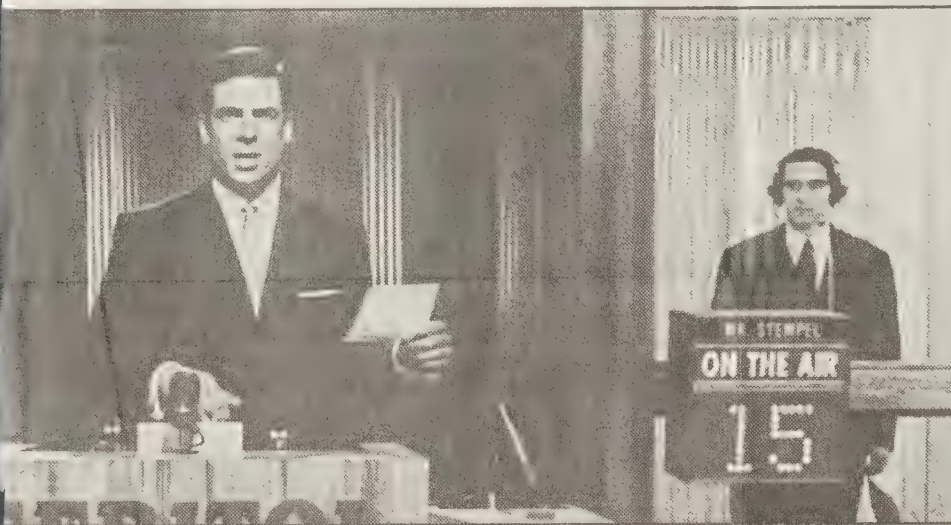
We are fortunate to have had Franz Bader draw for us the finest of all portraits, of a man who triumphed over evil, adversity and horror to bring the beauty of appreciation of creativity to the city that gave him a new home.

The Washington Post

Style

6 TV Column: CBS picks up affiliate in Dallas

7 New on Video: 'Serial Mom,' 'Major League II,' 'PCU'



berbie Stempel (John Turck); bottom left, Stempel with his wife (Johann Carlo); and producer Al Freedman (Hank Azaria) and Van Doren display the champ's mail.

McDonald); bottom left, Stempel with his wife (Johann Carlo); and producer Al Freedman (Hank Azaria) and Van Doren display the champ's mail.

The Press, Down On the Hill

Congress Gets No Respect, Book Reports

By Howard Kurtz
Washington Post Staff Writer

This just in: Those overpaid, underworked hacks in Congress get lousy treatment from the press.

All right, let's try that again: Those 535 dedicated visionaries on Capitol Hill are getting clobbered by the media. In fact, according to a new book and network news survey being released today, their coverage is even more negative than that accorded President Clinton.

The book, published by the Brookings Institution and the American Enterprise Institute, says reporting of Hill affairs has become increasingly scandal-oriented over the past three decades. The survey, by the Center for Media and Public Affairs, says that since last year 64 percent of the comments about Congress on the three network evening newscasts have been negative.

"This Congress..."



Isabel Bader and her husband Dr. Alfred Bader (centre), along with Clyde Lendrum (right) are visiting the area in search of paintings by the late Ernest Sawford-Dye of New Liskeard. The artist's works caught the eye of Dr. Bader, who has been guest curator, along with his wife, for a number of art exhibits. If the project is successful in locating 30 paintings with a variety of perspectives on the northern landscape, an exhibit will be held at Dr. Bader's alma mater at Queen's University in Kingston. (Staff photo by Darlene Wroe)

Ernest Sawford - Dye paintings being sought for Queen's University exhibit

by Darlene Wroe
Speaker Reporter

NEW LISKEARD — Dr. Alfred Bader and his wife Isabel (born Isabel Overton in New Liskeard and residing in Timmins and Kirkland Lake as a child), were visiting the Tri-Towns this week in search of paintings by Ernest Sawford-Dye who lived in New Liskeard and painted here from the 1920s onward. Mr. Sawford-Dye died in 1965 at the age of 91. Some of his paintings are on display at the New Liskeard Public Library.

Dr. Bader (who recently purchased and donated an English castle to his alma mater — Queen's University in Kingston) has a deep appreciation for art, mainly Dutch seventeenth century paintings, and he and his wife have researched and gathered paintings for a number of art exhibitions over the years, bringing many fine artists and paintings to light, increasing their value and the knowledge of others about these previously unknown or little known works and artists.

Dr. Bader's attention turned to the works of Mr. Sawford-Dye after being shown two outstanding paintings in Kirkland Lake. "We had the good fortune in Kirkland Lake that the first ones we saw were great masterpieces," said Dr. Bader in an interview at a New Liskeard residence the party was visiting Tuesday, July 19.

Dr. Bader did some research on the artist but found "the man is totally unknown in old Ontario. After mentioning his interest in the little known artist to Clyde Lendrum who also is an alumnus of Queen's University and is a former resident of Cobalt, Mr. Lendrum felt he could help Dr. Bader by way of the people he knows in the area.

And so Dr. and Mrs. Bader, who now reside in Milwaukee, Wisconsin, were joined in their travels to the district by Clyde Lendrum, who resides in King City (and is the son of former Speaker editor Frank Lendrum who held the position from 1939 to 1946). The group is travelling through the Tri-Towns

and Kirkland Lake, also planning to attend the celebrations of the 75th anniversary of Kirkland Lake.

The project is to borrow about 30 paintings showing a good variation of subjects for display at an art exhibition at Queen's University.

PROLIFIC PAINTER

Mr. Sawford-Dye was a prolific painter and his paintings reflect the outdoors of the northern Canadian landscape in the first half of the century. Mr. Sawford-Dye captured the delicate and simple beauty of the area in his paintings but, Dr. Bader noticed, suffered from a lack of exposure to other artists and patrons who would encourage him to diversify his subject. Mr. Sawford-Dye might have become an outstanding artist "if he had had a good friend who knew about art who would have pushed him," Dr. Bader commented. It seemed Mr. Sawford-Dye was earning a living by doing his paintings. Mrs. Bader observed, and

so was being limited in exploring new subjects, having interest expressed for work he had already produced, and requests for new paintings of the same subjects. Had he received the encouragement and support that would have pushed him further as an artist, Mr. Sawford-Dye would have been among the great artists of Canada, Dr. Bader believes. "He didn't have a critical audience and he didn't have any peers."

It is thought that some of Mr. Sawford-Dye's works may have been taken out of the area when families who had one or more of his paintings in their possession moved away.

Those with knowledge of the whereabouts of any of Mr. Sawford-Dye's paintings are invited to contact him in care of the Agnes Edgington Art Centre at Queen's University in Kingston.

Casey Township rate-payers face tax hike

CASEY TWP. (Staff) — Casey Township ratepayers will see an increase in their tax bill.

On July 11, township council approved its 1994 budget. The municipal portion of the tax bill increases by two per cent.

When the education levy is factored in, public school supporters face a total increase of 3.1 per cent. Separate school ratepayers will see a 2.4 per cent hike.

The township's operating budget for 1994 is \$366,000. It has also budgeted \$810,000 for capital projects, but a large portion of that will be paid by the Ontario Government.

The completion of the Greenwood bridge rehabilitation is the big-ticket item, at \$625,000. The province is picking up the total cost of the work.

The province is also paying 80 per cent of the cost of resurfacing the

development road. That project's total estimated cost is \$62,000.

Meanwhile, the township has applied to use its allocation under the Canada-Ontario infrastructure program to add a bay and extension to the municipal office.

The municipality would be responsible for one-third of the project's estimated \$23,000 cost.

The municipality's proposal has yet to be approved.

It is also nearing completion of the \$30,000 construction to install sewers and electrical servicing for its nine-lot, waterfront residential subdivision.

The lots are now for sale at prices ranging from \$7,000 to \$8,500. Anyone interested in purchasing a lot is asked to contact the township municipal office.

A condition of sale is that a building be erected within two years of purchase.

Cobalt council notes

BRIDGE WORK

Cobalt and Coleman Township will split their share of the cost to renovate the Larose Bridge at Ferland Avenue.

Each municipality will contribute \$4,200.

The undergirding of the wooden bridge needs repairs.

A LIFT

Town staff are investigating grant programs that may fund the installation of an elevator or lift to make the upper level Community Hall accessible to the disabled.

ON HOLIDAYS

Mayor George Ohmer and Councillor Mike Brooks will attend the Annual Association of Municipalities of Ontario conference in Toronto August 21 to 24.

They had hoped to schedule a meeting with Economic Development and Trade Minister Frances Lankin to discuss the town's bid for support under the Set Aside Fund.

The Set Aside fund is a \$100-million job creation fund established by the Ontario Government last year to compensate municipalities where promised provincial job relocations were cancelled.

But the minister will be on holidays, said clerk-treasurer Lorraine Brace. No one else from her office was offered to meet with town officials at the conference.

DONATIONS

Council agreed to donate \$100 to the Happy Paws Pet Orphanage and Adoption Centre.

Another \$100-donation was approved to send a Cobalt Public School student to a national music camp.

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Barbara Campbell

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New Post Community Complex

New Post First Nation - Via Cochrane

Doors Open at 5:30 p.m.

Bingo Starts at 7:30 p.m.

ADMISSION: \$30.00

Admission Price includes 1 book of 12

Extra Half Books of 6: \$10.00

EARLY BIRD: \$100.00

10 Regular Games @ \$150.00

2 Boosters @ \$350.00

\$3,000.00 JACKPOT PLAYED 4 WAYS

1st LIVE: \$150.00 2nd LIVE: \$350.00

Blackout: \$2,000.00

Second Blackout: \$500.00

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\$100.00 & \$500.00 NEVADA TICKETS

TELEPHONE: 272-5685 MUST BE 18 YEARS OF AGE TO PLAY

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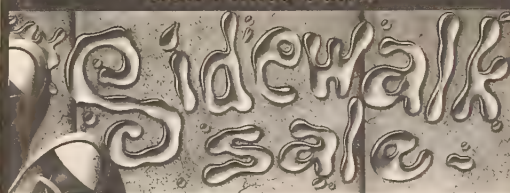
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COBALT MINERS' FESTIVAL
AMATEUR NIGHT
Sunday, July 31st
from 6 - 9 pm.



If you sing, dance, play any instrument, come out and show your stuff. To enter call André at 679-5343 or leave your name and number.

Random draws of cash and prizes for all who enter.

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New Liskeard needs additional funding for Niven pumping station

NEW LISKEARD (Staff) — The town of New Liskeard is applying to the Ontario Clean Water Agency for additional funding for the construction of the Niven pumping station.

The town opened its tenders for the construction of the new pumping station and found its lowest bid to be \$2,700,000 which is \$270,500 above the \$2,430,000 initially estimated. The town's engineering consultant, G. G. & S. S. Consulting Engineering, preliminary estimate.

New Liskeard Mayor Charles Caldwell explained the project has increased in cost because of the high cost of additional requirements that the Ministry of Environment has added to the project. These changes included requirements for larger pumps, larger motors, and a larger back-up generator system.

The town is prepared to pay its portion of the additional costs which will mean an additional \$70,000 to the town. But Mayor Caldwell says the project will be extended over two fiscal years for the town meaning that the additional \$70,000 can be brought out of the town's 1995 budget.

The town hopes to get the project underway by early September and have the new pumping station operational by June, 1995.

The town is also providing the province with the facts why the project is over budget (noting the additional cost is due to a provincial ministry's added requirements) and will request additional funding to complete the project.

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Heures de travail : environ 2 ou 3 heures par semaine, probablement plus d'heures durant la période précédant une représentation.

Les tâches comprennent :

- sous la direction de la directrice générale, surveiller tous les aspects du Programme Interliens;
- travailler avec un comité afin de discuter des détails du Programme, d'établir un calendrier des répétitions, d'écrire des lettres, d'organiser des répétitions et de planifier le concert;
- s'occuper de toutes les questions se rapportant aux médias et à la publicité;
- en collaboration avec le chef des affaires, trouver des sources de levée de fonds, acheter le matériel et effectuer des déboursures;
- préparer le programme du concert, les listes de participants, les certificats et les rappels, selon les besoins;
- être maître de cérémonie aux représentations.

Date de clôture : le 29 juillet 1994.

Envoyer votre demande à :

M^{me} Carol MacGillivray
Directrice générale par intérim
Association canadienne pour la santé mentale
Filiale de Kirkland Lake
36, av. Prospect
Kirkland Lake (Ontario)
P2M 2V4
Télécopieur (705) 567-5211



As is the norm, many people are outside enjoying summer. Bryce Lajuness (just out of camera range) took his one-year-old son Brodie and his four-year-old son Braydon for a walk around the block of their home on McCamus Street. (Staff photo by Gordon Brock)

Haileybury's Christmas in July promises to combine festive season with summer fun

HAILEYBURY (Staff) — Yuletide sights and sounds will echo around Haileybury on Saturday for the celebration of Christmas in July.

The third annual event combines the best of Christmas festivities with traditional summer fun in an expanded line-up of activities and entertainment designed to appeal to the entire family.

The festival was born in 1992 to make up for a Heritagefest dampened by miserable weather that included snow.

This year's version will feature a fireworks display at 10:15 p.m. History repeats itself; the show had originally been scheduled for Heritagefest in June, but a severe thunderstorm forced its cancellation.

A new wrinkle this year is the Festival of Lights boat parade. Boat owners are encouraged to decorate their vessels with Christmas lights, and the illuminated boats will make their own tour of the waterfront after fireworks.

Home owners are also welcome to decorate their Christmas lights to maintain that festive air.

Also new this year is a Pro-Water Ski Clinic. Two-hour instructional sessions will be held at 9 a.m., 1 p.m. and 4 p.m., and only a few spots remain available.

To register, contact the Haileybury Recreation Department. Also making their first appearance at the festival this year are a mixed beach volleyball tournament, beginning at 10 a.m., and a three-on-three basketball tournament, beginning at 10:30 a.m. The entry fee is \$10 per team.

But most of the fun is free. Handicraft activities begin at 10:30 a.m.

At noon, there's a scavenger hunt, followed by a host of children's games and entertainment. Santa drops by at 3 p.m.

At 6 p.m., the stage opens to amateurs for a lip-synch contest. The entertainment resumes at 7 p.m.

To register for the events, or to get more information, contact the recreation department at 672-2520.

The Tomagami-Latchford economic development office was shut down March 31 after five years of operation when provincial funding expired.

New funding for five years was announced at the end of May. But the province has cut its share of the costs.

Mayor Lefebvre said tentative figures budget about \$110,000 for the restructured office in the first year.

The municipalities would then be responsible for about \$20,000, but they could make up half of their share by offering services, such as clerical support and office space.

Restructured EDC may be on the way

by Diane Johnston
Speaker Reporter
LATCHFORD — A restructured economic development organization for Temagami and Latchford may be in operation by fall.

The two municipalities are drafting a budget and working plan for a new corporation that will create two part-time economic development officer positions, said Anne Marie LeRoy of the Haileybury office of the Ministry of Northern Development and Mines.

The new organization will need the approval of the corporation's joint board of directors. It would be restructured to the ministry for the final okay.

Latchford Mayor George Lefebvre is optimistic that the restructured organization — which will separate economic development officers for each municipality — will be running sometime this fall.

"We want to do this as quickly as we can," he said.

But while the two positions will be separate, he said there will be cooperative projects involving the two municipalities on which they will work together.

They will continue to report to a joint board of directors.

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FORGET-ME-NOT BOUTIQUE

On the north end of Highway 11B is located the new "Forget-Me-Not Boutique". Sharing a building with Gardens & Gifts, the new kitchenware shop is owned by Linda Cunningham who formerly operated Kitchen Classics located at the Temiskaming Square Mall. This new gift shop also provides a bridal gifts registry service. The Forget-Me-Not Boutique may be a size smaller than their former store located at the Temiskaming Square Mall but management says the atmosphere is a lot more cozy and appropriate. With Gardens & Gifts sharing the same building, two businesses hope to complement each other. From left to right is: Linda Cunningham, owner of boutique; Claudette Plamini, an employee; Adèle Duguay, co-owner of Gardens Gifts; Emily Goodwin, summer employee; and Laura MacKewn, the Gardens centre manager. (Photo by Edith Roy)

Fed. government wants commercialization of the Earlton airport

(continued from page 1A)
The federal government is looking at commercialization of the air navigation system in Canada.

UPGRADING CONTINUES
The federal government plans to continue funding the capital upgrading of privatized airports, however.

An Airport Capital Assistance Program will be implemented to provide funding for safety related projects such as runways and taxi ways.

The privatization of federally-operated services is the thrust of the federal government in all programs in which it is involved, commented Mr. Serré.

But New Liskeard Mayor Charles Caldwell, who was in attendance at the press conference, was not happy with the concept. "I see this as another way of senior levels of government downloading," he commented to Mr. Serré.

According to the press release "over the next five years, beginning April 1, 1995, the government will continue to increase the viability of regional/local airports through an aggressive process of implementing operational efficiencies which

should lead to financial self-sufficiency, thereby making the airport more attractive for operation by local entities. During this period the federal government will offer these airports to provincial and local governments, airport authorities, private businesses or other interested organizations."

"The commercialization of Earlton (airport) does not mean the death of the airport." It was also stated in the press release. "On the contrary it will allow the community to have a say in the day to day operation of the airport and put the decision making power in the hands of local authorities. Experiences has shown that locally operated airports have been more responsive to the needs of the community and are better able to match service levels to local demands and resources. Safety and security will not be affected. Transport Canada will retain its regulatory powers in these areas."

If at the end of five years there are no parties interested in taking over the airport, Mr. Serré expects the aggressive process of implementing operational efficiencies which



OFF TO THE NATIONALS... WE WISH YOU THE BEST!

- To
- Josée Chartrand
 - Annette Fournier
 - Claire Godmaire
 - Diane Godmaire
 - Nicole Grimard
 - Norma Hughes-Howard
 - Glenna Hughes
 - Sara Kinnear
- Becky Mullin
Angie Plante
Grand Union TAVERN
Coaches
Larry Carr
Perry Beaudoin
Guy Godmaire
- And Fellow Employees
Kim Perry
Kelly Perry
Not Able To Attend
Sue Cote
Lori Hughes
Gail Klawitter
Huguette Leveille
- From **THE TEMISKAMING SPEAKER**
- The Temiskaming Speaker
Kirkland Lake Gazette

SIDEWALK SALE

JULY 21, 22, 23

THURSDAY, JULY 21, ONLY
\$5.00
MERCHANDISE VOUCHER
TO THE FIRST 50 PURCHASING CUSTOMERS AT OUR NEW LISKEARD STORE ONLY

FRIDAY, JULY 22, ONLY
FREE LOTTO TICKET
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SATURDAY, JULY 23, ONLY
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Weekly livestock report

This Weekly Livestock Report is from Temiskaming Livestock Exchange (1992). New Liskeard for Monday, July 18, 1994. There were 232 head traded on Monday. Veal calves traded at steady prices. Bob calves traded at higher prices, feeder calves traded at firm prices, cows traded at high prices.

Market Cattle
Feed Steers 74.00 to 85.00
Fed Heifers 68.25 to 88.75
Holstein Steers 63.50 to 76.75
Heiferettes 60.25 to 68.50
D1 & D2 Cows 60.00 to 65.00
D3 Cows 58.00 to 60.00
Shelly Cows 55.00 to 58.00
Shelly Cows 40.00 to 55.00

Market Calves
Choice Veal 130.50 to 170.00
Good Veal 76.00 to 130.50
Calves 74.50 to 76.00
Veal Calves (beef X) 130.50 to 170.00

Replacement Cattle:
Bob Calves 137.50 to 237.50
Good Quality Bob Calves Medium & Common 89.00 to 137.50
Stockler & Feeder Steers <550 lbs 59.75 to 87.75
Steer Calves 72.00 to 121.00
Stockler & Feeder Heifers <650 lbs 68.25 to 92.75
Heifer Calves 87.50 to 103.50
Dollars Cows 510.00 to 1061.00

Pigs:
Weaning Pigs 25.00 to 32.50
Sheep & Goats (all weights) 65.00 to 116.00
Goats 47.50 to 86.00
Horses "It pays to sell by Auction!"

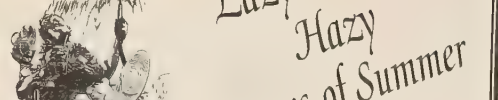
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SENIOR'S DAY

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15% OFF REGULAR MERCHANDISE (Except Prescriptions & Sale Items)

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237 WHITEWOOD AVE. NL. 647-8186

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New Liskeard needs additional funding for Niven pumping station

NEW LISKEARD (Staff) — The Town of New Liskeard is applying to the Ontario Clean Water Agency and the Ministry of Energy and Environment for further funding assistance for the Niven Street pumping station.

Airshow organizers hoping for blue skies

(Continued from page 1a) also co-chairs the organizing committee.

"The performances in the air only form a small portion of what's going to be available on site," said Mr. Larocque. The real draw will be the aircraft, he said.

The public will have the opportunity to "touch them, feel them, smell them."

"They'll be able to meet their operators and even go up for a flight — an experience what he describes as an 'airborne roller coaster ride.'"

There's a barbecue Saturday night at the Earleton area, and a dance that night with music by Carl Kees, who recently performed at New Liskeard's Summerfest.

On Sunday morning, the public can enjoy breakfast with the pilots with a breakfast at the airport beginning at 9 a.m.

The shows in the air continue Sunday.

SECURITY

The safety of spectators is a prime concern for the show's organizers.

Organizers, the airport staff and Transport Canada have measures in place to ensure security and in case of emergency, he said.

The performers are experienced pilots and approved by Transport Canada, which will have an inspector in attendance throughout the show.

"A tremendous amount of expertise and practice goes into the manoeuvres to make it about as safe as anything can be," he said.

WEATHER

With the organizing almost complete, the only question remains weather.

"When the committee first to plan the show, Mr. Larocque played deliberately tried to schedule to coincide with a full moon.

That traditionally means a high pressure zone and clear blue skies."

"All we can do is sit herded hope," he said.

As of late Monday afternoon meteorological situation isn't promising, Mr. Taylor said.

"There is a good high pressure system sitting away out here. It could be Saturday," he said. "It could come Saturday. It just depends on the speed of the system."

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- s'occuper de toutes les questions se rapportant aux médias et à la publicité;
- en collaboration avec le chef des affaires, trouver des sources de levée de fonds, acheter le matériel et effectuer des déboursments.

préparer le programme du concert, les listes de participants, les certificats et les rapports, selon les besoins;

être maître de cérémonie aux représentations

Date de clôture : le 29 juillet 1994

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FORGET-ME-NOT BOUTIQUE

On the north end of Highway 11B is located the new "Forget-Me-Not Boutique". Sharing a building with Gardens & Gifts, the new kichenware shop is owned by Linda Cunningham who formerly operated Kichen Classics located at the Temiskaming Square Mall. This new gift shop also provides a bridal gifts registry service. The Forget-Me-Not Boutique may be a size smaller than their former store located at The Temiskaming Square Mall but management feels the atmosphere is a lot more cozy and appropriate. With Gardens & Gifts sharing the same building the two businesses hope to complement each other. From left to right is: Linda Cunningham, owner of boutique; Claudette Plouffe, an employee; Adele Duguay, co-owner of Gardens & Gifts; Emily Goodwin, summer employee; and Laura MacKew, the Gardens centre manager. (Photo by Edith Roy)

Fed. government wants commercialization of the Earleton airport

(Continued from page 1a) federal government is looking at commercialization of the air navigation system in Canada.

UPGRADING CONTINUES
The federal government plans to continue funding the capital upgrading of privatized airports, however an Airport Capital Assistance Program will be implemented to provide funding for safety related projects such as runways and taxi ways.

The privatization of federally-operated services is the thrust of the federal government in all programs in which it is involved, commented Mr. Serre.

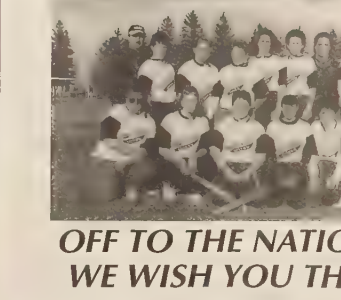
But New Liskeard Mayor Charles Caldwell, who was in attendance at the press conference, was not happy with the concept. "I see this as another way of senior levels of government downloading," he commented to Mr. Serre.

"According to the press release over the next five years, beginning April 1, 1995, the government will continue to increase the viability of regional/local airports through an aggressive process of implementing operational efficiencies which

should lead to financial self-sufficiency, thereby making the airport more attractive for operation by local entities. During this period the federal government will offer these airports to provincial and local governments, airport authorities, private businesses or other interested organizations."

"The commercialization of Earleton (airport) does not mean the death of the airport," it was also stated in the press release. "On the contrary it will allow the community to have a say in the day to day operation of the airport and put the decision-making power in the hands of local authorities. Experiences has shown that locally operated airports have been more responsive to the needs of the community and are better able to match service levels to local demands and resources. Safety and security will not be affected. Transport Canada will retain its regulatory powers in these areas."

At the end of five years there are no parties interested in taking over the airport, Mr. Serre expects the federal government will reconsider what to do with the airport.



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As is the norm, many people are outside enjoying summer. Bruce Lajeunesse (just out of camera range) took his one-year-old son Braddon and his four-year-old son Braddon for a walk around the block of their home on McCamus Street. (Staff photo by Gordon Brock)

Haileybury's Christmas in July promises to combine festive season with summer fun

HAILEYBURY (Staff) — Yuletide sights and sounds will echo around Harbourplace in Haileybury on Saturday for the celebration of Christmas in July.

The third annual event combines the best of Christmas festivities with traditional summer fun in an expanded lineup of activities and entertainment designed to appeal to the entire family.

The festival was born in 1992 to make up for a Heritagefest dampened by miserable weather that included snow.

This year's version will feature a fireworks display at 10:15 p.m. History repeats itself: the show had originally been scheduled for Heritagefest in June, but a severe thunderstorm forced its cancellation.

A new wrinkle this year is the Festival of Lights boat parade. Boat owners are encouraged to decorate their vessels with Christmas lights, and the illuminated boats will make their own tour of the waterfront after the fireworks. Home owners are also welcome to turn on their Christmas lights to maintain that festive air.

Also new this year is a Pro-Water Ski Clinic. Two-hour instructional sessions will be held at 9 a.m., 1 p.m., and 4 p.m., and outvies a few

Restructured EDC may be on the way

by Diane Johnston
Speaker Reporter

LATCHFORD — A restructured economic development organization for Temagami and Latchford may be in operation by fall.

The two municipalities are drafting a budget and working plan for a new corporation that will create two part-time economic development officer positions, said Anne Marie LeBoey of the Haileybury office of the Ministry of Northern Development and Mines.

The new organization will need the approval of the corporation's joint board of directors. It would then be forwarded to the ministry for the final okay.

Latchford Mayor George Lefebvre is optimistic that the reformed organization — which will be separate economic development officers for each municipality — will be running sometime this fall.

"We want to do this as quickly as we can," he said.

But while the two positions will be separate, he said there will be cooperative projects involving the two municipalities in which they will work together.

They will continue to report to a joint board of directors.

The Temagami-Latchford economic development office was shut down March 31 after five years of operation when provincial funding expired.

New funding for five years was announced at the end of May. But the province has cut its share of the costs.

For the first year, it will provide \$90,000. Its support will drop annually until, by the fifth year, the province is contributing only \$25,000.

Mayor Lefebvre said tentative figures budget about \$110,000 for the restructured office in the first year.

The municipalities would then be responsible for about \$20,000, but they could each make up half of their share by offering services, such as clerical support and office space.

Weekly livestock report

This Weekly Livestock Report is from Temiskaming Livestock Exchange (1992). New Liskeard for Monday, July 18, 1994. There were 232 head traded on Monday. Veal calves traded at steady prices. Bob calves traded at higher prices, feeder calves traded at firm prices and cows traded at high prices.

Market Cattle

Fed Steers	74.00 to 85.00
Fed Heifers	68.25 to 88.75
Holstein Steers	63.50 to 76.75
Heiferties	60.25 to 68.50
D1 & D2 Cows	60.00 to 65.00
D3 Cows	58.00 to 60.00
D5 Cows	55.00 to 58.00
Shelly cows	40.00 to 55.00

Market Calves

Choice Veal	130.50 to 170.00
Calves	76.00 to 130.50
Good Veal	
Common Plain	74.50 to 76.00
Veal Calves	130.50 to 170.00
(beef X)	

Replacement Cattle:

Bob Calves	137.50 to 237.50
Good Quality	
Bob Calves Medium	89.00 to 137.50
Stocker & Feeder	59.75 to 87.75
Steer Calves	72.00 to 121.00
Heifer Calves	68.25 to 92.75
650 lbs	
Dollar Cows	87.50 to 103.50
510.00 to 1061.00	

Pigs:

Weaning Pigs	25.00 to 32.50
Sheep & Goats	
Lambos	65.00 to 116.00
(all weights)	
Goats	47.50 to 86.00
Horses	50.00 to 79.00

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Down C. Lee, daughter of Judy and Allan Lee of Haileybury, Sales and Editorial Representative, College Division, McGraw-Hill Division Ltd., awarded 1993 Canadian Representative of the Year. This award was presented to Down in St. Petersburg, Florida at McGraw-Hill Inc. National Conference. McGraw-Hill Inc. is the parent company of McGraw-Hill, Sydnor Ltd. McGraw-Hill is a leading publishing house, its flagship being textbooks for both school and college/university markets. McGraw-Hill Sydnor Ltd. in 1992 of London where she had graduated earlier with a B.A. (Hons) in English from the University of Western Ontario.

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ENJOYING A NEW LEASH ON LIFE (Staff photo by Gordon Brock)

Editorial Page

Kicking Canada

What is it about this country in international sports and the behavior of our fans, athletes, and officials that make up a lot of people ask: "Is everyone here ashamed to be Canadian?"

Just recently many national editorialists, sports officials, and plain sports fans have been wondering what's going on at those recently held Francophone Games?

The Francophone Games are roughly the French-language equivalent of the Commonwealth Games. In short, it's a mini-Olympics but restricted to French-speaking countries. Canada, with French as an official language, is naturally a member in good standing.

But hold the show! Canada didn't send one team to the Francophone Games. They sent three. Quebec fielded a separate team as did New Brunswick. The other eight provinces and two territories made up the Canadian team. All federally funded.

Canada's top 100 metre sprinter, and a legitimate contender for the 1996 Summer Olympics, Grany Surin, beat countrymen Donovan Bailey in a great race to win the gold medal in Paris. However, Bailey ran for Canada. Surin for Quebec. After his win, Surin ran his victory lap draped in the Quebec fleur-de-lis.

Presumably if he was from New Brunswick he would have waved the New Brunswick flag.

On the medal podium O'Canada was played.

What is this? While critics of the federal funding of three Canadian teams competing under different flags at international events are left howling, they must be reminded this is Canada, after all.

Look at some of the top international athletes in the world: in track and field, Mark McCoy; in Canada raised-and trained gold medalist in the 100 metre hurdles in the 1992 Olympics, prefers now to compete internationally for Austria; the magnificent Duschenas who grew up in this country and learned their innovative trend-setting ways here through worldwide thrill audiences worldwide in the ice dance competi-

tions, but chose to skate for France; hockey superstar Brett Hull, who grew up and learned his hockey in Canada, prefers to compete internationally for the United States... on this list could go.

Our spectators are no different. The recently concluded World Cup of Soccer may have made some Canadians ask: what about the Canadian team?

Once again, this country didn't qualify. They were eliminated last autumn after a great spirited run. They showed the world they aren't far off from being just qualifying for this global spectacle. However the team also drew the pity of the soccer world for gaining a reputation of coming from a country where the nation's soccer fans cheer against their own country. Too many of Canada's soccer fans, although they may have been born and raised here and claim to be proud to be Canadians, cheer for the country where their ancestors were born.

It's just not soccer fans. The world championship of basketball will be held in Toronto in August and indications are that a lot of Canadian fans will be cheering for whatever overseas team corresponds to their own ethnic background or they will be cheering for the glamorous American "Dream Team".

It's obvious somewhere along the line this country has failed these fans, athletes, and even officials.

Or maybe these people have failed the country.

It's a little like the chicken and egg argument but in this case do our athletes, if they have the opportunity, compete for someone else because they don't get the support at home? Or do fans in this country, if they have the option, support another nation, because they know the athletes involved would do the same if they had a chance?

Sunday's *Toronto Star* carried an editorial on the farcical Francophone games situation. The following lines from that editorial applies to this one...

Either way, it doesn't add up. Either we're Canada, or we're not.

Gordon Brock



From the editor's desk Reaching for the moon

It's been 25 years. July 20, 1969. They say 35 per cent of the world's population today was not even born back then. But for the rest of us that were, particularly those that were born, say, before 1960, they probably remember exactly where they were.

It was called mankind's most memorable achievement.

To a 16-year-old watching that Sunday night in Maple, it was incomprehensible. Here was a man, not only about to set foot for the first time on another planet, but it was being shown live on television, and not only on every channel on our TV set but to billions of people around the world! No television show has ever come close to matching the audience that watched Neil Armstrong take that "one small step for man, one giant leap for mankind."

Never mind that those astronauts were American and hoist the flag of the United States of America was planted in the moon's soil. For one moment, and maybe a little bit of the

next day, this planet collectively never felt so good about itself.

Unlike sporting events and wars, there were no winners and losers. It was a victory for mankind.

As syndicated columnist Glen May wrote in a subsequent Speaker, "You observe another world being shown to you. You see colors, shadows, crevices, depressions, rocks, craters, never seen before by your eyes. It's all there: The majestic beauty of a naked planet."

"The voices are of your tongue, no strange sounds. Not a foreign language. You can recognize all words. It is weird."

"As you watch you keep thinking... there's a man on the moon... that's wrong there are men on the moon."

"You glance out the window and notice lights in every house. Yes, you think the entire world is watching."

"How can you describe it? 'You try to answer. It can't be done.'"

"You go to bed, puzzled, confused, but extremely happy you're alive."

In the editorial in the July 24, 1969 Temiskaming Speaker it was written: "The epic voyage of three courageous men during the past week has fired the imagination of the whole world, and given heart to those equally courageous souls who work almost hopelessly at the task of clearing the Aegean stables of our own beautiful planet."

"It is our belief that the success of these men will mean the attention of governments, and equally brilliant minds towards the impossible task of solving world problems of war, poverty, hatred and the evolution of a true brotherhood of man."

"And in the near future, all mankind will call that world as 'The Blessed Three.'"

As naive as that may seem 25 years later, people did feel that hopeful. Anything was possible.

Ask yourself, "when was the only time in this century that the world as one fell so hopeful?"

Only during that summer of 1969 when man landed, walked and subsequently returned safely to the earth, from the moon

OTHER OPINIONS

Hike at pumps unjustified

EDITOR'S NOTE: The following editorial first appeared in the *Norfolk Post of Colchester*.

When will Northerners see adequate regulation of local gas prices. Three cents at the pumps. What a ludicrous increase! This was not a provincial one. It was distinctive to the North. Why?

Do we Northerners not already pay enough when pulling up to a local gas station? Few will argue that the price increase was justified.

According to an article in the *Northern Times* July 6, Glen Thompson, chairperson of the Temiskaming Commission for Fair Gasoline Pricing said the three-cent hike across the North is unjustified. He claims the increase was a price gouge instigated by the oil companies to haul in higher profits during the peak tourist season.

The new prices came into effect about one month ago, just in time for the busy tourist season. Cochrane prices jumped to 65 cents a litre.

One of the common complaints echoed by tourists who venture North are the high prices of gasoline. No doubt, this fact deters many tourists from coming North.

Granted, the cost of hauling gasoline North is a little more costly than in southern Ontario, but the difference exceeds the transportation cost incurred. It's unfair and unjustifiable.

Northern Ontario has always had difficulty extracting tourists from its southern counterparts, and increase gasoline prices only add to that difficulty.

Private kindergartens fails

EDITOR'S NOTE: The following editorial first appeared in the *Signal of Riverview, Alberta*.

A private kindergarten starting this fall in Grande Prairie could send repercussions throughout the whole system.

A \$95 fee per month per student is what it costs parents to get the whole 400 hour system like past years. Most kindergarten hours were reduced to 200 or 300 hours with government cutbacks. Distraught parents in Grande Prairie felt that

wasn't enough and decided to start their own private kindergarten at \$95 a student.

This is what the government wants to see.

Since Alberta is the only province where kindergarten isn't mandatory, this private system is the way the government is sure to be leaving. If Premier Ralph Klein's third company find out that enough parents are willing to take kindergarten into their own hands, then that is one less

program they'll have to carry. If it's successful, and even if it means a two-tiered system, it reduces the government's education expenditures, then you can be sure they'll look at it very closely for putting it on the chopping block.

That means that those parents who can afford the \$95 to \$150 per student per month cost will be sending their kids to kindergarten. Those that can't won't.

There can be arguments both

Hard-hitting story missed subtlety of interviewee

TORONTO (Special) — The Ontario Press Council has upheld a complaint that a professor's research and views were misrepresented by a Toronto Sun article that quoted her as saying Canada is a hotbed for violence because of ethnic diversity.

Rosemary Gartner of the University of Toronto, who does research on crime, was asked to comment on a United Nations report that showed Canada ranks second to the United States among developed nations in homicide rates.

She said she told the Sun her research had shown that the strongest and most consistent factor associated with crime is income inequality, a point not mentioned in the story. Other factors included level of spending, the age distribution of the population and levels of cultural homogeneity.

When the Sun asked about the effect of cultural homogeneity, she said she replied that "more heterogeneous populations tend to be characterized by lower levels of integration and greater intergroup conflict, which may increase motivations toward violent behavior and decrease controls on violent behavior."

The Sun, which brought a printed copy of the reporter's notes to the Council hearing, said it stands by the story. It said the only inaccuracy was in a paragraph quoting Gartner as saying the UN report was "totally valid and accurate."

The reporter admitted she didn't use the word "totally" but insisted it was not, as Ms. Gartner said, a made-up quote.

Referring to a complaint by Ms. Gartner that the Sun agreed to run

her letter to the editor undated but made changes, the Sun said its managing editor would have never made such an offer. It added that the only sentences deleted from the letter were those that accused the Sun of gross misrepresentation and personally attacked the reporter.

Explaining why the transcript of the interview was so brief, the reporter said a good note taker does not write down digressions but concentrates on the essentials of what is being said.

Asked whether "income disparity" was mentioned by Ms. Gartner as the main reason for high homicide rates, the reporter said it was only one of the facts listed.

Noting that Ms. Gartner said she is an American and would never use "we" or "ours" in reference to Canada, as appeared in quotations in the story, the Sun insisted that she had in fact expressed herself that way.

Text of the adjudication: Rosemary Gartner, a University of Toronto professor who does re-

search on crime, complained that a September 24, 1993, article in the Toronto Sun, headlined "Ethnic mix blamed for Canuck violence," misrepresented her research and views.

The Ontario Press Council, after hearing from the two parties to the dispute, inclines toward the belief that the Sun oversimplified what Ms. Gartner had said, resulting in some distortion.

For example, the first paragraph of the article reported Ms. Gartner as saying Canada is a hotbed for violence because of its ethnic diversity. Ms. Gartner, on the other hand, maintained that she had said income inequality is the most consistent factor in high homicide rates in developed nations, a point not mentioned in the article.

Despite the presentation by the Sun, the Press Council, after consulting with Ms. Gartner, the Council believes the story's hard-hitting approach missed the subtlety of what a research professor would have said. It upholds the complaint.



Photo by Joe Wrinn

Nobel laureates E.J. Corey (left) and Dudley Herschbach (right) flank Dr. Alfred Bader, PhD '50, during an event to honor Bader's contributions to the Chemistry Department and chemistry research. During "Bader Day," the department feted Bader, who is the founder of Aldrich Chemical Co., which merged to become Sigma-Aldrich, the world's largest supplier of research organic chemicals and biochemicals. The Bader Symposium featured lectures by Dr. Bader, Dr. Hisashi Yamamoto of Nagoya University, Japan, and Dr. Chi-Huey Wong of the Scripps Research Institute in La Jolla, Calif.

Strengthen Management Skills, Set Goals

...n, almost 100 managers of
ing departments under Vice
Administration (VPA) Sally
met for a two-day executive
session at the Business School
here to learn how they could
their customers.

Business School faculty has long
advanced management training
managers working in some of
corporations in the nation,"
ser. "Historically we at Har-
few opportunities collective-

ly to take advantage of this expertise for
our purposes, and this session proved
invaluable. We designed it to be a collabo-
rative effort aimed at building our manage-
ment skills, creating stronger departments,
and developing a clearer strategic vision
for the future."

Most of Harvard's internal services are
provided by units within VPA. They
include the Faculty Club, Dining Services,
Facilities Maintenance, Harvard Real
Estate Inc., the Office of Human
Resources, the Planning Group, the Uni-

versity Press, the Office of the University
Publisher, as well as the Arnold Arbore-
tum and *Harvard Magazine*.

According to Professor of Business
Administration Leonard Schlesinger, an
internationally recognized authority on the
management of service industries who
served as the program's principal speaker,
the problems faced by a not-for-profit ser-
vice provider like VPA are not substantial-
ly different from those facing for-profit
industries.

(Continued on page 7)

New Brain-Scanning Technique Maps Strokes as They Happen

By William J. Cromie
Gazette Staff

A stroke hits you like a gunshot wound
to the head. It's over in seconds; there's no
good treatment; the damage is irreversible.
That's been the dogma.

But science is a dogma eat dogma busi-
ness. A fresh creed is taking hold: strokes
may last hours; new brain-scanning tech-
niques can see them in progress; drugs can
stop, even reverse, the damage.

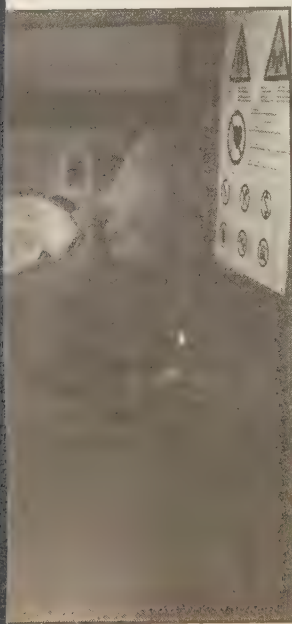
Researchers even refer to one promising
class of drugs as "lazaroids," after Lazarus
who, according to the Bible, rose from the
dead.

"Until recently, people who came to an
emergency room with a stroke might go

the Medical School. "Now, we are starting
to develop the kind of immediate treatments
applied to heart attacks. We possess the
ability to locate a stroke and determine how
bad it is. Drugs that dramatically limit brain
damage in animals are beginning to be test-
ed in humans."

Warach, Robert Edelman, associate pro-
fessor of radiology, and Chaim Mayman,
associate professor neurology, will do such
tests at Beth Israel Hospital. Tests also will
be conducted at Massachusetts General
Hospital and four other medical centers in
New England.

Currently, Beth Israel is the only place
where advanced brain-imaging is being
done with patients during a stroke. Warach
expresses cautious optimism that the imag-
ing plus drug procedure will be routine in



Photoy Laura Wulf

Gazette

March 4, 1994

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■ Exhibitions: Houghton Library pays homage to the innovation and influence of *The Yellow Book* **Page 3**

■ Learning: The English as a Second Language program responds to increased need for services **Page 3**

■ Supplement: The Arthur and Elizabeth Schlesinger Library on the History of Women in America



Photo by Jane Reed

Vietnamese Association dancers perform at the Cultural Rhythms festival. For more photos, see page 6.

Proposal for Instructor Competency Reviewed

By Debra Bradley Ruder
Gazette Staff

A proposal to identify instructors who may need help communicating in English was discussed Wednesday by the Faculty Council of the Faculty of Arts and Sciences (FAS).

The measure would require teaching fellows and teaching assistants who are not native English speakers to be tested for English language competency before they are allowed to teach, said Jeffrey Wolcowitz, assistant dean for undergraduate education.

"While everyone [on the Council] was in favor of the spirit of the proposal, there was a wide-ranging discussion about how best to achieve the goal," said Wolcowitz, who developed the proposal after researching policies at other institutions.

Some faculty are concerned, for example, that such a mechanism might signal a reduction in the responsibility of the course head for ensuring the competency of the instructors.

"The responsibility for what goes on in the classroom is a professor's," Council member Gary King, professor of government, said Thursday. "This plan would reduce faculty members' obligations. Faculty should decide whether to send their teaching fellows through this testing or to teacher-training classes, and they should be held responsible if there's still a problem."

One of the biggest problems, he said, is that faculty in some departments do not meet their instructors before the term begins. As a compromise, King sought an

(Continued on page 5)

\$1M Given To Chemistry Dept.

Gift from Alfred Bader, PhD '50, funds graduate fellowships for students from Czech

By William J. Cromie
Gazette Staff

A \$1 million fund for graduate fellowships in organic and bioorganic chemistry has been established by a gift from Alfred Bader, PhD '50 (organic chemistry).

The gift is intended to benefit students from the Czech Republic and to assist the Department of Chemistry in

maintaining the quality of its Ph.D. program. Bader is of Czech origin.

Jeremy Knowles, Dean of the Faculty of Arts and Sciences and the Amory Houghton Professor of Chemistry and Biochemistry, acknowledged the gift "with gratitude and pleasure that Dr. Bader should be so supportive of my 'old subject' and of a department that remains great, nationally and internationally."

"We plan to start the Bader fellowships this fall," said E.J. Corey, the Sheldon Emery Professor of Organic Chemistry. "An excellent candidate from the Czech Republic has already been identified."

At present, there are 190 graduate students in the Department of Chemistry, none from the Czech Republic.

Bader has kept close ties with the

(Continued on page 5)

Analysis Finds Tuberculosis Vaccine To Be Effective

By William J. Cromie
Gazette Staff

A vaccine not yet widely used in the United States cuts the risk of tuberculosis in half and significantly reduces TB deaths, researchers at the School of Public Health and the Medical School have found.

Their analysis of 26 human trials of the BCG (Bacillus Calmette-Guerin) vaccine concludes that it offers 50 percent protection against developing TB and 71 percent protection against death from the disease. Such a vaccine might help contain the rapid resurgence of TB in this country.

"Our results are important for considerations of use of the vaccine in high-risk settings in the U.S.," said Graham Colditz, associate professor of epidemiology and

of medicine. Such settings include crowded jails and shelters for the homeless.

Although used in many countries and recommended by the World Health Organization, BCG is not generally given in the U.S. partly because of doubts about its effectiveness.

"Our study specifically dealt with this question and it sets to rest doubts about efficacy," said Harvey Fineberg, Dean of the School of Public Health (SPH) and a member of the research team. "However, it's not a straight shot to a policy decision about using the vaccine in this country. Such a decision involves other factors such as cost, side effects, and the fact that vaccination with BCG hampers detection of new TB infection by the standard skin test."

(Continued on page 6)

Students Organize Effort To Raise Funds for Bosnia

Goal is to raise \$50,000 for a relief truck and food

By Debra Bradley Ruder
Gazette Staff

The rising death toll in Bosnia-Herzegovina has propelled a group of undergraduates to try to raise \$50,000 for a relief truck, a driver, and 20 tons of food.

About 80 students planned to visit every House and first-year dormitory this week to deliver literature and collect donations for the truck, which would transport food and medicine to Sarajevo and possibly carry out refugees.

"We've got people canvassing every

room on campus," said Martin Lebwohl '96 of Leverett House, one of the organizers.

The group hopes to solicit donations of at least \$10 each and to raise awareness about the plight of Bosnian civilians, thousands of whom have been killed, raped, and tortured over the past two years in a campaign of "ethnic cleansing."

"We're not a political organization," explained Marc Kuchner '94 of Dunster House. "Our message is, 'We care.' We hope to spark other efforts that bring Bosnia to the forefront of

(Continued on page 5)

Harvey Leibenstein Dies at 71; Pioneer in Economic Theory

Harvey Leibenstein, the Andelot Professor of Economics and Population *Emeritus* and the developer of the X-Efficiency theory, died Monday at his Cambridge home of cancer. He was 71.

A memorial service at Harvard is being planned and will be announced at a later date.

Leibenstein immigrated from Russia as a child and grew up in Canada. He earned advanced degrees from Northwestern and Princeton universities. Prior to coming to Harvard, Leibenstein taught at Princeton and the University of California, Berkeley.

"The Harvard Economics Department has a number of professors who came here from Berkeley: Robert Dorfman, Richard Caves, David Landes, Dale Jorgenson, and me," said Henry Rosovsky, the Lewis P. and Linda L. Geyser University Professor and former chairman of the Economics Department. "Harvey was also a member of that group. We knew him for nearly 40 years and always appreciated his extraordinarily original mind. He was 'non-mainstream' in his approach but he certainly influenced the mainstream of economics."

Leibenstein was the author of nine books on economic theory. He was particularly interested in the economic development of low-income countries and organizational analysis. His 1987 book, *Inside the Firm: The Inefficiencies of Hierarchy*, challenged many of the established

theories of organizational management.

"Harvey Leibenstein's outstanding characteristic as an economist was his insistent awareness that the people involved in the economy are people rather than calculators," said Robert Dorfman, the David A. Wells Professor of Political Economy *Emeritus*. "He introduced into economic theory such motivations as snobbery, conformity, habitual inertia, and especially, in his concept of X-Efficiency, laziness. He analyzed the effects of these motivations on the behavior of the economy."

Leibenstein's theory of X-Efficiency explored the differences between what a worker can be made to do, what he thinks he ought to do, and what he would really like to do. Leibenstein thought a worker's attitude toward "output efficiency" was the starting point for productivity growth analysis.

Leibenstein was an active member of the Hillel community and an honorary associate of Leverett House. "Harvey had a real personal warmth and spark that attracted people to him, said Dr. Roy Feldman, a longtime friend and colleague. "It was a quality that went beyond the academic brilliance for which he was appreciated. There was a quality of friendship and concern that touched everyone who met him. He seemed genuinely devoted to whomever he was speaking with at the time," said Feldman.

Notes

President to hold informal office hours for students

President Rudenstine will meet with students on an informal, first-come, first-served basis in his Massachusetts Hall office on Wednesday, March 9, 5-6 p.m. (This date supersedes the previously announced March schedule.) Office hours are open to all students in the University.

American Cancer Society's Daffodil Day orders due today

Today (March 4) is the order deadline for purchasing bouquets of daffodils (\$5 each) to support the fight against cancer.

To place your order, submit cash or a check (made payable to the American Cancer Society) to your office representative or call the Office of Government, Community and Public Affairs at 495-4955.

The daffodils, in bouquets of 10, will be delivered the first week of spring, on Wednesday, March 23.

Latin American and Iberian studies grants available

The Committee on Latin American and Iberian Studies (CLAIS) will offer research travel grants to Latin America for the summer of 1994.

Undergraduate Summer Research Travel Grants to Latin America. The competition is open to Harvard-Radcliffe students engaged in research toward senior honors theses on Latin American subjects. Priority will be given to undergraduates who will have applied for the Certificate in Latin American Studies by the grant deadline.

Summer Field Research Grants in Latin America for Graduate and Professional School Students. These grants are awarded to outstanding Harvard graduate and professional school students to explore dissertation or other kinds of

research in Latin America. Application deadline is Monday, March 14, for summer 1994 grants.

Fundación Mexico en Harvard Research Grants for Faculty, Graduate, and Professional School Students. These grants are awarded to Harvard faculty, graduate, or professional school students for extended research in Mexico. The application deadline is Thursday, April 14, for summer 1994 grants.

Fundación Capacitar Research Grants. These grants are awarded to faculty, Harvard graduate and professional school students, and Harvard seniors working on a thesis on Ecuador. An emphasis of these grants is the exchange of information between Harvard and Ecuadorian scholars working in similar fields. The application deadline is Monday, March 14, for work beginning in summer 1994. However, these grants need not be used just during the summer; projects may be undertaken at any time. Therefore, applications will be accepted throughout the academic year for review by the committee. In general, applications should be received at least two months before the anticipated beginning date of the research project.

Real Colegio Complutense Summer Field Research Grants. These grants are awarded to outstanding undergraduate or graduates Harvard-Radcliffe students to allow them to gather research data and develop contacts with Spanish scholars and institutions. The grants may be used for the assessment of the feasibility of a dissertation or to complete research projects related to papers, senior honor theses, or dissertations on Spanish subjects (or on Spain as part of Europe and the Latin America community). The application deadline is Monday, March 14, for summer 1994 grants.

For more information, call Anne Normann, assistant director, CLAIS, at 495-3366.

HRE Announces Rent Approvals

Harvard Real Estate Inc. (HRE) has announced the approval of the new rent schedule for approximately 1,700 Harvard-owned apartments for graduate students and other University affiliates.

The Faculty Advisory Committee on Affiliated Housing has reviewed the comments received from members of the Harvard community and has endorsed the new rents, as proposed in the *Harvard Gazette* (Feb. 4, 1994). The Committee will respond to affiliates who have written with their comments as soon as possible. The new rents will take effect July 1, when the 1994-95 rental season begins, and will show an overall increase from their present levels of 4 to 5 percent.

Members of the Faculty Advisory Committee on Affiliated Housing include: Lisa Martin, Professor of Government; William Hogan, Thornton Bradshaw Professor of Public Policy and Management; Christoph Wolff, William Powell Mason Professor of Music and Dean of the Graduate School of Arts and Sciences; John Forrest Kain, professor of economics and regional planning; Steven Shavell, professor of law and economics; and Sally Zeckhauser, Vice President for Administration (chair).

Application Procedure

Applications for apartments in the

14 housing complexes reserved for Harvard affiliates will be available from the Harvard Housing Office at 7 Holyoke St. Only full-time, regularly enrolled, tuition-paying degree candidates at Harvard and full-time, Harvard-paid employees (officers, faculty, and staff) are eligible to live in affiliated housing.

A special Housing Office telephone number, 495-5239, is available for application requests. This number is answered 24 hours a day by an answering machine. Callers should leave their full names and addresses. The new Housing Office booklet containing an application, instructions, and the 1994-95 rents, as approved by the Faculty Advisory Committee on Affiliated Housing, will be mailed to the caller. (Questions and other requests should be called in on the regular Housing Office line, 495-3377.)

Out-of-state applicants may use the Housing Office's toll-free number (1-800-252-5020) to request the application materials and to ask questions.

Application materials also may be picked up at the Housing Office Monday through Friday between 10 a.m. and 4 p.m.

Completed applications are accepted by mail. Waiting list numbers will be assigned on a random basis beginning at 5 p.m. on Friday, April 15.

Alumni Miss the Mark at Olympics

Harvard athletes didn't experience the thrill of victory during the Olympic Games in Lillehammer.

Team USA, the Olympic hockey team that included four Crimson players and coaches, made the quarterfinal medal round but left the Games with an eighth-place finish and a disappointing 1-4-3 record.

The roster included forwards Ted Drury

'93-94 and Peter Ciavaglia '91, head coach Tim Taylor '63, and goaltending coach Joe Bertagna '73.

Another alumnus, Jim Herberich '85, was a driver on America's bobsled team. He missed qualifying for the four-man race by a mere two-100ths of a second and wound up finishing 14th in the two-man competition, according to the Associated Press.

Obituaries

David L. Gunner, curatorial associate in anatomy and cellular biology at the Medical School, died Feb. 20. His Harvard service began November 1970.

Police Log

The following incidents were reported by the University Police Department for the week ending Feb. 26:

Feb. 22: A painting in the Kresge Dining Hall was stolen.

Feb. 22: A purse in an unattended locker at Malkin Athletic Center was stolen.

Feb. 22: An easy chair in the Cabot Hall living room was stolen.

Feb. 22: A pair of athletic shoes left outside a room in Quincy House were stolen.

Feb. 23: A watch that was left unattended at Bright Hockey Center was stolen.

Feb. 24: Cash in a cash box that was kept in an unlocked cabinet drawer at 25 Mt. Auburn St. was stolen.

Feb. 25: A package that was left in the entryway of 15 Everett St. was stolen.

Also reported were 1 arrest, 1 harassing or obscene phone call, 11 medical assists, and 6 instances of recovered property.

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College



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to the MBA Program or other areas of the Harvard Business School as necessary or desired. Interacts extensively with applicants, alumni, students and faculty. Minimum Requirements: MBA; at least two years' administrative experience; excellent interpersonal, verbal and written communication skills; must be decisive, perceptive, patient, and disciplined; should be comfortable in position of high visibility and responsibility; must enjoy personal autonomy within the culture of a closely knit department. NOTE: Please send resume to Ellen Cirillo, Human Resources, Harvard Business School, Fowle House, Boston, MA 02163. No telephone calls or walk-ins please. (03/04/94)

Temporary Administrative Assistant. Req. 44584. Radcliffe College, Publishing Course. Works directly with course administration in all aspects of intensive summer course in publishing procedures. Manages office and handles course inquiries. Coordinates national recruiting and admissions procedures and produces course workbook. Acts as liaison to publishing professionals. Oversees word processing systems and alumni records. Helps with job placement service, handles University accounting procedures and oversees bulk mailings. Coordinates classroom operation during course. Minimum Requirements: College degree; three to five years' office experience; ability to work independently without supervision; excellent writing skills; ability to work well with people and to meet deadlines under pressures; knowledge of word processing and ability to prepare own correspondence; some knowledge of the publishing profession helpful. NOTE: This is a temporary position currently through June 30, 1994 and also requires some evening and weekend hours during the six-week course. Please send resume and cover letter to Lindy Hess, Director, Radcliffe Publishing Course, Radcliffe College, 10 Garden Street, Cambridge, MA 02138. (03/04/94)

Help Desk Coordinator. Req. 44583. Harvard Medical School, Information Services Department. The position involves handling all incoming support calls, entering these calls into a central database and either answering the question or forwarding it to the appropriate support representative. This function also coordinates computer class registration and electronic mail access. Additional reporting and maintenance of the call database will be required (training of this function provided). Minimum Requirements: A qualified candidate will possess excellent organizational, analytical, and verbal communication skills, and a lot of patience. It is also crucial that the candidate have a good working knowledge of a variety of software applications running on networked DOS/Windows and Macintosh computers. Knowledge of communication software and accessing the Internet is also helpful. A bachelors degree in a business-related field or one to three years experience using a variety of software applications required. NOTE: Please send resume and cover letter to Susan Thompson, Harvard Medical School Employment Office, 164 Longwood Avenue, Boston, MA 02115. (02/25/94)

Telecommunication Technician. Req. 44582. Harvard Medical School, Telecommunications. Reports to Senior Telecommunication Technician. Responsible for daily moves, adds and changes of voice and data wiring and equipment as directed. Responsible for reporting time spent and action(s) taken on individual work orders. Acts independently on daily assignments. Is available for occasional on-call emergency as needed. Minimum Requirements: High school graduate or equivalent. Completion of a two-year technical program or equivalent work experience. Experience in the installation and maintenance of voice and data wiring systems and equipment preferred. Must be service-oriented and possess the ability to prioritize based on changing client needs. Excellent trouble shooting and problem solving abilities a must. NOTE: Please send resume and cover letter to Susan Thompson, Harvard Medical School Employment Office, 164 Longwood Avenue, Boston, MA 02115. (02/25/94)

Licensing Associate. Req. 44581. Harvard Medical School, Office of Technology Licensing. Reporting to the associate director is primarily responsible for identifying, evaluating and licensing Medical School faculty research and scientific innovation which has potential commercial applications. Actively markets HMS technology to industry to enhance opportunities for licensing and research collaboration. Advises faculty on writing Reports of Invention, protection and dissemination of intellectual property; develops confidential and non-confidential descriptive materials to market intellectual property. Negotiating options/licenses, biological material exchange agreements, and Industry-Sponsored Research Agreements with industry counter-parts. Monitors the scientific activities of the faculty and develops and contributes to a variety of publications to be used in OTL's intellectual property management; and business development and marketing efforts. Organizes and participates with faculty interviews for research summaries; supervises writing of research summaries, edits final copy; manages database of such summaries for inclusion in revised Director of Research. Initiates and manages special project aimed at enhancing HMS' program for collaboration with industry and facilitating the transfer of technology invented by HMS scientists. Designs and executes innovative methods for increasing license and research activities of HMS. Minimum Requirements: Bachelor's degree in the biological sciences. Masters degree preferred; at least three years of experience in technology licensing; three to five years' direct experience with the bio-pharmaceutical industry preferred; facility to communicate with scientists in pre-clinical departments of HMS; experience with science writing, negotiation of technology licenses/research contracts; experience in marketing technologies; familiarity with U.S. patent law as it affects technology transfer and the basic elements of university-industry relationships; excellent communication skills. NOTE: Please send resume and cover letter to Diane Lamarre, Harvard Medical School Employment Office, 164 Longwood Avenue, Boston, MA 02115. (02/25/94)

Applications Programmer/Analyst. Req. 44580. Harvard Medical School, Information Systems. Position Objectives: To analyze, design, create or modify programs and data bases as part of a project workplan to carry out the objectives of a system design process, or to enhance existing systems in conformance with departmental procedures. Responsibilities: To analyze, design, create or modify programs consistent with system design, programming standards and conventions, and documentation standards. Duties: Designs and develops computer

data bases, programs and procedures (new and existing systems) in accordance with user specifications. Consults with user department managers and staff to determine requirements for computer programs and systems. Constructs test data for program debugging; debugs and tests all programs written, prior to actual implementation. Writes technical (programmer) documentation for all programs written or enhanced. Writes user documentation as assigned. Trains HMS staff in use of computer systems. Consults with users to resolve system problems. Minimum Requirements: B.S./B.A. or equivalent. Computer science or other technical discipline preferred. Solid exposure to data base management systems (relational preferred) and structured procedural programming required. Experience with Powerhouse, Sybase, Unix, 'C', Pascal a plus. NOTE: Please send resume and cover letter to Susan Thompson, Harvard Medical School Employment Office, 164 Longwood Avenue, Boston, MA 02115. (02/25/94)

Manager of Financial Affairs. Req. 44579. Harvard Medical School, Division of Medical Sciences (DMS). This position reports directly to the Director of the Division of Medical Sciences with a matrix reporting relationship to the Associate Dean for Finance of Harvard Medical School. The Manager is a member of the senior management team with responsibility for managing the financial and operational needs of the Division. The DMS is the PhD-degree granting unit of Harvard Medical School (HMS) and the Graduate School of Arts and Sciences (GSAS) of Harvard University with an annual budget of \$10 million. Specific duties include but are not limited to: supervision of staff responsible for financial planning, acquisition of external funding sources including training grants, individual research grants, and foundation sources; interaction with relevant offices within HMS, FAS, GSAS, the Harvard hospitals, HSPH, and others involved in the financing of the program; prepare and negotiate annual budget and five-year financial plan; provide administrative and financial support for strategic planning; participate in fund raising team; oversee financial plans for student support, including determinations of funding sources and negotiations with individual faculty and respective research institutions; participate in providing administrative leadership in continual development of computer data systems that best service the financial and operational needs of the Division. Minimum Requirements: College degree, advanced degree preferred in business administration or related field. A minimum of five years progressively responsible experience managing the financial, systems and general operations of a complex organization; preferably in an academic or similar setting. Demonstrated communication and negotiation skills. Proficiency with Excel or compatible spreadsheets, word processing and database management systems and a working knowledge of office computer systems development. Ability to work effectively with a diverse population of administrators, faculty and students in an academic and hospital setting. The Manager must possess demonstrated skills in teamwork, creative problem solving, staff development, independent decision-making and an orientation toward service delivery. Experience in an academic environment preferred. NOTE: Please send resume and cover letter to Diane Lamarre, Harvard Medical School Employment Office, 164 Longwood Avenue, Boston, MA 02115. (02/25/94)

Database Administrator. Req. 44578. Harvard Medical School, Information Services. Participates in development and support projects, within HMS, and in cooperation with other faculties, to design and modify data bases and related software. Ensures that data bases support business rules embodied in the design of applications. Supports and maintains security through the use of user names, passwords, and restricted views, on an ongoing basis. Supports client-server software, particularly in layers below the 'front end', both on servers and client machines. As needed, develops and maintains written policies in support of all of these objectives. Develops and supports strategies for distribution of client software, and for coordination of production and development versions of software, both client and server-based. Works closely with application data administrators, applications developers and support personnel, operations staff, networking staff, help desk, end users and key contacts in support of all of these objectives. Minimum Requirements: College degree in computer science or related work experience. Solid knowledge of relational theory required. Experience with the design, operation, and security of a relational data base management system, including data access and management using SQL, required. Must be able to write scripts or programs in SQL and some other procedural language, such as 'C' or Pascal. Experience with Unix operating system required. Exposure to network protocols necessary. Knowledge of DOS and Macintosh operating and file systems helpful. Exposure to Sybase, Uniface, 'C', SQR, or HP-UX helpful. Exposure to end user query tools and report writers would be helpful. NOTE: Please send resume and cover letter to Susan Thompson, Harvard Medical School Employment Office, 164 Longwood Avenue, Boston, MA 02115. (02/25/94)

Associate Technical Specialist. Req. 44577. Office for Information Technology. Organizes information and administers details for contract compliance with AT&T and NET. Will coordinate administrative processes for many highly specialized telecommunications services, and identify the appropriate technical products and services for each vendor. Track performance of vendors, using information collected from several OIT groups. Primary point of order tracking and escalation for student orders. Coordinate the reporting on OIT production performance. May assist in data tracking for calling cards, switch related codes, and usage trending. Analysis of system reports (i.e., Netpartner, Monies) for customers and for production measurement. Will need to interface with outside vendors, and will work in a team environment that requires information sharing and prompt feedback. Will be expected to escalate problems with vendor performance to document problems. Minimum Requirements: Some college, with a minimum of three years business experience in telecommunications-related business. Excellent interpersonal, communications, organizational skills required. Must be detail oriented, with developed problem solving skills. Must have solid knowledge of ISDN configurations, telephone equipment options, and vendor tracking methods. Proven analytical and negotiation skills necessary. Knowledge of telephone utility reporting structures and billing methods very helpful. Must be proficient in office automation software and databases; Macintosh preferred. NOTE: Please send a cover letter and resume to Ann Bando, Harvard University, Office of Information

Technology, 830 Holyoke Center, Cambridge, MA 02138. (IH 02/25/94)

Director of the Office of Human Resources. Req. 44576. Office of Human Resources. Reporting to the Vice President for Administration (VPA), the Director of OHR is the senior full-time human resources officer within the University. Coordinates human resources activities throughout the University, manages the day-to-day operations of the Office of Human Resources, and is a permanent member and chair of the University's Human Resources Policy Council. Manages the Policy Council's staff. Working in collaboration with the school and departments, articulates a long-range human resources (HR) vision of the University, including managing the University's HR strategic planning process, preparing the University's consolidated HR plan and recommending required changes to the planning system. Recommends to the Policy Council University-wide HR policies, structures, and required information and reporting systems necessary to manage and deliver HR services. Determines core services to be offered by OHR to local HR departments, identifies central HR services to be offered on a fee for service basis, and develops business plans for these services. Prepares resulting annual departmental staffing and budget requirements. Determines and develops appropriate service criteria to measure delivery of OHR services. Takes a leadership role in the collaboration between OHR and the Deans and Vice Presidents in the development of the administrative staff and ensures each school and unit has access to organizational development expertise to ensure continuous improvement and effective management in all University departments. Conducts yearly reviews with each local HR and OHR departments to determine the successful achievement of OHR departmental and unit goals. As necessary, in collaboration with the individual departments, develops plans to improve performance. Works in collaboration with the Deans and Vice Presidents to ensure the compliance of individual schools and units with University guidelines, ensuring the exchange of good practices, standards and procedures among the local HR departments. Minimum Requirements: Candidate will have at least 10 years experience in increasingly responsible positions in managing a large complex service-driven operation within a highly decentralized, culturally diverse organization; senior level human resources management experience required with University experience highly desirable; proven ability to manage change, coupled with an understanding of the delivery of service within a highly decentralized environment; ability to build and manage a customer service driven organization; proven knowledge in the definition and implementation of a strategic planning process; experience in the management of large complex information systems in a large and diverse organization; organizational ability, communication skills, sense of humor, tenacity and entrepreneurial spirit are essential. NOTE: Please send cover letter and resume to Karen Wilcox, Isaacson Miller, Inc., 334 Boylston Street, Boston, MA 02116. (02/25/94)

P.T. English as a Second Language Student Advisor/Instructional Coordinator. Req. 44575. Division of Continuing Education, English as a Second Language (ESL). Reports to the Program Administrator. Under the direction of the Program Administrator, advises students, answers questions about program and course content, level, and placement for approximately 800 Summer School students and approximately 1000 Extension School Students. Serves as ESL specialist to other DCE departments, providing advice on serving non-native speakers. Works with Program Administrator to coordinate ESL courses and recruit and supervise instructors. Acts as consultant to ESL instructors on textbooks and course materials. Assists Registrar's Office in testing and placement of students. Minimum Requirements: Post-graduate degree in applied linguistics or Teaching English as Second Language; two or more years' teaching experience and advising in diverse settings (U.S. and preferably overseas); knowledge of ESL teaching materials; strong interpersonal skills; fluency in at least one foreign language, preferably Spanish and/or Japanese. Familiarity with PC or Macintosh word processing. NOTE: This is a year-round half-time position. Additional hours may be necessary during peak times. Please send resume and cover letter to Wayne Ishikawa, Division of Continuing Education, Harvard University, 51 Brattle Street, Cambridge, MA 02138. No phone calls or walk-ins please. (IH 02/25/94)

Program Coordinator (Supervisor/Research Assistant). Req. 44574. Harvard School of Public Health, Program of Human Development and Criminal Behavior. Under the direction of the Deputy Director of Cohort Assessment, is responsible for the supervision of 10-12 research assistants; assist with recruitment, hiring and evaluating research assistants; responsible for timekeeping activities. Assist with designated research and data collection tasks related to the PHDCB longitudinal study to be implemented in Chicago, Illinois; conduct investigation into the accuracy and availability of agency record data from various government units; conduct descriptive data and analysis projects in support of PHDCB research plan; perform data management and analysis tasks; organize and present information for research presentations and publications; manage special data-bases for collections, management and analysis of agency record data. Minimum Requirements: College degree (Master's preferred) in social or behavioral sciences; five or more years experience in criminal justice, education or public health; statistical analysis experience; experience with personal computer software including statistical packages, word processing and spreadsheets. Proven supervisory experience required. Superior communication skills required. NOTE: Please send resumes to Patricia Lau, Administrator, MCH/Program on Human Development in Chicago Neighborhoods, Harvard School of Public Health, 25 E. Washington Street, Ste. 1500, Chicago, IL 60602. (02/25/94)

Senior Direct Mail Coordinator. Req. 44573. Harvard University Press. Works closely with the Promotion Manager in the complex planning and development of the Press's direct mail marketing effort. Independently executes seasonal direct mail projects. Budgets individual projects. Selects books to promote, researches audience, and purchases mailing lists. Develops creative concept and writes brochure copy. Gathers price quotation, hires and directs freelance designers, chooses printer, and buys printing services. Coordinates printed mailing pieces at mailing house and ensures timely and accurate mailings. Analyzes performance of the project. Works closely

with the Promotion Manager, Marketing Director, acquisition editors, and vendors. Minimum Requirements: College degree, three to four years' book publishing experience with emphasis on both the creative and the financial aspects of direct mail production; excellent copywriting and analytical skills; Macintosh computer experience; ability to work with scholarly authors in a university press setting. NOTE: Please send resumes to Sheila Barrett, Harvard University Press, 79 Garden Street, Cambridge, MA 02138. No walk-ins or faxes please. (02/25/94)

Research Specialist I. Req. 44572. Harvard School of Public Health, Center for the Prevention of Cardiovascular Disease. Under the direction of the Principal Investigator, assists in the execution of various research projects in the origin of arteriosclerosis using transgenic and gene-deletion mice. Responsible for ordering and maintaining inventory of rats and mice housed at off-site facility, cross-breeding transgenic and gene-deleted founder's lines, and ordering specialized supplies and equipment for animal surgery. Assists in surgery, observes animals post-op, provides tissue samples to project staff, maintains all research records related to project's animal work and performs statistical, pathological, histological and other analyses of data as required. Adheres to all School, University and government safety/security regulations. Performs other related duties as required. Minimum Requirements: B.S. in veterinary science or biology with at least two years of experience working with various species of lab animals. AALAS certification required. Skills in problem-solving, basic experimental design, and analysis and interpretation of data are critical. Must be self-motivated with ability to learn and integrate new techniques and work independently. Must have strong organizational, interpersonal, communication and computer skills. Prior experience with computers required, preferably the Macintosh, and knowledge of FileMaker Pro, Word, and Lotus 1-2-3 helpful, but not required. NOTE: Please send cover letter and resume to Mary Mitchell, Center for Prevention of Cardiovascular Disease, Harvard School of Public Health, 677 Huntington Avenue, Bldg. II, RM. 115, Boston, MA 02115. (02/25/94)

Subsidiary Rights Manager. Req. 44571. Harvard University Press. Aggressively seeks out the sale of translation rights of Harvard University Press titles to other publishers, negotiates contractual terms, generates contracts, and oversees the maintenance of all financial records resulting from same. Coordinates production requirements resulting from these sales, including requisition and billing. Responds to inquiries into the availability of subsidiary rights such as translation, reprint, electronic, movie, and others. Generates all rights reversion documents and contract cancellations. May review contracts negotiated by others and recommend negotiation strategies. Strong travel required, such as to the annual Frankfurt (German) Book Fair. Supervises office staff assistant, writes own correspondence, and utilizes in-house computer system and desk-top computer. Minimum Requirements: Strong experience with scholarly book lists and interest in the subsidiary rights area of book publishing; demonstrated interest in university press book publishing; familiarity with electronic rights issues and experience negotiating contracts; strong negotiating skills, effective presentation of general scholarly material, and ability to supervise are all necessary. Foreign language ability will be a plus. Ability to work in a collegial environment and with academics and other professionals necessary. College degree required, equivalent university press publishing experience preferred. NOTE: Please send resumes to Susan J. Seymour, Harvard University Press, 79 Garden Street, Cambridge, MA 02138. May fax to 496-4677. No walk-in please. (02/25/94)

Temporary Bibliographer for the Gray Herbarium and Research Associate in Plant Systematics. Req. 44570. The Harvard University Herbarium. The position reports to the Director of the Herbarium and works closely with the Assistant Director for Collections and the Librarian of the Botany Libraries. The bibliographer will be responsible for screening current publications for new names of plants, verifying citations, entering data into a database, and maintaining and modifying verification files. In addition to the above responsibilities the Research Associate will work on a research project involving plant materials in the Harvard University Herbaria. The Gray Herbarium Index is a botanical bibliography providing sources of names of vascular plants described from the western hemisphere. Performs related duties as required. Minimum Requirements: Advanced degree in botany required; knowledge of the application of the rules of botanical nomenclature; specific knowledge of and research in plant systematics and computer skills with application to bibliographic databases. NOTE: The position is a one-year appointment. Please send cover letter and resume to Mary Reynolds, Organic and Evolutionary Biology, Harvard University, 26 Oxford Street, Cambridge, MA 02138. (02/18/94)

Senior Planner. Req. 44569. Harvard Medical School, Planning Office. Matrixed reporting relationship to both the Administrative Dean for Planning and the Executive Dean for Administration. Provides direct support and consultation to medical school faculty and staff in matters related to major institutional planning initiatives of a strategic, financial, and/or programmatic nature. This person must develop an understanding of the issues presented, determine what questions are relevant, gather the appropriate information, and develop a plan(s) based upon information gathered and related knowledge. Specific duties may include, but are not limited to: staffing committees in various stages of initiating change; developing workplans and staffing such initiatives; developing models and assisting in the assessment of existing projects/programs; organizing/coordinating the work of committees and other types of task groups. Performs other related duties as required. Minimum Requirements: College degree required, advanced degree in business or a health-related field preferred. Minimum five years experience in a senior level staff position in a complex organization required, preferably in an academic medical setting. Individual must be self-directed, able to work well independently and manage multiple projects simultaneously. The Planner must have outstanding oral and written communication skills (writing samples will be required of all final candidates); strong mediation and negotiation skills; facility in evaluating resource requirements; excellent problem-solving abilities; a demonstrated high level of diplomacy. Previous senior-level consulting experience helpful. NOTE: Please send resume and cover letter to Diane Lamarre, Harvard Medical School Employment

(Continued on next page)

Harvard Opportunities

(Continued from previous page)

Office, 164 Longwood Avenue, Boston, MA 02115. (02/18/94)

Coordinator for Classes and Reunions. Req. 44568. Radcliffe College, Office of Alumnae Affairs. Responsible for all aspects of the Radcliffe 35th-65th Reunion program, including the Harvard-Radcliffe joint reunions (5th-30th, 5 year intervals) with Harvard counterparts and with Reunion Planning Committees. Also responsible for the activities for non-reunion classes. Oversees class officer structure, class mailings and events, and recordkeeping. Supervises staff support for Class Organization and Reunions Committee and performs other duties as assigned. Must be a self starter with the ability to handle a myriad of details. Requires frequent evening activities. Minimum Requirements: College graduate with five to seven years experience in event planning or Alumnae Affairs; excellent organizational, communication and interpersonal skills; ability to work well with volunteers of all ages, ability to work as part of a team. Experience with Macintosh computers preferred. Familiarity with Harvard-Radcliffe community helpful. NOTE: Please send resume and cover letter to Jane Opel, Office of Alumnae Affairs, Radcliffe College, 10 Garden Street, Cambridge, MA 02138. (02/18/94)

Director of External Affairs. Req. 44567. John F. Kennedy School of Government. Reports directly to the Associate Dean for External Affairs and assists with the design, execution and oversight of plans for development, communications, and liaison activities connected with the upcoming University capital campaign. The Director will have extensive management responsibilities in overseeing development operations and will be required to work effectively with internal and external constituencies in meeting campaign objectives. Travel required. Minimum Requirements: B.A. required; Master's degree preferred. Minimum of ten years of professional level management/development experience required. Knowledge of and experience at the Kennedy School strongly preferred. Must have demonstrated leadership and administrative skills including the ability to work effectively with internal and external constituencies on meeting campaign objectives. Creativity; outstanding oral and written communication skills; plus the ability to articulate the Kennedy School's mission essential. NOTE: Please send a cover letter and resume to Jean Hood, John F. Kennedy School of Government, 79 John F. Kennedy Street, Cambridge, MA 02138. No phone calls please. (02/18/94) *S.I.C.

Library Reporting Specialist, Office for Information Systems. Req. 44566. University Library, Office for Information Systems (OIS). OIS provides technical and user support for HOLLIS, the large-scale integrated library management system used throughout the libraries at Harvard. OIS currently provides customized management and bibliographic reports to individual Harvard libraries. The office is also actively engaged in a project to implement a new reporting system that will allow Harvard librarians to create many of their own reports directly without OIS staff involvement. Reporting to the Manager of the Library Services Group, the Library Reporting Specialist will have primary responsibility for the HOLLIS reporting system. Tasks will include consultation with users, analysis of users request and some programming for creation of custom reports; major involvement in planning, design and implementation of the new reporting system; training, documentation and support for users of both the old and new reporting systems; some involvement in training, documentation and support for users of other HOLLIS functions. Minimum Requirements: Master's degree in Library of Information Science or equivalent. Experience with automated library systems; Demonstrated analytical and problem-solving skills. Excellent oral and written communication skills. Strong user services orientation. Desirable: Technical services experience, using an automated library system; Familiarity with library data and MARC formats; Demonstrated aptitude for computer programming; Familiarity with HOLLIS or NOTIS; Experience supporting users or customers; Experience with Paradox, Sybase or other database management software would be useful. Familiarity with Harvard library systems would be a plus. NOTE: Please send cover letter and resume to Malcolm Hamilton, University Personnel Librarian, University Library, 1341 Massachusetts Avenue, Cambridge, MA 02138. (02/18/94)

Supervisor. Req. 44565. Office of Financial Systems, Fringe Benefit Operations. Reporting to the Manager of Fringe Benefit Operations, is responsible for the day-to-day operations of the office; which includes financial transactions, calculations, and data entry of the University Benefit Programs. This involves the University pension Plans, Tax Deferred Annuities, Flexible Spending, Disability, Pension Payroll, Health, Dental and Life Insurance. Will assist in the hiring, training and evaluation of staff. Works with the staff as a hands-on supervisor. Helps to develop new procedures to establish more efficient processing methods. Helps to maintain financial controls for all accounts within the department. Is responsible for the coordination of the benefit choices, TDA process, 1099R process, statistical information, confirmation statements and other related projects; keeps abreast of all changes regarding new regulations and Benefit Administration changes, works closely with Benefit Administration, Departments and outside companies. Performs related job duties and special projects as required. Minimum Requirements: Excellent organization and communication skills; ability to perform detailed work and complex calculations with accuracy; background in accounting and finance; ability to work with details and deadline pressure; knowledge of computerized systems; supervisory experience and Benefit background helpful. NOTE: Please send a cover letter and resume to Kelly Scott, Harvard University, Fringe Benefit Operations, 1350 Massachusetts Avenue, RM. 601, Cambridge, MA 02138. No phone calls please. (02/18/94)

P.T. Writing Coordinator. Req. 44564. John F. Kennedy School of Government, National Security Programs. Reports to the Associate Director. Coordinates publications of the National Security

Program, with emphasis on the research papers written by the National Security Fellows. Tracks the progress of the Fellows' research efforts from topic selection to final draft. Participates in and oversees the production and distribution of papers chosen for publication in from the National Security Program Discussion Paper or Policy Analysis Paper Series. Helps Fellows identify and narrow focus for their topics; identifies serious problems in any research projects for Program staff; copyediting final papers for publication; distributes published papers; maintains mailing lists; interfacing with commercial publishers; participates in writing and research workshops for Fellows. Performs other related duties as required. Minimum Requirements: B.A. or equivalent experience plus five years experience editing manuscripts in the field of security affairs for publication and familiarity with publication/production processes required. Excellent oral and written communication skills essential. Ability to interact with a wide range of constituencies necessary. Advanced knowledge of WordPerfect 5.1 and excellent organizational skills needed. Knowledge of Harvard/Kennedy School systems preferred; production/managerial experience highly desirable. NOTE: Please send a cover letter and resume to Beth Banks, John F. Kennedy School of Government, 79 John F. Kennedy Street, Cambridge, MA 02138. No phone calls please. (02/18/94)

Microsupport Technician. Req. 44563. Harvard Medical School, Information Services Department. The position involves supporting a variety of software applications running on networked DOS/Windows and Macintosh computers. Additional responsibilities include assisting clients in making hardware and software purchases and some classroom software training. The support function is largely accomplished using the telephone but also requires site visits and one-on-one training within the Medical School Quadrangle. Minimum Requirements: A qualified candidate will possess excellent organizational, analytical, and verbal/written communication skills, and a lot of patience. It is also crucial that the candidate have a good working knowledge of a variety of software applications running on networked DOS/Windows and Macintosh computers. Knowledge of communication software and accessing the Internet is also helpful. A bachelors degree in computer science or related field and three to five years experience in computer training/support are required. Novell certification is a plus. NOTE: Please send resume and cover letter to Susan Thompson, Harvard Medical School Employment Office, 164 Longwood Avenue, Boston, MA 02115. (02/18/94)

Development Assistant for Research. Req. 44562. University Development Office. Reporting to the associate director of research, identifies and prepares research on potential funding sources for University potential prospects. Identifies potential prospects for Harvard schools and units by regular review of materials featuring Harvard alumni, philanthropists, and other prospects. Keeps current on the objectives and funding goals of FAS and other Harvard schools and programs. Keeps current on use of reference tools, including electronic databases, publications, and seminars. Minimum Requirements: Bachelor's degree; minimum of two years' post-college work experience (in research or development work preferred); scientific literacy essential, as the sciences will be a major goal for the Campaign; significant evidence of ability to perform in-depth library research required; ability to work independently in a deadline-oriented environment; familiarity with the Macintosh computer software, especially Microsoft packages; excellent interpersonal skills; ability to work with confidential materials with discretion; excellent communications skills; evidence of willingness to contribute to the team effort by helping others work as required. NOTE: This is a temporary position until June 30, 1996 in support of Harvard's Campaign. Please send cover letter and resume to Martha M. Budding, Manager of Human Resources, Harvard University Development Office, University Place, 124 Mount Auburn Street, Cambridge, MA 02138. (02/18/94)

Research Associate. Req. 44561. Harvard School of Public Health, Department of Health Policy and Management, Technology Assessment Group (TAG). Responsible for the design and implementation of a national conference on the role of meta-analysis in the review, evaluation, and approval of new drugs by the FDA. Acts as liaison with FDA and AHCPH officials. Identifies, and negotiates with potential speakers. Arranges the program for the initial meeting and a follow-up conference one year later. Secures additional funds if possible from the AHCPH. Obtains agreements from speakers to follow-up with manuscripts, if indicated. Participates in ongoing activities of TAG, integrating this study into the overall activities. Minimum Requirements: Doctoral degree in medicine, dentistry, or public policy essential; experience convening meetings and conferences required; additional experience in the dissemination of research findings, in meta-analysis, and the evaluation of technology preferred; strong analytical skills; ability to address public policy and legislative issues surrounding the potential role for meta-analysis in drug regulatory policy; excellent oral and written communication skills, including presenting technical concepts to a broad audience. NOTE: Please send resumes to Dawn Elliott-Linehan, Health Policy and Management, Harvard School of Public Health, 677 Huntington Avenue, Boston, MA 02115. (02/18/94)

Deputy Director, Cohort Assessment. Req. 44560. Harvard School of Public Health, Maternal Child Health-Project on Human Development in Chicago Neighborhoods. The Project on Human Development in Chicago Neighborhoods (PHDCN) is the field research unit of the Program on Human Development and Criminal Behavior. This Project is designed to become one of the largest field research operations at Harvard and will involve a staff of research administrators and field researchers based in Chicago, Illinois. Under the general guidance of the Site Director, the Deputy Director for Cohort Design is responsible for supervising research staff and data collection activities. Specifically hiring and supervising a field staff of approximately 40 research assistants; hiring, training, and supervision of field supervisors; development of field and subject assessment protocols; working close-

ly with community groups and city agencies on the implementation of field work in Chicago; working closely with senior management team on development of project data files and subject histories, and on coordination and implementations of PHDCN overall plan. Minimum Requirements: Advanced degree in behavioral sciences required; doctorate preferred. Clinical skills preferred along with substantial experience managing a large scale research project with 5,000 or more study subjects. Experience in project management and administration, research team work, and publication of results preferred. NOTE: Please send cover letter and resume to Dr. John K. Holton or Patricia Lau, Maternal Child Health-Project on Human Development in Chicago Neighborhoods, Harvard School of Public Health, 25 E. Washington Street, Chicago, IL 60602. (02/18/94)

Donor Relations Officer. Req. 44559. Harvard School of Public Health, Development Office. Donor relations officer develops and maintains stewardship program working closely with faculty and staff in the preparation of annual individualized reports to donors of endowed funds (and specific current use funds) outlining the School's use of donors' gifts. Develops creative ways of re-involving past donors through stewardship process. Donor Relations Officer also communicates and works with the internal constituencies of the School and the University (faculty, administrators and students) on development projects. Prepares special acknowledgment letters for the Dean and faculty for restricted annual, endowment and capital gifts. Minimum Requirements: College degree; excellent written and verbal communication skills; one to two years of development experience; ability to manage multiple projects effectively; excellent interpersonal skills and ability to related well with faculty, staff, students, prospects, and volunteers; ability to handle confidential information and inquiries with sound judgment and discretion; knowledge of Harvard and public health helpful. NOTE: Please send cover letter and resume to Cathy Baer, Harvard School of Public Health, Development Office, 116 Huntington Avenue, 9th Floor, Boston, MA 02115. (IH 02/18/94)

Director of Financial Aid. Req. 44558. Graduate School of Education. Reports to Administrative Dean. Responsible for the oversight of an automated Financial Aid program comprised of federal, state, institutional and private funds. Advises the Dean's and faculty regarding financial aid trends and policies which affect student recruitment and retention. Represents the School to national, local and university audiences as appropriate. Coordinates programs and procedures with the Office of Admissions to achieve target goals. Minimum Requirements: Bachelor's degree required, Master's degree preferred; significant professional Financial Aid experience; demonstrated supervisory experience; interest and experience in dealing with adult; mid-career students; knowledge of, and experience in working with automated financial aid systems; strong presentation and public speaking skills. NOTE: Please send a cover letter and resume to Ellen Slater, Human Resources, Harvard University, Graduate School of Education, 118 Longfellow Hall, Appian Way, Cambridge, MA 02138. (02/18/94) *S.I.C.

Program Coordinator (Supervisor/Research Assistant). Req. 44557. Harvard School of Public Health, MCH/Program on Human Development in Chicago Neighborhoods. Under the direction of the Deputy Director of Cohort Assessment, is responsible for the supervision of ten to twelve research assistants; assist with recruitment, hiring and evaluating research assistants; responsible for timekeeping activities. Assist with designated research and data collection tasks related to the PHDCN longitudinal study to be implemented in Chicago, Illinois; conduct investigations into the accuracy and availability of agency record data from various government units; conduct descriptive data and analysis projects in support of PHDCB research plan; perform data management and analysis tasks; organize and present information for research presentations and publications; manage special data-bases for collections, management and analysis of agency record data. Minimum Requirements: College degree (Master's preferred) in social or behavioral sciences; five or more years experience in criminal justice, education or public health; statistical analysis experience; experience with personal computer software including statistical packages, word processing and spreadsheets. Supervisory experience required. Superior communication skills required. NOTE: Please send resumes to Patricia Lau, Administrator, MCH/Program on Human Development in Chicago Neighborhoods, Harvard School of Public Health, 25 E. Washington Street, Ste. 1500, Chicago, IL 60602. (02/18/94)

Special Listings

Temporary Day Care Director. Harvard/Radcliffe 25th Reunion Office. Works with Reunion Office to develop program for approximately 50 children from the ages of 16 months through 5 years for the 25th Reunion, during the week of Sunday, June 5-10, 1994. Duties include: overseeing daily program, supervising staff, and working with children directly Monday through Friday of the reunion, as well as pre and post reunion responsibilities. Minimum Requirements: Degrees: B.A., Certification: Mass. Office for Children, Head Teacher and/or Director preferred. Experience and training in early childhood education/day care. Please forward resumes with references to: Marion Briefer, 25th Reunion Office, Wadsworth House, Harvard University, Cambridge, MA 02138. For more information, please call the Reunion Office at 495-5301. (03/04/94)

Dumbarton Oaks. Copy edits and proofs scholarly book-length manuscripts in Byzantine studies, pre-Columbian art and archaeology and landscape architecture. B.A. in Humanities; working knowledge of at least one foreign language (French, German, Spanish preferred), minimum two years editing experience, plus handling illustrations. Excellent communication and interpersonal skills. Macintosh computer experience. Upper \$20's; excellent benefits, free parking. Write to Glenn Rugs, Dumbarton Oaks, 1703 32nd Street, NW, Washington, DC 20007. (02/25/94)

■ The following jobs, described in previous issues, are still available. For information Research Associate, Dept. of Biostatistics, HSPH. Req. 44463.

Communication Technician, OIT. Req. 44556.
Programmer/Analyst, OIT. Req. 44555.
Laboratory Administrator, Chemistry Dept. Req. 44554.
Project Associate: Advisor to the Russian Privatization Center, HIID. Req. 44553, 44552, 44551, 44550, 44549.
Project Assistant: Macroeconomic, Trade and Industrial Policy, CEM Project, Indonesia, HIID Req. 44548.
Assistant Director for Finance and Administration, Harvard University Police Dept. Req. 44547.
P.T. Temporary Public Interest Attorney Advisor, HLS. Req. 44546.
Senior Network Engineer, FAS Computer Services. Req. 44545.
Division Manager, New England Regional Primate Research Center, HMS. Req. 44544.
Publicity Manager, Harvard Business Review, HBS. Req. 44543.
Manager, Research Services, HBS. Req. 44542.
Publicist, HBS Press, HBS. Req. 44541.
Accounting Manager, Financial Operations and Analysis, HMS. Req. 44540.
Deputy Director of Development and Major Gifts, Office of Development and External Relations, GSE. Req. 44539.
Research Associate, The Center for the Prevention of Cardiovascular Disease, HSPH. Req. 44538.
Program Coordinator, Dept. of Medicine, Cambridge Hospital, HMS. Req. 44537.
Temporary Microcomputer Support Specialist, Information Services, HMS. Req. 44535.
Assistant Manager I, Dining Services, HSPH. Req. 44533.
Temporary Project Cataloger, Houghton Library, College Library. Req. 44532.
Temporary P.T./F.T. Associate in Research, Division of Research, HBS. Req. 44530, 44529, 44528, 44527, 44526, 44525, 44524, 44523, 44522.
Temporary P.T./F.T. Research Assistant III, Division of Research, HBS. Req. 44520, 44519, 44518, 44517, 44516, 44515, 44514, 44513, 44512, 44511.
Project Associate: Director of Large Scale Transactions, Russian Privatization Center, HIID. Req. 44510.
Project Associate: Director of Enterprise Restructuring, Russian Privatization Center, HIID. Req. 44509.
Administrative Assistant, Francois Xavier Bagnoud Center for Health and Human Rights, HSPH. Req. 44507.
Temporary P.T. Publications Production Coordinator, Peabody Museum. Req. 44506.
Director of Facilities, Facilities Dept., Radcliffe College. Req. 44505.
Project Manager, Schumann Foundation, University Health Services. Req. 44504.
Public Information Officer, Office of News and Public Affairs. Req. 44503.
Research Associate, Population and Development Studies, HSPH. Req. 44502.
Major Gifts Office, Development Office, Radcliffe College. Req. 44501.
Communications Coordinator, HBS. Req. 44500.
Editorial Production Coordinator-HBR, Harvard Business Review, HBS. Req. 44499.
Biostatistician I, Dept. of Biostatistics, HSPH. Req. 44498.
Manager of Production and Electronic Distribution, Health Publications Group, HMS. Req. 44497.
Programmer/Analyst, Ambulatory Care and Prevention, HMS. Req. 44496.
Project Director, Ambulatory Care and Prevention, HMS. Req. 44495.
Virology Database Specialist, Dept. of Biostatistics, HSPH. Req. 44493.
P.T. Microcomputer Systems Specialist, Dept. of Organic and Evolutionary Biology. Req. 44492.
Senior Development Writer/Editor, University Development Office. Req. 44491.
Parking Office Manager, Parking Office, UOS. Req. 44490.
Supervisor of Film Studios and Electronic Engineer, Visual and Environmental Studies. Req. 44489.
Senior Virology Data Coordinator, Dept. of Biostatistics, HSPH. Req. 44488.
Assistant Director for Finance, HIID. Req. 44486.
Coordinator of User Services, FAS Computer Services. Req. 44484.
Systems Manager, Mathematics Dept. Req. 44483.
Biostatistician I, Dept. of Biostatistics, HSPH. Req. 44482.
Biostatistician I, Dept. of Biostatistics, HSPH. Req. 44481.
Associate Site Director, Project in Human Development in Chicago Neighborhoods, Maternal and Child Health, HSPH. Req. 44479.
Research Associate, Laboratory of Reproductive Physiology, Population and International Health. HSPH. Req. 44478.
Assistant Fellowship Director, Institute for Social and Economic Policy in the Middle East, KSG. Req. 44476.
Recruitment Officer, HIID. Req. 44475.
Coordinator of the Electronic Teaching Center, Widener Library, College Library. Req. 44470.
Director of Radcliffe Public Policy Institute, Radcliffe College. Req. 44468.
Box Office Assistant Manager, American Repertory Theatre. Req. 44464.
Research Associate, Dept. of Biostatistics, HSPH. Req. 44463.
Research Associate, Dept. of Biostatistics, HSPH. Req. 44462.
Cataloger, Harvard Theatre Collection, Houghton Library, College Library. Req. 44461.
Coordinator for Special Events, University Development Office. Req. 44457.
Director, Corporations and Foundations, Development Office, HSPH. Req. 44455.
Research Specialist, Dept. of Cancer Biology. Req. 44454.
Research Specialist I, Prevention of Cardiovascular Disease, HSPH. Req. 44453.
Director for the Pacific Basin Research Program, Center for Science and International Affairs, KSG. Req. 44449.
Program Coordinator, Programs in Professional Education, HGSE. Req. 44447.
Development Writer, Development Services Office, HSPH. Req. 44443.
Project Director, Mathematics Case Development Project, HGSE. Req. 44442.

Milwaukee Journal Sentinel
SERVICE AWARD April 7/95

Chemist honored for generosity

**Alfred Bader made mark
in chemical research,
promoting art history**

Alfred Bader, founder of Aldrich Chemical Co. of Milwaukee, was honored last week by the American Chemical Society with a special award for his "outstanding public service" as a leading chemist and philanthropist.



Bader

The society described Bader, 71, as "a world leader" in chemical research. It credited him for his efforts in collecting nearly 40,000 rare

chemicals from researchers around the world, making them available at nominal cost to others and encouraging their use by industry.

It noted that Bader started his own journal, *Aldrichimica Acta*, to disseminate chemical review articles and personally endowed several awards in chemistry and underwrote chemical research at universities in Europe, Israel and North America.

Bader is also widely known for his philanthropic work in support of art history, having made gifts of paintings to museums across the country and providing funds for the study of art history.

WASH. POST
about these things
more. I have — not guilt — but regret
I didn't know more. His life ran out

Thomas J. Scanlan, who was 69 when he died, had fought on Guam; and on Iwo Jima and knew "how insane it was," his son said. "The futility of it."

Scanlan, 38, owns an insurance firm. A flag that hangs over his desk was brought back from Iwo Jima by his father.

During the last years of his father's life, "I began thinking of him as a kind of hero and wanted to go back and walk where he had walked," Scanlan said.

His father, who was a platoon leader in the 3rd Marine Division, told his son that he and his men followed "the flame throwers, and blew up caves where the Japanese were," Scanlan said.

After talking to a man who had been in the same area of fighting, Scanlan wanted to walk his father had. From the black beach to the airfield. For Scanlan, it was a tough walk, over rough terrain. But he had to crawl.

"I was thinking about my dad, and he told me, how frightened he was," Scanlan said.

Scanlan saw a woman bury an American flag in the sand in memory of her father who was a commander of one of the invasion ships. He had been killed and buried at sea.

Scanlan saw another son of Iwo Jima walking the walk. The man's father had been killed in the invasion.

In Milwaukee, when Scanlan had told his friends and relatives he was going to Iwo Jima, he'd never been, to commemorate a battle that occurred before his birth, he was asked why, again and again.

He, of course, knew how unimportant this small, five-mile-long rock of an island was to our country's young people, most of whom have never heard of it.

But he also knew that more than 20,000 Japanese died on Iwo Jima. And he knew that the United States listed more than 20,000 casualties, including 6,800 dead, more than 10,000 wounded and 13,000 Marines.

Long ago, while listening to his father's story, Scanlan made a decision.

If Iwo Jima was important enough to die for, it was important enough to remember.

INSIDE ART

Carol Vogel

House Favorites:
Old Masters

As with any good showman, Stephen A. Wynn, chairman of Mirage Resorts, wants to please his audience. At Bellagio, his \$1.6 billion hotel and casino complex in Las Vegas, Nev., some 2,000 visitors a day are willing to pay \$10 to see the mini-museum that opened there in October. When Mr. Wynn learned that they preferred art by familiar traditional artists to some of the more difficult 20th-century works, he decided to make changes.

In the last few months he has been revising his collection, selling works by such artists as Jasper Johns and Giacometti and buying Old Masters, stirring hopes among eager New York and London dealers in that field.

So far Mr. Wynn has made two important purchases, both of which went on view just after Thanksgiving: Rembrandt's "Portrait of a Bearded Man in a Red Coat" (1633) and Rubens's "Head of John the Baptist Presented to Salome" (1609). These were the two most expensive paintings sold at Sotheby's in New York last January, with the Rembrandt fetching \$9 million and the Rubens \$5.2 million. Sotheby's said that the buyer of both paintings was Dr. Alfred Bader, a Milwaukee collector who is the backer of Otto Naumann, a Manhattan dealer in Old Masters.

While Mr. Naumann refused to comment about the purchases, Mr. Wynn was more than happy to talk about his decision to broaden his collection. "It's not just one period of art that's fascinating or fun to look at," he said. "The power of Old Masters is enormous especially when they can be seen near the work of other artists painting some 300 years later."

A Certain Dosso

A haunting image of St. George in armor, with the dragon's head as a trophy in the foreground, is displayed by itself on a wall of the Metropolitan Museum of Art. It is a highlight of "Dosso Dossi: Court Painter of Renaissance Ferrara," an exhibition that opened yesterday (review, page 37).

The painting's label says it is a loan from Derek Johns, the London dealer. But the J. Paul Getty Mu-



Rembrandt's "Portrait of a Bearded Man in a Red Coat" (1633).

seum in Los Angeles has just bought it, reportedly for \$500,000.

The painting dates from 1513-1515, just after the artist moved to Ferrara, Italy, where he became court painter for Duke Alfonso I d'Este and then his son, Ercole II.

It is the third painting by Dosso to enter the Getty's collection. The other two are later works and very different in subject matter. One is a figural composition, "Allegory of Fortune" (circa 1529-32), the other a lyrical "Mythological Scene" (1535-38).

Officials at the Getty decided to buy "St. George" when they saw it at the Palazzo dei Diamanti in Ferrara, where the exhibition opened. The Getty is one of the show's organizers, along with the Met and two Italian art institutions.

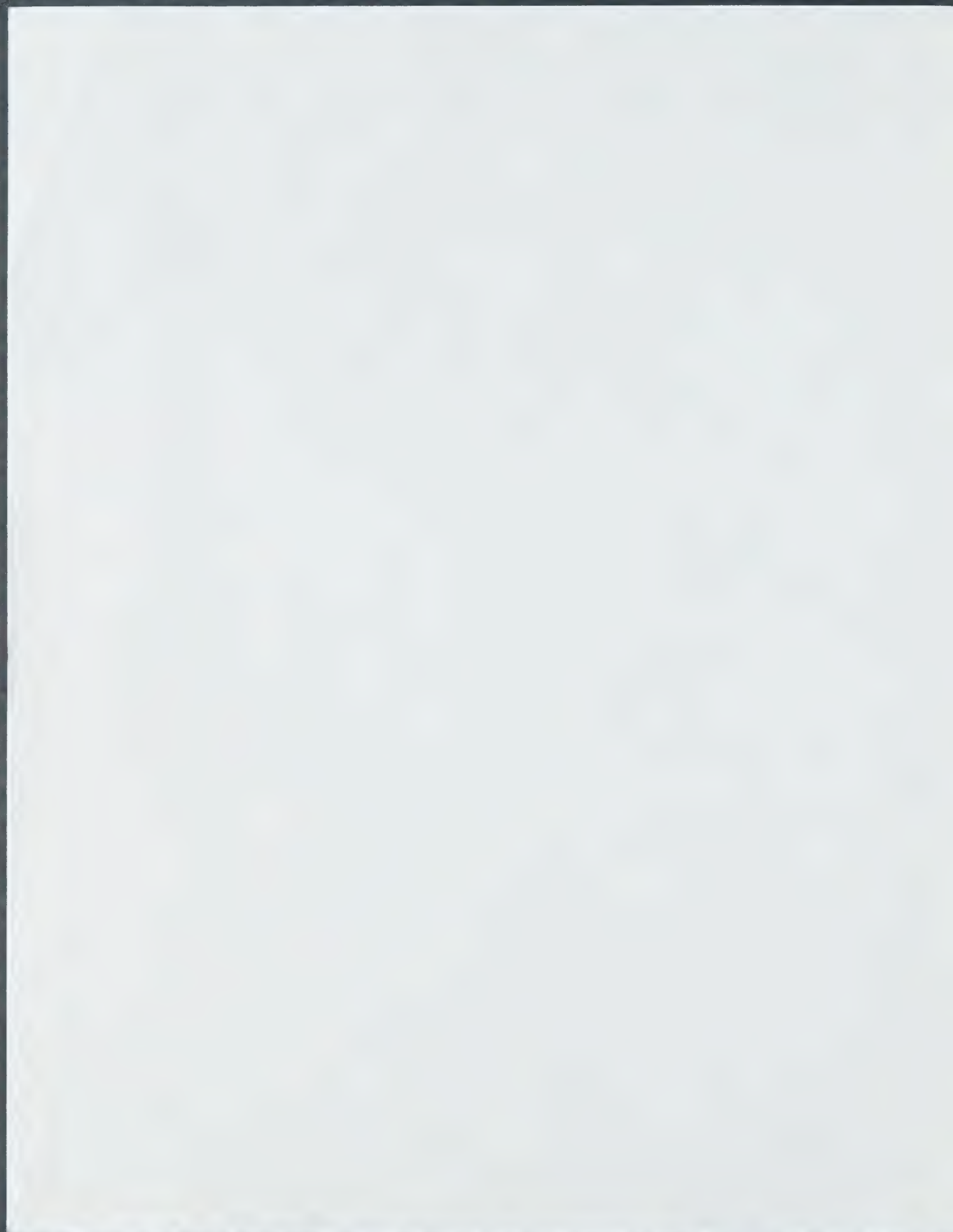
"We're not only filling gaps but

trying to get the best pictures available to build on our strengths," said Deborah Gribbon, deputy director and chief curator at the Getty. "While Dosso isn't as well known as, say, Monet, paintings of this period are terribly difficult to come across."

After the Dosso show closes at Met on March 28, it will go to the Getty, and run from April 27 through July 11. Then the Getty plans to put "St. George" on permanent view in its 16th-century Renaissance paintings galleries.

Fancying the Flemish

Even curators at the Metropolitan Museum concede that they were surprised by the enormous positive response by mail and telephone from people who have seen "From Va-



Why we American Muslims are feeling so much pain

Civilized people seem to worry more about animals

By MAHER HATHOUR
Special to the Los Angeles Times

In a pluralistic society, a major guarantee of harmony is the understanding of the different components of the pluralism — the understanding of one another. The sharing and appreciation of one another's pain, frustrations and aspirations will contribute to breaking the walls of psychological ghettos. It is morally right and pragmatically important that all the groups in our society reveal their collective suffering.

And so we American Muslims want everyone to know how we feel today — the extent of our agony, the darkness of our anger, the depth of our sadness. We feel what is happening in Bosnia as if it were happening to us. I will not mince the words and claim that we are upset because of the failure of law and order in the world, or the crushing of a promising

democratic pluralism in Bosnia or the disintegration of the United Nations. Neither are we solemnly heartbroken because of the disillusion in American ideals or the loss of the leadership of our country to the free world.

We hurt because we see Muslims being killed because they are Muslims, women raped because they are Muslim women, children maimed because their parents carry Muslim names. We hurt because we see the genocide widely publicized, almost celebrated for the scope of its savagery, and yet nobody cares. In our perception, whether it's right or wrong, if the victims were other than Muslim, the situation would be different.

We hurt because the major powers in the world have not only refrained from helping the victims, but have also imposed an arms embargo that is preventing the victims from helping themselves. We hurt because, with unbelievable insensitivity, our country's leaders say that all this suffering is not worthy of the sacrifice of a single American life because the lives of Muslims are not worthy and their blood is



cheaper.

We hurt because we see civilized people pricking consciences over the fate of animals while Bosnian Muslims are not exotic enough to be preserved. We hurt because we saw our country lining up the U.N. solid and straight to secure the flow of oil from the Persian Gulf, but not to stop the flowing

blood of Bosnian Muslims.

We are hurt to hear the obscenity of claims that lifting the arms embargo will increase the bloodshed, which does not mean the quantity of blood, but rather sharing the pool of blood lost with the aggressors. We are angered to see people harbored in the "safe haven" zones and then to hear the

suffering in Bosnia transformed into a debate on how to save the peacekeeping forces. Yes, we are agonizing for our brothers and sisters for whom there is no one left to mourn.

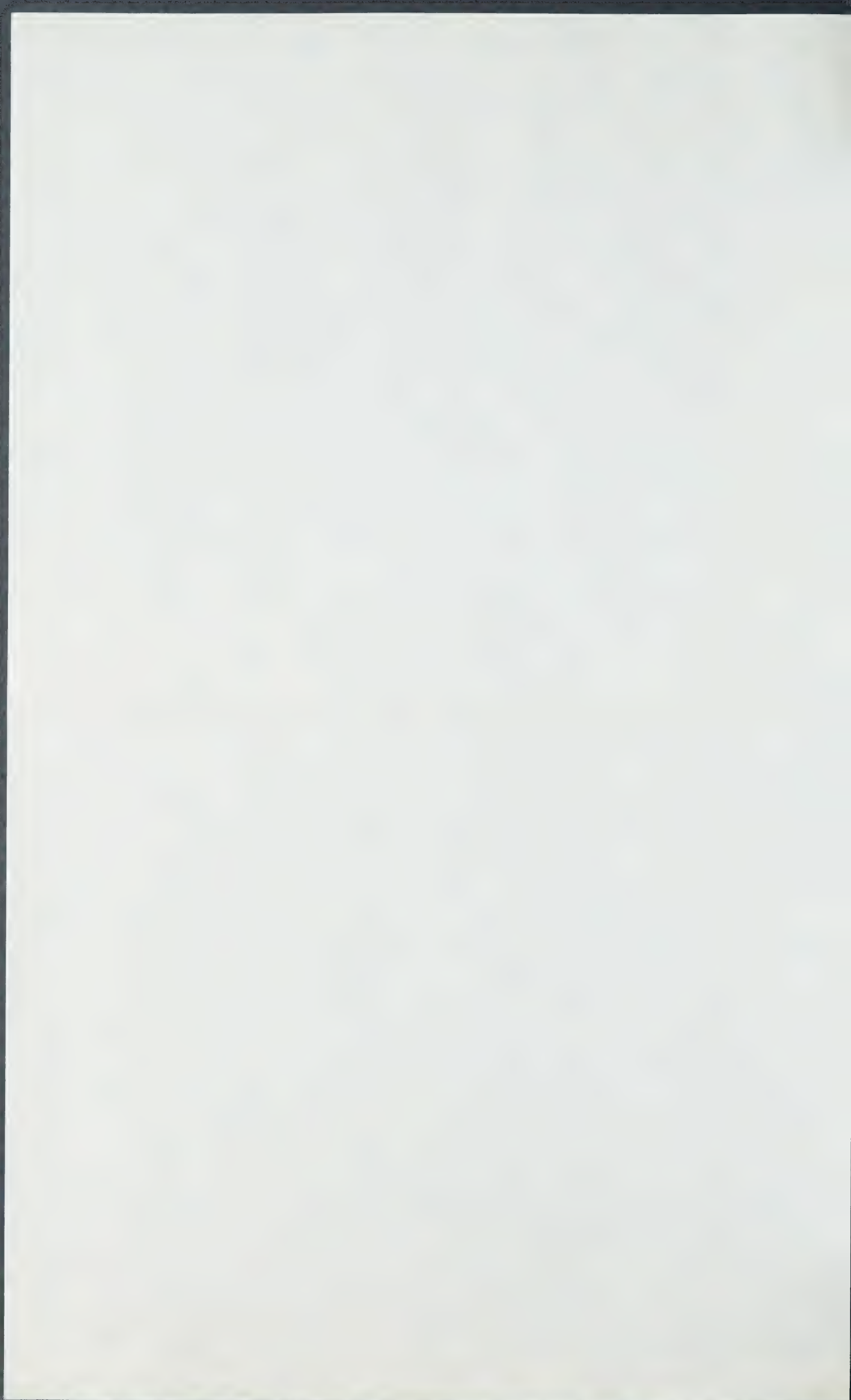
We harbor the kind of anger that is not amenable to erasure by time, an anger shared by one-fifth of the inhabitants of

the globe; only fools can ignore its impact.

It is maddening to American Jews to have someone deny the Holocaust, because they know how the world denied the pain when it was inflicted. To American Muslims, it is even worse because the atrocity in Bosnia is not denied; it is shown. Nobody will be able to claim, as most did after the Holocaust, that we did not know, or that we only discovered the horror after the fall of Hitler and the liberation of Auschwitz. Here we all know, we see the genocide in our family rooms, then push the button to see who is testifying in the Simpson trial.

Yes, we Muslims are angry, madly so. It would be dishonest to keep it to ourselves or to create an emotional ghetto. We owe it to our fellow citizens, that they should hear it in its crude truth. We will be stuck together with this anger for a long time. I know that I will never forget and I wonder if I can ever forgive.

Maher Hathour is a frequent spokesman on Muslim affairs and president of the Inter-Religious Council of Los Angeles.



IN THE CITY

News Editor, Bonnie Even Pike, Phone 822-4310, Ext. 262

A talk, no action Televised debate fizzles

By CARL NELSON
The Guelph Mercury

The all-candidates round-table debate last night on Cable 8 wasn't really much of a debate. Instead, it was an evening filled with 90 minutes of posturing, record defending, a few personal slams, a question or two from the media panel and a question or two from the television audience.

It was, in short, a chance for the six candidates to stake out territory that has already been staked out by anyone tuning into the program heard nothing new coming from the candidates running in the June election.

But whatever the evening was, incumbent Derek Fletcher of the NDP appeared to squeak out another successful evening as the Tory and Liberal openly sparred.

One thing became increasingly clear: Ontario's Progressive Conservative think it's a two-way race. Tory Brenda Elliott sees Liberal Rick Ferraro as the threat.

They don't believe the NDP can win again in this riding or in the province. It was an impression spread at the end of the evening with Elliott's campaign manager, Mike Cutbush's confirmation.

The evening began with each of the six candidates allowed a few minutes to make a pitch to voters for their party. Tom Bradburn, Librarian, talked about less government and fewer taxes. Anne Di Carlo of the Ontario Renewal Party, talked about a government of people caring for people. John Gots of the Family Coalition, spoke about a back to basics government supporting family values. Brenda Elliott reiterated the now-familiar PC positions on tax cuts in what they are calling the "communi-revolution." Rick Ferraro expressed the Liberal red book and Fletcher held up his party's record over the past five years.

After a few questions from the media panel, beginning with voter cynicism, the evening warmed up when the hospital redevelopment

issue was brought into the forum. The three big-party candidates PC, Liberal, NDP — were asked if they would support the Blundell Report on hospital redevelopment. While all three said they would, and spoke about a hospital system that represented the community's needs, Elliott used the chance to again attack Ferraro.

Elliott accused Ferraro of ending women's health care during his last term in office — Ferraro said to Fletcher in the '85 campaign — when St. Joseph's was touted as the acute care hospital. St. Joseph's is a Catholic hospital where abortions raise religious concerns.

It was an accusation Ferraro flatly denied calling her comments "absolutely false."

He did, however, admit to taking a stand on the hospital redevelopment issue as the community's representative to Queen's Park which was a key factor in his political defeat to Fletcher.

It was also a chance for Ferraro to counter-attack the Tories proposed levy on health care use by higher income earners.

He defended it as a move to replace the health care tax faced by employers in an attempt to wobble business back into Ontario.

The verbal skirmishing — it's not really developed into a decent fencing match — revealed Ferraro as Elliott's target. After the debate Cutbush said Tory polls have shown the NDP is the party voters have identified as the one they would vote for.

"It's a two-way race," he said. Making it even more obvious Ferraro is seen as Elliott's rival is a new election brochure released this week by her campaign office.

The same as Elliott's rival is a new election brochure released this week by her campaign office. It lists Ferraro's record in office in what one political pundit called "American-style" campaigning.

University of Guelph Professor Fred Vaughan, of the Political Studies department, was at the debate and said this was the first time he has seen anything like this type of election in Guelph during 30 years of elections.

Ontario Election '95 Rick Ferraro: Running for answers

By RICHARD DOOLEY
The Guelph Mercury

Rick Ferraro more than wants his old job back: he wants to know he lost it.

It's a question that has dogged him since losing his seat as Guelph's MPP in the 1990 election that swept Bob Rae and the NDP to power.

"I think I have to know if it was (former Liberal premier) David Peterson, Rick Ferraro, the hospital issue or a combination of all those things that cost the election," Ferraro said.

Deciding to run again was a question that raised a lot of discussion around the Ferraro support table. It was a decision that was discussed carefully with his wife JoAnn and their two children Krista, 17 and Kevin, 19.

"Looking back was harder on me than it was on me," he said. "I wasn't sure if I wanted to put them through that again."

JoAnn Ferraro said she saw what politics, and losing at politics did to her husband the last time at the polls.

"I think he worked hard for Guelph. Very hard," she said.

Ferraro as a hard worker is an easy one to believe after talking to friends and colleagues. His friends regard Ferraro highly, even though his nicknames among his little less than plausorous.

"I call him the Big Banana," said Alex Macrae, explaining Ferraro's ability to slide into a room and talk at ease with anyone.

Macrae is the former executive director of Family and Children Services. He served with Ferraro in the early 80s when Ferraro served as the county's representative on the Family and Children Services board.

"I think the important thing I recall about Rick in those days is that he wanted to be on the board, that he asked for the appointment," said Macrae.

Macrae said it was an attitude that people at the agency noticed. "I think people appreciated his outlook."

No stranger to elections or provincial politics, Ferraro said he was lured back from the political hinterlands to run again because of a growing concern for the future of the province.

"I'm worried about where this province is going and in particular about the future for our young people," he said.



FERRARO FAMILY: Former Liberal MPP Rick Ferraro is running for his old job with the support of his family. Ferraro and his wife JoAnn, centre, are flanked by their children Kevin and Krista.

FERRARO FACTS

Rick Ferraro, 45, married wife JoAnn works in the office of a local surgeon. Two children, Krista, 17 graduating from Bishop Macdonnell and Kevin, 19, a political studies student at Carleton University. Ferraro's record as an MPP includes passing the Fault Insurance legislation through the legislature. But there is also the money on his back resulting from the hospital issue in Guelph an issue that might have cost him the 1990 provincial election. He stands on the issues. Health care is the number one concern of people followed closely by the deficit. His law of the campaign "It's been a dirty campaign and will likely get worse."

trade and Commerce and the minister of financial institutions, vice chair of the finance and economic affairs committee; member of public accounts committee; resource committee and justice committee — as well as being responsible for seeing no fault insurance through the legislature.

Before his legislative experience Ferraro served as a Guelph city clerk from 1980 to 1985.

Hospital redevelopment is an issue that still dogs Ferraro. "I made a mistake," he says, can't do anything about on hospital redevelopment in 1990.

Ferraro opposed the then-Liberal government's decision to study hospital development one more time in the city. He brokered a deal which would see the development of an acute care hospital at the Catholic-owned St. Joseph's and the opening a free-standing women's health clinic.

The now-defunct deal appealed nobody and prompted an outcry among the Liberals and Ferraro. "I made mistakes," said Ferraro adding that he senses people dis-

trust politicians in general. "I think it is up to us to win that trust back."

Chemical research essential element of global markets

By SCOTT TRACEY
The Guelph Mercury

Canada must place more emphasis on research and development issues to survive in a global economy, chemists heard Monday.

While the country has traditionally survived by exploiting its natural resources, this is no longer a viable option any more. Martin Moskowitz, chairman of the department of chemistry at the University of Toronto, said

Moskowitz was a panelist during a science policy forum at the 78th Canadian Society for Chemistry Conference, taking place this week at the University of Guelph.

He said technological innovation has not been necessary to sustain a profitable economy because of Canada's ability to survive as a resource nation. However, some natural resources run out and renewable ones such as forests can't be regenerated in time to be useful.

But because of the country's reliance on its resources, there has been no emphasis placed on research and development.

"We'll all go bankrupt," Moskowitz said. "There isn't a sector that's immune in this."

He explained as industry was not doing a lot of research, sources of funding have not been established and government places research at the bottom of its list of priorities.

In fact, he said, Canada spends less of its gross domestic product on research and development (R and D) than any other country in the western world. Some Canadian industries are "even a little hostile to the R part of R and D."

Arthur Carty, president of the National Research Council, said federal science and technology expenditures could be cut by up to \$1 billion as a result of an ongoing review of scientific policy.

The review is being headed by Jon Gerrard, secretary of state for science, research and development.

By SCOTT TRACEY
The Guelph Mercury

Dr. Alfred Bader's story is a little bit out of the ordinary.

Born a Jew in pre war Austria, Bader would go on to found one of the world's largest chemical companies and become a world-renowned collector and dealer in fine paintings.

He is in Guelph as the keynote speaker at the annual conference of the Chemical Institute of Canada now at the University of Guelph. Bader and wife Isabel told their story to the Mercury Standard.

Bader was born in Vienna in 1923 and was adopted by his aunt after his father died. Bader was two weeks old at the time. His aunt, his father was a Jew and Bader was raised in his faith. His natural mother, however, was a Catholic and attempted to convert the young man to change his religion.

"Whenever I did see my natural mother she would talk to me about Catholicism. When you could consider all the Jewish propaganda — that time I was a very mixed-up kid," he recalled.

Following anti-Jewish demonstrations in 1938, the British government offered 10,000 visas to Jewish children and Bader was one of the first to arrive in England in 1940, however, the British government became concerned they may be a spy among the returned and placed them in internment camps.

Bader was eventually shipped to Canada as a prisoner of war, but Canada was not willing to accept him. He was eventually released to Canada, which brought Bader to Canada, also contained some captured Nazi weapons that he brought with him when we arrived there. We were quite sure they were not at all authentic. You damn Nazis! He said, remembered.

He got a good education in the Canadian camp and was eventually recruited to Queen's University in Kingston, where his life changed.

Famous chemist turns art collector



FAMED CHEMIST: World renowned chemist and art collector Dr. Alfred Bader is making a brief stop at the Chemical Institute of Canada conference, held at the University of Guelph this week. Accompanied by wife Isabel, Bader was the keynote speaker at the annual conference of the Chemical Institute of Canada conference, held at the University of Guelph.

I was so wonderfully well-treated at Queen's," he smiles. "It was the first time in my life I was treated as a real human being."

This kindness bestowed upon him during his school years has been returned many times over — the university has become the primary source of Bader's income.

Last year he donated approximately \$14-million to Queen's for the purchase of a resle in England and has also donated \$2-million for the enhancement of the university's art department so it will eventually be able to accept the couple's massive collection of fine paintings, in addition a number of Rembrandts.

While attending Queen's, Bader worked during the summer for the Purdy Plant Company in Mantoloking, New Jersey. On graduation he accepted a full-time job formulating paint.

His research had taught him

some little-known tricks at the trade and Murphy's clients appreciated it.

Sales went straight up and the salesman, being on commission loved me," Bader said. "They were always arguing over who would take Bader the next day."

So he was obviously surprised when Murphy president Harry Thorpe asked him to leave the company to obtain a PhD at Harvard and then return Thorpe paid \$1,600 for Bader's education.

By the time he finished Harvard though, Murphy had been bought by Pittsburgh Plate Glass Company and Bader went to PPG's paint research facility in Milwaukee, where he has lived ever since.

He stayed with PPG for four years and at one point they sold one of the patents for \$1 million so I left my commitment was repaid.

White still working for PPG

Bader and an attorney friend founded Alkerm Chemical for \$250 each in 1951. They flipped a coin to see who would name the new company and his friend won, naming it for his fiancée, Betty Aldrich.

Bader spent 40 years building the company's reputation and saw it grow from \$1,700 in sales the first year to more than \$800 million this year. Despite having founded the company, Bader was thrown off the board of directors in 1981 amid

trumpet-up charges," he under-

mined the integrity of the company by selling up shares in the company at the attack on his credibility. Bader says now his expansion had "a silver lining." Specifically, it enabled him to sell more shares in the company to fund various endeavours to the cause. With more than three million shares, Bader is still the company's largest shareholder.

Column clarification

Just to clear up an error in the editing process, questions marked in a fat red column by T. Sher Shih on 3 Sunday's Perspective page, the latter punctuation made it appear I thought some of the passages were direct quotes from provincial PC leader Mike Harris when, in fact, they were not. He was not the author's.

Election candidates on radio phone-in show

Guelph's candidates for the MPP will take to the radio waves Wednesday night.

The politicians will be hosted by Noel Clements, CJOY, along with other media types including The X-100's own John Stead during a phone-in show on CJOY at 10 p.m. Wednesday.

After the hour-long media session, the community will get a chance to talk to the candidates in the second hour of the show.

The phone line will be thrown open to allow the public to pose questions of the candidates.

Incumbent NDP MPP Derek Fletcher will be joined by Liberal MPP Rick Ferraro, Progressive Conservative Brenda Elliott, Family Coalition Party member John Gots and Labour Party member Bill Hammel available to the phone-in.

The phone number for the open line show is 1-229-8211 (CJOY).

OPINION

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EDITORIAL/The economy

The power of life and death

As the principal sector of interest rates and other strange pieces of Canada's monetary policy puzzle, the Bank of Canada has taken a fair amount of heat over the years. Yet no criticism is more damaging, nor can much be more eloquent, than that levelled last week by John McCallum, the chief economist of the country's largest commercial bank, the Royal Bank. In essence, McCallum blames Bank of Canada decision-makers for bad government for a decline in Canadian living standards in each of the past five years. Furthermore, he suggests, any improvement in overall living standards in Canada over the next two years will be paltry, and will be at least partially offset by higher taxes or lower government transfers to people. This sad reality, he says, is also mainly the central bank's doing. It not only helped set off the 1994 recession by overdoing its high interest rate policy, but it has added to that damage ever since, robbing people of jobs and the steadily improving standard of living they should have enjoyed. What to do? Fine the lot of them?

On possible reforms to the system, McCallum has nothing more radical to say than the central bank's tight monetary policy was wrong. Such sparsity of suggestive material may be okay, coming from a banker. But it does mean that nothing much is likely to change very soon. And without some constructive change, there will be nothing, but nothing, to prevent Bank of Canada officials from making the same disastrous mistakes again and again, and foisting them off again on someone's wisdom.

Without some such suggestions as to where we go from here, McCallum seems to imply that the unelected governor of the Bank of Canada should continue to wield the same powers of life and death over the Canadian economy as he does now, only without making any more little loans.

A clarification

The description of hired thugs made in Saturday's editorial was misinterpreted by some of our readers as derogatory. A sentence within the editorial referring to gangsters was not intended to refer also to people of a particular nationality or race nor to any known individuals.

OTTAWA DIGEST/

What really happens on Parliament Hill

OTTAWA (TNS) — Taxpayers could be spending as much as \$2 million for their senators to stop the electronic highway. The Senate decided recently to upgrade its slow computer system so it can access the Internet and the Commons' internal network. Pulaski

But upgrading the computers could cost taxpayers as much as \$2 million, said a senator reviewing the project.

As of today, we are moving to go online with them (MPS), Alberta Senator Earl Hastings told the upper chamber.

I should warn honorable senators that this will mean a considerable expense for the Senate in 1995-96.

At the very least, the upgrade will require re-writing in Senate offices' expert computers and new software said Timothy Wilson, a Senate clerk involved in studying the changes.

He estimated the project will cost closer to \$200,000. The Senate doesn't know until a full study of the changes has been commissioned.

The study will likely take place over the summer months and will be presented to the Senate in the fall, the clerk said.

Although nothing has been decided, Wilson said the new system could eventually save the Senate money by reducing the number of committee transcripts printed.

We pay big bucks to print 500 pages of every committee transcript, he said.

He estimated the Senate could reach 10 million people by going on the Internet, and it wouldn't cost anything to access the information. Some steps Liberal MPs almost allowed the Reform party to make



Klein comes down with the health-cut blues

By JULIA NECHIFF
THE CANADIAN PRESS
EDMONTON — A steady-eyed Ralph Klein said he wouldn't be over his health-care cuts when he marked on a drive in 1994 to 288 miles of Alberta's coastline. But Klein, midway through his term, is now looking to the next election and his Tories can't escape the anger that is beginning to surface, says Rich Vivone, who publishes a newsletter on Alberta politics.

They are finding out there's widespread unhappiness with health care changes. It's been built into the last 18 months. Last week, more than 800 angry people attended a meeting in Evansburg, about 100 kilometres east of Edmonton, to protest acute-care bed closures in three area hospitals.

Another rural hospital closures in small, Tory-voting towns such as Galahad — where an 18-month-old \$3 million hospital was shut this month — have stunned residents.

The government plans to slash about \$760 million from health by the end of '97.

It restructured the system by sorting up 17 regional health authorities and changed them with the task of implementing the cuts.

Hospitals have been slated for closure or downgraded around the province. Thousands of health workers have lost their jobs or are waiting for the axe to fall.

Klein acknowledged people's worries about health care during a televised address in January. He said many Albertans all was well.

But despite the vote, the premier urged them to stay the course with him.

But after the Evansburg meeting, the decision of the regional health authority was changed and at least one of the facilities — the Seton Hospital in the mountain resort town of Jasper — was preserved.

But despite the vote, the Conservative party whip, openly lobbied the government-appointed health authority to save the hospital in his own riding. Until then, government members hadn't protested cuts in their constituencies.

Klein admitted Thursday that some in his caucus will no longer remain silent.

There was a notion that perhaps the BHA (regional health authority) would be absolutely free of political interference.

WHAT CANADA THINKS

In a letter to the monthly Anglican Journal, K. Teddy Smith of Kitchener urges alternatives to long jail terms: Many people have been hurt or killed in a crime and some voices urge longer sentences to get tough. Here is the other side of the coin. For every man sentenced to a jail term there is often a wife, three or four children.

We break up a family, and a wife usually must go on welfare. Children grow up without a father. All the sentence it is often difficult for the man to find employment. The jail term and support of the family has cost the country and its taxpayers much more.

To maintain our prison services in overcrowded jails costs close to \$1 billion. And the end result is often a group of dysfunctional men, not to speak about damaged children and lonely wives.

Quebec Premier Jacques Parizeau's switch in his political approach should fool no one, says an editorial in the weekly Tribune of Campbellton, N.B. Can it really be true? Jacques Parizeau, the renowned separatist of Quebec, has been converted to the Lucien Bouchard school of sovereignty association.

Yet reports indicate Parizeau is now convinced that some sort of economic and political association with Canada is the best option for Quebec.

No one is being fooled. If Parizeau is now singing the praises of a confederal union, it's only because he cannot split separation to the reasonable people of Quebec.

From What Canada Thinks, a regular feature of The Canadian Press.

The Opposition Liberals haven't urged the government over health care almost daily during the session. Several times they raised cases of people waiting for surgery or receiving inadequate care.

Klein accused them of fear mongering and seeking publicity for "victim of the worst" stories.

Liberal Leader Grant Mitchell says it's become clear health cuts in the Tories' power base of rural Alberta are causing the government crisis.

"I think the wheels are falling off," he said.

From What Canada Thinks, a regular feature of The Canadian Press.

Queen's Park Gil Hardy

Unions finally see Bill 40 threat

TORONTO — Suddenly, four years' worth of election, Ontario's common public-sector unions have discovered their future may be threatened by a Liberal or Conservative government.

It happens every time the province's public sector unions, know that Liberal Leader Jim McGee and Tory Leader Mike Harris have vowed to get labor-law reforms put in place by the NDP.

Both leaders have been saying so for quite some time but until last week this has not been apparent to said Ryan.

Ryan, president of the Ontario and the Canadian Union of Public Employees, says he has a start on that job with new-old results. He immediately began ranting about labor unrest at either the GPs or Tories, though what he meant was the NDP.

That's the legislation that bans replacements workers during strikes, among other things. When the law was passed, there were 200,000 public-sector jobs at risk. The legislation has had a discernible impact on investment in this province. Just look at the billions of dollars the auto industry has pumped into Ontario in the last few years.

But in their showmanship, the NDP's proposed changes would put in place the Liberal and Tories have vowed to get rid of most of the legislation.

St. Ryan was warning that there'd be a long

REGION

News Editor: Bonnie Ewin in Pk. Phone 822-4310, Ext. 262

Ontario Election '95

Candidates comment on education

We asked: What are main platform planks on education issues?



DON ROSS LIBERAL

As a trustee on the Wellington County Board of Education for six years, and the chairman of the board from 1981-84, I had the opportunity to observe the education system closely. Furthermore, I am convinced that the Liberal platform on education with its emphasis on equity and excellence is responsible, do-able and will result in an improved educational system for Ontario.

The Liberal Party is committed to creating an educational system with high standards of achievement, at a reasonable cost, and with zero tolerance for school violence. Our platform for action is to get within 30 days of taking office, the Liberals will expand apprenticeship and co-operative education programs, and will end the NDP's failed JobsOntario training program in favor of training programs which really work.

Within 90 days of taking office, the Liberals will proceed with the establishment of local school councils made up of volunteer parents, student teachers, and community representatives. We will also establish a volunteer council for international and global studies to increase opportunities for Ontario students to study overseas, and link students with businesses needing workers with skills in other languages.

Within one year of taking office, the Liberal party will develop a core education program for Ontario students, with clearly defined goals and standards. We will encourage boards to reduce costs by sharing services with other boards and public sector institutions. We will strengthen teacher education through new initiatives such as in-ternship, two-year training programs, graduate programs, and co-operative programs with school boards.

We know that colleges and universities must be accessible and affordable. We will ensure that students are not forced to shoulder a disproportionately greater financial burden for their tuition. We will also develop a new students assistance program, and will examine the feasibility of several options for student assistance, including an income-contingent loan repayment program. We will create program links between colleges and universities, and will increase the number of post-secondary courses offered during summer evenings etc.

The Liberals want an educational system from JK to post-secondary which is excellent, open, accountable, service-oriented and responsive to community needs.

To buffer these cutbacks so that quality education does not suffer because we all benefit from higher education. Cost should not stop any child from achieving the highest level of education possible. We will have to restructure and reduce it. We will ask students and educators to make priorities and the NDP will work hard to obtain a reasonable balance between budget cutbacks and quality education.

By Valerie Hill
The Guelph Mercury
ELORA — Don Ross is willing, even anxious, to give up the farm. The Liberal candidate for Wellington says he has considered temporarily turning his \$60-acre dairy, beef and cash crop operation over to someone else if elected as MPP in the upcoming provincial election.

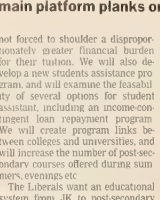
"We would have to make some far-reaching decisions about what would happen to the farm," he admits. "I hope I picked up the skills there at the board that I can take to the provincial level."

Ross sports were frame glasses wears tidy tweeds and has a long lean, Preston Manning look about him. He seems more an accountant than a farmer. Yet his dedication to the land becomes obvious when he talks about his family's long history in the county.

"My dad lives in the same house I was born in," he says. The elder Ross resides in the family home spread across the road from the son, who farms both properties.

Ross is quiet and not given to spouting off about his party's political success. "It's been tried before and it didn't seem to work," he says.

"We have a live per cent tax cut planned, aimed at businesses. It's aimed to choose what programs it needs," he says. "Junior Kinder



TED ARNOTT CONSERVATIVE

As Wellington's Member of Provincial Parliament, I have always maintained that education is one of the most important services of government delivery.

We in Ontario must strive towards having the very best education system in the world. If we can accomplish this goal, when our children are grown they will be able to compete and win in the global marketplace.

In discussing the need for higher education, we must show us, the students' first.

Parents in Wellington tell me they want more accountability, objective yardsticks to demonstrate school performance, and lower administration costs.

We must respond to these expectations, while exempting our classrooms from spending reductions that means more standard tests, report cards, parents can understand and funding ways to fairly eliminate unnecessary administration.

Our teachers in Wellington are excellent. We need to support them and build on this strength in classrooms. Therefore we need to reduce the number of school boards and cut trustee salaries. Currently Toronto has 10 school boards and trustees earn \$40,000. In 1984, the NDP government brought in legislation to reduce the number of trustees by five per cent, saving \$18 million.

Federal cutbacks will reduce university funding. We will have to attempt

to accommodate marijuana plants and

Police believe the holes were dug to accommodate marijuana plants and

Anyone finding a similar situation on their property should contact the OPP at 1-800-265-2525

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Election profile: Don Ross-Liberal



FARMER DON: Wellington Liberal MPP candidate Ross is trying to unseat incumbent Ross in his campaign office. Ross is trying to unseat incumbent Ross in his campaign office.

Ross indicates studies have shown that students who attended Junior Kindergarten are no further advanced by the time they reach Grade 9 than those who did not.

He believes communities, if allowed to develop their own programs, could "make the programs more individual."

The Liberals, he says, also have plans to cut welfare payments "for able-bodied" recipients. Those who are collecting benefits will be encouraged to do job training, finish their education, volunteer in community organizations and take part-time jobs. If nothing else is available, all these activities help workers gain valuable work experience skills and contacts which could lead to full-time work, he says.

Ross criticizes the Tory plan to cut personal income tax by 30 per cent, thereby stimulating consumers to buy more products. "It's been tried before and it didn't seem to work," he says.

"We have a live per cent tax cut planned, aimed at businesses. It's aimed to choose what programs it needs," he says. "Junior Kinder

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Be wary of small pot holes

Be wary of small holes on your property, warn the Guelph OPP. It could be an indication marijuana growers have targeted your land.

OPP report a property owner on Corn. E. Erie Township found 200 holes, six inches in diameter and covered with earth and fertilizer in his field.

Police believe the holes were dug to accommodate marijuana plants and

Anyone finding a similar situation on their property should contact the OPP at 1-800-265-2525

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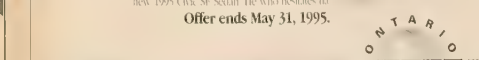
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NEWSLINE

Money motive for murder

WINNIPEG (CP) — Murder for profit — namely \$600,000 in life insurance benefits — is the reason Mohamed Khan killed his sister and his wife, says the prosecution in the double-murder trial.

It was murder by design, Crown prosecutor George Dufferin told a jury Monday in his opening remarks on the first day of the trial.

The plan was a simple one — to insure the victim of a sum of money higher than normal and shortly after to put her to death.

Khan, 40, is charged with killing his 23-year-old wife, Sureta, for her two insurance policies worth \$300,000 and his 27-year-old sister Bibi, for her two policies worth \$250,000.

He has pleaded not guilty to both counts of first-degree murder.

The Crown says Khan later received 55 per cent of his sister's life insurance benefits, but made no attempt to collect on those of his wife.

No charges in scalding

TORONTO (CP) — Charges won't be laid in the death of a disabled girl who was found badly scalded in her suburban home last December.

But police said a coroner's inquest will be held into the death of Audrey Cohen, 8, it was determined that Cohen drowned in a bathtub.

Her parents have complained police treated them as criminals during the investigation.

No date has been set for the inquest.

Firm shocked by WCB bill

PETERBOROUGH (CP) — A mix-up at the Workers' Compensation Board may force a local company out of business, its owner says.

Canac Kitchen Design Studios was recently billed \$36,511 for compensation premiums — \$16,500 more than owner Gord Fisher expected.

The WCB discovered Canac employee — and been wrongfully classified for two years through no fault of the company. Fisher's premiums — have been increased about 50 per cent — and the WCB has billed him retroactively to Jan. 1.

Judge rapped for deadline

TORONTO (CP) — The Ontario Court of Appeal has ruled that a Pembroke judge should not have even the six-month deadline in a case a deadline, and overturned the conviction in the case.

In a written decision released Monday, the appeal court called the judge's deadline for the jury's deliberations "coercive."

It said that and other comments by the judge so flawed the case that the verdict against Dave Branch could not stand.

Justice Martin J. Gauthier, who wasn't named in the decision but was identified in other court documents, concluded a jury wasn't deliberating quickly enough.

Five hours after they started he called them back into the courtroom and told them they could take 15 minutes.

Inmates beat towing owner

ST. CATHARINES (CP) — A man whose car was towed by a police officer after he was arrested in a bar fight, says the car was damaged by inmates in a prison parking lot.

The man, who is a member of the Ontario Police Association, says he was arrested in a bar fight in St. Catharines on Monday night.

He says the car was towed to a police station and then to a prison parking lot.

He says the car was damaged by inmates in the parking lot.

He says he was told by a police officer that the car was damaged by inmates.

He says he was told by a police officer that the car was damaged by inmates.

Son jailed in dad's death

ST. CATHARINES (CP) — A man whose son was charged with the murder of his father, says the son was sentenced to a year in prison.

The man, who is a member of the Ontario Police Association, says his son was charged with the murder of his father in St. Catharines on Monday night.

He says his son was sentenced to a year in prison.

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He says his son was sentenced to a year in prison.



PROTEST: Metro-unionor Jack Layton joins in a protest with shoppers at Queens Park Monday. The shoppers want Ontario to ban shopping in bars, a practice they say is putting their health and lives at risk.

Dumps harm health

TORONTO (CP) — A new study says children living near a nearby Pickering landfill site have an unusually high number of health problems.

The report was prepared for a local citizens group by Dr. Rosalee Bevilacqua, who helped expose the danger concealed beneath the Love Canal community in Niagara Falls, N.Y.

Bevilacqua spent more than a year in reviewing and examining 400 children from 200 families.

She found the incidence of health problems, including asthma and eczema, increased "significantly" in those living close to the Brock West landfill site.

Brian Gallaugher, a consultant for the Pickering-Ajax Citizens Together group that commissioned the study, said the report doesn't blame the dump for the health problems.

"It simply states that the closer you live, the higher the incidence. Some people might draw an inference, but the report doesn't assign blame," Gallaugher also said the report had "statistical significance" because of the large number of children interviewed.

The PACT group has lobbied for years to have the landfill site closed.

Tories under attack

While Conservative leader Mike Harris tries to build up his standing in the Ontario election campaign, his Liberal and NDP opponents are tunnelling away at the foundations.

NDP Premier Bob Rae and Liberal Leader Lyn McLeod, reacting to recent polls suggesting Harris' popularity is rising, have been attacking his credibility.

"Hidden in Mr. Harris and I see a mean-spirited, thoughtless attack on people on institutions, on values that have for generations kept this province together," Rae says in speeches that have taken on an increasingly strident tone.

Liberal Leader Lyn McLeod's campaign strategy clearly is now to contrast her policies as gentler and kinder than Harris' platform of welfare reform, deep tax cuts and a crackdown on crime.

During a visit to the University of Toronto campus, McLeod warns students would pay more under tax cuts being promised by the Tories. She says a Liberal government would keep tuition fee increases at or below the rate of inflation.

Under the Conservatives, the door of this university could well have a sign on it that says: "Only the wealthy need apply," she says.

Harris is brushing off the mounting offensive, accusing his opponents of desperation and fear-mongering.

But McLeod says the Tories, who opinion polls have succeeded were rising to challenge the Liberals going into the final weeks of the campaign, must now face greater scrutiny from media and voters, especially over their promises to slash government spending.

She believes that the Conservatives in the next 10 days have to get to show some important questions

ONTARIO ELECTION '95

about the impact of these spending cuts on people," she says.

The New Democrats are shifting their focus from defending Rae's record in government to attacking their opponents, airing two new radio and TV ads comparing life in Ontario under an NDP government with life under Tory or Liberal rule.

"The campaign has changed, says party spokeswoman Rosemarie Bahr. "The Tories have increased their standing. They're first. The Liberals are going down very quickly."

Harris said his opponents are getting desperate in the last 10 days of the campaign.

"Realizing their own campaigns are in difficulty they're dreaming up all this stuff, making it up," he said after being interviewed on the super-hour newscast of a Toronto TV station.

Chocolate bar battle breaks out

TORONTO (CP) — It's a sign of how nasty things are getting in the run up to the June 8 Ontario election — they're fighting over chocolate bars.

The Liberal and Conservative camps are snapping back and forth over an alleged remark by Tory leader Mike Harris.

In a news release Monday, the Liberals said Harris told a high school student who asked him about tuition: "You'll have to end up selling more chocolate bars to pay for some of those things on your own."

Local Conservative candidate Margaret Marland fired back a statement entitled A Fib Too Far to it, she said Harris was approached by a student at Toronto's Woburn Collegiate, who explained he was selling chocolate bars as part of a student program to buy musical instruments.

Harris encouraged him in his efforts and didn't say a word about tuition, Marland said.

Liberal Leader Lyn McLeod said she stood by the release.

Advance polls open Thursday

TORONTO (CP) — Qualified voters who can't make a date with the ballot box on election day will have the opportunity to mark their choice beforehand.

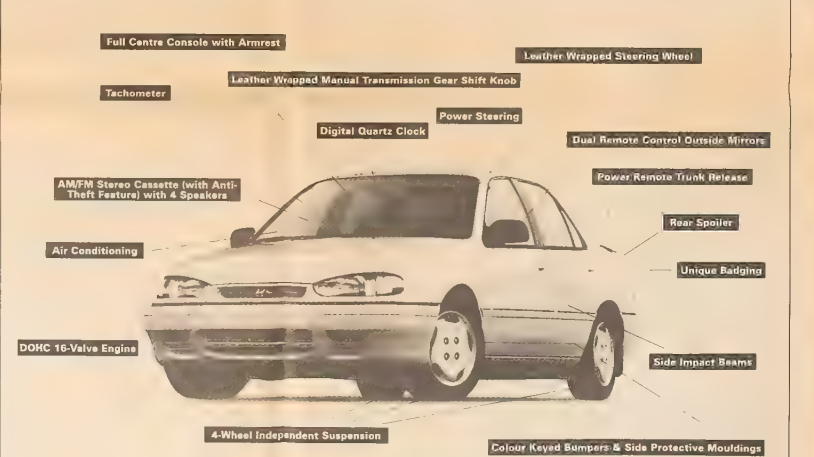
Advance polls will be held Thursday, Saturday and Monday on June 1, June 3 and June 4.

Hours for voting at these advance polls are 11 a.m. to 8 p.m.

Voting in the returning officer's office is also permitted until June 6 between 11 a.m. and 8 p.m. except for Sunday.

Locations for advance polls will be advertised in daily and weekly newspapers. The ads will include telephone numbers to call in each area.

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POWER STRUGGLES

Downfall of the founder

John Emsley on a classic source book for students of corporate history

How does the chief executive officer of a company execute the removal of the man who founded it and is its president? Boardroom power struggles make exciting episodes in novels and films, but in real life little detail emerges except the result. The victor cannot be seen to crow, nor the victim to cower, and so neither is likely to write a personal account of the battle.

How remarkable then to read, in *Adventures of a Chemist Collector*, an inside report by one of the participants, and all the more remarkable because it is the loser who is telling the tale.

The CEO was Tom Cori, who is now head of Sigma-Aldrich, the world's largest supplier of chemicals. The president was Alfred Bader, the man who started the firm in 1951 in a garage in Milwaukee. The first year's turnover was a mere \$1,705; today it exceeds \$1bn, with branches throughout the world. On Wednesday November 20 1991, Bader, a big shareholder with stock worth around \$200m, was confronted by Cori in the

Russell Hotel, London. He left the hotel stripped of his presidential post.

The sacking of Bader caused a sensation in the world of chemistry and the chemicals industry. Nobel prizewinning friends wrote to leading journals, expressing their support for him, but to no avail. In the end the goodwill he generated as the company's roving ambassador was simply written off, the donations he made to universities from his private wealth counted for nothing.

As Bader tells it, his downfall came as a result of an innocent mistake. He had wanted to give his old university, Queen's in Ontario, Canada, 10,000 shares (out of his holding of 3m). Immediate sale in 1991 would have raised \$430,000 but the planned donation was to be made early in 1992, and Bader was told that he could safeguard the value of his gift, and even add to it, by selling options on the shares.

So he did - and got an extra \$2.58 per share. He need not have bothered, because by the time the options expired the shares were worth \$52 anyway. (Bader made up the difference to Queen's with an extra donation.)

Sadly, Bader was unaware of a new rule of the SEC which brought options trading under the same regulations as insider trading, requiring them immediately to be registered. When he

discovered he had contravened the ruling, Bader registered his options, but he was technically a couple of months too late, though still several months before the options were due to expire.

Bader thought no more about it, but a whispering campaign had begun at Sigma-Aldrich that its president was secretly, and illegally, betting against the company. The board members gave the CEO their authority to confront the grand old man and ask him to resign. Cori rang Bader, and asked to meet him in London two days lat-

Adventures of a Chemist Collector

By Alfred Bader
Weidenfeld & Nicolson,
£14.99, 288 pages

er... the rest you can read in Chapter 13.

The Bader affair, however, is only one part of *Adventures of a Chemist Collector*, which recounts a remarkable story of a life full of drama. Bader was born in Vienna in 1924, the son of a Jewish father, who was murdered soon after his son was born, and a Catholic mother, who was disowned by her aristocratic family because of her runaway marriage. When the Nazis took over Austria in 1938, Bader was among a consignment of 10,000 Jewish children who were allowed to emigrate to Britain.

In 1940, after the defeat at

Dunkirk, the British government rounded up everyone above the age of 16 who had come from Nazi-occupied Europe and who might be spies. Bader was shipped off to Canada. There he continued his studies, and after much pleading finally got into Queen's.

That act of kindness on the university's part was never forgotten and over the years he has given it millions of dollars and a castle - Herstmonceux in Sussex - which is now its European campus. He plans also to give Queen's his collection of Dutch old masters.

Much of *Adventures of a Chemist Collector* is devoted to Bader's struggle to build up his fledgling company through takeovers and mergers, and in this respect it will become a classic source book for those studying corporate history. But it is not a textbook, despite the mass of business detail in its pages. It is an account of a life packed with drama, telling of the interwoven lives of Bader the art-collector, Bader the romantic, Bader the family man, and Bader the scientist. This is the tapestry of a rich and varied life, and all the more surprising is the remarkable clarity and style with which Bader the writer weaves his remarkable tale.

John Emsley is science writer-in-residence at Imperial College, London, and winner of the 1995 Rhône Poulenc Science Book Prize for The Consumer's Good Chemical Guide.

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Lavish donations put art lover Bader on map

Millionaire philanthropist, in town for two lectures, has never forgotten his wartime benefactors

Alfred Bader knows all about better living through chemistry. Once a penniless refugee, Bader became the founder of the Aldrich Chemical Company, a multi-millionaire, and an art collector.

The American philanthropist is in Edmonton to deliver a talk on art restoration tonight at the Edmonton Art Gallery, and a lecture Tuesday night on art history at King's University College.

Most recently, Bader gained notoriety for his lavish donations to his alma mater, Queen's University in Kingston, Ontario. Bader gave the school some 120 Dutch old master paintings, as well as the money to purchase an English castle, Hermonceux Castle, near London, England, has the distinction of being the former Royal Greenwich Observatory. It sits on 530 acres of land and has about 140 rooms. Bader says all but one of the observatory's telescopes are still there.

In 1992, Bader provided Queen's with the funds for the castle, negotiated the sale on their behalf, and gave them "a couple of million English pounds" to refurbish it. The university uses it as an international study centre.

Bader spoke to the *Journal* from

Vancouver, where he was lecturing and touring in support of his new autobiography, *The Adventures of a Chemist Collector*. The book will be published in Canada by Little Brown.

The 70-year-old casually mentioned that he bought a "beautiful Italian still-life painting at 3 a.m. Saturday morning. Three in the morning happened to be noon in London, England, and there was a sale."

Bader added that selling or buying old master paintings in Milwaukee, Wis., where he makes his home is "pretty impossible."

Life wasn't always so grand for Bader. As a young boy the Vienna-born Bader fled Austria in 1938 following Kristallnacht, the night of Nazi violence and a prelude to the horrors to come.

He lived as a refugee in England, supported by a woman who paid his rent of one pound, one shilling.

In 1940, English authorities rounded up Bader as part of a crackdown on German and Austrian refugees during the Second World War.

Canada agreed to hold the "prisoners-of-war," so Bader was shipped to Fort Lennox near Sherbrooke, Quebec.

He remained there until 1941, at which



Charles Mandel

Visual Arts

point a benefactor in Montreal took him in and sponsored him for school.

Bader's first choice was McGill University; however, at that time they had a quota system for Jews and Bader's application was turned down. The University of Toronto also refused Bader entrance.

But Queen's University accepted him. "For the first time in my life I was treated as an equal," says Bader. He graduated from Queen's in 1945 with a Bachelor of Science degree in engineering chemistry.

For the next couple of summers, Bader worked for Montreal's Murphy Paint Company. He helped the company's sales to the point where the president gave

him the tuition to pursue his Ph.D.

When Bader graduated from Harvard University two years later, the Murphy Paint Company had been sold to the Pittsburgh Plate Glass Company. They based all their paint research in Milwaukee, where Bader settled.

Bader wanted to concentrate on pure research, something his job at Pittsburgh Plate Glass didn't allow. He began to research chemical processes on his own on weekends and started a company with his friend Jack Eisendrath.

Unable to decide on a name, the two men held a coin toss. Eisendrath won and named the company after his fiancée, Betty Aldrich. Bader says they formed the company in 1951 with \$300.

"The first year we sold \$1,705 worth of chemicals. We paid no salaries and we had a profit of \$20," recalls Bader. Today the company is worth over \$800 million.

Bader is still the company's largest individual shareholder, but is no longer involved with its operation. Ironically, Bader's devotion to his old school caused the rift with the company he formed.

Bader wanted to mark the 50th anniversary of his arrival at Queen's with a major gift to the school. In 1991, he sold an option of 10,000 shares of the 3.6

"The first year we sold \$1,705 worth of chemicals. We paid no salaries ... had a profit of \$20."

— philanthropist Alfred Bader

million he owned of Aldrich stock. In a two-month period, the stock rose in value from \$41 to \$47 a share.

Tom Cori, the son of two Nobel prize laureates and Sigma-Aldrich's CEO (the merger with the Sigma Chemical Company took place in 1975), said the sale amounted to betting against the company. He called on Bader to resign as the company's chairman emeritus. Bader retired in 1992.

Since then Bader has devoted himself to art and to philanthropy. He opened Alfred Bader Fine Arts in Milwaukee, bought himself paintings by Rembrandt and Rubens, and purchased his old school a castle.

Bader's talks are part of the Canadian Society for Chemistry 75th Conference Lecture Series. Bader's lecture tonight at the Edmonton Art Gallery (2 Sir Winston Churchill Square) starts at 8 pm. His lecture Tuesday night at King's University College (9125-50 St.) begins at 7:30 p.m.



farm these out to other producers whenever it was more economical to do so. No company could afford to build production facilities that would ensure adequate supplies of the thousands of rare, sparingly used chemicals.

The Art of the Deal

Bader, the owner-manager, personally visited laboratories throughout the world to locate reliable sources of the specialty chemicals that were the backbone of his product line. He selected the chemists who staffed the company's laboratories and kept close contact with all the employees in the office and those who handled the shipping and receiving.

To ensure product quality, to develop new products, and to continue the dialogue with his research customers, he created an organization in which leading scientists played a key role. By 1965 there were 125 people in the organization, of whom 34 were graduate chemists with no fewer than 9 holding Ph.D. degrees in chemistry. There were an equal number of office employees, and the rest of the staff were directly involved in the shipping and receiving of orders and plant maintenance.

All but nine employees were located in Milwaukee.

For all intents and purposes, the Aldrich strategy was neither to discover nor to produce new specialty chemicals, although it did both. Its strategy was much simpler: to purchase and distribute specialty and rare chemicals to people who needed them. The success of the company depended on its ability to strike a deal that satisfied both its customers and its suppliers.

The Success of Aldrich

By 1965, a decade from the time Bader decided to devote himself full time to his specialty chemical company, revenues had increased from \$54,000 to over \$2,000,000. Profits were increasing rapidly as well, reaching almost \$200,000 in 1965, and profit margins were some 20% before taxes. But the company was just in the lift-off stage. By 1970, sales had tripled to almost \$6,000,000, and profits (before taxes) increased almost fourfold to

\$843,495. And it continued; by 1974 (the last year before the merger), sales had almost doubled again to over \$11,000,000, and profits had more than doubled to almost \$3,000,000.

The Bader Board of the 1960s

The Board of Directors which oversaw this evolution was relatively small and made up mainly of insiders. Between 1961 and 1974, 11 directors served on Aldrich's board at one time or another. The only two who served throughout the period were Alfred Bader and Marvin Klitsner. The

other insiders through 1967 were: Helen Bader, Alfred's first wife, who was also the company's Treasurer, John Biel, a medicinal chemist, VP and Director of Research, and William Buth, also a chemist, VP and Director of Operations. Ironically, it was the other inside Directors who outvoted Bader, the "art collector," to put the "old master paintings" on the cover of the company's catalog. The paintings, all of which came from Bader's personal collection, soon became an Aldrich hallmark.

Bader did bring in more outsiders to serve on the Board, but they

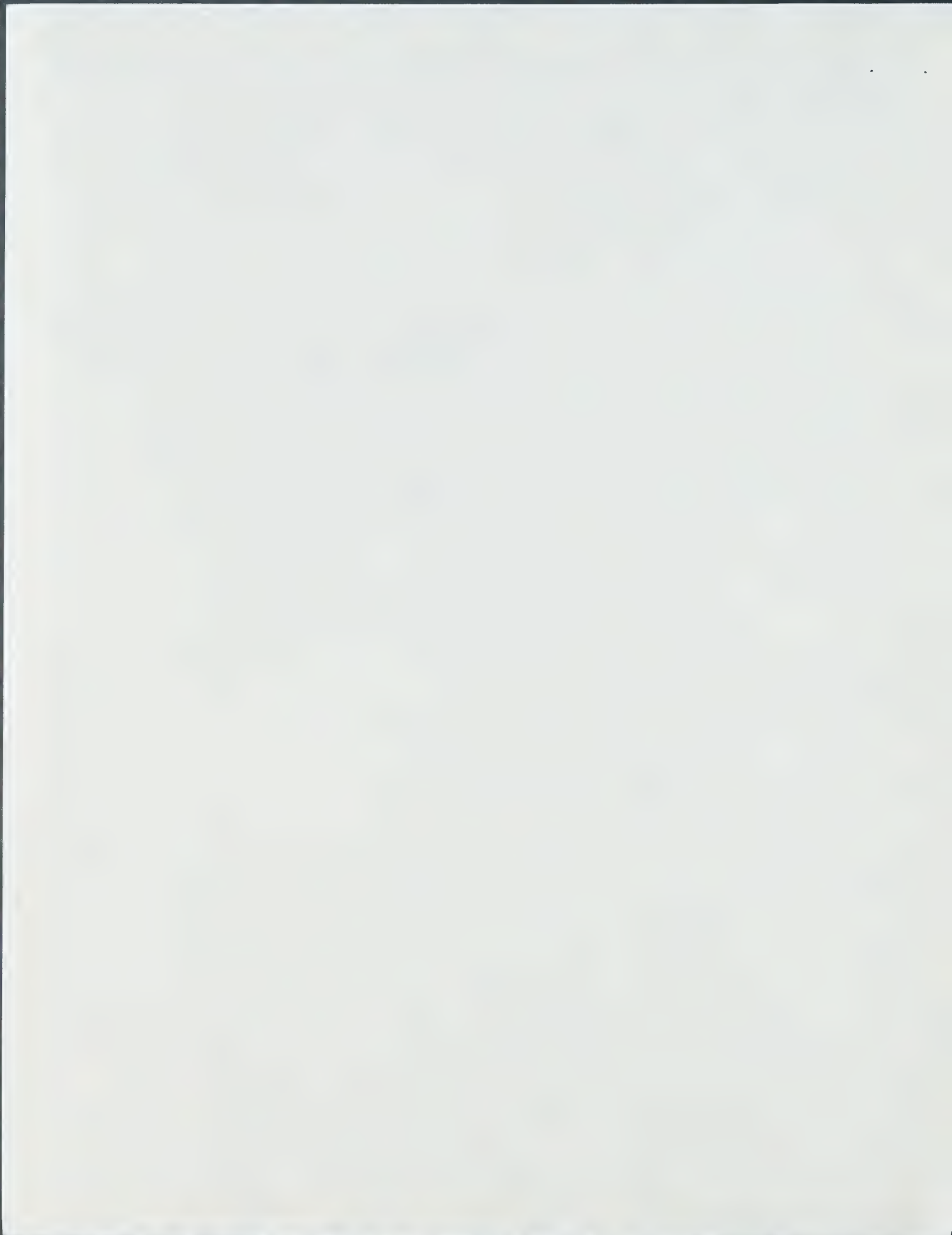
were all knowledgeable about the company and/or the industry. For example, one of the last appointments before the merger was Dr. H.C. Brown of Purdue, who had developed a process that permitted the production of hundreds of compounds by hydroboration. Aldrich bought exclusive right to Brown's patents and set up a wholly owned subsidiary (Aldrich-Boranes Inc.) to produce the products.

The Merger

By the early seventies, Bader began to see the advantages of a still bigger operation, especially from the financial market's perspective. Taking the company public in 1965 had not generated the interest among the investing community that he had hoped for. Another way of expanding could be through a merger. One company that had caught his eye was Sigma-International, almost a clone of Aldrich except that its field was



Aldrich Chemical Company, Inc.



Three Boards and "A Bet Against the Company"

P. BRUCE BUCHAN

The Russell Hotel, located in the Bloomsbury district of London, was an attractive but unusual location for the three businessmen, two from Milwaukee and one from St. Louis, to hold a meeting on Wednesday, November 20, 1991. They were the three most senior officers of the Sigma-Aldrich Company and one, the eldest, was about to be terminated—not in the Mafia sense but in the corporate sense. Dr. Alfred Bader was the only one of the three who did

not know the real purpose of the meeting. The other two, Dr. Tom Cori, Chairman, President, and CEO, and Dr. David Harvey, Chief Operating Officer, knew, but they also knew that it wasn't going to be a pleasant task. Was there some solace from knowing that they were simply carrying out the wishes of the Board?

The previous Friday, November 15, Dr. Cori had phoned Dr. Bader, who was visiting the chemistry department of his alma mater, Queen's University. When the call arrived, Bader had just delivered a lecture on "Challenges at Sigma-Aldrich," which was a personal history of



Aldrich Chemical Company, Inc.

ANNUAL REPORT

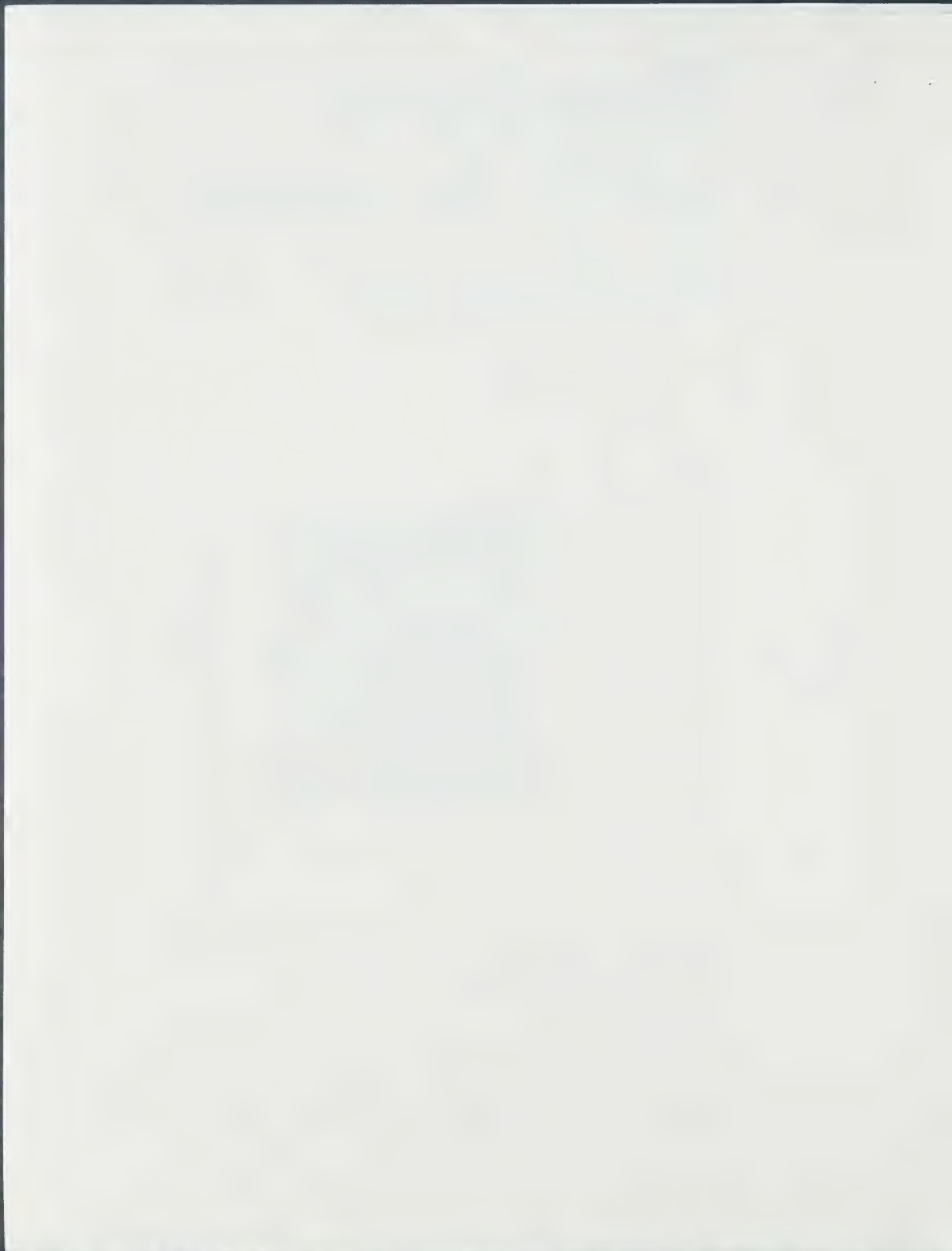
the company he had helped to found. Although his voice was quiet, each phrase painted a vivid picture of the challenges, the setbacks, the victories. There was still a trace of a German accent. The structure of his talk reflected the precise, orderly mind of the scientist, but the content also reflected a literate mind that admired the power of the English language to captivate and excite. As an undergraduate, he had been impressed by the animated prose of Thomas Babington Macaulay, the nine-

teenth-century English historian and essayist. Despite having been in Canada for only a few years, despite his German accent, he won the Dominion of Canada university debating championship.

As he reviewed the early years of the company, he amused his audience with the story of the very large chemical company (Kodak) which announced that it no longer wanted to be bothered directly with small orders for specialty chemicals. This declaration had inspired him to take an ad in the chemical journals inviting his customers to "please bother us."

P. Bruce Buchan,
School of Business,
Queen's University at Kingston,
Kingston, Ontario K7L 4V1,
Canada

Three samples of the
cover illustrations of the
Aldrich Annual Reports,
pages 24-27.



Bader delivered a second lecture that morning in the art history department, "Adventures of a Chemist Collector." In the evening, he gave yet a third lecture on Jan Lievens, a Dutch painter of the "grand epic manner." His final lecture on "The Bible through Dutch Eyes" was scheduled for Saturday afternoon in the art center. The diversity of the subject matter of these lectures captured the essence of the interests and the career of the 67-year-old Bader. Art, the Bible, and chemistry (and his company) were often referred to as the ABC of his life; a life which had taken a significant turn on November 15, 1941 when he had first enrolled in Queen's University as a teen-aged Jewish refugee. The purpose of the special reception by the University and the lectures was to celebrate the 50th anniversary of this event.

The Dismissal

At the Russell Hotel meeting in London, Cori jumped right to the point and told Bader that there was no room on the Board for anyone who would "bet against the company"; and his selling of stock options had been just that. In light of this action, the Board was unanimous in its request for his resignation.

Bader was stunned. He was being accused of betting against the company. *His* company? Because he sold 100 options on some of his Sigma-Aldrich stock? If selling 100 options (for 10,000 shares) was a bet against the company, what was the retention of the other 3.7 million shares that he owned? Although his shares represented only some 7% of the outstanding shares in the company, he was still its largest private shareholder. The sale of the call options had simply been part of his planned gift of 10,000 shares to Queen's.

Bader was not going to let his career come to such an ignominious end. He phoned and/or wrote to each of the outside directors arguing his case. Although the reactions varied the message was the same, "He should not have bet against the company."

On December 30, a notice went up on the Aldrich bulletin board, announcing the end of Bader's consulting contract and wishing him well in his retirement.

Bader still would not give up. He and Marvin Klitsner were still directors until the annual meeting of the Board in May. Marvin was Bader's closest friend and business advisor and had been a director of Sigma-Aldrich since the merger and, prior to that, a director of Aldrich Chemicals from its early years.

Bader and Klitsner, the last of the Aldrich board members, appeared before the nominating committee at its February meeting and presented their case as strongly as they could, vigorously denying they had bet against the company. They emphasized that the options they had sold were "covered" call options, which meant the shares were committed at the time of the sale. Technically, they had not reported the sale of the options as promptly as they should have. But it was a new regulation, and both had reported their sales as soon as they had become aware of the need to do so. The company's own meager memo on the subject had made no mention of options trading. Had it done so, they undoubtedly would have met

that deadline requirement as well.

However, the Board did not waver from its position taken the previous November, and Bader had full measure of the extent to which he had grown out of touch with his fellow directors.

The Evolution of a Board

Indeed, the Sigma-Aldrich Board of the 1990s was very different from the Board of the 1980s and a world apart from the Aldrich Board of the 1960s and 1970s. The evolution of the board was a reflection

of the evolution of the company and a classic example of the separation of ownership and control, and, for the original owner, it held tragic consequences.

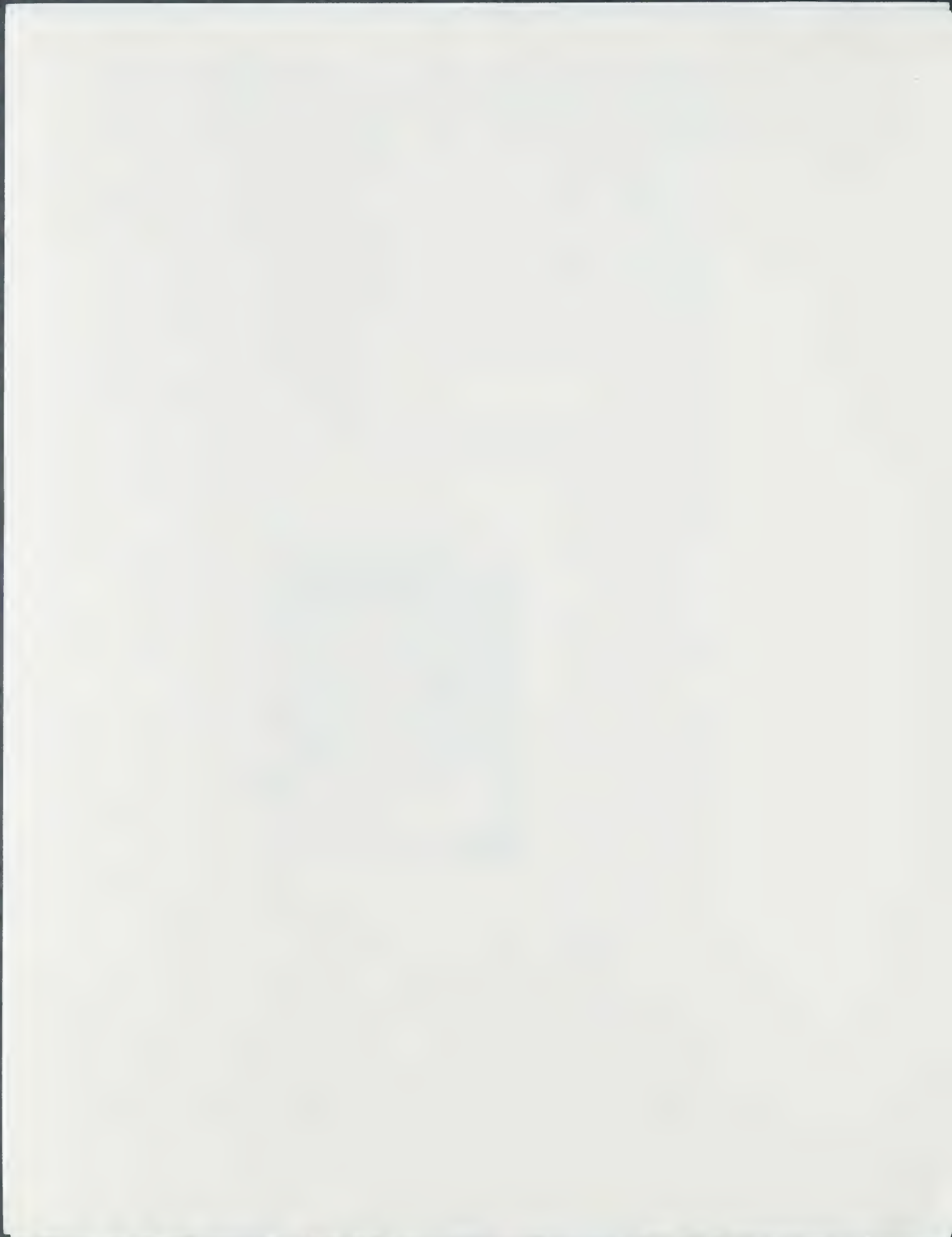
The Board of the 1960s was Bader's Board, made up of people who knew the company and/or the industry and with whom he felt comfortable. Following the merger of Aldrich with Sigma-International in 1974, and for the next decade, the board was a Compromise Board with representation from the two founding companies. During the last half of the 1980s, a new Modern Board emerged, one with a higher proportion of outsiders who had

THE ALDRICH ANNUAL REPORT



1968





proven records as CEOs and/or expertise in marketing, production, or finance. Any knowledge of the chemical industry was of secondary importance. These men also reflected the interests of the President and CEO.

The Foundation of a Company

To understand the different character of these three boards, we have to understand the history of the company, and for this we have to understand a major part of the life of Alfred Bader, for, as Emerson once observed, "an organization is the lengthened shadow of one man."

Queen's University was already two months into its fall term of 1941 when Alfred Bader enrolled in the Engineering Chemistry program. He had a lot of catching up to do, but he did and then went on to fulfill the requirements for both the B.Sc. and M.Sc. degrees. He continued further and completed his doctoral studies at Harvard in 1949 and then accepted a job with Pittsburgh Plate Glass (PPG) in its paint research laboratory in Milwaukee.

While working in the Harvard lab, Bader had become frustrated waiting for delivery of a basic chemical needed to carry out his experiments. The specialty chemical was offered by only one large chemical company, Eastman Kodak, and it had more important products on its priority list. In response to a follow-up memo from Bader, Eastman Kodak sent him a postcard telling him they would send the chemical as soon as it became available but, in the meantime, would he stop adding to their paperwork.

Shortly after joining PPG's laboratory, Bader recommended that a small division within PPG be set up to make and sell specialty chemicals. The proposal was turned down; why even try to compete with Eastman Kodak? However, there would be no strong objection if he started his own enterprise on his own time, provided it did not interfere with his work with PPG. Bader the chemist became Bader the entrepreneur, the one who saw a commonly experienced frustration as a business opportunity.

First-year sales were only \$1,705, but sales rose to \$5,400 in the second year and in the third year almost tripled to \$15,000. When PPG decided, in 1954, to move its Milwaukee laboratory to Springdale, near Pittsburgh, Bader elected to stay in Milwaukee and to devote himself full time to the fledgling enterprise.

The company's target market was clearly defined from the very beginning: chemists in research labs who needed specialty chemicals to carry out their research. The products would usually play a small, but very vital part, in the activities of the laboratory. Although the chemical

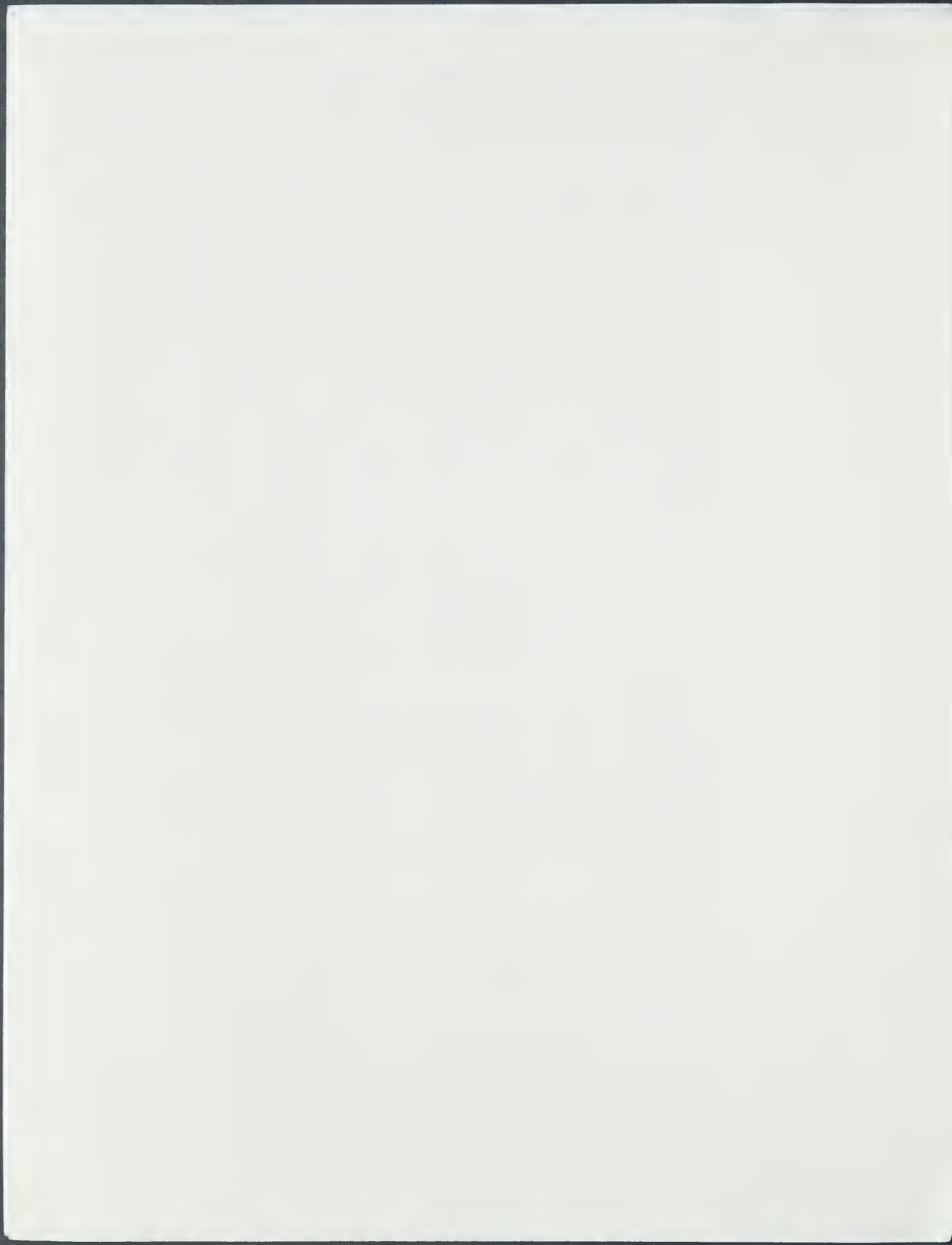
might be expensive on a unit basis, the number of units required was small, and the actual cost was insignificant relative to the overall cost of the experiment. However, the product had to be of reliable quality, not necessarily perfect, but good, and it had to be available quickly.

To buy the necessary products, Bader had to travel outside Milwaukee. The potential suppliers of the products were any laboratory in the world, and some of the best laboratories were located in Germany, England, and Switzerland. Bader obviously was fluent in German and English and spoke passable French. He began canvassing laboratories throughout the United States and Europe. As a research chemist, he could talk their language and recognize who were the top producers, what were their needs, and what were their problems; as a businessman, how could he help them in their work?

It was a relatively easy matter to identify the commercial and academic research laboratories and to communicate with them. A simple catalog would be sufficient to identify Aldrich's product line. Indeed, Aldrich's first catalog was one page, with one product, a product he had learned to make in the laboratory of Professor A.F. McKay while working on his M.Sc. degree at Queen's. By 1965, the company cataloged over 9,000 different chemicals, with its best selling chemical accounting for no more than 2% of its total sales, and no other chemical accounting for as much as 1% of its total sales. The company's customers included many substantial industries throughout the world, the federal government, universities, and laboratories doing medical research. The federal government's laboratories accounted for less than 10% of the company's sales, and no private concern accounted for as much as 5% of sales. Regionally, 80% of the sales were in the United States, 10% west of the Rockies and 45% each in the Midwest and the East. Foreign sales were distributed across 20 countries, usually through foreign agents.

The diversity of the company's product line and customer base provided a stable foundation for its explosive growth. Marketing its products through the catalog was relatively easy and effective, and, best of all, no expensive sales force was required.

By 1965 the company manufactured approximately 15% of its product line, purchased approximately 10% from a German affiliate (EGA), and bought the rest from many different sources, none of which supplied more than 10%. The company's strategy was to manufacture only those products that it could not buy advantageously from other sources. Even when it did initiate new chemicals in its own facilities, it would



biochemistry, and it dominated the biochemical laboratory sector.

The two companies merged in 1975 forming Sigma-Aldrich. Combined net sales in 1975 were \$43 million, and profits, before taxes, \$11 million.

The Compromise Board, Sigma-Aldrich, 1975-85

Immediately following the merger, the Board consisted of eight directors, four each from Sigma and Aldrich. The Aldrich directors, chosen by Bader were A. Bader, who became President of Sigma-Aldrich, H. C. Brown, R. Emanuel, and M. Klitsner. Brown's appointment to the Board was not renewed in 1978, and the company just missed the opportunity to have a Nobel prize winner on its Board, for the following year Brown received the Nobel Prize in chemistry.

The directors appointed by Sigma were D. Broida, A. Fischer, J.W. Sandweiss (a lawyer), and S.J. Weinberg (a financial adviser). Broida, Bader's counterpart at Sigma, became Chairman of Sigma-Aldrich. A. Fischer had hired Broida (in 1936) into the small consulting firm that he and his brother had started in 1934. Sigma was started in the early 1950s under the umbrella of the consulting firm, but almost entirely through the initiative of Dan Broida.

The Sigma-Aldrich Board was increased by two in 1977, and that was when Dr. C.T. Cori joined. Cori, who had been a vice-president of Sigma-Aldrich since the merger, was promoted to President of Sigma in July of 1976 (succeeding D. Broida). Cori's rise through the ranks was quite exceptional, having just joined Sigma in 1970 as a production chemist, fresh out of the University of Washington (Missouri) with a Ph.D. in biochemistry. His parents, Carl and Gerti, were exceptional scientists who had both won the Nobel Prize in 1947 for their work on carbohydrate metabolism and enzymes.

In 1983, Cori became the CEO while Bader retained his position as Chairman of the Board. Throughout, Bader focused most of his attention on the vital liaison work with customers and suppliers around the world. The primary difference now was that any new leads on biochemical products were turned over to Sigma. The overall management of Sigma-Aldrich was left in the hands of the aggressive CEO.

The Modern Board

In 1985, a reorganization plan was prepared by Cori which envisaged a larger Board and increased representation by "outside" directors. Only Bader and Klitsner remained from the Aldrich Board. One outside director described his views on boards in general:

How people got on the board, and what they think they were put on the board for is important. And getting the board to come together and be willing to have a few good fights, on an equal basis, and get rid of egos. Getting rid of egos is a very important part of getting value out of the board. It's not easy to get a bunch of high-powered guys—who are, in their own right, successful and important to some extent—to be prepared to look at the issues of another entity without getting their egos in the act. It can screw things up considerably when they do.

A Change in the Chairmanship

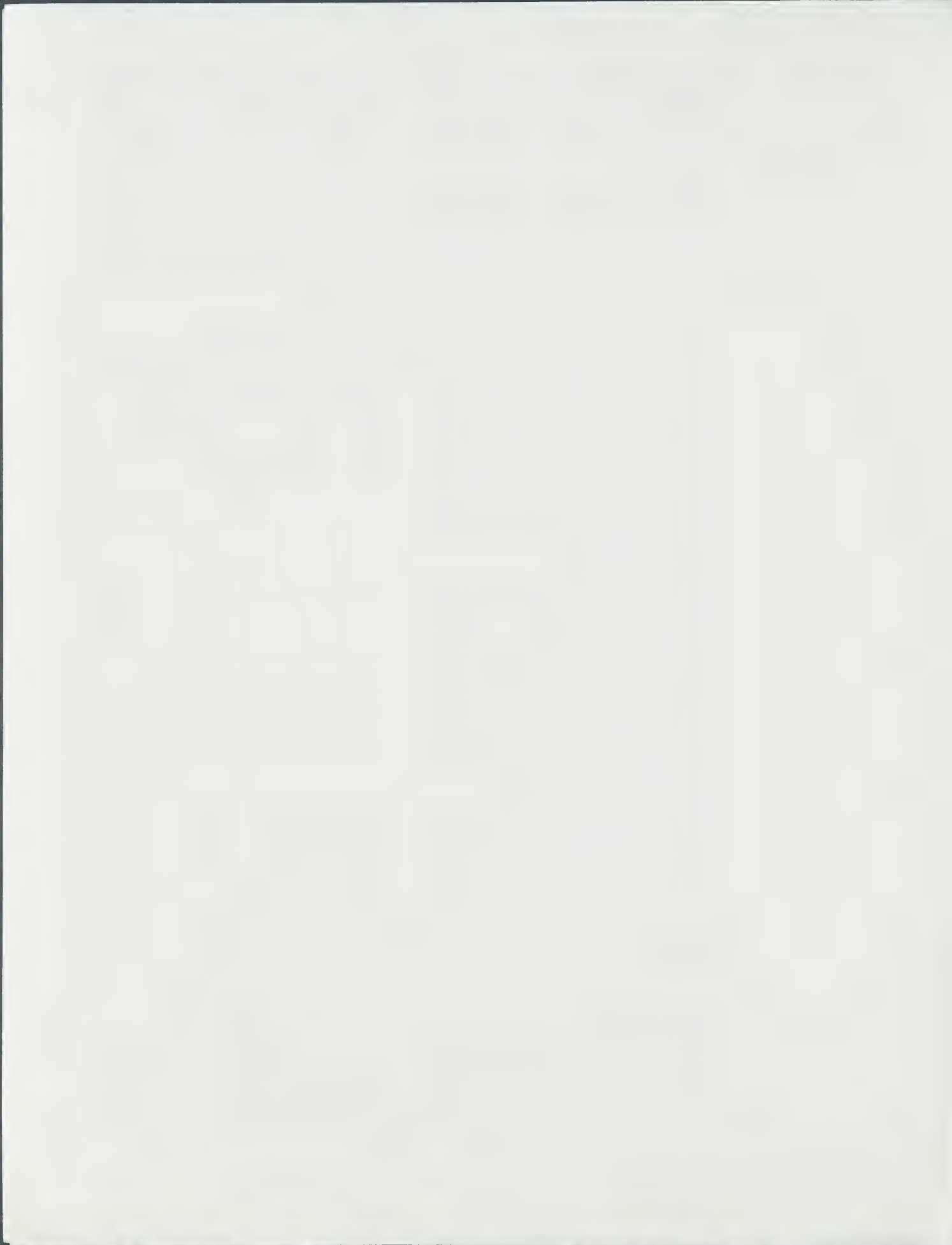
Bader learned who controlled the Board in the spring of 1991 when he was forced to resign as Chairman. He was given the title of Chairman Emeritus and remained a director. In this capacity, he continued his vital external liaison activities with customers and suppliers. Arguably, he was the most widely recognized chemical executive in the academic research world, holding six honorary degrees from universities in the United States, Canada, and Britain.

Thus, it was that in May 1991 Dr. Cori became the Chairman of the company as well as its President and CEO. He occupied all the key positions.

Six months later, on the evening of November 11, at the traditional reception for the Sigma-Aldrich directors, Marvin Klitsner informed Tom Cori that he had been selling options on his holdings of Sigma-Aldrich stock. He had just learned that there were new Securities and Exchange Commission (SEC) regulations that required directors and officers to report such sales, and he had just sent the necessary forms to the SEC. Cori's concern was to ensure that any short-term profits be returned to the company in compliance with the law.

Following the board meeting the next day, Cori and Bader had gotten together to draft out, in rough terms, Bader's assignment for the next year. Cori had made it clear that Bader would not receive any salary, but if he wished to continue his liaison work, his expenses, office, and secretarial requirements would be covered.

Cori learned that not only had Marvin Klitsner been selling stock options but so had Alfred Bader. He phoned Bader in Milwaukee and angrily charged him and Marvin with selling options "in concert." Bader had sold, on one occasion, some stock options, but it was not in concert with Marvin; rather it was part of his planned gift of 10,000 shares to his alma mater, Queen's University. He had just learned that such sales needed to be reported to the SEC, and the forms were already signed and a copy was on its way to Cori in St.



Louis. Cori advised Bader that he was going to leave the matter in the hands of the company's lawyers.

Options Trading

When Bader sold the options on August 15, 1991, Sigma-Aldrich shares were trading at \$45. He got \$2½ for each of the 10,000 shares (\$26,250) covered under the option. The purchaser of the options received the right to buy the shares at the strike price of \$45 any time up to the options' expire date on January 17, 1992. Bader planned to give the proceeds from the options plus the covering 10,000 shares as part of his pledged gift to the University, and it would be ahead by the \$26,250. Only if share prices rose above \$47½ would the University be worse off. In fact, the price of the shares rose to \$52, and Bader sent the University another check for \$50,000 to cover brokerage fees and to ensure that his \$2,000,000 pledge was reached. He had been for some time one of the University's more generous benefactors. In 1990, for example, his donations exceeded \$750,000; in the Spring of 1991 he had pledged more than \$2,000,000 toward a chair in chemistry, a chair in art history, and the art gallery.

Thou Shalt Not Bet Against the Company

The generosity of Bader and his family to his universities and the greater Milwaukee community is widely known, and so it is unlikely that any informed observer would label his sale of the stock option as an "ex post facto" attempt to gain sympathy for certain sly stock activities. But why might the reasonable, rational observer consider the sale of stock options, by an insider, to be a bet against the company? What is the origin and the validity of the argument underlying the phrase "bet against the company"? The new regulations issued by the SEC in 1991 were designed to bring the trading of options under the same regulations that governed insider trading of stocks. Any "short swing profits" were to be subject to disgorgement to the company; i.e., any officer or director, considered an insider, would have to return to the company any profits realized within 6 months of the transaction. The intent, stemming from the abuses in the market during the 1920s and 1930s, was to protect the general investor from those who might have "inside information" not generally available to the public. There was no need to prove that such information existed or that the insider knew of such information. All such profits are automatically returned to the company. The act was crude and simplistic but effective. It did not prohibit the trading of stocks or stock options but simply eliminated any short swing profits by insiders and hence removed any

incentive to engage in such activities.

Was It a Bet Against the Company?

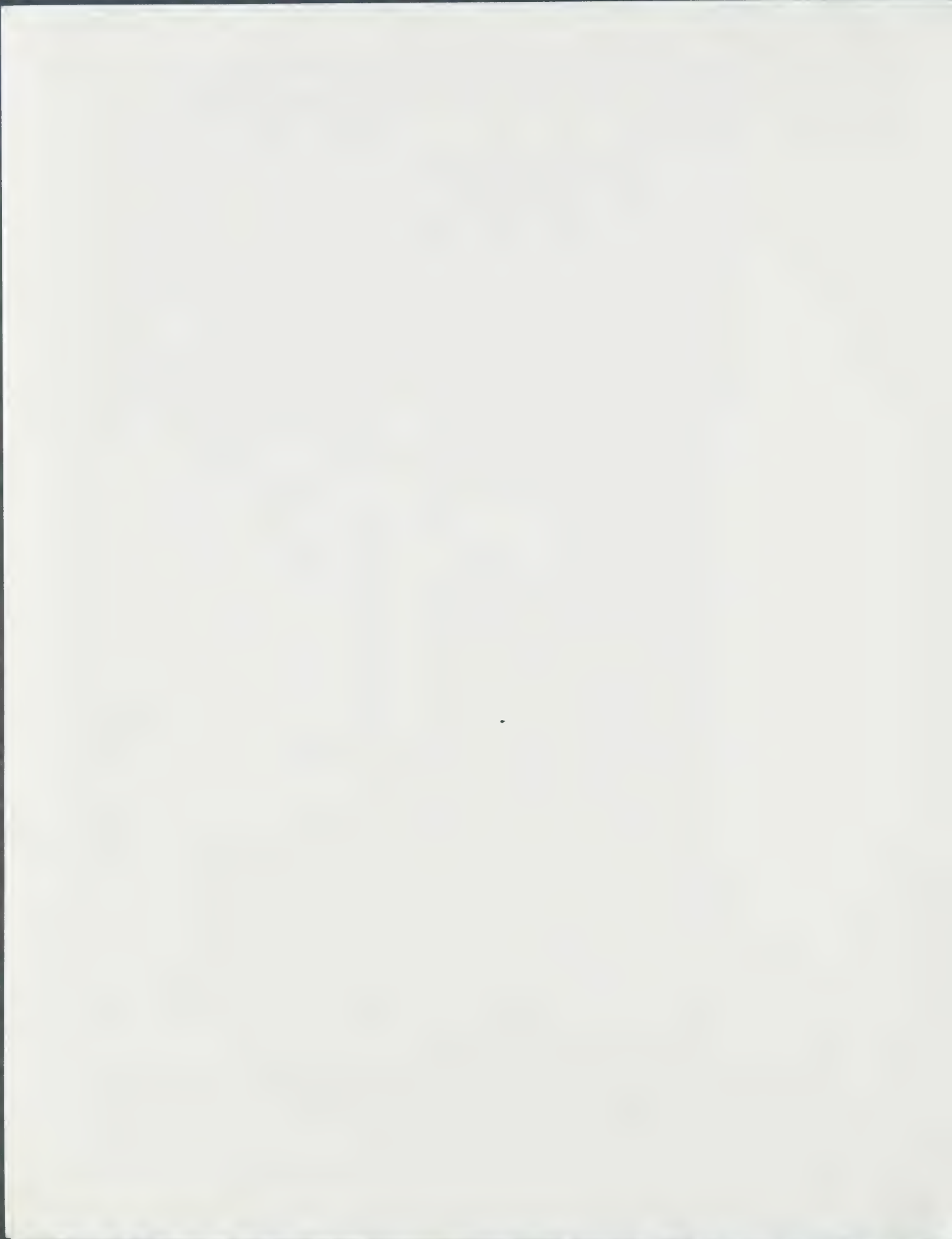
Before the 1991 regulations, it was not clear whether the old regulations even applied to option trading. Generally, trading in options, by insiders, is frowned upon because it might be construed as a "bet against" the company. When a person sells an option he is, in a sense, gambling that the price will not rise above the strike price (\$45 in this case) during the life of the option (5 months). It is unwise for any officer or director to put, or to even appear to put, any limitations on his/her expectation regarding the future value of the company's stock. There should be no conflict or even apparent conflict between an insider and the future growth of the company. Might one be tempted to hold back on an important decision that might cause the stock to rise? Was Bader's sale of the 100 options a bet against the company? Did he have any information that would lead him to expect the value of the stock to fall? No! He simply selected an investment that was going to yield a sure \$26,250 over the current market price on the 10,000 shares he had committed. Undoubtedly, the absurdness, the cruelty, the shallowness of the "betting against the company" charge grated and incensed Bader more than any other aspect of the incident and drove him to fight the accusation. Technically, it is an interpretation, a label, that can be automatically applied to any insider who sells options. But, as is evidenced here, it is an indiscriminate label which can misrepresent the real motivation of the individual. It is like labeling a surgeon who has lost a patient a murderer. Technically, he may have performed an act which has taken the life of an individual, hence the label "murderer," but to judge the act without considering the circumstances or the motivation is simply wrong.

Bader pleaded his case in the chemical journals and the financial press and gained a great deal of sympathy and support. Articles appeared in the financial columns in American and European newspapers; even a national magazine, *Forbes*, carried a story under the banner "Back stabbing" in which one insider claimed "Cori was tired of working in Bader's shadow and was looking for any excuse to oust him." The company's image among its primary suppliers and customers was tarnished. Numerous leading chemists called, wrote, and took up the case with the CEO at company headquarters. All to no avail.

Lessons for the Board

One of the hottest topics around boardrooms these days is whether or not the Chairman

CONTINUED ON PAGE 41



ble infrared detection of the C_{60} molecule, if it is indeed as ubiquitous in the cosmos as some have supposed.

Reference 19 is to a conjecture of Kroto's published in 1987. The supposition of cosmic ubiquity is Kroto's, too. Krätschmer and Huffman are gentle in their disparagement. They proceed to their own, down-to-earth summary:

To our method for producing macroscopic quantities of C_{60} , we have added a method for concentrating it in pure solid form. Analyses including mass spectroscopy, infrared spectroscopy, electron diffraction and X-ray diffraction leave little doubt that we have produced a solid material that apparently has not been reported previously.

The authors take care to separate the methods of production and purification, perhaps preparing the ground for patent applications. Their scientific discovery, the isolation of a new substance, they apparently regard as secondary to these technologies. They are nevertheless keen to lay ownership to the new solid material as well:

We call the solid fullerite as a simple extension of the shortened term fullerene, which has been applied to the large cage-shaped molecules typified by buckminsterfullerene (C_{60}).

The name *fullerite* is well chosen. It is easy to say. It sounds natural. Indeed, it sounds like a mineral. Others doubted that the solid bulk material warranted its own name. Unlike "fullerene," it has not caught on.

The various physical and chemical properties of C_{60} can now be measured and speculations concerning its potential uses can be tested.

In contrast to Kroto and Smalley five years earlier, Krätschmer and Huffman forbear to offer their own speculations. By now, there is no shortage of these.

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Three Boards and "A Bet Against the Company"

CONTINUED FROM PAGE 29

should be an insider or an outsider. The main advantage of having an outsider as Chairman is that he or she can be more objective and impartial. Let us see how an "outside" Chairman might have handled this situation.

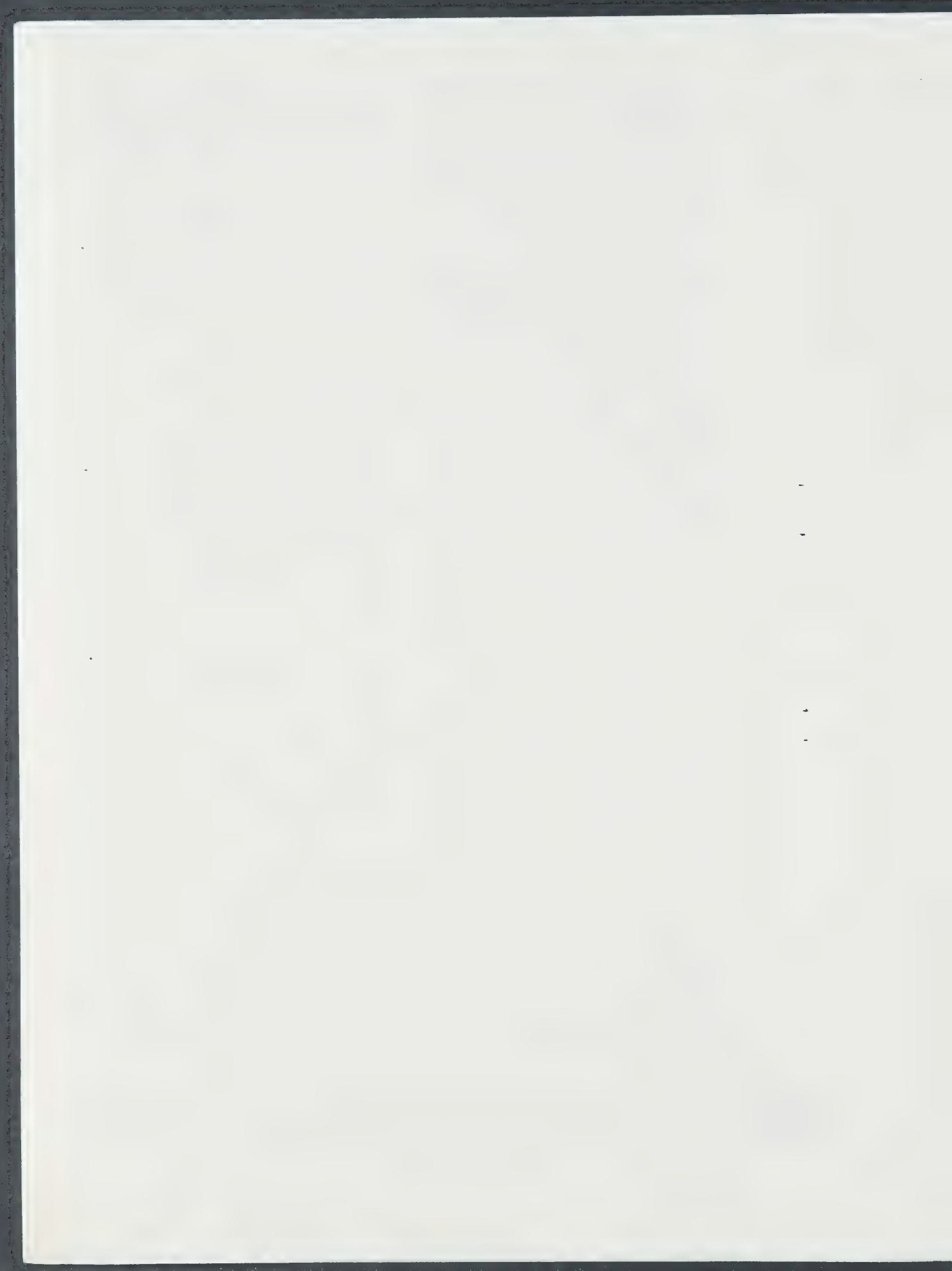
There is a good chance that an independent, outside chairman would have proceeded more deliberately in his investigation. First, it is unlikely that he would have felt the same urgency to resolve the problem. He probably would have wanted to meet directly with Bader to investigate the incident thoroughly, to review the new legislation, to get the advice of fellow outside board members and of the company's lawyers, and to consider alternatives.

Assuming that one would reserve the severest penalty, dismissal, for the most flagrant violation (a deliberate attempt to take advantage of insider knowledge for personal gain), the Chairman

might have considered a range of alternatives: removal of the "Chairman Emeritus" title, payment of a fine to the company (say some multiple of the alleged insider profits) over and beyond any disgorgement required by law, a public apology to the shareholders, or nothing more than a slight slap on the wrist with a sharp warning never to do it again. Assuming one of these alternatives was selected by the Chairman of the Board, he would have preserved for the company's benefit one of its most important human assets and continued to reap the rewards from the lifetime association of the company with one of its founders and spokespersons. The Chairman's challenge was to find the "win win" solution that best served the interests of the company; to bet with the company. With an outsider as Chairman, the Board at least would have had the possibility of another option to consider. One outcome is certain: The confrontation between three American businessmen at the Russell Hotel in London on November 20, 1991, would not have taken place.



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The Master buyer of Milwaukee



FRANCESCO GUIDICINI

Dr Alfred Bader in front of Herstmonceux Castle, a recent purchase

A leading American businessman-chemist has become a major force in the Old Master field — reselling one Rembrandt to the Rijksmuseum

BY GERALDINE NORMAN

"I'M BEGINNING to feel itchy," Dr Alfred Bader told me when he called at my flat to be interviewed. "I haven't bought a picture since yesterday." The small American chemist from Milwaukee with specs, ebullient enthusiasm and a heavy briefcase (full of papers relating to his activities as a picture buyer), has bought around 200 paintings a year for the last 30 years. Old Masters are his favourites, especially Dutch and Flemish, but he rarely spends more than \$50,000 a time. Some pictures he keeps, some he sells and some he gives away to museums.

But last year he was ignominiously sacked as unpaid chairman emeritus of the company he founded in 1951 and he now feels free to sell company stock and buy on a more lavish scale. As a result, he is becoming a major force in the Old Master market. His first multi-million indulgences have included a Rembrandt, a Rubens — and a medieval castle.

Last July he spent £4.18m on a Rembrandt portrait of the Remonstrant minister Johannes Uytenbogaert which Lord Rosebery had sent to Sotheby's; he sold it on to the Rijksmuseum in Amsterdam in December for \$10m. The Dutch press explosively criticised his profit margin, claiming that the museum should have bought the Rembrandt

at Sotheby's for itself. At Christie's sale last December he spent £1,045,000 on a Rubens *Entombment* which he has recently sold at another comfortable profit to the Getty Museum in Malibu, California.

And last Sunday he cut a tricolour ribbon with a sword — three times, for the convenience of press photographers — on the bridge that spans the moat at Herstmonceux Castle in Sussex. "When I first saw Savills' advertisement, I asked my wife if she would like a castle," he told me. "Too many rooms to clean, she replied." Undaunted, Bader got in touch with his old university and asked if they would like one. He has ended up giving Queen's University at Kingston, Ontario, £6m to buy it and do it up. Until five years ago Herstmonceux and its park housed the Royal Greenwich Observatory. Queen's is planning to turn it into a centre for European studies.

Most Americans are bored by art made before about 1870, but Alfred Bader is an American by adoption, not by birth. His father was Czech and his mother Hungarian, though he was born in Vienna in 1924 and lived there with his aunt — his father died two weeks after his birth — until Hitler's shadow began to fall across the imperial city. When he was 14 he took advantage of a British

offer to give Jewish children a safe home; he attended East Hove School, then Brighton Technical College. But in 1940 Winston Churchill decided to round up all enemy aliens in the 16-60 age bracket and Bader found himself deported to an internment camp in Canada.

After sitting matriculation exams at the camp, he was accepted by Queen's University where at last he began to feel welcomed and wanted. Bader has been showering the university with presents ever since: scholarships, endowments, more than 100 Old Master paintings and

finally a medieval castle in Sussex.

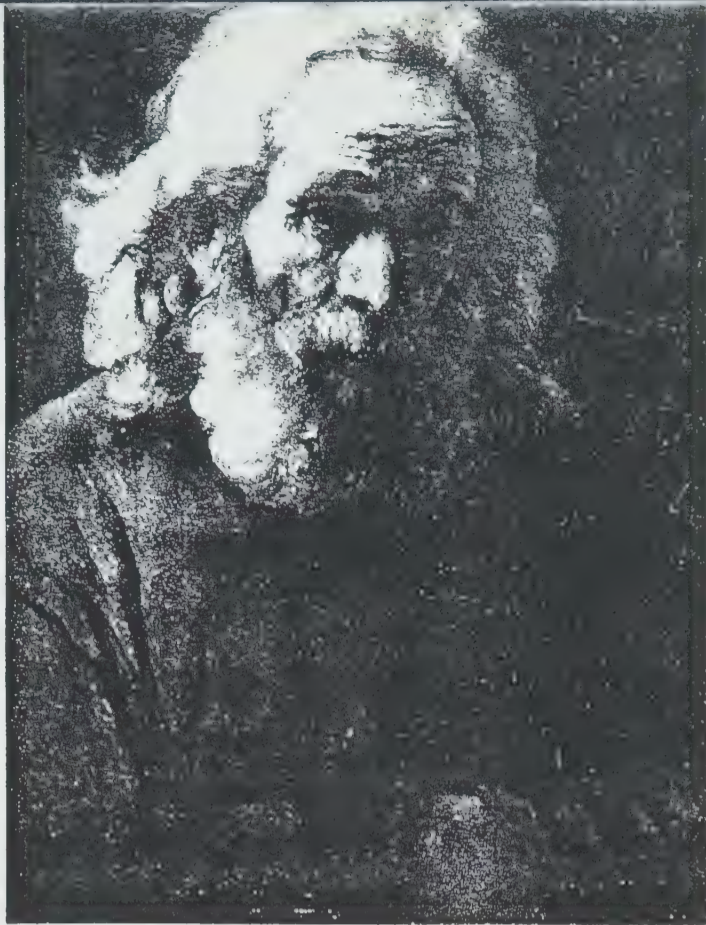
In 1951 Bader and a Milwaukee attorney friend founded a company called Aldrich. The first year's sales amounted to \$1,705 with a \$20 profit, but Bader was a brilliant chemist and the company prospered. In 1975 he merged with a larger group called Sigma from St Louis and became first president, then chairman of Sigma-Aldrich, whose sales topped \$440m in 1990. He retired and became chairman emeritus in 1991. The cover of the company's catalogue and its quarterly magazine, *Aldrichimica Acta*, always sported an

Old Master from Bader's collection.

He parted with the company because of a "call option" he sold in August 1991 on 10,000 Sigma-Aldrich shares he was giving to Queen's University. The board claimed that selling an option amounted to "betting against the company" and sacked him. While Bader was outraged and deeply hurt, he has clearly enjoyed his new freedom to sell shares and play with the money.

He has been officially "dealing" since 1961 when his attorney pointed out that he was making so much money buying and selling pictures





that he had better register for tax purposes. But "Alfred Bader Fine Arts" was run from home until last year. The dealership is now housed in a suite in the Astor Hotel in downtown Milwaukee, near the lake. It handles pictures worth up to \$20,000 or so; local buyers don't often go beyond that. On his big-time deals, Bader works in partnership with the New York dealer Otto Nauman.

Both as dealer and collector Bader's prime interest lies in Biblical

He buys beautiful paintings, then plays art detective

scenes, history paintings and portraits — a broadly unfashionable taste; he discovered the Bible in his internment camp and has taught Sunday school in Milwaukee for more than 30 years. Beyond that, he looks for what he calls "quality". He buys paintings which have not been securely attributed to any known artist because they are beautiful; he then gets down to work as an art detective to try to find the name of the artist — but is not too concerned if he fails, since he bought the picture for its intrinsic quality.

Bader also loves to buy a dirty picture and clean it, betting that there is something good underneath. Thus the paintings he has given to Queen's University include a hotch-potch of styles and minor names — but they are worth many millions of pounds and teach the viewer a lot about the technical skill of Old Masters.

In the London Old Master sales in July he spent £11,500 at Phillips on a double portrait attributed to a minor German master active around 1550; Bader believes it is Flemish and dates from around 1500. He left a bid

of £52,000 on an interior by the Rembrandt pupil Peter Verelst which Sotheby's had estimated at £12,000-£16,000. He then lost it to Richard Green, the London dealer, who bid £54,000. At Christie's he hoped for a Paul Brill landscape covered with country house dirt from the Wrotham Park collection but was left the underbidder when it sold for £551,500 to Bernheimer, a Munich dealer.

He had similar hopes for a Roman view by Vanvitelli, which he ran to double estimate; but he bowed out and let his competitor have it at £331,500. In the event, he only got one picture at Christie's, *A Young Scholar in his Study* by a Rembrandt pupil called Heyman Dullaert, which cost him £13,800

Rembrandt, his contemporaries and his pupils are Bader's consuming passion — this particular pupil was not yet represented in his collection. The first big price he paid at auction was \$319,000 at Sotheby's New York four years ago for a Jan Lievens *Portrait of Rembrandt's Mother*. The first time he paid over a million was for last year's Rembrandt portrait.

In his eyes, this year's greatest "coup" has been the purchase of a portrait of *An elderly bearded Man, Half length* at Christie's in April for around £35,000; it was estimated at £60,000-£80,000 but left unsold. Bader bought it after the sale.

Christie's had attributed the painting "Circle of Rembrandt" and Bader considers it a wonderful picture, perhaps by a very gifted Rembrandt pupil. "I tried to buy it when it was catalogued as a genuine Rembrandt in the Erickson sale of 1961. I bid up to \$60,000 for it but it made \$180,000," he says. It has recently been rejected by the Rembrandt Research Project, a group of Dutch academics who have tried to sort out what Rembrandt painted and what he did not. "The Rembrandt Research Project is a great benefactor of the private collector," he laughs. □

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Last year's coup: Bader bought Rembrandt's *Portrait of Johannes Uytenbogaert* (above) for £4.18m and sold it to the Rijksmuseum, Amsterdam, for \$10m. He thinks this year's is buying *An elderly bearded Man, Half length* (top right) — not a Rembrandt, but a wonderful picture — for about £35,000

CONGREGATION BETH JEHUDAH

BETH JEHUDAH

REMEMBERING ...

Remembering has become a popular theme in the recent year. Yom Hashoa marks fifty years of remembering the Holocaust and the uprising of the Warsaw Ghetto. We constantly recall the memories of the Six Million who perished. The question is how does a Jew remember?



Rabbi Benzion Twerski

"Only beware and guard yourself carefully lest you forget the things your eyes have seen and lest they stray from your heart all the days of your life. And you are to

make them known to your children and to your children's children – the day you stood before Hashem your G-d at Sinai." (Deuteronomy 4:9-10)

We are commanded by G-d to remember. We are instructed to pass it on to our children. We are warned never to forget lest they stray from our hearts. What are we remembering? And more importantly how are we to remember?

One event in Jewish History has set us apart from all other nations. This event is celebrated by the upcoming Holiday of "Shavous." On the seventh day of Sivan, 49 days after we left the impurity and defilement of Egypt, G-d revealed Himself to us, millions strong, and crowned us with His Torah.

Our Sages tell us that G-d turned to all of the nations and offered them the Torah. Each nation, although agreeable to the majority of Torah, found itself having difficulty with specific commandments, for

they could not accept those commandments which were viewed as contrary to their nature.

When the Almighty approached the descendants of the Patriarches, the response was altogether different. It was an impetuous, illogical and unbusiness-like response. It was a response of love, faith and ultimate trust. As a people we exclaimed, "Naseh Venishma, We will do, and then we will hear." Unlike the nations who intellectualized and stipulated, we accepted with love, and now we toil to gain deeper insights into G-d's Torah.

It was at that intimate moment, of that precious proclamation, that we became the nation of Israel. As a nation we are defined by our willingness to accept the will of G-d without conditions. It was that irrational declaration that fused G-d, Israel and Torah into one inseparable entity.

Remembering this event is the challenge, for it demands that we recreate that love and commitment and continue to pass it on to future generations.

Allow me to share a personal insight into Jewish remembrance. *My mother-in-law, who constantly is questioned by my children about the strange numbers on her arm, was only eleven years old when the Nazis marched into her town of Suleza. They immediately set out to fetch her father, the revered town Rabbi and spiritual leader. His family was among the first deportees to Auschwitz. As the Nazis began the deportation process, the saintly Rebbe turned to his children and said, "My dear children, always remember who you are." Those last words carried this young soul through the hell of Auschwitz, and she clung to them later in a religiously unsympathetic orphanage in Sweden.* She remembered, and thank G-d, continues to remember. She remembers that she is a link in a chain of a glorious past and a glorious future. She remembers an unconditional



The Sulezer Rebbe
Rabbi Yakov Y.Y. Rubin

response to her Jewishness: "We will do, and then we will hear." That statement links the Jewish people forever with the events at Mt. Sinai. It affirms that we stood there, all of us together.

So, we too remember the Holocaust, but not only by gathering yearly to listen to historical sermons about why the horrors occurred, nor by merely visiting motionless monuments erected in memory of the Millions that perished. These memorials will be best served if they remind the world of its indifference to human suffering and death and, more importantly, if they impel us to rebuild authentic Jewish spirit and Jewish life.

We remember, by creating living examples of our grandparent's values and life missions. We remember by having our children chant the very same verses of Torah and Mishna of those millions of children whose voices were silenced by the gunfire and gas of the Nazis. We remember by educating ourselves in the traditions and morals emanating from Sinai, transmitted from father to son, and from mother to daughter, to recreate vibrant living generations who fulfill the precious commandments given that morning on a small mountain in the Sinai desert.

"And you are to make them known to your children and to your children's children – the day you stood before Hashem your G-d at Sinai."

AVIR YAKOV HUMANITARIAN AWARD DINNER

Almost four hundred people gathered on April 20 at the Sheraton North to pay tribute to two very special individuals — quite a strange combination, a holocaust survivor, Cyla Stundel and a young American philanthropist, Daniel Bader. Although their backgrounds are so drastically different, their strengths blended wonderfully during this moving evening.

After a delicious meal was served, Marty Stein, master of ceremonies, began the program sharing his childhood memories of Congregation Beth Jehudah and his treasured ties to the Twerski family.

Howard Karsh captivated the audience with his beautiful poems and fascinated slides, giving a poignant perspective of the honorees.

Rebbitzin Feige then presented the **Pillar of Chesed Award** to Mrs. Stundel. Her words pierced the heart, as she spoke about Cyla's tireless dedication to Rebbitzin Leah and the special place Cyla holds in our hearts.

Dr. Alfred Bader brilliantly expounded upon the theme of the evening, bringing together historical and scholarly material in a most intense and emotional message to his son.

Rabbi Michel presented Daniel Bader with the **Avir Yakov Award** and spoke about the Rebbe, of blessed memory. He related how the Rebbe's wisdom was a resource shared with the entire community, and not held only for himself. "So too," the Rabbi continued, "Dan Bader has the wisdom to use his resources for the betterment of life for everyone."



Dan Bader eloquently noted how the honor he received was really an honor received by all of those who worked so hard to establish the Helen Bader Foundation and those who worked to help him become who he is.

We are fortunate to honor such uniquely generous human beings, and wish them the Almighty's continued blessings of health and success in their noble pursuits.

Special thanks to all those who made this event possible.



Reviewing the Season

We have celebrated a number of holidays at Congregation Beth Jehudah with great intensity and simcha. Let's spend a few moments reflecting:

PURIM: From the beginning of the Megillah reading Saturday night through the late hours of Sunday evening, simcha and joy permeated the streets of the West Side. The streets were full of costumed adults and children delivering their Shalach Manos packages. Purim festivities were celebrated at many different homes, as well as at the Purim Seudah at Beth Jehudah. The shpiel featured all of our favorite entertainers, as the clowns kept the children fascinated with their tricks. The shpiel concluded with "leibidick" Chassidic dancing



which took us into another sphere. We thank all those who helped organize the Purim events.

PESACH: As the multitude of guests poured into town, the Shul's warmth was greatly intensified. The beautiful tefilos (prayers) sprinkled with the Rabbi's Divrei Torah and classes, offered everyone a new perspective on celebrating the Yom Tov. Those who gathered for the "Splitting of the Sea" at Rabbi Twerski's home learned many of the new melodies brought home by our yeshiva students. The Rabbi related the secrets of calming the turbulent seas in all of our lives.

The closing moments of Yom Tov were spent by the community joining in the shul's social hall. As the sun set and we faced the task of going home to pack away the Pesach utensils, the Rabbi instructed us how to keep the spirit and message of Pesach vibrant and relevant all year. He spoke of the importance of Jewish unity through Torah and service of Hashem.

LAG BA'OMER: For the first time, on the night of Lag Ba'omer, our community gathered around a bonfire, a custom among many Sephardic and Chassidic Jews. Chaim and Baila Pinsky hosted the crowd in their yard, where the fire was built and an evening of story, song and bonding by the warm flames was celebrated. The Lag Baomer picnic provided a fun day in the sun for our children and the child in us all.

EXPAND YOUR HORIZONS WITH CBJ

Are you too busy to attend classes? Do you want to learn at your own pace? If this is the case, we have two great ways for you to study about Judaism. One, is the David Kahn Torah Tape Library, a cassette tape library featuring tapes on every area of Jewish learning. Learn about Jewish history, the meaning of your Haftorah, the Holidays or a great variety of areas of Jewish law. Take advantage of this valuable resource. The second is the Julius Ertel English Book Library. You can borrow books dealing with the complete spectrum of topics from history to novels, Holocaust diaries to short stories. Discover your heritage today!

Picnic Time

Beth Jehudah looks forward to the 1993 Summer Picnic. We expect all the usual excitement, great food, children's games and especially our all-star baseball game. Now that Beth Jehudah has joined the "major leagues," we will watch the stars play each other! Come and join in the fun! Be there Sunday, August 8, 12:00 Noon, McGovern Park, Area 2.

THE COMMUNITY ...

Wishes a Mazel Tov to...

- Mrs. Feige Arenzon on her nomination of the Kesselman Award
Mr. and Mrs. Steven Askotzky on the birth of their son Shmuel
Mr. and Mrs. Mel Askotzky on the birth of their grandson
Mrs. Elaine Pomerance on the birth of her grandson Harlan and Kari Loeb upon their marriage
Mr. and Mrs. Leonard Loeb on the marriage of their son Harlan
Mr. and Mrs. Ronald Bookbinder on the marriage of their daughter Kari
Dr and Mrs. Alan Corre on the engagement of their son Isaac
Mr. and Mrs. Reuben Kahn on the engagement of their daughter Ilana
Mr. and Mrs. Reuben Kahn on the engagement of their son Harley
Rabbi and Mrs. Binyomin Anton on the birth of heir daughter
Rabbi and Mrs. Yakov Anton upon the birth of their granddaughter and upon the engagement of their son Daniel to Hindy Gertzulin of St. Louis
Mr. and Mrs. Larry Graber in Bnei Brak, Israel on the birth of their son
Rabbi and Mrs. Aaron Twerski on the birth of their grandson
Mr. and Mrs. Fred Berkovitz on the birth of their son
Mr. and Mrs. David Berkovitz upon the birth of their grandson

Wishes a refuah shlaima to...

- Mrs. Debbie Askotzky
Mr. Sherwin Benner
Mrs. Sarah Frank
Mrs. Brenda Freidman
Mr. Bill Kesselman
Rabbi Bezalel Mandelman
Mrs. Rose Shappro
Reuven Levine
Rabbi Tsvi Schur

Reaches out to ...

- Mrs. Feige Arenzon-Porter upon the loss of her husband, Mr. Yehudah Arenzon
Rabbi Bezalel Mandelman on the loss of his father Mr. Archie Mandelman
Dr Marshall Benner and Mr. Sherwin Benner on the loss of their mother, Mrs. Rose Benner
The Letwin Family upon the loss their mother
Mr. Nathan Kalman and the Kalman children on the loss of his wife and their mother, Mrs. Sophia Kalman
Mrs. Elaine Appel on the loss of her father
Mrs. Shaindy Pinsky on the loss of her grandfather
Mr. Philip Israel on the loss of his mother, Mrs. Molly Israel
Mr. Al Malkin on the loss of his wife
Mrs. Gilah Saltzman on the loss of her grandfather

Thank you for sponsoring Kiddish...

- Mr. and Mrs. David Berkowitz
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Thank you for sponsoring Shalosh Seudos...

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Mr. and Mrs. Nathaniel Hoffman
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Mr. and Mrs. Chaim Liff
Mr. and Mrs. Todd Miller
Rabbi and Mrs. Yitzchok Ort
Rabbi and Mrs. Yossie Richter
Rabbi and Mrs. Tuvia Torem

Special thanks to...

- Rabbi and Mrs. Tsvi Schur for donating a book cart for the Women's section of the shul
Rabbi and Mrs. Yitzchok Ort for donating a vacuum cleaner, a washing machine and the Sfirah Counting Boards
An Anonymous donor for donating a new laser printer to the Shul
Rabbi and Mrs. Yitzchok Ort for sponsoring the Purim Seudah
Mr. and Mrs. Jacob Weiner for sponsoring the Néilas Hachag

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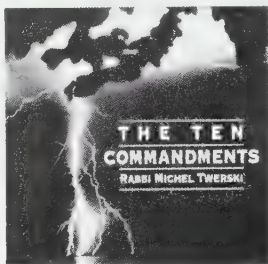
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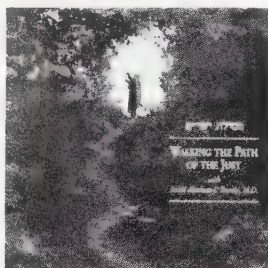


Our Spring 5753 catalogue features four new tape series. The first is the **Ten**

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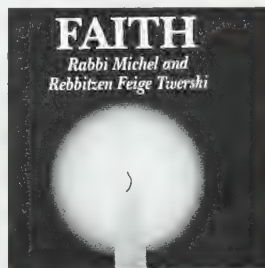
along with great insight into the deeper meaning of the Commandments. Rabbi Michel focuses on topics like living up to our full potential, ridding our lives of all forms of foreign g-ds, the power of free choice, discovering the true meaning and benefits of Shabbos, how to deal with Jewish guilt, the evils of envy, and the art of giving rebuke. They make a very stimulating and powerful set of tapes.



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Mr & Mrs Scott Israel in memory of Mrs Molly Israel

BETH JEHUDAH SHMOOZING...

EXIT-US SPORTS BAR

(Formerly Pharoh and Di's)



The author receiving a transmission from ??

We ate in this restaurant whose ownership had suddenly been transferred in the month of Nissan. The location had also been moved very rapidly in broad daylight. It had previously been a celebrity spot owned by Mia Pharoh and Princess Dianu. They specialized in breads and Middle Eastern foods. It was well known for their plate of egg, bone, bitter herb, lettuce, and haroset. The restaurant made a great deal of money over a seven year period but went into bankruptcy after a subsequent seven year period of difficulty. For 210 years it had been located in a former palace overlooking the Nile River. There was a bar on the top level with a beautiful vista. It was called See Nile Bar, and you could share beautiful memories there.

The new owners, Moses Malone and Hank Aaron, have converted it into a kosher sports bar which for some reason served no beer. The new owners moved the location into a formerly deserted area. The movement was hazardous and highly publicized in the local papyrus, The Red Sea Haggadah. Many of Pharoh's creditors chased the athletes into the sea to grab collateral and recoup their losses, but they all mysteriously drowned.

We ate in this restaurant whose ownership had suddenly been transferred in the month of Nissan. The location had also been moved very rapidly in broad daylight. It had previously been a celebrity spot owned by Mia Pharoh and Princess Dianu. They specialized in breads and Middle Eastern foods. It was well known for their plate of egg, bone, bitter herb, lettuce, and haroset. The restaurant made a great deal of money over a seven year period but went into bankruptcy after a subsequent seven year period of difficulty. For 210 years it had been located in a former palace overlooking the Nile River. There was a bar on the top level with a beautiful vista. It was called See Nile Bar, and you could share beautiful memories there.

We had a reservation right before sundown, but they made us wait 18 minutes. Because of their busy schedules Moses and Aaron only open for dinner eight nights a year. Two of those nights have a special menu starting with the Sea of Reeds Soup. Their specialty is Calf de Golden, formed in a tablet shape. My two came broken, but my dinner partner subsequently received her order in the original shape. They are well known for their kosher buffet of mock blood, mock frog, mock rice, mock beast, and mock locust. It was generally quite good, but there was disagreement about the "mock-locust." This fiber-rich diet often causes a quick Exodus and no idle worship over the food. After this meal I heard one dissatisfied British customer say, "E'gipped me!"

Another specialty is unleavened bread, an under cooked item to which you mysteriously become addicted over an 8 day period. They serve a delicious item called Mannah that somehow tastes just like many other foods and is served by Moses in a beautiful Nile basket.

The Goshen lamb was excellent, cooked with 613 spices that bind well, combining for a beautiful and consistent flavor. I asked Four Questions about the recipe. They followed with Ten Commandments regarding cooking and buying lamb. The new owners have a 40 year lease on the location, so everyone should have an opportunity to make a pilgrimage.

by Shala Shootus
Veteran Beth Jehudah Bulletin
Restaurant Reviewer
(with special thanks to Don Grande)

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	Kollel Study	12:00 A.M.
May 26	Shachris	9:00 A.M.
	Mincha	8:00 P.M.
May 27	Shachris	9:00 A.M.
	Yizkor	10:45 A.M.
	Mincha	7:30 P.M.
	Neilas Hachag	7:45 P.M.
	Maariv	9:30 P.M.

SHAVUOS ALL NIGHT LEARN-A-THAN

Tuesday, 12:00 Midnight, May 25

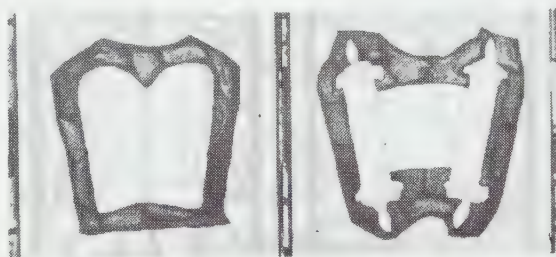
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CANDLE LIGHTING TIMES

May 21	7:40	Bamidbar
May 25	8:00	Shavuos
May 28	6:46	Naso
June 4	6:52	Bahaloscha
June 11	6:56	Shlach
June 18	6:58	Korach
June 25	7:00	Chukas
July 2	6:59	Balak
July 9	6:58	Pinchas
July 16	6:55	Matos
July 23	6:51	Vaeschanan
Aug. 7	7:34	Eikev
Aug. 14	7:25	R'eh

Please note: candle lighting times are advanced because Congregation Beth Jehudah ushers in Shabbos early. For those of you who are associated with the Minyan on a daily or weekly basis, it is prohibited to light Shabbos candles after the congregation has officially welcomed in Shabbos.



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THE COLUMBIA CHEMIST

DEPARTMENT OF CHEMISTRY

NEWSLETTER

SUMMER 1991



Congressman Green, Professor Fine, President Sovern

Columbia Hails Center for Chemical Research

Columbia celebrated the completion of its new, \$41 million Center for Chemical Research at ceremonies on the Morningside Heights campus Friday, January 11, 1991.

Speaking at the ceremonies, President Sovern said the construction of the Center preserves "the outstanding quality we have enjoyed for so long in chemical research. I believe we have created, functionally and aesthetically, one of the most successful buildings at Columbia since the turn of the century. I hope as well that we have set a standard for campus renewal that will help guide other institutions as they update facilities for scientific research."

Construction at the center was aided by federal grants through the Department of Energy totaling \$24 million. President Sovern acknowledged the help of Senators Daniel Patrick Moynihan and Alfonse D'Amato and Congressmen Charles Rangel and Bill Green in supporting the project. Green spoke at the ceremonies, which were held after a tour of the Center.

"New York is represented on Capitol Hill by several leaders of extraordinary vision," he said. The Center is "a direct result of their efforts on behalf of New York and the national interest." Sovern praised Green as a tireless advocate of university-based research since he joined Congress in 1978.

Green said: "This is a magnificent reality. I hope it will accomplish for Columbia, the City of New York and the whole human race everything we hoped for it."

The center provides more than 150,000 square feet of new, state-of-the-art laboratory space for Columbia's chemistry department, which is among the most respected in the world. Six floors of research and undergraduate laboratories are housed in a new addition to Havemeyer.

CHEMISTRY HIGHLIGHTS

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And Havemeyer itself, a nearly 100-year-old original campus building, has been largely rebuilt inside to accommodate seven new floors of laboratories, classrooms, conference and seminar rooms and other facilities.

The space will allow the Department's 18 faculty members to intensify their pioneering research in organic, inorganic, physical, biophysical and theoretical chemistry.

In the past year alone, Columbia chemists designed new compounds useful in cancer therapy, discovered light-activated substances to probe the structure of DNA and revealed fundamental properties of superconducting materials.

As a result of their leading research programs, the faculty have attracted one of the largest per-capita research budgets of any chemistry department in the nation.

Six Columbians--faculty and alumni--have won the Nobel Prize in chemistry. Alumni of the department hold top posts in major industries and universities across the country.

The Havemeyer addition was designed by Davis, Brody Associates and is built of brick and limestone to be in harmony with the materials and architectural features of the 1896 structure by McKim, Mead and White.

Construction of the Center for Chemical Research began in 1984 and was completed in three stages, which included light renovation of an adjacent chemistry laboratory and classroom building, Chandler Hall.

The Chemistry Department teaches 110 graduate students and nearly 1,500 undergraduates and employs more than 50 postdoctoral research scientists and fellows.

In addition, 20 or more senior scientists from around the world visit the department annually, to teach, conduct research, or give seminars.

Alfred Bader Establishes Graduate Fellowship

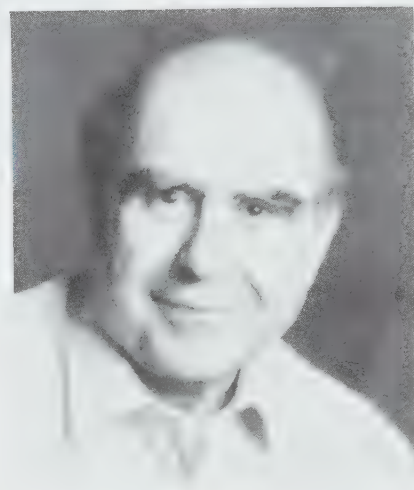
The Department is pleased to announce the establishment of the Alfred Bader Graduate Fellowship for a Czechoslovakian graduate student in Organic Chemistry.

Dr. Alfred Bader, chairman of Sigma-Aldrich Chemical Co., donated \$150,000 to the Graduate School of Arts and Sciences this spring to establish the fellowship, which will be awarded for the first time next year to a qualified Czechoslovakian student pursuing a Ph.D. in chemistry. The Bader Fellow will receive \$13,500 annually for three years.

In a letter to Bader, Graduate School of Arts and Sciences acting dean Paul Anderer wrote, "Your very generous gift will allow us to continue to strengthen our outstanding chemistry department and promote cultural diversity at the University."

Dr. Bader has long been a friend and visitor of our Department and has been seen many times in Chandler, often accompanied by his wife. He has sought close ties with research chemists and has developed associations that provide him the means to learn of and respond to the needs of the community. Two typical questions that he often asks to initiate a conversation are: "How can Aldrich help you?" and "Do you have any interesting new or rare structures from your research chemical inventory that you'd like to sell me to add to my collection?" The first, reveals his desire to maintain Aldrich's role as the world's leading supplier of fine organic chemicals and the second reveals his fascination with the

chemicals themselves as objects of inherent value and interest.



Alfred Bader

Bader founded the Aldrich Chemical Co., a research chemical supply business, in 1951. Aldrich merged with Sigma Chemical Co. in 1975, at which time Bader was named chairman of the new corporation.

Gilbert Stork Receives Chemical Society Award

Professor Gilbert Stork received the American Chemical Society's Roger Adams Award in organic Chemistry June 18, 1991 at the National Organic Chemistry Symposium in Minneapolis.

Stork, the Eugene Higgins Professor of Chemistry, was honored for a lifetime of achievement in organic synthesis. He has devised a host of new methods to build natural products, and he helped revolutionize the field by synthesizing molecules, regio- and stereo-selectively, with control over an atom's precise position and orientation in three-dimensional space.

The Chemical Intelligencer

VOL. 2, NO. 4 / OCTOBER 1998

US \$9.00 / CAN \$12.50

INTERVIEWS:

J.C. Polanyi

F.S. Rowland

"Beckman"
and Beckman

Alfred Bader
and Sigma-Aldrich

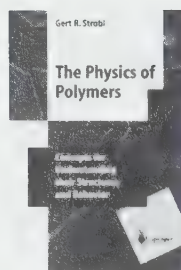
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An Introduction
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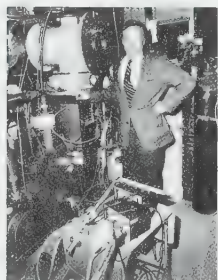
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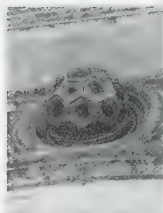
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The Chemical Intelligencer

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LETTER FROM THE EDITOR-IN-CHIEF



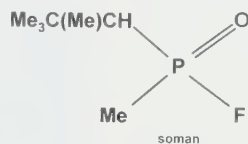
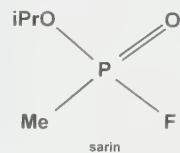
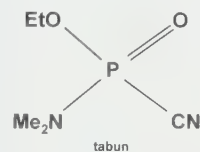
The Chemistry of Functional Groups by Wiley-Interscience is a well-known series (series editors Saul Patai and Zvi Rappoport). The latest addition to the series, which appeared earlier this year, is the fourth volume of the subseries *The Chemistry of Organophosphorus Compounds*, entitled *Ter- and Quinque-valent Phosphorus Acids and Their Derivatives* (edited by Frank R. Hartley). The concluding Chapter 10 (pp. 781–840) of this volume has a chilling title, “The Chemistry of Organophosphorus Chemical Warfare Agents.” With the thoroughness characteristic of the series, the authors of this chapter, R.M. Black and J.M. Harrison, describe not only the chemistry of these agents but also their historical development and review the synthetic, analytical, and toxicological chemistry of the organophosphorus nerve agents. The last section deals with the much needed control of the nerve agents and their analogues under the terms of the Chemical Weapons Convention.

The highly toxic organophosphorus compounds, among them tabun, sarin, and soman, were first synthesized and patented in the laboratories of the infamous I. G. Farben during the late 1930s in Germany. Although 20–50 times more lethal agents than phosgene, they were not used in WWII for fear of retaliation in kind. These nerve gases are potent inhibitors of the enzyme acetylcholinesterase and exhibit high mammalian toxicities by the inhalation route. Their too high toxicity makes them unfit for use as commercial insecticides.

The chapter has an Addendum referring to the terrorist attack in the Tokyo subway system on March 20, 1995. The terrorists released sarin into the subway at several locations, killing 10 people and injuring more than 5000. Ton quantities of the precursor chemicals were subsequently discovered in a warehouse.

There is a single reference cited in the Addendum, and it is D. Van Biema's article in *Time* magazine (April 3, 1995). Of course, it was not only *Time* that carried accounts of the terrorist attack. There was, for example, a detailed description of the chemistry of sarin and its biological effects in *The Economist* (March 25, 1995). It is an ominous sign, though a sad necessity, when a newsmagazine is quoted in a scientific monograph, instead of scientific news making the newsmagazines. Let us hope that there will not be any more occasion to reverse the conventional order for such a reason.

Sincerely,
István Hargittai

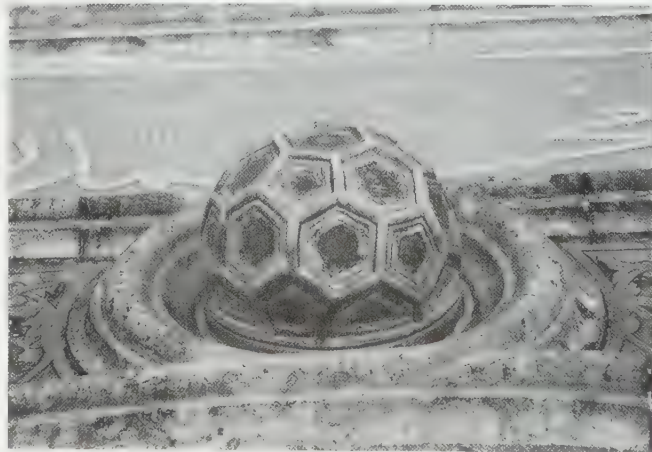




The Chemical
Tourist

Buckminsterfullerene in the Sarayi

MAGDOLNA AND ISTVÁN HARGITTAI



On a recent visit to Istanbul, we noticed a truncated icosahedron sticking out of the wall above the entrance into the "Hall with the Fountain" of the Topkapi Sarayi. The photograph here shows the entrance, and the close-up shows what for every chemist today is obviously an ancient model of the C_{60} molecule.

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Interview

John C. Polanyi

I S T V Á N H A R G I T T A I

Dudley R. Herschbach (b. 1932), Yuan T. Lee (b. 1936), and John C. Polanyi (b. 1929) received the 1986 Nobel Prize in chemistry for their contributions to the understanding of the dynamics of chemical elementary processes. Recently I recorded a conversation with Professor Herschbach in Boston and with Professor Polanyi in Toronto.

Dr. Herschbach is now Frank B. Baird, Jr. Professor of Science at the Department of Chemistry, Harvard University, Cambridge, Massachusetts, and Dr. Polanyi is University Professor at the Department of Chemistry, University of Toronto, Toronto, Canada.

Because of scheduling difficulties, the meeting with Dudley Herschbach took place in a noisy lobby at Logan Airport in the evening of July 23, 1995. The transcripts of our conversation have not been finalized yet, and hence only a brief summary is given here (see box). The location of the conversation with John Polanyi, on Tuesday, August 1, 1995, was his quiet office but his schedule was only slightly less busy than Logan Airport. However, the conversations were very pleasant and informative in both cases. The interview with Professor Polanyi is augmented here by the brief speech he gave at the Stockholm City Hall on the occasion of the Nobel Prize ceremonies in December 1986.

ISTVÁN HARGITTAI (IH): Let's jump in at the middle. What's the relationship between reaction dynamics and molecular structure?

JOHN C. POLANYI (JP): I wish I knew. The beginnings of reaction dynamics, in which I was involved, hardly required penetrating insights into molecular structure, since the rules were being established for reactions in which an atom attacked a diatomic molecule. The type of question being asked was, does the atom approach the diatom along the axis of the two atoms or at right angles to that axis? What sort of forces does the atom feel, as it approaches? Is it immediately trying to climb over an energy barrier? When

does it start to feel some attraction, as the new chemical bond begins to form? In answering these questions, one must understand the structure of the *transition state*; it simply isn't enough to look at the structure of the molecule under attack. In fact, whatever the reaction, we directed our attention to the attacking atom and to the two atoms that constituted the bond under attack. The first thing we did was to write



People laughed, because that was how Dudley Herschbach, Yuan Lee, myself, and many others in the dynamics community routinely began our lectures.

IH: Does the reaction dynamics approach now extend to complicated molecules?

JP: Yes, it is beginning to, but the simple framework of $A + BC$ remains useful. Our finding was that most of the interesting things were related to the bond that was being formed and to the bond that was being broken. If you start to hang complex structures on the attacking species or on the species under attack, the focus of your attention remains on the atoms that comprise the bond being formed and those that comprise the bond being broken. As reaction dynamics invades organic chemistry, where more intricate rearrangements are observed, this will cease to be so true.

IH: At the end of your Nobel lecture, as if projecting into the future, you mentioned two directions. One was *transition-state spectroscopy* and the other was *surface-aligned photochemistry*. That was nine years ago. Was this a prediction?

JP: It was in a sense, because both these fields were very much in their infancy. The question was, how far would they go? As it turns out, both of them are maturing today in a very satisfying way.

I was involved with both early on. In the case of transition-state spectroscopy, we had the idea that we could see the very short-lived intermediate between reagents and products by means of something like line broadening. The spectral line broadening would be due to the strong repulsion for a millionth of a millionth of a second (10^{-12} s) between the pair of particles that were in the process of separating as reaction products. So we looked at spectral lines in chemiluminescence and found very great broadening, that is to say, what are called "wings" on the lines emitted in a chemical reaction that was forming electronically excited atoms.

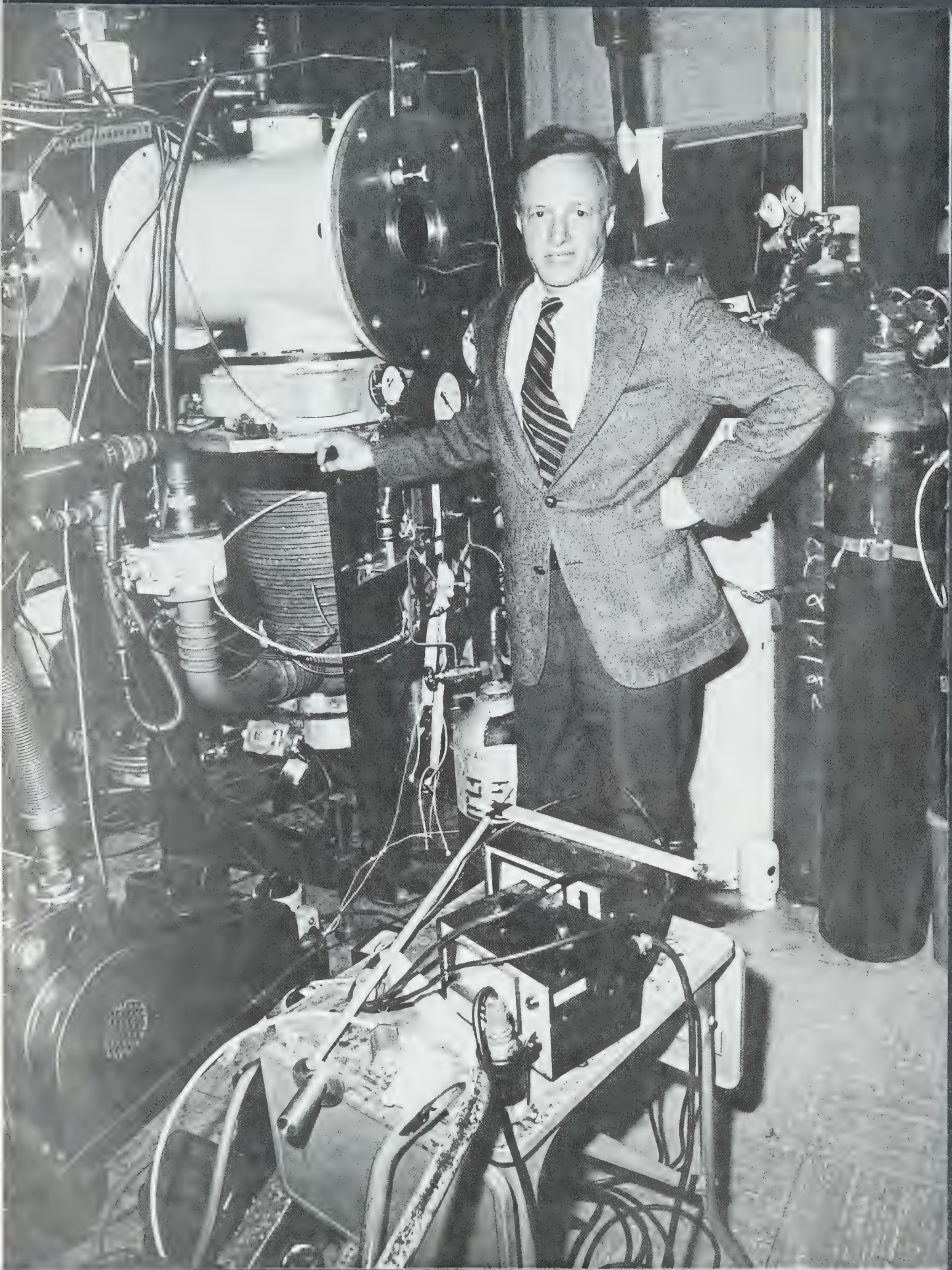
John C. Polanyi in the lab.

University of Toronto.

about 1982.

Photos courtesy Professor

John C. Polanyi.



This was a beginning to a field that has matured in surprising and marvelous ways. One way is due to Neumark and his co-workers at the University of California, Berkeley, who obtain the transition states of chemical reactions not by bringing the reagents together but by first forming a negative ion incorporating them and then removing an electron. It's a beautiful method. It plunges you right into the heartland of a chemical reaction. Another approach is well advanced in the

tween reagents and products. As it turned out, it could be done in much better ways than were initially dreamed of.

So much for transition-state spectroscopy, a field in which I am still enthusiastically involved.

At the same time I am heavily involved with what we call "surface-aligned photochemistry." There are quite a number of machines in my laboratory devoted, as in the past, to getting information about the motions of newly born reaction products. Previously, however, we were

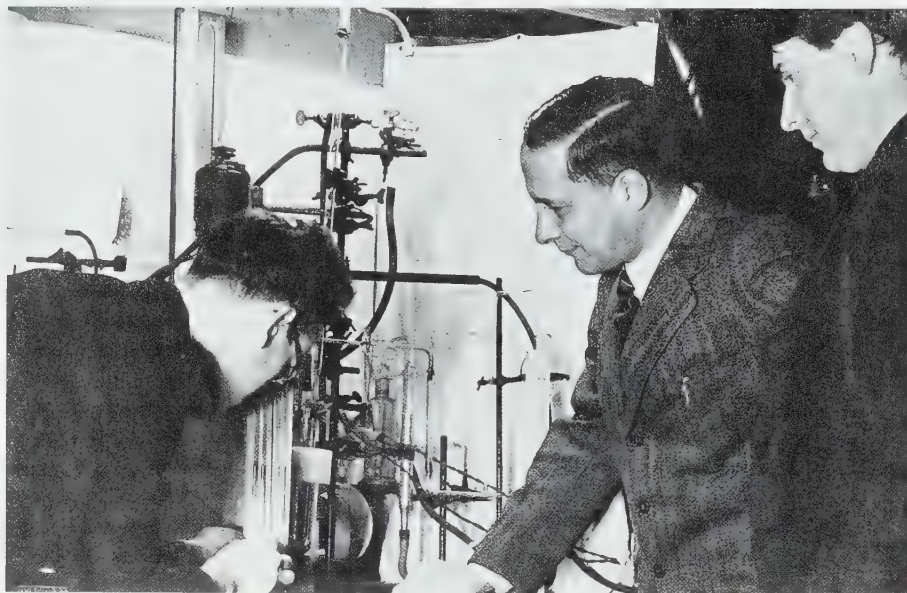
on the stage. If you look at their unfolding motions following this ordered start, it should now be easier to infer what they did in the transition state, which is the most mysterious and interesting stage in a chemical reaction.

IH: Do calculations parallel the experiments?

JP: Our work has always included experiment and theory proceeding in parallel. We're just writing a paper which is part experimental, part theoretical, describing how photofragments leave the surface after a photolysis event. In the same paper we report the calculations (the theory) of the initial geometry of the molecular species, which we then check experimentally with polarized infrared spectroscopy. We then simulate the action of the light theoretically by considering the effect of changing a bond into an antibond. Our theoretical molecule flies apart. Next the classical and quantal equations of motion are used to predict the outcome. Finally, and crucially, we compare the computed outcome in terms of energy distributions and angular distributions with those we measure in the lab. This to-and-fro between theory and experiment has been typical of our *modus operandi*.

IH: What molecules are involved in such a study?

JP: The simplest ones are hydrogen halides. We just had a discussion in this room, before you came in, about hydrogen iodide adsorbed on lithium fluoride and on sodium fluoride. The crystalline surface of lithium fluoride is an alternating pattern of big F^- ions and little Li^+ ions. Even a perfect crystal will have, therefore, a rather rough surface. When we change our surface to sodium fluoride, we are changing the unit-cell size. In each case we adsorbed the same molecule, which is HI at the moment. The HI molecules try to get comfortable on the surface by bringing the iodine



Michael Polanyi (John's father) in his lab about 1940 with Dr. A. G. Evans on his right.

laboratory of Zewail and co-workers at Cal Tech and involves the use of femtosecond lasers to actually clock the reaction as it passes through the transition state. Again a fabulous development. Neither of those things was anticipated.

The way new fields are born is as a consequence, first of all, of a surmise that there is something new that can now be done. In the case of transition-state spectroscopy, the surmise was that one could study the interaction of light with the very short-lived collocation of atoms that we are talking about here. These are subpicosecond collocations which constitute the successive intermediate configurations be-

getting some evidence about the molecular dance in cases in which the dancers could come onto the stage in any configuration they wished; that's what happens in gas-phase chemical reactions. But if you start with your reagents in the adsorbed state on a single crystal, the forces that adsorb them also order them. Then you trigger the reaction by sending a pulse of light through the ordered species. That's usually an ultraviolet laser pulse. The reaction now starts to unfold, that is to say, the dancers start to engage in their dance. The novelty is that they have started their movements this time from defined positions, marked by chalk

over Li', to maximize attraction. They also try to bring their hydrogen end over F', and that's an operation that involves them in making compromises, since the fit is imperfect as with a grown-up riding a child's bicycle. Then, as one increases the coverage, the adsorbed HI molecules become aware of each other's presence, and the alignment is affected not just by the adsorbate-substrate forces but by adsorbate-adsorbate forces.

One of the variables we use in order to change the pattern of

analyzing the photoreaction. More interesting still, this is geometrical catalysis, brought about by aiming things differently. It is a form of catalysis that should be of particular interest to people in the dynamics community, like myself. We have been discussing the effect of different arrangements and alignments of molecules on chemical reactions for decades. Now we are developing a means of manipulating our reagent species by adsorbing them on different surfaces and

is, can one get them to listen? I would claim that if you make a sufficiently cogent argument, they will have to listen. I think we scientists have some training in organizing our thoughts and in trying to persuade difficult audiences.

In fact, our colleagues constitute just such an audience. When you go to a scientific meeting with a new idea, you don't expect people to applaud. What they do is to tear it apart. That's their function. In science we arrive at the truth through an adversarial dialogue. So we are used to having to make a case, and shouldn't be frightened to do so.

In the past, it is true, we were frightened to speak out on larger issues. We felt that we'd be trafficking in our reputation as scientists in order to get a hearing and that as a result we could bring science into disrepute, since people could say that we had abused our credentials.

As with most criticisms, there is something to this one. We do have to be careful about this. We have to explain what our expertise is.

But were we to take the opposite view that science is a sort of priesthood and that to keep it in high esteem we must keep it pure by ensuring that no scientist or group of scientists meddles in things outside their own discipline, then we would be involved in a different sort of irresponsibility.

The fact is that science is having a colossal effect on the world scene, and as a result we cannot responsibly opt out of the debate on world affairs. Earlier today, I had somebody in here who wanted to talk about the fiftieth anniversary of the dropping of the first atomic bomb in Japan. I was 16 in 1945 when that bomb was dropped. Though it came at the end of a huge and terrible war, it was a transforming moment in other respects, too. My own thinking was



John C. Polanyi, Michael Polanyi, and Eugene P. Wigner around 1934, on the lawn of the Polanyi home in Didsbury Park, Manchester, England.

adsorbate is the nature of the substrate, but it's a pain in the neck to change the substrate. Another variable, as I was saying, is the coverage. It's very common in surface science for molecules at low coverage to lie down and then at higher coverage, as they start to crowd each other, to stand up. If these molecules are the reagents for some photoreaction, then, with changing coverage, they change their relative orientation. Why does this matter? Because we have a basis for expecting the outcome of the chemical reaction to change with orientation, and hence it must change between low coverage and high.

In a sense the crystal is *cat-*

with different coverages on a given surface so as to produce different alignments and arrangements at will.

IH: Apparently, you are a public figure in Canada. You have a busy waiting room with magazines like in a dentist's office. What's your experience in communicating with people outside the scientific community?

JP: Perhaps you'll concede that my magazines are better than most dentists'?

You are right that I've been engaged in various political debates, such as those sponsored by Pugwash, for over 35 years. My experience is that one can readily get access to senior politicians. The real question



Michael Polanyi addressing the Congress of Cultural Freedom in Milan about 1956 with French political scientist Raymond Aaron.

deeply affected by it, as it should have been. It transformed, for example, the relations between nations. But it was only one of a whole series of technological changes, to which we scientists have contributed, that have changed the world. It would be irresponsible, therefore, for us not to be involved in the debate that follows.

Often, all that we have been able to contribute has been technological solutions. But even these can have tremendous impact. I have, for example, been involved in a lot of arms control discussions with Russian scientists. They may perhaps seem peripheral now, but at the time two colossal adversaries were threatening each other and the world. The danger of the arms race was very real. Nonetheless, the political community, our leaders, were saying that we can't do anything about it for a whole lot

of technical reasons. It was necessary for the technical community to say quite specifically, "yes, we can." If we fail to stop testing of nuclear weapons, or if we fail to reduce the number of nuclear weapons, it's not because it's impossible to verify these things. We explained in some detail how we could do it. If then we *didn't* do it, it was because we didn't want to. By clearing the way on the technological level, one has an undoubted influence on the way history unfolds.

IH: Let's speak about your teachers. Was your father your teacher?

JP: Formally he was my teacher for one year. I entered Manchester University in 1946 when I was 17. He lectured to me in the first year. That was the last year he lectured in science. Then he transferred to philosophy. He also taught me a great deal in conversations despite my many absences away from home, first in boarding school and then for three years as an evacuee in Canada.

Most of what he taught me about physical chemistry I learned at one remove from him. I was a student for six years in the Department that he had shaped in Manchester. My professor Meredith Evans, was one of his favorite students, and my Ph.D. supervisor Ernest Warhurst was another student of his. What I learned from his students gave me a sense of scientific values—where the field was going, what were the important questions to tackle, and, to a degree, how to tackle them. Without those things I would have been lost. But it happens that I didn't get them directly from him, but from people who owed a lot to him.

IH: When you speak about transition-state spectroscopy, it seems to me to have a close relationship to Michael Polanyi.

JP: It does, of course, but I don't

think that's the closest I got to his interests. He would have thought it far-fetched that one might get light to interact with this subpicosecond entity which is neither reagents nor products. Though it was not first done with lasers, it was the existence of lasers—of which of course, he never dreamed—that got people thinking about "seeing" the transition state.

I find myself now at the age of 66 engaged with great excitement in some novel experiments in which we are trying to look at transition states for sodium-atom reactions. It is this project that brings me eerily close to my father's interests of 1929 and subsequent years.

When I was being conceived (I was born in 1929), my father was establishing himself as the most perceptive interpreter of sodium-atom reactions, which he understood as being in a sense the simplest of all reactions. They are so simple that even a physicist can understand them. The sodium, which is easily ionized, comes up to a molecule with high electron affinity, and an electron jumps across. Then the positive sodium ion is drawn to the negative molecule. Because the electron hops a large distance, my father coined the term "harpooning" for this. It is also called this because the positively charged sodium hauls in its negative catch. This is a uniquely simple reaction. It is different from most reactions which are fascinating because they are *not* sequential events. Harpooning reactions can however be described as sequential. Step 1, reagent approaches; step 2, the harpoon jumps across; step 3, the alkali fisherman pulls in the catch. The end.

Today, in my lab, we are finding that it is possible to access the harpooning event, not by taking the reagents and bringing them together, but by

TOP: Michael Polanyi,
Professor of Physical
Chemistry, Manchester
University, around 1937.

BOTTOM: John C. Polanyi
during the interview.

(Photo by I. Hargittai.)



forming a loose complex which is in the configuration of the transition state, that is to say, by starting in the middle of the reaction. That is what we are currently doing. And that is indeed a lineal descendent of my father's interests.

I am, however, only one of many who have seen the extraordinary possibilities offered by harpooning reactions. For example, Dudley Herschbach began his life as a dynamicist by studying that type of reaction. One should also add that my father himself was part of a continuous progression. What drew him to sodium reactions was that Fritz Haber had been studying an unexplained chemiluminescence from them. This was in Berlin and my father was in Haber's Institute as a young researcher. The history, as is usual in science, constitutes an unbroken chain.

IH: Was he the determining influence in the direction you took in science?

JP: He personally wasn't. But where I trained for six years was. If the question is whether he was the determining influence in my going into science, then, yes, but I should qualify that answer. At the time when I learned most from my father, in my late teenage years, his interests were even livelier in nonscientific fields than in scientific ones. He had another son, George, who went into the humanities, equally under his

influence. I could just as easily have gone into economics or philosophy or theology and have ascribed it to my father's stimulus. He was, of course, delighted to see me go into science, just as he would have been delighted to see me go in many other directions.

Perhaps I am being disingenuous. I can only say that if he steered me toward science, I didn't notice.

IH: How did he make the transition from physical chemistry to philosophy? Were you a witness to this?

JP: We seem destined to discuss transition states. Yes. I witnessed this one directly. I got back to England right at the beginning of my fifteenth year, and until I was well into my twenties I saw a good deal of my father. That was the time, beginning in 1944, when he was making the transition. The fact that he made that transition isn't so surprising. There are a lot of scientists who have started to ruminate about how discoveries are made, how people learn anything, and the role of logic in this as compared with faith. And all this was of interest to him too.

What is striking, in my view, is the originality and impact that he had in his new field of epistemology, the theory of learning. He would have said confidently that what he did in that area was much more important than what he did in science.

I have a sense of wonder at all he did in science, and yet I believe he may easily have been right that his contribution to epistemology will turn out to be more lasting. The sales of his books and the interest in his ideas continue to be great. Eventually his name will, of course, be forgotten, but his philosophical ideas will live on as a significant contribution to the development of philosophical thought.

What is remarkable, then, is the quality of the contribution he made in his decades as a philosopher. Actually, his first book on a nonscientific theme was being conceived in the 1950s when he attacked the Russian economic system and at the same time confronted the leading British social scientists of his day, Sydney and Beatrice Webb, who'd published a learned volume explaining how the Soviet five-year-plan constituted a superb innovation and was bringing prosperity to the USSR. My father took this thesis apart in a series of essays, which became a book in 1940, that went far beyond economics and inquired why it was that British liberals, the so-called Fabians, were so careless of the freedoms that they enjoyed; the book was called *The Contempt of Freedom*. It was an influential book and a prescient one. It is forgotten today. His best known book is, instead, *Personal Knowledge*.

As with new scientific theories, my father's thinking was initially rejected by the professionals. He was not embraced by the philosophers of his day, who felt that he was an ignorant outsider. This lasted for a large part of his time in philosophy. The people who paid attention to his work were closer to theology. This was in part because the philosophy of the time was "linguistic analysis." That brand of philosophy, cen-





DUDLEY R. HERSCHBACH obtained his Ph.D. in chemistry at Harvard with E. Bright Wilson, in rotational spectroscopy. Since he had found chemical kinetics

challenging and had heard, in a physics course, about molecular beams, he decided to use them to study molecular reactions. The idea was to cross two molecular beams in vacuum; though most of the molecules would miss one another, those that did actually interact would do so in a collision, and the free-flying products could be detected. Then it would be possible to work backward from the information on velocity and angle, and, using spectroscopy, the rotational motion and the vibrational motion of the products could also be studied. All this information allowed Dr. Herschbach and his students to learn about the forces that govern the elementary act of making and breaking a bond in a single collision.

In the very early days, these techniques were used to study alkali reactions, which seemed to most chemists to be completely unrepresentative, just an eccentric family of reactions. Dr. Herschbach and his students learned, however, that there was an enormous variety of reaction dynamics even within that family of reactions. Also, they could relate reaction dynamics to electronic structure.

They kept developing techniques which made it possible to detect ever diminishing intensities, ultimately, just one ion per second. After developing their so-called supermachine, they studied reactions like $H + Cl_2$. They found that the scattering angles and intensities of HCl were, except for the scale, almost identical to those of KI from the reaction of $K + CH_3I$. Dynamically speaking, the two reactions were the same, but the usual notation would not reveal their similarity.

In the case of $K + CH_3I$, Dr. Herschbach and his students confirmed the picture that Michael Polanyi had already had in the 1920s. The target molecule, CH_3I , is electrophilic; the alkali atom comes near and transfers an electron, which goes into the antibonding sigma orbital (only the terminology is different today from the 1920s), and that's the same orbital that is excited in photodissociation of CH_3I . There is a very strong repulsive force between the carbon and the iodine in the methyl iodide. So it starts coming apart. The electron affinity of iodine is far greater than that of the methyl group so the electron is associated with the iodine, the species falls apart, and the alkali cation comes in to combine with the iodide ion. The characteristics that are measured, the velocity

of the product and its angular distribution, are determined by the strong repulsive force that is released when the electron enters the antibonding sigma orbital.

In the case of $H + Cl_2$, there is no electron transfer, but, in terms of the molecular orbitals in the transition state, the frontier orbital, in Fukui's terminology, receives the third electron, and this orbital has a node between the two chlorine atoms; in other words, it is antibonding. There is strong repulsion between them, and it's really the same reaction even though the full electron is not transferred.

There is then the *principle of orbital asymmetry*. In the reactions of ICl , the two ends of ICl differ substantially in electronegativity. It was found that hydrogen atoms, methyl radicals, oxygen atoms, or other halogens, when they react with ICl , prefer the iodide and not the chloride, even though the bond to chloride is much stronger. The principle of orbital asymmetry explains this because, looking at the molecular orbitals of ICl , one finds that the orbitals involved in the reaction are antibonding and are mostly iodine orbitals. The bonding orbitals are mostly chlorine orbitals. Whether the reagent wants to take an electron out or put one in, it deals with the iodine. This explains the reactions of ICl with many different reagents, and a lot of other reactions in analogous situations.

Michael Polanyi was an early influence on Dudley Herschbach. The first time they met was in 1962 when Michael Polanyi came to Berkeley to give some lectures. In contrast to John Polanyi, Dudley Herschbach is the first scientist in his family. However, he doesn't think this was a handicap in any way. He grew up in Campbell, California, not far from San Jose and not far from Cupertino, which is very famous now as the center of Silicon Valley. He had a wonderful chemistry teacher in high school. From high school, he went on to Stanford and was very much taken by its intellectual atmosphere.

Nowadays Dr. Herschbach is very concerned about the general public's apathetic or antagonistic attitude toward chemistry. He hears from people what a terrible time they had with chemistry in high school. We should be able to do something about that. There is no reason why chemistry should be a miserable experience in high school. Especially with computers today, we ought to be able to make chemistry much more palatable and much more appealing.

Dr. Dudley Herschbach on July 23, 1995.

(Photo by I. Hargittai.)

Nobel Banquet, Stockholm

December 10, 1986

by John C. Polanyi

Your Majesties, Your Royal Highnesses, Ladies and Gentlemen, late in his career as an actor Richard Burton was asked by an interviewer what it was in his work on the stage that had given him the keenest pleasure. Burton thought for a while, and then replied: "the applause."

That is not so ignoble a confession as it sounds. The applause is a celebration not only of the actors but also of the audience. It constitutes a shared moment of delight.

In some countries the actors are permitted to participate in the applause. This is what, by mutual agreement, the three of us—Dudley Herschbach, Yuan Lee, and myself—wish to do tonight.

Alfred Nobel in inaugurating his prizes, and thereafter Your Majesties, the Nobel Foundation, and the people of Sweden in giving them this elegant and open-hearted expression, have shown the world how to celebrate.

What you have undertaken to celebrate is, of course, the truly remarkable aspect of this occasion. I know of no

other place where princes assemble to pay their respects to molecules. Yours is a rare enthusiasm, expressed with such a degree of conviction that the world has come to share it.

When, as we must often do, we fear science, we really fear ourselves. Human dignity is better served by embracing knowledge.

We three have known each other for decades. Now, because of you, we regard one another with a new sense of wonder. Because of you, our wives hesitate for just an instant before summoning us to do the dishes. Thanks to you, the wider community of reaction dynamicists, who share our interests and have contributed in a vital fashion to the development of this field, declare themselves proud.

We applaud you, therefore, for *your* discovery, which has made a memorable contribution to civilization—I refer, your Majesties, and our Swedish hosts, to the institution of this unique prize, for which we, in the company of many others, thank you.

tered on the study of the structure of language, passed. I don't know whether my father contributed at all to its passing. It is an interesting question. Whatever the case, there followed a school of philosophy far more friendly to his ideas.

IH: Do you share his interest in philosophy?

JP: Just as a human being; not as a philosopher. I have no qualifications or ambitions in that area. It was a very brave and extraordinary undertaking on his part to do something so ambitious in the realm of philosophy. Unless you read widely and deeply, you are vulnerable to attack. But he did read widely and could withstand a skeptical and at times hostile audience.

IH: It wasn't only Michael

Polanyi who made the name of Polanyi famous. It was a very extraordinary family in Hungary. Are your children aware of their family background?

JP: They are well aware. The spirit of curiosity and creativity is very evident in them. Our daughter is a journalist and TV producer (in science, to her surprise), and our son has done a lot of things starting with science and leading into the heartland of politics and social science.

IH: Earlier you mentioned that your father shaped his department in Manchester. Have you shaped your department at the University of Toronto?

JP: No I haven't. The structure of science in the academic world is totally different here. In England, as on the continent,

the Head of the Department shaped the interests for the whole department. That's not the case here. Nobody who has worked with me since I've been here, starting in 1956, has been appointed to a position at the University of Toronto. There is no "School." It's not like that. But I do have students in other places working on things that had their origins in interests they encountered while working in this laboratory. I'm happy about that.

Whatever the structure of the academic community, one expects one's influence to be fleeting. What people hope for is that this fleeting influence will, on balance, be positive. Perhaps it is as well that they never find out.





Interview

F. Sherwood Rowland

I S T V Á N H A R G I T T A I

The 1995 Nobel Prize in chemistry was awarded to Paul J. Crutzen, Mario J. Molina, and F. Sherwood Rowland "for their work in atmospheric chemistry, particularly concerning the formation and decomposition of ozone." What follows is a conversation with Professor F. Sherwood Rowland (b. 1927), who is at the Department of Chemistry of the University of California at Irvine. The conversation was recorded on February 22, 1996, in Professor Rowland's office on the Irvine campus.

ISTVÁN HARGITTAI (IH): Two years ago I was attending a meeting on fluorine chemistry in Yokohama and there was a special session on chlorofluorocarbons. Officials flew in from Washington and London, and a government representative came from Tokyo. They gave beautiful speeches about all the regulations, but they only considered North America, Western Europe, and Japan. I was rather puzzled by this lack of concern about the rest of the world.

F. SHERWOOD ROWLAND (SR): The chlorofluorocarbons are an adjunct of affluent society. Take the automobile, for example. Automobiles are not very numerous in Third World countries. To have an air conditioner in the automobile is even more a sign of an affluent society. The aerosol propellants, hair sprays, deodorants, or the cleaning of microelectronics—all these products are driven by the First World. So if you control production in Germany, in France, in Italy, in Japan, in the United States, and in a few other countries, you have taken care of about 95 to 98% of all the production.

IH: How did the original realiza-

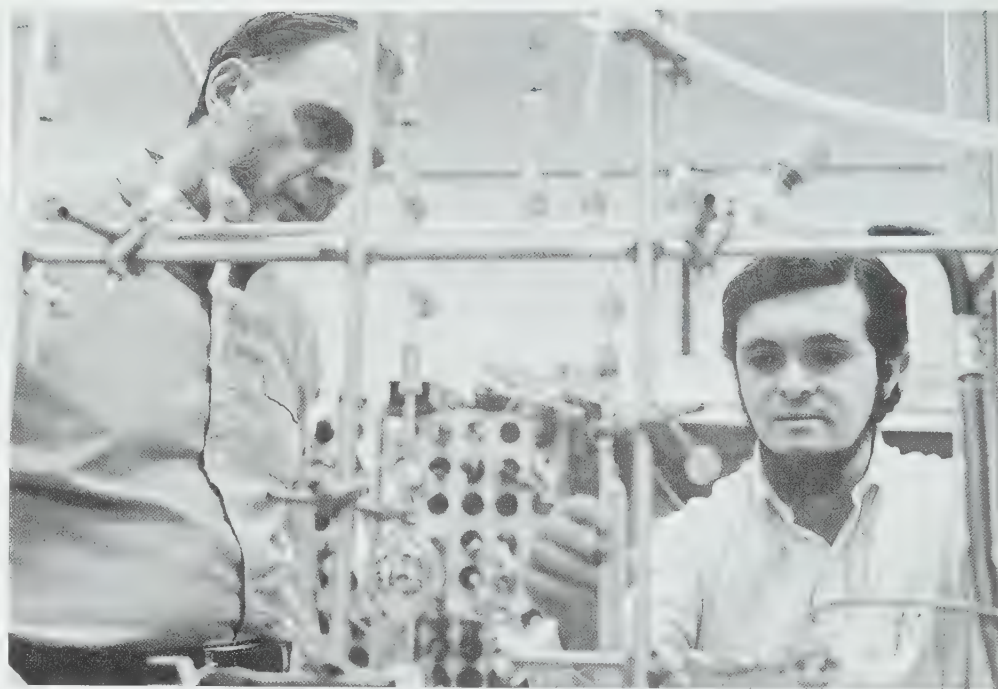
tion of the hazards of chlorofluorocarbons come about?

SR: The philosophy of scientific research that I picked up from my Ph.D. supervisor, Willard Libby, famous for carbon-14 dating, was that the excitement and the fun in science comes from doing new things. There are two phrases in the English language, "in the groove" and "in a rut," which have physically exactly the same meaning but one means that things are going very well and the other means that you have trapped yourself into doing the same thing over and over again. The boundary between getting into the groove of really understanding something and then pounding on it too long is not very sharp. The first time you do an experiment, you don't have quite the right experimental apparatus; the next time you improve it, and the third time you really get it done right. But the tenth time you don't really have to do the experiment because you think you know what the result should be. If that's the case, then it's not much of an experiment anymore. So the problem is how do you stay in the groove long enough and get out before you are in a rut. I made a

conscious effort from the beginning of my career to think about it every six or eight or ten years and strike off in a new direction without necessarily giving up what we were doing before. My original training is as a radiochemist. Radiochemistry for us meant looking at the chemical reactions of atoms that are produced in nuclear reactions—"hot atom" chemistry. Much of it turned out to be done with tritium atoms that are produced in thermal neutron reactions with either helium-3 or lithium-6. The tritium atoms that come out of those reactions have in one case 192,000 electron volts and in the other case 2.7 million electron volts. So they have an enormous amount of energy, and nothing can stop such a tritium atom in a collision with a molecule. However, when the atom has lost most of its extra energy, a molecular collision can leave the tritium bonded to some other atoms in the form of a stable molecule. If you look at the tritium atom after that collision, you are going to see its last collision, the one out of which it formed a chemical bond. The big uncertainty is just how much energy did the tritium atom still have when it entered that final collision. Because the atom frequently has a few electron volts of energy then, the name "hot atom" became attached to the process. Over a period of time we put these atoms in contact with various organic molecules and looked at the physical organic chemistry of those reactions. The first experiment was done with crystalline glucose, and we found that the energetic tritium atom was able to substitute for a hydrogen atom bonded to carbon in glucose, and did so with retention of configuration; that is, it came out as radioactive glucose, and not some other isomeric sugar. This substitution reaction was previously unknown and is still essentially unexplored. You

F. Sherwood Rowland during the interview in his office at the University of California at Irvine, on February 22, 1996. (Photo by I. Hargittai.)

F. Sherwood Rowland and Mario Molina back at the time of their working together in Dr. Rowland's lab in the Department of Chemistry, University of California at Irvine. (Photo courtesy Professor Rowland.)



don't expect hydrogen atoms to substitute into a carbon skeleton, unless the hydrogen atom has a very large amount of energy. Later on, we did this with methane and showed that the activation energy threshold was about 1.5 electron volts for a tritium atom substituting into methane. If you react thermal hydrogen atoms with methane, what you'll see is that a thermal hydrogen atom pulls off an atom of hydrogen to form H_2 . But if the atom has enough energy, it can also trigger a substitution reaction instead. My first tritium experiment was at Princeton. Then I moved to the University of Kansas in Lawrence. In the analysis we hooked up a proportional counter to a gas chromatograph, and did radio gas chromatography. We measured the radioactive yields of the various species that would come out. That was going well. The first publication on the hot atom chemistry of tritium was in the mid-1950s. It was almost my first publication out of graduate school, and it appeared in *Science*. As a result, the Atomic Energy Commission (AEC) came to

me and said, "we would like to support your work." My research support from the AEC started when I went to Kansas in 1956.

I was raised in Ohio and found the Midwest to my liking. I graduated with my Ph.D. in 1952 from the University of Chicago. I went to Princeton as an Instructor that fall and was an Instructor for four years and then went to the University of Kansas as an Assistant Professor in 1956. My situation was also complicated by the fact that when the AEC approached me in 1954, the department chairman at Princeton said no to AEC research support—he said I was too young to have independent support. Then the University of Kansas made me an offer and Princeton matched it—in fact, they bettered it. But I didn't like the negotiations—that they would do for you under pressure what they would not do for you on its own merit—and so I went to Kansas. Kansas had built a lot of space specifically for a radiochemist, and my AEC project started there.

Kansas was a very fertile place for me; I had a lot of good

graduate students, and we had a lot of research freedom. I stayed there for eight years and left as a Full Professor in 1964 to come out here to Irvine. This is my 32nd year here at U.C.I. The campus didn't take students until 1965; my main job as founding chairman was to have a functioning department in one year.

In the early 1960s I decided that it was time to do something different, so we went into photochemistry. We were taking advantage of our special capabilities in radio gas chromatography, using radioactive compounds in the experiments. First, we took something that we believed was very well understood, and that was the reaction of methylene with hydrocarbons. It seemed to me that there would be some advantages to studying what happened when you labeled the photochemical fragments with isotopes so that you could see what could not be seen before. However, it turned out that methylene wasn't as well understood as we first thought. When we looked into it, there

were two review articles within a couple of years of each other in the early 1960s, one of which said that methylene was one of the most reactive substances anyone has ever dealt with, and the other one said that methylene was extremely inert. Both of those turned out to be correct. The first one was describing singlet methylene, and the second was describing triplet methylene. As it turned out, with nearly all of our methylene experiments, the most interesting result would not have been seen if the methylene were not radioactive, if we couldn't have traced it isotopically.

Then in the late sixties we started doing some radioactive chlorine and radioactive fluorine experiments. Our gaseous inert source of tritium was the neutron bombardment of helium-3. However, the nuclear reactions for creating radioactive chlorine or fluorine started with target atoms of the same element. Thermal neutrons react with chlorine-37 to make radioactive chlorine-38, and fast neutrons make radioactive fluorine-18 from stable fluorine-19. We were looking for inert sources to hold the stable chlorine-37 isotope, and one of them was monochlorotrifluoromethane, $CClF_3$. We knew it wasn't reactive with most thermal species. However, we actually found that an energetic chlorine atom could react and replace a fluorine atom or replace the chlorine atom, in each case leaving a radioactive molecule. Often, the substitution process left the molecule sufficiently excited that it would decompose into fragments. But most of the radioactive chlorine atoms became thermalized.

At the same time I had been chairman of the Irvine Chemistry Department from the time of my coming here in 1964, and in 1970 I decided that six years was enough, and I would return

to full-time research. That autumn I went to a meeting in Salzburg in Austria concerning the environmental applications of radioactivity. I didn't have any research of that kind at the time and was looking to see if there was anything that might interest me. There were two outcomes from that meeting. One was that I shared a compartment in the train from Salzburg to Vienna after the meeting with a man from the Atomic Energy Commission, William Marlowe. His duties included organizing meetings for the AEC to cross-fertilize meteorology and chemistry. The AEC was, of course, interested in applications of isotopes, and this is why they were supporting my research. They also had radioactive fallout in the atmosphere, and that's probably why they were holding these meetings. They needed to know more about the atmosphere, and one way of doing that is to get more chemists interested in it. Marlowe found out two things. One was that I was being supported by the AEC, and by that time, 1970, I was just going into my 15th year of AEC support. It started in 1956 and stopped in 1994, so it lasted 38 years. My support has survived two major changes in the Agency during that period, but the contract essentially went on and survived my transfer from Kansas to Irvine. It was excellent support, and they gave me a lot of freedom.

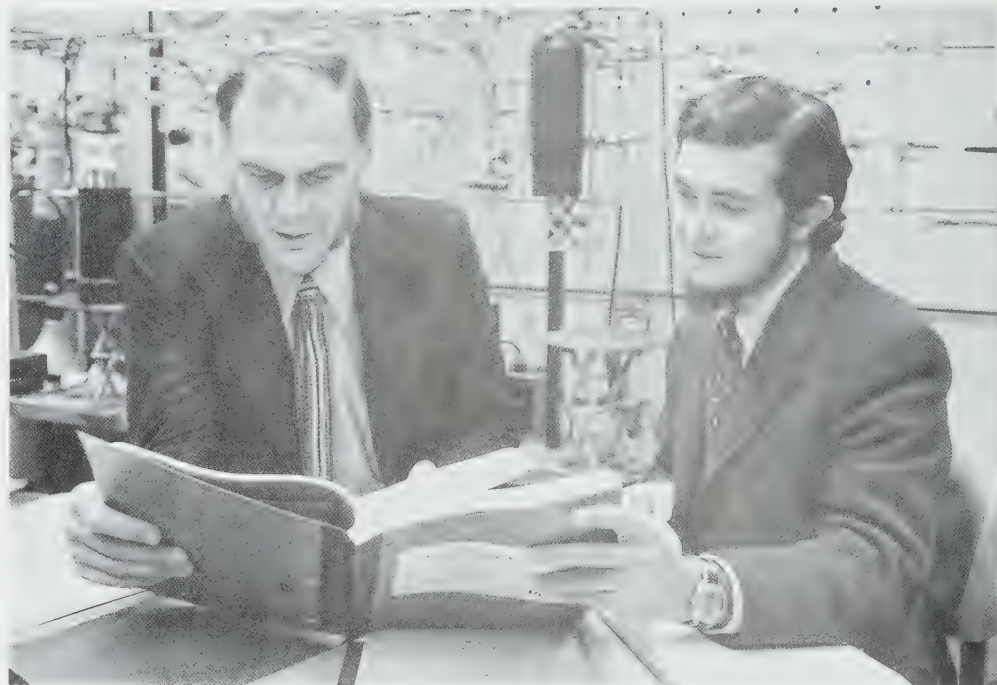
IH: Why did they stop it in 1994?

SR: Probably because the Department of Energy is under different kinds of pressure than the AEC was. We submitted our next proposal, and it got basically good reviews. It was a continuation proposal with some new aspects. However, the question of basic research and of what has to be supported is very unclear at DOE. In the end they decided that our work was

too long-range. By that time, DOE was no longer our principal support agency; our major funding was coming from NASA.

Returning to the consequences of that 1970 meeting in Salzburg, the second one was that I came back with an idea of a new experiment, and it was the following. There was a lot of interest in mercury poisoning at that time, and we managed to get hold first of a swordfish that had been caught in 1946, and this was now 1971. So there was a 25-year-old swordfish. Our first reaction was that swordfish would make great historical samples. Everyone puts the fish up on the wall with that long bill and knows exactly where it was caught. We thought that the mercury would go with the calcium so we'd just analyze the amount of mercury in the bill. However, it turns out that the mercury is in an organic form and doesn't go to the bill. We got a small swordfish, and the mercury wasn't in the bill but in the flesh. It doesn't concentrate in the bone, so the idea that we could just go to everybody's display and get a little bone didn't fly. But there had been then a swordfish caught in the San Diego area which had had a terrible accident when it was tiny. It had stabbed itself, and it grew up with its sword bent back and buried in its own forehead. It was not an ordinary swordfish and was not able to fish on its own. When they caught it, in 1946, they saved the head because it was so unusual. It was put into a preservation solution in a museum in San Francisco. We also obtained some samples of pipe fish, tiny things that were preserved at the same time. We found that the mercury concentration in the flesh of that particular swordfish was essentially the same as people were recording for freshly caught swordfish. Then we got some samples of tuna fish that

F. Sherwood Rowland and Mario Molina when they worked together in Dr. Rowland's lab in the Department of Chemistry, University of California at Irvine. (Photo courtesy Professor Rowland.)



had been saved at the Smithsonian Institution, in Washington, D.C. All those had the same levels of mercury as fresh tuna, about 0.5 parts per million. The oldest one was from 1878, and all of them had mercury. We published this in *Science* and said that the presence of mercury in these oceangoing fish was not a matter of contamination, it was a matter of working its way through the food chain, because the amount that was there a hundred years ago was about the same as now. That was the first scientific outcome of having gone to this meeting on radioactivity and the environment.

Another consequence was that Marlowe invited me to the next chemistry-meteorology workshop in Fort Lauderdale, Florida, in 1972. The second thing Marlowe had found out about me on the train that I was interested in the atmosphere, basically because I always thought that Libby's carbon-14 data was just a marvelous example of how you can use chemistry and physics to study a particular problem that can

spread beyond the initial boundaries. As you know, Libby's discovery revolutionized archaeology. But it all started in the atmosphere because carbon-14 was produced there by cosmic rays.

We had actually gotten an air sample when I was still at Princeton and spending my summers at the Brookhaven National Laboratory. We measured the tritium content of the atmospheric hydrogen from this sample and submitted a short note to *Physical Review*. This journal at that time was edited at Brookhaven so we just took it down the hall. Only one previous measurement of atmospheric tritium had then been made. The answer we got back was that if you withdraw that paper it'll be fine, but if you insist on publishing it, it'll be classified, and it still won't be published. This was 1953. Looking back, the key here was that if our measurement was correct, then you could ask the question, why was there more tritium in the atmosphere in the beginning of the 1950s than was there in the late forties?

The answer was that the U.S. was working on the hydrogen bomb and had spilled some tritium into the atmosphere. This would be a clue to other people that there had been work going on in the U.S. involving a lot of tritium. Eventually we published our paper in 1961, when it made no difference because everyone knew that we and the Soviets had hydrogen bombs using tritium. The lesson was that if you get too close to something of military significance, you may not be able to get published.

At the 1972 meeting there was a presentation by Les Machta, who had been with the Health and Safety Laboratory of the AEC working on atmospheric effects, and he reported some experimental results that British scientist Jim Lovelock had made the year before. Lovelock was the first to detect chlorofluorocarbons in the atmosphere. Lovelock actually invented the electron capture detector for gas chromatography, an enormously sensitive technique, and put air through his gas chromatograph. He lived in

western Ireland and detected chlorofluorocarbons in the air there. What I heard from Machta was that Lovelock had then traveled on a ship headed for Antarctica from England and found trichlorofluoromethane in every air sample taken on board. Machta was talking about what a marvelous tracer it would be, because it's inert. From my point of view, of course, I had been working with tracer experiments all my life. We had been using the CFCs as an inert source, but we knew that they reacted if there was enough energy around and we knew that they could be photolyzed. A CFC molecule is inert, but not totally. This was sort of an idle thought, but it touched a number of things that we had done before.

So in 1975 when I was writing my annual proposal to the AEC as to what we would do during the next year, I had two parts to it. Part A was to go on doing the nuclear reactor kind of studies with chlorine and fluorine and so on. But there was also Part B, in which we would branch out and would do something else, and one of those things was to look at the fate of the chlorofluorocarbons in the atmosphere. Mario Molina joined my research group later that year, and, as I would do with all postdoctoral fellows, I offered him a choice of problems. The CFCs in the atmosphere problem interested him because it was so different from what he had been doing before. But, of course, it was also very different from what I had been doing before.

This topic was just one page in the proposal, and there was no mention in our proposal of stratospheric ozone. If you start looking at the fate of most compounds in the atmosphere, one of three things happens to them. Some absorb visible radiation, leading to photolysis. For

example, if you photolyze molecular chlorine, that's the end of it. It's a green gas, absorbs visible radiation, and decomposes. That takes about an hour in sunlight. Hydrogen chloride, on the other hand, is a transparent gas so it's not interacting with visible radiation. It doesn't interact with near-ultraviolet radiation either, so it doesn't photolyze in the lower atmosphere. But it dissolves in rainwater. Other compounds don't photolyze, don't react with rainwater, but may be oxidized by hydroxyl radical, and this may take months or even years in the atmosphere. So the main possibilities for compounds in the atmosphere are photolysis, solubility, and oxidizability. The chlorofluorocarbons, however, don't absorb in the visible—they don't really absorb strongly until you get to the vacuum ultraviolet—they're really not soluble, and they don't oxidize. Nothing happens to them in the lower atmosphere. Molina and I did a calculation that the average lifetime of trichlorofluoromethane would be between 40 and 80 years, and its sink would be photolysis in the stratosphere. We had models from other people's work of exactly where the ozone was, and the wavelengths that can be absorbed by the CFCs are also absorbed partially by ozone and partially by molecular oxygen. You put into a model the absorption, the amount of O_2 , and the amount of O_3 , and you have to have some parameter for the vertical transport. When you get to about 30 km altitude, there is enough ultraviolet radiation at 220 nm and below that the molecules are falling apart pretty rapidly. That's what controls the lifetime in the atmosphere. During most of their time in the atmosphere, CFCs are not exposed to anything that would cause them to

be destroyed. It's the transit time up to this dangerous level of 30 km that determines how long the average molecule lasts. So now we knew the fate of the CFCs.

IH: Was this just a thought experiment?

SR: It was basically a thought and calculation experiment by Molina and myself, except that we had to know the absorption cross sections of the CFCs in the range from about 180 to 250 nm. The published measurements stopped at 200 nm, right in the middle of the interesting region.

There was an obvious discrepancy in the publication about CFCs in the UV region. In the place where the cross section was changing rapidly, the graph shifted scale by a factor of 10. We looked at it and found out that the overlap of the left- and right-hand lines didn't correspond to a factor of 10, so there was obviously something wrong with one or both of the lines for cross section. So we measured the ultraviolet cross sections of the compounds down to 180 nm with a simple Cary spectrometer and then could do the complete calculations. That was the only new laboratory measurement that went into it. We reached that point not more than about two months after we started. At this point we knew more about what's going to happen to these compounds than anyone else did. We could have published these findings then, but we had a loose end—the decomposition of CCl_2F produced a free chlorine atom. First we wanted to find out what happens to the chlorine atom. That's what put the fat in the fire, because when you ask what's going to happen to the chlorine atom, you find that it overwhelmingly reacts with ozone to give chlorine oxide. Then you ask, what's going to happen to chlorine oxide? There are two reac-

tions. One of them is chlorine oxide plus an oxygen atom, which gives you back the chlorine atom and O_2 . Usually that oxygen atom would have found an oxygen molecule and made ozone. Instead, it is intercepted by chlorine oxide, and out comes an O_2 , not O_3 , and the chlorine atom reappears. So you have a chain reaction. Chlorine, chlorine oxide, back and forth, and $O + O_3$ give two oxygen molecules, and you haven't gotten rid of the chlorine. Then we put in all the other reactions that you think could happen up there. Chlorine can react with methane, but it's about a thousand times less likely than chlorine plus ozone. Having reacted with methane, the chlorine atom is tied up as HCl, and for a moment that looks like the end of the road. But then hydroxyl radical reacts with HCl and gives you the chlorine atom back, and the chain starts all over again. You end up with chlorine existing as Cl and ClO in the chain reaction, or in reservoir molecules such as HCl, HOCl, or chlorine nitrate, ClONO₂. Plug that into our calculation of lifetimes, where the concentrations that we were dealing with now were steady-state concentrations, and you could see far more CFCs in the future atmosphere and much more Cl and ClO. Multiply those concentrations, and we realized that we were looking at an ozone removal process that was dominant over the processes in the normal stratosphere. That changed the whole exercise from scientifically interesting into a serious environmental problem.

IH: Did it strike you as such at once?

SR: Yes. First, of course, we thought that we must have made some serious mistake, because the calculations indicated that if we go on releasing the

CFCs, the amount of ozone is going to be severely depleted. That didn't seem to make any sense. Where could we have made an error of a factor of a thousand? So we went back and looked at it in different ways. Part of this initial response had to do with the instinctive reaction of a chemist dealing with laboratory experiments in which the concentration of free radicals relative to the other molecules is always very low. There were always lots of other molecules and only a few free radicals in our radiation chemistry experiments in the 1960s. In the stratosphere, however, the free radicals could be 15, 20, 30%. It's a photochemical system, putting a lot of energy in, molecules keep dissociating, and you end up with a lot of free radicals. Once you realize that that's the characteristic of the stratosphere, then you know that your instinct was playing false by extrapolating from the usual laboratory conditions. Now laser chemists have the same situation with high power inputs creating many free radicals simultaneously.

IH: When did it finally hit you that this was indeed a global environmental problem?

SR: Mid-December of 1973.

IH: What did you do then with that knowledge?

SR: The first thing we did was to check what was known about it. Remember, neither of us was then an atmospheric chemist, and we were working entirely outside that community. So I decided to go to somebody who was in touch with the atmospheric community and find out what's going on out there. I called Hal Johnston, Professor of Chemistry at Berkeley, and Mario and I went up to see him between Christmas and New Year of 1973. We told him about our work and he told us about the work of Ralph Cicerone and Richard Stolarski, who had

been coming from the standpoint of hydrogen chloride from volcanoes and chlorine released from the rocket fuel of the space shuttle. They had found the chlorine chain reaction that we were just talking about, but they had decided that neither volcanoes nor the space shuttle were major chlorine sources for the atmosphere. Stolarski had presented a talk about it at an atmospheric science meeting in Kyoto in September of 1973, and they had submitted a publication to *Science* that had been rejected. At that time both Cicerone and Stolarski were at the University of Michigan, and Johnston had seen their preprint. Both of them are Molina's age. They were soft-money people working in one of the departments. Cicerone was trained as an electrical engineer, and Stolarski as a physicist. Now, both are very well-known senior atmospheric scientists. At that point we had confirmation that the chlorine chain reaction was already known, but the whole business involving the CFCs had not come up with anyone. We thus decided that it was time to write our paper. The complication was that I was scheduled to go to Vienna for a sabbatical in early January to spend six months to think about something new to do. So I was one week away from going to find something new, and this bombshell had just exploded in front of us. My wife and I talked about canceling the trip but decided, no, I would go ahead and go. Molina and I would stay in contact, and I would be talking to people in Europe and he would be in the U.S.

The first three things that I did when I got to Vienna were to find an apartment for my wife and myself, to find out about the tennis team of the International Atomic Agency and learn that I would be eligible to

play on it, and to write the paper that was sent to *Nature* in the third week of January. It took about five months for our paper to get published. There were several reasons. One of them was that finding a referee who was a competent photochemist for the CFC part of it and a competent atmospheric scientist for the other part of it proved difficult. Another complication later was that the person who was handling the manuscript for *Nature* went away to Switzerland one weekend and just never came back. He quit without notice, leaving his desk in a mess. I called *Nature* in early May to find out what was going on, and they told me that they simply didn't know where the manuscript was, let alone its status. In the meantime, Molina and I had submitted an abstract for a meeting in San Diego, scheduled for the first week of July 1974. The people of *Nature* made sure to have our paper out before that. It appeared on June 28, 1974, my 47th birthday [M.J. Molina and F. S. Rowland, "Stratospheric Sink for Chlorofluoromethanes: Chlorine Atom-Catalyzed Destruction of Ozone," *Nature* 1974, 249, 810-812.]. By that time my sabbatical in Vienna was over and I was back in Irvine. We knew the paper was coming out and we arranged for a press conference here at U. C. Irvine. This was then a very small university, and we had not very much in the way of contacts. Nothing we had done before had ever been newsworthy at all, except the mercury, and one of my colleagues had talked about that. So the *Los Angeles Times* published a story about our work, but only in its Orange County edition, and nothing from here went outside southern California. The English news agency Reuters published a story but didn't identify us by name and didn't identify

us as being on the Irvine campus of the University of California, so the story had no follow-up. We thought it was an important article, and it had just absolutely zero news coverage for the rest of the summer. Actually not zero; science writers for newspapers in Toronto and Toledo, Ohio, wrote features on it, but no one followed. By that time, Mario and I had spent all of that summer writing a much longer, much more complete document. We knew far more by the time the *Nature* article came out than we had in the publication, and the question was how could we get that information out? A 150-page review article normally takes a year or more to get published. So I labeled this review as an Atomic Energy Commission Report and sent it off to the AEC. This didn't require any refereeing. It also wasn't an AEC requirement—it was just a procedure that I made up to get our knowledge into print. Then we gave out hundreds of copies to everyone. There was an American Chemical Society meeting in the second week of September 1974, and we distributed copies of it there too. ACS had a press conference on the work of several scientists, of whom I was one, and the Associated Press story from that went to 400 newspapers with a total circulation of 100 million people. Immediately after that, Cicerone and Stolarski, to whom we had sent preprints back in February, and who had then done some calculations, published their work in *Science*. And the Harvard group to whom we also had sent our AEC report came out with their results, and CFCs and ozone became a big media story. Our long review article was also published then exceptionally quickly, coming out in January 1975 [F.S. Rowland and M.J. Molina, "Chlorofluoromethanes

in the Environment," *Reviews of Geophysics and Space Physics* 1975, 13, 1-35]. This was basically just the AEC report with some revisions.

IH: Do you suppose that in addition to the scientific discovery, politics has also played a role in your Nobel prize?

SR: I think there is an element of scientific politics in it, but I don't think the awarding of the prize involved nonscientific politics. The question of whether or not this kind of work is fundamental chemistry, or whether it belongs in geosciences or meteorology, has always been there. To us it was always chemistry, but from 1974 until 1988 I did not get very many invitations to speak at chemistry departments. I'd get them from other university departments: toxicology, geology, physics. Part of the reason for this circumstance is that there is a very strong feeling within most academic chemistry departments that this kind of work is not chemistry; rather, it is some sort of application only, because it's outside the laboratory. Another aspect is that chemistry has had a strong industrial component since the 1920s, and until 1988, we were directly in opposition to some of the major chemical companies, such as DuPont and Allied. In the 1974 time frame, two-thirds of the CFC production was in the form of propellants for aerosol sprays in the United States. About half of the global CFC use was then in the United States. The aerosol spray propellants were mostly chlorofluorocarbons. Some used hydrocarbons, but probably 80% of the aerosol industry was in the front line immediately, and they came out swinging. In the American Western movies, the good cowboys always wear white hats and the bad guys always wear black hats so the little kids know whom to cheer

for. We had black hats, as black as you could get. Every month Molina and I would read their publication, *Aerosol Age*, to find out what else they were saying about us. One example that illustrates to me how far they would go was when they had an interview with a person who speculated that we were agents of the KGB, intent on disorganizing American industry.

IH: How much did this hurt you?

SR: It probably interfered seriously with my research group in the sense that the postdoctorals I had during this time all came from overseas because I was no longer getting any applications from Americans just finishing their degrees. How people choose where they are going to work as a postdoc has a lot of things feeding into it. Irvine was a small campus, not very well known, atmospheric chemistry was a doubtful area to many chemists, and our work was controversial and being ridiculed by industry, so coming to work here was not what the mainstream chemist would tell his graduate student to do. Molina and the others who were in the group at that time were my last mainstream postdocs from major American schools for the next 15 years. But I had a lot of excellent Japanese and European postdoctorals. The quality of research in my group was quite satisfactory to me, but the applications came from abroad. To some extent I was an outcast in my profession, but I hadn't been cast so far out that it affected my life very much, and the funding of my research was not affected either.

IH: Was Paul Crutzen's work known to you?

SR: Not when we started. His findings on nitrogen oxides were important, and he had done modeling calculations on the happenings in the stratosphere. He and Hal Johnston al-

so had difficulties with industry because NO and NO₂ are introduced into the atmosphere by supersonic aircraft. It's not the speed of the supersonic aircraft that raised the problem but that they are designed to fly at high altitudes. This concerned the Concorde in Europe and the proposed supersonic Boeing in the U.S. But Congress failed to put U.S. money into supersonic aircraft for a different reason, mainly a matter of economics. Hal Johnston had raised the question about SSTs putting NO_x into the stratosphere back in 1971, and this was one of the reasons I went to Johnston when we wanted more information about current stratospheric studies.

IH: Now you are a hero of environmental protection. Were you concerned about the environment before all this? How did you view environmental problems before your own involvement in 1975-74?

SR: If you have a bipolar world and the environmentalist is at one end and the industrial polluter at the other, I was certainly on the environmentalist side, but not active in any environmental movement at all. Of course, when we came out with our mercury-in-swordfish findings, for a while we were looked at as antienvironmentalists.

Let me also add that the first Earth Day was in 1970, and the members of my family were very interested in that. Probably I was influenced by them in thinking about the environment as a potential area when deciding what I might want to do next. We are a close family; my children were then teenagers, and they had become very interested in the environmental movement.

When I was a graduate student, our basic attitude was that if you get out of the laboratory alive, then the hazards are over for today. In other words, the on-

ly hazards you have are acute hazards. Most of the time, of course, you don't think of experiments as hazardous or dangerous—you just do them. I worked for three years as a graduate student with intense lachrymators—alkyl bromides—in a lab without a hood and had to start wearing glasses because I would get headaches behind my right eye from reading. But my eyes recovered in a few years, and I gave up the glasses until age came into play. But the idea that there may be long-time hazards, especially outside the laboratory, was not very prominent. The hazards of contamination of the rivers and the atmosphere were not on our mind. Some of the changing attitude has to do with the sensitivity of our detection schemes. If the sensitivity for measurement were one part in a million, then no one would yet have discovered chlorofluorocarbons in the atmosphere because they aren't even up to a part in a billion level (U.S. billion, 10⁹) and they aren't going to get to it, because of the limitations set by the Montreal Protocol. If you can measure to a part in a trillion, then you can see CFCs all very clearly. Even if your measurements are good to one part in a billion, you wouldn't find out about the ozone problem from CFC measurements—you would notice first the mysterious disappearance of ozone over the Antarctic.

I remember a conversation back in 1958 with a former Princeton graduate student who went to work for one of the chemical companies. He told me that he was looking for trace species left over in a process. I asked, why don't you use radioactivity because it's so much more sensitive? His answer was that we don't use it because if we did, we would find some. But if we use our present technique and don't find any, then we won't have to

do anything to fix it. That attitude was essentially saying nothing really bad actually happens from chemistry. That attitude has changed because we have seen that very negative things do actually happen. On balance, I believe that advances in chemistry have been very good for society, but not all of it has been positive.

Coming back to our work, I can divide the past quarter-century into several time periods. The first one is when Molina and I knew about the CFC problem, but no one else did except a few other scientists. That lasted from late 1975 until September of 1974. Then, for about two years, only a few people spoke out about it, chiefly Molina, Cicerone, and me. Most scientists tended to say, I know they're talking about it, but I haven't heard anybody unbiased speaking about it. That ended in September of 1976 when the first

National Research Council report came out and said that the science behind this was very well founded.

IH: After all the difficulties, initial disbelief, and even accusations, today you are a Nobel laureate. Do you feel elated?

SR: Obviously, any scientist is elated by recognition with a Nobel prize. I wouldn't describe it as a goal, but rather the feeling that if you ever did anything really significant, such recognition was possible. One would expect that the judgment of the Swedes would persuade some people that what we did was a good thing, and in fact that is the reaction of the overwhelming majority. However, in the U.S. it is just as controversial now, but essentially outside the scientific community. The backlash started in 1990. Legislation is being introduced, just as we speak, in several states permitting the use of CFCs. The immediate right-

wing political reaction to the Nobel prize was that the Swedes must really be in trouble for environmental politics to dominate things so much. The immediate assertion was, what a gross error the Swedes had made, there must be serious political problems in their country. A person from our Environmental Protection Agency asked me about a year ago, have you written anything up recently? I said, no, but the latest document of the World Meteorological Organization and NASA is out with all these details. And he said, the people that I'm trying to provide answers for don't want to hear that the World Meteorological Organization has said anything because the WMO is part of the United Nations, and, of course, they would be saying this because that is part of the takeover of the U.S. Government by the United Nations. So we are living in a very interesting period.



Three Boards and "A Bet Against the Company"

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The Russell Hotel, located in the Bloomsbury district of London, was an attractive but unusual location for the three businessmen, two from Milwaukee and one from St. Louis, to hold a meeting on Wednesday, November 20, 1991. They were the three most senior officers of the Sigma-Aldrich Company and one, the eldest, was about to be terminated—not in the Mafia sense but in the corporate sense. Dr. Alfred Bader was the only one of the three who did not know the real purpose of the meeting. The other two, Dr. Tom Cori, Chairman, President, and CEO, and Dr. David Harvey, Chief Operating Officer, knew, but they also knew that it wasn't going to be a pleasant task. Was there some solace from knowing that they were simply carrying out the wishes of the Board?

The previous Friday, November 15, Dr. Cori had phoned Dr. Bader, who was visiting the chemistry department of his alma mater, Queen's University. When the call arrived, Bader had just delivered a lecture on "Challenges at Sigma-Aldrich," which was a personal history of



Aldrich Chemical Company

the company he had helped to found. Although his voice was quiet, each phrase painted a vivid picture of the challenges, the setbacks, the victories. There was still a trace of a German accent. The structure of his talk reflected the precise, orderly mind of the scientist, but the content also reflected a literate mind that admired the power of the English language to captivate and excite. As an undergraduate, he had been impressed by the animated prose of Thomas Babbington Macaulay, the nine-

teenth-century English historian and essayist. Despite having been in Canada for only a few years, despite his German accent, he won the Dominion of Canada university debating championship.

As he reviewed the early years of the company, he amused his audience with the story of the very large chemical company (Kodak) which announced that it no longer wanted to be bothered directly with small orders for specialty chemicals. This declaration had inspired him to take an ad in the chemical journals inviting his customers to "please bother us."

Three samples of the
cover illustrations of the
Aldrich Annual Reports,
pages 24-27.

Bader delivered a second lecture that morning in the art history department, "Adventures of a Chemist Collector." In the evening, he gave yet a third lecture on Jan Lievens, a Dutch painter of the "grand epic manner." His final lecture on "The Bible through Dutch Eyes" was scheduled for Saturday afternoon in the art center. The diversity of the subject matter of these lectures captured the essence of the interests and the career of the 67-year-old Bader. Art, the Bible, and chemistry (and his company) were often referred to as the ABC of his life: a life which had taken a significant turn on November 15, 1941 when he had first enrolled in Queen's University as a teen-aged Jewish refugee. The purpose of the special reception by the University and the lectures was to celebrate the 50th anniversary of this event.

The Dismissal

At the Russell Hotel meeting in London, Cori jumped right to the point and told Bader that there was no room on the Board for anyone who would "bet against the company"; and his selling of stock options had been just that. In light of this action, the Board was unanimous in its request for his resignation.

Bader was stunned. He was being accused of betting against the company. *His* company? Because he sold 100 options on some of his Sigma-Aldrich stock? If selling 100 options (for 10,000 shares) was a bet against the company, what was the retention of the other 3.7 million shares that he owned? Although his shares represented only some 7% of the outstanding shares in the company, he was still its largest private shareholder. The sale of the call options had simply been part of his planned gift of 10,000 shares to Queen's.

Bader was not going to let his career come to such an ignominious end. He phoned and/or wrote to each of the outside directors arguing his case. Although the reactions varied the message was the same, "He should not have bet against the company."

On December 30, a notice went up on the Aldrich bulletin board, announcing the end of Bader's consulting contract and wishing him well in his retirement.

Bader still would not give up. He and Marvin Klitsner were still directors until the annual meeting of the Board in May. Marvin was Bader's closest friend and business advisor and had been a director of Sigma-Aldrich since the merger and, prior to that, a director of Aldrich Chemicals from its early years.

Bader and Klitsner, the last of the Aldrich board members, appeared before the nominating committee at its February meeting and presented their case as strongly as they could, vigorously denying they had bet against the company. They emphasized that the options they had sold were "covered" call options, which meant the shares were committed at the time of the sale. Technically, they had not reported the sale of the options as promptly as they should have. But it was a new regulation, and both had reported their sales as soon as they had become aware of the need to do so. The company's own meager memo on the subject had made no mention of options trading. Had it done so, they undoubtedly would have met

that deadline requirement as well.

However, the Board did not waver from its position taken the previous November, and Bader had full measure of the extent to which he had grown out of touch with his fellow directors.

The Evolution of a Board

Indeed, the Sigma-Aldrich Board of the 1990s was very different from the Board of the 1980s and a world apart from the Aldrich Board of the 1960s and 1970s. The evolution of the board was a reflection

of the evolution of the company and a classic example of the separation of ownership and control, and, for the original owner, it held tragic consequences.

The Board of the 1960s was Bader's Board, made up of people who knew the company and/or the industry and with whom he felt comfortable. Following the merger of Aldrich with Sigma-International in 1974, and for the next decade, the board was a Compromise Board with representation from the two founding companies. During the last half of the 1980s, a new Modern Board emerged, one with a higher proportion of outsiders who had



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proven records as CEOs and/or expertise in marketing, production, or finance. Any knowledge of the chemical industry was of secondary importance. These men also reflected the interests of the President and CEO.

The Foundation of a Company

To understand the different character of these three boards, we have to understand the history of the company, and for this we have to understand a major part of the life of Alfred Bader, for, as Emerson once observed, "an organization is the lengthened shadow of one man."

Queen's University was already two months into its fall term of 1941 when Alfred Bader enrolled in the Engineering Chemistry program. He had a lot of catching up to do, but he did and then went on to fulfill the requirements for both the B.Sc. and M.Sc. degrees. He continued further and completed his doctoral studies at Harvard in 1949 and then accepted a job with Pittsburgh Plate Glass (PPG) in its paint research laboratory in Milwaukee.

While working in the Harvard lab, Bader had become frustrated waiting for delivery of a basic chemical needed to carry out his experiments. The specialty chemical was offered by only one large chemical company, Eastman Kodak, and it had more important products on its priority list. In response to a follow-up memo from Bader, Eastman Kodak sent him a postcard telling him they would send the chemical as soon as it became available but, in the meantime, would he stop adding to their paperwork.

Shortly after joining PPG's laboratory, Bader recommended that a small division within PPG be set up to make and sell specialty chemicals. The proposal was turned down; why even try to compete with Eastman Kodak? However, there would be no strong objection if he started his own enterprise on his own time, provided it did not interfere with his work with PPG. Bader the chemist became Bader the entrepreneur, the one who saw a commonly experienced frustration as a business opportunity.

First-year sales were only \$1,705, but sales rose to \$5,400 in the second year and in the third year almost tripled to \$15,000. When PPG decided, in 1954, to move its Milwaukee laboratory to Springdale, near Pittsburgh, Bader elected to stay in Milwaukee and to devote himself full time to the fledgling enterprise.

The company's target market was clearly defined from the very beginning: chemists in research labs who needed specialty chemicals to carry out their research. The products would usually play a small, but very vital part, in the activities of the laboratory. Although the chemical

might be expensive on a unit basis, the number of units required was small, and the actual cost was insignificant relative to the overall cost of the experiment. However, the product had to be of reliable quality, not necessarily perfect, but good, and it had to be available quickly.

To buy the necessary products, Bader had to travel outside Milwaukee. The potential suppliers of the products were any laboratory in the world, and some of the best laboratories were located in Germany, England, and Switzerland. Bader obviously was fluent in German and English and spoke passable French. He began canvassing laboratories throughout the United States and Europe. As a research chemist, he could talk their language and recognize who were the top producers, what were their needs, and what were their problems; as a businessman, how could he help them in their work?

It was a relatively easy matter to identify the commercial and academic research laboratories and to communicate with them. A simple catalog would be sufficient to identify Aldrich's product line. Indeed, Aldrich's first catalog was one page, with one product, a product he had learned to make in the laboratory of Professor A.F. McKay while working on his M.Sc. degree at Queen's. By 1965, the company cataloged over 9,000 different chemicals, with its best selling chemical accounting for no more than 2% of its total sales, and no other chemical accounting for as much as 1% of its total sales. The company's customers included many substantial industries throughout the world, the federal government, universities, and laboratories doing medical research. The federal government's laboratories accounted for less than 10% of the company's sales, and no private concern accounted for as much as 5% of sales. Regionally, 80% of the sales were in the United States, 10% west of the Rockies and 45% each in the Midwest and the East. Foreign sales were distributed across 20 countries, usually through foreign agents.

The diversity of the company's product line and customer base provided a stable foundation for its explosive growth. Marketing its products through the catalog was relatively easy and effective, and, best of all, no expensive sales force was required.

By 1965 the company manufactured approximately 15% of its product line, purchased approximately 10% from a German affiliate (EGA), and bought the rest from many different sources, none of which supplied more than 10%. The company's strategy was to manufacture only those products that it could not buy advantageously from other sources. Even when it did initiate new chemicals in its own facilities, it would

farm these out to other producers whenever it was more economical to do so. No company could afford to build production facilities that would ensure adequate supplies of the thousands of rare, sparingly used chemicals.

The Art of the Deal

Bader, the owner-manager, personally visited laboratories throughout the world to locate reliable sources of the specialty chemicals that were the backbone of his product line. He selected the chemists who staffed the company's laboratories and kept close contact with all the employees in the office and those who handled the shipping and receiving.

To ensure product quality, to develop new products, and to continue the dialogue with his research customers, he created an organization in which leading scientists played a key role. By 1965 there were 125 people in the organization, of whom 34 were graduate chemists with no fewer than 9 holding Ph.D. degrees in chemistry. There were an equal number of office employees, and the rest of the staff were directly involved in the shipping and receiving of orders and plant maintenance.

All but nine employees were located in Milwaukee.

For all intents and purposes, the Aldrich strategy was neither to discover nor to produce new specialty chemicals, although it did both. Its strategy was much simpler: to purchase and distribute specialty and rare chemicals to people who needed them. The success of the company depended on its ability to strike a deal that satisfied both its customers and its suppliers.

The Success of Aldrich

By 1965, a decade from the time Bader decided to devote himself full time to his specialty chemical company, revenues had increased from \$34,000 to over \$2,000,000. Profits were increasing rapidly as well, reaching almost \$200,000 in 1965, and profit margins were some 20% before taxes. But the company was just in the lift-off stage. By 1970, sales had tripled to almost \$6,000,000, and profits (before taxes) increased almost fourfold to

\$843,495. And it continued; by 1974 (the last year before the merger), sales had almost doubled again to over \$11,000,000, and profits had more than doubled to almost \$5,000,000.

The Bader Board of the 1960s

The Board of Directors which oversaw this evolution was relatively small and made up mainly of insiders. Between 1961 and 1974, 11 directors served on Aldrich's board at one time or another. The only two who served throughout the period were Alfred Bader and Marvin Klitsner. The

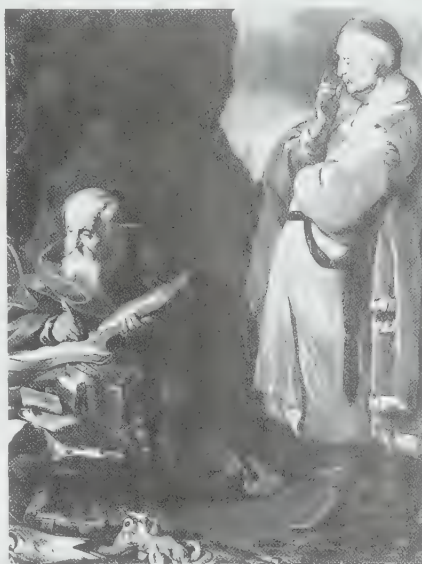
other insiders through 1967 were: Helen Bader, Alfred's first wife, who was also the company's Treasurer, John Biel, a medicinal chemist, VP and Director of Research, and William Butli, also a chemist, VP and Director of Operations. Ironically, it was the other inside Directors who outvoted Bader, the "art collector," to put the "old master paintings" on the cover of the company's catalog. The paintings, all of which came from Bader's personal collection, soon became an Aldrich hallmark.

Bader did bring in more outsiders to serve on the Board, but they

were all knowledgeable about the company and/or the industry. For example, one of the last appointments before the merger was Dr. H.C. Brown of Purdue, who had developed a process that permitted the production of hundreds of compounds by hydroboration. Aldrich bought exclusive right to Brown's patents and set up a wholly owned subsidiary (Aldrich-Boranes Inc.) to produce the products.

The Merger

By the early seventies, Bader began to see the advantages of a still bigger operation, especially from the financial market's perspective. Taking the company public in 1965 had not generated the interest among the investing community that he had hoped for. Another way of expanding could be through a merger. One company that had caught his eye was Sigma-International, almost a clone of Aldrich except that its field was



Aldrich Chemical Company, Inc.

biochemistry, and it dominated the biochemical laboratory sector.

The two companies merged in 1975 forming Sigma-Aldrich. Combined net sales in 1975 were \$45 million, and profits, before taxes, \$11 million.

The Compromise Board, Sigma-Aldrich, 1975–85

Immediately following the merger, the Board consisted of eight directors, four each from Sigma and Aldrich. The Aldrich directors, chosen by Bader were A. Bader, who became President of Sigma-Aldrich, H. C. Brown, R. Emanuel, and M. Klitsner. Brown's appointment to the Board was not renewed in 1978, and the company just missed the opportunity to have a Nobel prize winner on its Board, for the following year Brown received the Nobel Prize in chemistry.

The directors appointed by Sigma were D. Broida, A. Fischer, J.W. Sandweiss (a lawyer), and S.J. Weinberg (a financial adviser). Broida, Bader's counterpart at Sigma, became Chairman of Sigma-Aldrich. A. Fischer had hired Broida (in 1956) into the small consulting firm that he and his brother had started in 1954. Sigma was started in the early 1950s under the umbrella of the consulting firm, but almost entirely through the initiative of Dan Broida.

The Sigma-Aldrich Board was increased by two in 1977, and that was when Dr. C.T. Cori joined. Cori, who had been a vice-president of Sigma-Aldrich since the merger, was promoted to President of Sigma in July of 1976 (succeeding D. Broida). Cori's rise through the ranks was quite exceptional, having just joined Sigma in 1970 as a production chemist, fresh out of the University of Washington (Missouri) with a Ph.D. in biochemistry. His parents, Carl and Gerti, were exceptional scientists who had both won the Nobel Prize in 1947 for their work on carbohydrate metabolism and enzymes.

In 1985, Cori became the CEO while Bader retained his position as Chairman of the Board. Throughout, Bader focused most of his attention on the vital liaison work with customers and suppliers around the world. The primary difference now was that any new leads on biochemical products were turned over to Sigma. The overall management of Sigma-Aldrich was left in the hands of the aggressive CEO.

The Modern Board

In 1985, a reorganization plan was prepared by Cori which envisaged a larger Board and increased representation by "outside" directors. Only Bader and Klitsner remained from the Aldrich Board. One outside director described his views on boards in general:

How people got on the board, and what they think they were put on the board for is important. And getting the board to come together and be willing to have a few good fights, on an equal basis, and get rid of egos. Getting rid of egos is a very important part of getting value out of the board. It's not easy to get a bunch of high-powered guys—who are, in their own right, successful and important to some extent—to be prepared to look at the issues of another entity without getting their egos in the act. It can screw things up considerably when they do.

A Change in the Chairmanship

Bader learned who controlled the Board in the spring of 1991 when he was forced to resign as Chairman. He was given the title of Chairman Emeritus and remained a director. In this capacity, he continued his vital external liaison activities with customers and suppliers. Arguably, he was the most widely recognized chemical executive in the academic research world, holding six honorary degrees from universities in the United States, Canada, and Britain.

Thus, it was that in May 1991 Dr. Cori became the Chairman of the company as well as its President and CEO. He occupied all the key positions.

Six months later, on the evening of November 11, at the traditional reception for the Sigma-Aldrich directors, Marvin Klitsner informed Tom Cori that he had been selling options on his holdings of Sigma-Aldrich stock. He had just learned that there were new Securities and Exchange Commission (SEC) regulations that required directors and officers to report such sales, and he had just sent the necessary forms to the SEC. Cori's concern was to ensure that any short-term profits be returned to the company in compliance with the law.

Following the board meeting the next day, Cori and Bader had gotten together to draft out, in rough terms, Bader's assignment for the next year. Cori had made it clear that Bader would not receive any salary, but if he wished to continue his liaison work, his expenses, office, and secretarial requirements would be covered.

Cori learned that not only had Marvin Klitsner been selling stock options but so had Alfred Bader. He phoned Bader in Milwaukee and angrily charged him and Marvin with selling options "in concert." Bader had sold, on one occasion, some stock options, but it was not in concert with Marvin; rather it was part of his planned gift of 10,000 shares to his alma mater, Queen's University. He had just learned that such sales needed to be reported to the SEC, and the forms were already signed and a copy was on its way to Cori in St.

Louis. Cori advised Bader that he was going to leave the matter in the hands of the company's lawyers.

Options Trading

When Bader sold the options on August 15, 1991, Sigma-Aldrich shares were trading at \$43. He got \$2½ for each of the 10,000 shares (\$26,250) covered under the option. The purchaser of the options received the right to buy the shares at the strike price of \$45 any time up to the options' expire date on January 17, 1992. Bader planned to give the proceeds from the options plus the covering 10,000 shares as part of his pledged gift to the University, and it would be ahead by the \$26,250. Only if share prices rose above \$47½ would the University be worse off. In fact, the price of the shares rose to \$52, and Bader sent the University another check for \$50,000 to cover brokerage fees and to ensure that his \$2,000,000 pledge was reached. He had been for some time one of the University's more generous benefactors. In 1990, for example, his donations exceeded \$750,000; in the Spring of 1991 he had pledged more than \$2,000,000 toward a chair in chemistry, a chair in art history, and the art gallery.

Thou Shalt Not Bet Against the Company

The generosity of Bader and his family to his universities and the greater Milwaukee community is widely known, and so it is unlikely that any informed observer would label his sale of the stock option as an "ex post facto" attempt to gain sympathy for certain sly stock activities. But why might the reasonable, rational observer consider the sale of stock options, by an insider, to be a bet against the company? What is the origin and the validity of the argument underlying the phrase "bet against the company"? The new regulations issued by the SEC in 1991 were designed to bring the trading of options under the same regulations that governed insider trading of stocks. Any "short swing profits" were to be subject to disgorgement to the company; i.e., any officer or director, considered an insider, would have to return to the company any profits realized within 6 months of the transaction. The intent, stemming from the abuses in the market during the 1920s and 1950s, was to protect the general investor from those who might have "inside information" not generally available to the public. There was no need to prove that such information existed or that the insider knew of such information. All such profits are automatically returned to the company. The act was crude and simplistic but effective. It did not prohibit the trading of stocks or stock options but simply eliminated any short swing profits by insiders and hence removed any

incentive to engage in such activities.

Was It a Bet Against the Company?

Before the 1991 regulations, it was not clear whether the old regulations even applied to option trading. Generally, trading in options, by insiders, is frowned upon because it might be construed as a "bet against" the company. When a person sells an option he is, in a sense, gambling that the price will not rise above the strike price (\$45 in this case) during the life of the option (5 months). It is unwise for any officer or director to put, or to even appear to put, any limitations on his/her expectation regarding the future value of the company's stock. There should be no conflict or even apparent conflict between an insider and the future growth of the company. Might one be tempted to hold back on an important decision that might cause the stock to rise? Was Bader's sale of the 100 options a bet against the company? Did he have any information that would lead him to expect the value of the stock to fall? No! He simply selected an investment that was going to yield a sure \$26,250 over the current market price on the 10,000 shares he had committed. Undoubtedly, the absurdness, the cruelty, the shallowness of the "betting against the company" charge grated and incensed Bader more than any other aspect of the incident and drove him to fight the accusation. Technically, it is an interpretation, a label, that can be automatically applied to any insider who sells options. But, as is evidenced here, it is an indiscriminate label which can misrepresent the real motivation of the individual. It is like labeling a surgeon who has lost a patient a murderer. Technically, he may have performed an act which has taken the life of an individual, hence the label "murderer," but to judge the act without considering the circumstances or the motivation is simply wrong.

Bader pleaded his case in the chemical journals and the financial press and gained a great deal of sympathy and support. Articles appeared in the financial columns in American and European newspapers; even a national magazine, *Forbes*, carried a story under the banner "Back stabbing" in which one insider claimed "Cori was tired of working in Bader's shadow and was looking for any excuse to oust him." The company's image among its primary suppliers and customers was tarnished. Numerous leading chemists called, wrote, and took up the case with the CEO at company headquarters. All to no avail.

Lessons for the Board

One of the hottest topics around boardrooms these days is whether or not the Chairman

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Metaphoric Usage of the Second Law:

*Entropy as time's (double-headed) arrow
in Tom Stoppard's "Arcadia"**

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Almost as soon as the concept of entropy and the second law of thermodynamics were introduced, people began exploring their application to matters that, at first glance, appear to be outside their scope. This is perhaps not surprising—if the second law tells us about things as small as the efficiency of a heat engine and as large as the ultimate fate of the universe, it seems logical to conclude that there are *no* matters that fall outside its domain. The implications of the second law are as deep as they are broad, as the following quote insists [1]:

The law that entropy always increases—the second law of thermodynamics—holds, I think, the supreme position among the laws of Nature. If someone points out to you that your pet theory of the universe is in disagreement with Maxwell's equations—then so much the worse for Maxwell's equations. If it is found to be contradicted by observation—well, these experimentalists do bungle things sometimes. But if your theory is found to be against the second law of thermodynamics I can give you no hope; there is nothing for it but to collapse in deepest humiliation.

Couple that with the difficulties that existed (and persist!) in defining exactly what entropy is [2], and it is easy to see why it turns up in such a range of intellectual pursuits. Just a quick search of a library's (University of California) holdings

for titles with the word "entropy" turned up dozens of books on topics not explicitly concerned with thermodynamics, such as the environment, information theory, traffic patterns, etc. Also included are at least half a dozen works of fiction, as well as a score for a piece entitled "Entropy" for woodwind trio (which, alas, I have not yet heard).

To what extent do these various endeavors represent *rigorous* application of the second law, as opposed to approximate or even metaphoric usage? Nobody questions the rigorous applicability of the second law to heat engines. The inevitable "heat death" of the universe, too, is little questioned [5]. However, there is rather less immediate concern about the conclusion that we're all going to die in some billions of years than about the potential implications for the fate of man and society over a more relevant time scale. Are *those* implications rigorous? If not, are they nonetheless of value in the realms to which they are applied?

The metaphoric exportation of scientific concepts to other fields and the reverse process are well-explored topics. It has been noted that there are risks attendant upon imprecise usages, and the second law is no exception. Indeed, it gives us some prime examples, such as the creationists' entropic argument against evolution or Jeremy Rifkin's appallingly neo-Luddite "new world view" [4], which misapplies the second law in about every way possible. Such distortions are in-

* A shorter version of this paper was presented at the meeting of the Society for Literature and Science, Los Angeles, November 1995.

Fig. 3. M.C. Escher,
"Waterfall" © 1996
M.C. Escher/Cordon
Art-Baarn-Holland.
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deed dangerous, doubly so: not only do they validate dubious agendas by clothing them in (pseudo)scientific garb, but they also tend to discredit others who engage in related but more careful projects [5]. However, they do not (in my opinion) demonstrate that approximate or metaphoric treatments of scientific concepts are *inherently* bad; just that anything can be done badly.

The question of how the second law applies to the world of the human mind, and its interactions with the physical world, has received intense and enduring attention. From the early days of the concept of entropy, following the introduction of statistical treatments (by Maxwell, Boltzmann, and others), it has been suggested that the entropy of a system is in some way connected to how much we know about the system and that there is therefore a "subjective" component to entropy. The idea of subjective entropy reached its peak, perhaps, with the development of information theory around 1950 (Shannon, Brillouin, etc.), in which *mathematical* relationships between entropy and information are proposed. Denbigh and Denbigh have examined this idea and its history in some detail; they conclude that it is in fact *not* rigorous but at best approximate, and only applicable in certain, restricted situations [6]:

Although information theory is more comprehensive than is statistical mechanics, this very comprehensiveness gives rise to objectionable consequences when it is applied in physics and chemistry....It remains true, nevertheless, that information theory can be of value in an heuristic sense....Notions about "loss of information" can sometimes be intuitively useful. But they can also, like the comparable concept of "disorder," give rise to mistakes....It needs to be kept in mind that *thermodynamic* entropy is fully objective...and the same must apply to any other "entropy" which is used as a surrogate.

A much earlier treatise considered if and when thermodynamics might be applicable to human activity [7]:

The Second Law in its objective-physical form (freed from all anthropomorphism) refers to certain mean values which are found from a great number of like and "chaotic" elements. . . . this law has no *independent* significance, for its roots go down deep into the Theory of Probabilities. It is therefore conceivable that it is applicable to some purely human and animate events as well as to inanimate, natural events... provided the variable elements present constitute adequate haphazard for the Calculus of Probabilities.

This suggests that a minimum requirement for applicability of the second law is a sufficiently large number of elements—an Avogadro's number of people, perhaps?—as well as hinting at issues such as free will versus random actions. It appears, then, that the connection between thermodynamic entropy and informational "entropy" is at best only approximate, not rigorous [8].

Nonetheless, these analyses do not deny that even such approximate analogies may be of value, even if only to provide mental stimulus. So, with the above as background, let's turn to the explicitly metaphoric use of the second law in fiction. As I indicated earlier, there are hosts of examples, with widely varying purposes and impacts, ranging from the whimsical (pardon the pun) [9]:

What I like about your evidence, Miss Kohn, is that it adds the final touch of utter and impenetrable obscurity to the problem....It reduces it to the complete quintessence of incomprehensible nonsense. Therefore, by the second law of thermodynamics, which lays down that we are hourly and momentarily progressing to a state of more and more randomness, we receive positive assurance that we are moving happily and securely in the right direction....I have got to the point now at which the slightest glimmer of commonsense imported into this preposterous case would not merely disconcert me but cut me to the heart. I have seen unpleasant cases, difficult cases, complicated cases and even contradictory cases, but a case founded on stark unreason I have never met before.

to the rather pretentious [10]:

[He] found in entropy or the measure of disorganization for a closed system an adequate metaphor to apply to certain phenomena in his own world. He saw, for example, the younger generation responding to Madison Avenue with the same spleen his own had once reserved for Wall Street: and in American "consumerism" discovered a similar tendency from the least to the most probable, from differentiation to sameness, from ordered individuality to a kind of chaos. He found himself, in short, restating Gibbs' prediction in social terms, and envisioned a heat-death for his culture in which ideas, like heat-energy, would no longer be transferred, since each point in it would ultimately have the same quantity of energy; and intellectual motion would, accordingly, cease.

Both these extracts suggest how one *might* apply the second law, in metaphoric form, to mental as well as physical processes, although it is far from clear how aware these authors are of

the extent of their imprecisions. [Note in the second extract how Pynchon (or his protagonist?) recognizes the importance of a "closed system" in his definition of entropy but then applies the concept to a system that is about as far from closed as possible!]

In the remainder of this article, I will examine Tom Stoppard's treatment of this theme, in his recent play "Arcadia." Stoppard's earlier work evinces his interest in the intersection between art and science, most notably in the play *Hapgood*, which explores ambiguity by interweaving espionage and quantum physics. The main scientific themes in "Arcadia" are of chaos, time, and entropy. To be sure, "Arcadia" is about much more than that; other themes featured prominently include English gardens, Romantic poets, straying wives, outraged husbands, obsessed academics, etc. But a significant part of the mix is a picture of how entropy and time work—at least, in the world of the human mind—that is intriguingly different from more traditional and "purely scientific" views. One aspect that makes it particularly intriguing, as I will try to show, arises from the mode of presentation: not by overt exposition (although there is some explicit discussion of the scientific themes in the text) but, much more subtly, via the overall structure of the play, including staging.

A brief synopsis is in order first. "Arcadia" is set in a single location—an English country estate—but in two time periods, one around 1810 and one around now. The main characters (for our purpose) in the early period are Thomasina Coverly, the teenaged daughter of the manorial family, and her tutor, Septimus Hodge. Other characters include a son, Augustus, and a guest, Chater, with a notably promiscuous wife (never seen). In the contemporary period, the three key characters are all academic types. Hannah Jarvis is a guest, studying the history of the estate (concentrating on a mysterious hermit). Bernard Nightingale drops in, looking for support for his theory (based on some letters and penciled notes in manuscripts) that the poet Byron was a guest at the estate in 1809, had an affair with Mrs. Chater, killed Chater in a subsequent duel, and was forced to flee England (the last being the only established fact in the sequence). Valentine Coverly (the same family still owns the estate) is a mathematician, working on chaos theory—specifically population dynamics as represented by the records of grouse hunting in the estate game books. There are also two younger Coverly children, Chlöe and Gus.

It is clear from very early on that the play has *something* to do with time and entropy. Within the first ten minutes, we get this exchange [11] (pp 4–5):

THOMASINA: When you stir your rice pudding, Septimus, the spoonful of jam spreads itself round making red trails like the picture of a meteor in my astronomical atlas. But if you stir backward, the jam will not come together again. Indeed, the pudding does not notice and continues to turn pink just as before. Do you think this is odd?

SEPTIMUS: No.

THOMASINA: Well, I do. You cannot stir things apart.

SEPTIMUS: No more you can, time must needs run backward, and since it will not, we must stir our way onward mixing as we go, disorder out of disorder into disorder until pink is complete, unchanging and unchangeable, and we are done with it for ever. This is known as free will or self-determination.

Obviously Septimus is a bit of a cynic; his last sentence can't be meant seriously. [Earlier in the play (p1) he defines carnal embrace for Thomasina as "the practice of throwing one's arms around a side of beef."] Equally obviously, Thomasina is quite a prodigy; she anticipates both Laplace (p 5):

THOMASINA: If you could stop every atom in its position and direction, and if your mind could comprehend all the actions thus suspended, then if you were really, *really* good at algebra you could write the formula for all the future; and although nobody can be so clever as to do it, the formula must exist just as if one could.

and the second law (pp 87, 95):

THOMASINA: ...Newton's equations go forwards and backwards, they do not care which way. But the heat equation cares very much, it goes only one way...

SEPTIMUS: So, we are all doomed!

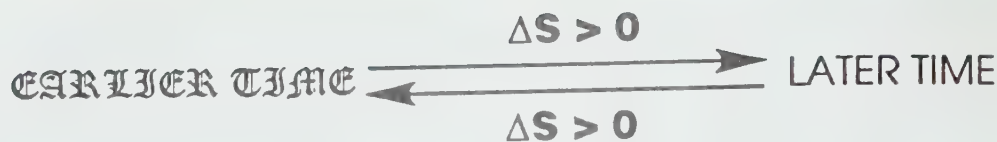
THOMASINA: (*Cheerfully*) Yes.

SEPTIMUS: So the Improved Newtonian Universe must cease and grow cold. Dear me.

Stoppard has drawn here the classic contrast between the eternal mechanical clock universe and the universe decaying toward its inevitable heat death—and if we go no deeper than these expository statements, then he seems to be accepting the latter, pessimistic view. Of course, Prigogine and Stengers have explained how this long-term pessimism is *not* the only alternative to the reversible and static Laplacean universe: so-called dissipative systems create order in localized subregions of open systems [12]:

A new unity is emerging: irreversibility is a source of order at all levels. Irreversibility is the mechanism that brings order out of chaos. How could such a radical transformation of our

Fig. 1. Entropy as time's
double-headed arrow



views on nature occur in the relatively short time span of the past few decades? We believe that it shows the important role intellectual construction plays in our concept of reality.

No doubt Stoppard would agree with the last sentence. However, the play seems to present a picture of reversibility at odds with both Laplace and Prigogine and Stengers. The latter argue [13]:

When time goes forward there is a role for chance, because small or random fluctuations near a bifurcation point can cause a system to take a different path than it otherwise would....But when time runs backward along the same track it took before, every juncture point is already predetermined, and hence chance can play no further part in the system's evolution.

Since "Arcadia" presents us with a single setting at two different times, we can examine how the "system" evolves over time. We may take it for granted that evolution in the forward direction is characterized by chance and disorder, even though Stoppard does not explicitly dwell on this motif in the play. (There are veiled hints about degeneration of the Coverly family: whereas Thomasina is a child genius and Augustus is a budding young aristocrat, Chlöe appears to be pretty much an airhead, while Gus is mysteriously mute.) On the other hand, a *major* focus of the play is on the various attempts—especially Bernard's—to *reconstruct the past*, which, in the informational world, is metaphorically a *backwards* trip in time. And what we see is that these backwards time travelers are subject to exactly the chance events and random fluctuations that Prigogine and Stengers deny! Bernard gets (nearly) everything wrong, because letters are left in the wrong place, misleading inscriptions are misattributed, crucial documents turn up at the wrong time, etc. So if we make the usual commonsense connection (but not the only possible choice; see below) equating randomness, disorder, and loss of information with increasing entropy, we get the result shown in Fig. 1. If entropy is "time's arrow," in this play it points both ways!

Well, this is just silly, isn't it—how can a quantity increase in both directions? Perhaps in the mental/perceptual world it *can*. A familiar illustration by M. C. Escher is shown in Fig. 2, where

one gets from point A to point B by going uphill and from point B to point A by going uphill! Before I try to interpret this paradox, though, let me extend it a bit further. As the Escher print shows, if you can travel uphill in *either* direction, then by continuing to travel in *one* direction, you must return to your starting point [14]. The analogue in "Arcadia" would be a demonstration that the system is in the same state (since thermodynamic entropy is a state function) in the two time periods. That equivalence is suggested by the staging. The directions for the opening of Scene Two, where we shift, for the first time, from 1809 to the present, read (p 15):

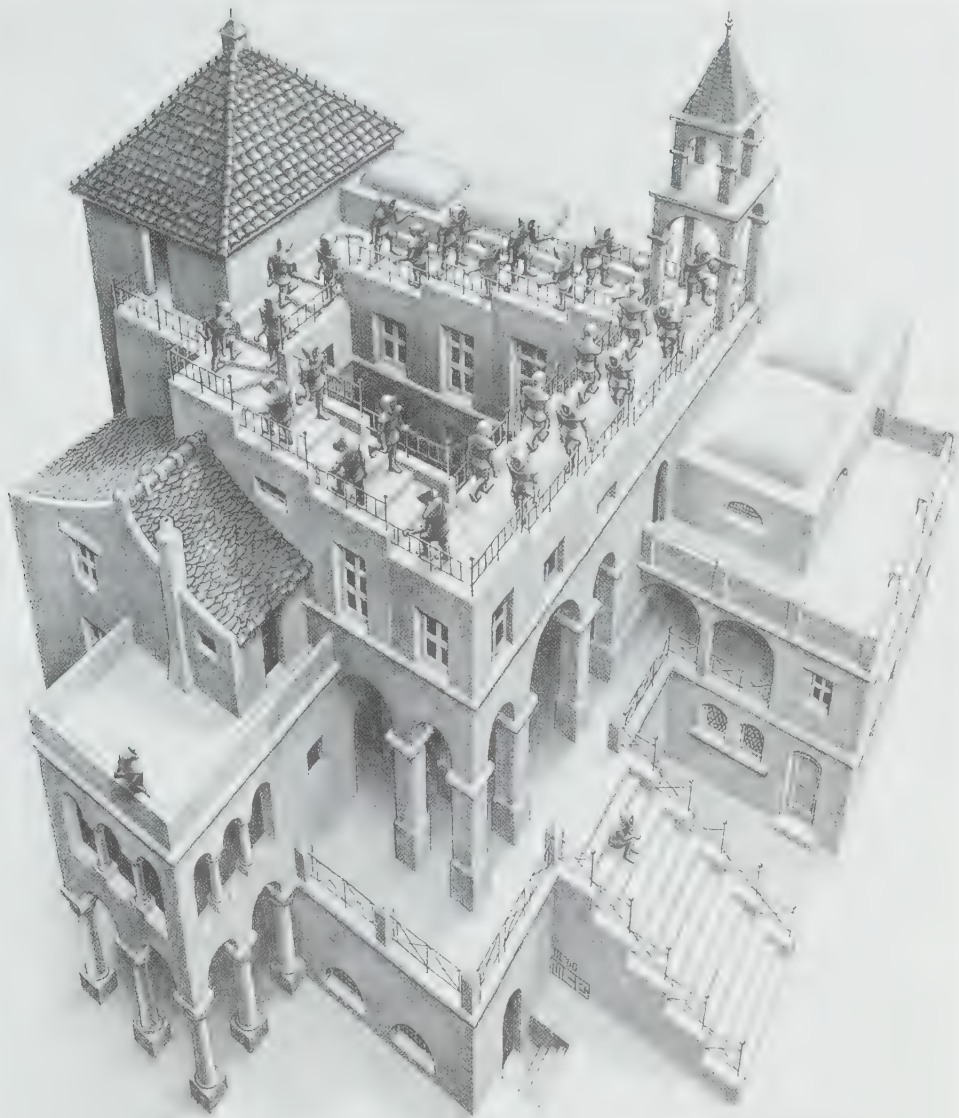
The lights come up on the same room, on the same sort of morning, in the present day, as is instantly clear from the appearance of Hannah Jarvis; and from nothing else.

Something needs to be said about this. The action of the play shuttles back and forth between the early nineteenth century and the present day, always in this same room. Both periods must share the state of the room, without the additions and subtractions which would normally be expected. The general appearance of the room should offend neither period....The landscape outside, we are told, has undergone changes. Again, what we see should neither change nor contradict.

This equilibration of the two time periods intensifies as the play proceeds. Whereas the first six scenes alternate between 1809 and the present, the seventh (last) scene is set in *both* time frames (the earlier one has moved forward to 1812). Eventually, characters from both periods occupy the stage simultaneously, right up to the end. Furthermore, in the final scene the action in the contemporary period includes preparation for a costume ball, so the characters are all wearing Regency dress and are not readily distinguishable from those of the earlier period—especially the 1812 character Augustus and the modern Gus who, the author directs, are to be played by the same actor.

What is Stoppard trying to convey by portraying in "Arcadia" a universe where changes over time are reversible—not in the Laplacean sense, but rather in the paradoxical Escherian mode of continuous change and return? I read it as a message

Fig. 2. M.C. Escher,
"Ascending and Descending"
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Art-Baarn-Holland.
All rights reserved.



of optimism, to counter the second law's pessimistic prediction of decay; but it does so quite differently from Prigogine and Stengers. Their message comes from superseding Laplace's time-reversible vision of stasis [15]:

The world of Laplace was eternal, an ideal perpetual-motion machine.

by one centered on the role of irreversibility in creating order. How do these pictures translate into informational entropy terms? If entropy and information are mathematically related, then, in Laplace's universe, entropy is constant, since information is constant—everything we need to predict the future or retrodict the past is always present. As we intuitively took entropy and infor-

mation to be *inversely* related, the creation of order seems obviously to correspond to a decrease in entropy. But, in fact, Shannon's version of information theory assigned entropy and information as mathematically *identical*, not opposite—entropy increases together with information. Perhaps with that in mind, Stoppard is not much concerned with creating order—which if continued indefinitely, after all, amounts to a one-way trip just as surely as its opposite. The destination of that trip is yet another dismal fate the second law holds out for us: we will be smothered to death by a glut of information [16]:

The achievement of redundancy—when everything that needs to be said has already been said—is analogous to entropic homo-

geneity when matter-energy settles into terminal equilibrium.

an image that is echoed in "Arcadia" (p 94) [17]:

VALENTINE: And everything is mixing the same way, all the time, irreversibly . . .

SEPTIMUS: Oh, we have time, I think.

VALENTINE: . . . till there's no time left. That's what time means.

SEPTIMUS: When we have found all the mysteries and lost all the meaning, we will be alone, on an empty shore.

So this is how the second law works in the Stoppardian-Escherian universe of the mind: entropy and information are always increasing but always stay the same. Perpetual motion *is* possible (see Fig. 3 for a diagram of a perpetual-motion machine)—but not as in Laplace's static universe. We are continuously creating information, but that simultaneously creates the demand for more information—and it is the creation, not the information itself, that is important (p 75):

HANNAH: It's *all* trivial—your grouse, my hermit, Bernard's Byron. Comparing what we're looking for misses the point. It's wanting to know that makes us matter.

And thus this metaphoric variant of the second law shows us how to escape its pessimistic implications [18]—all we need to do is never run out of questions. Which brings us back to the intersection of art and science—for Victor Hugo said much the same thing, over a hundred years ago [19]: "La science cherche le mouvement perpétuel. Elle l'a trouvé; c'est elle-même."

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2. Discussed, for example, in Kragh, H.; Weininger, S. J. "Sooner Silence than Confusion: The Tortuous Entry of Entropy into Chemistry," *Historical Studies in the Physical and Biological Sciences*, submitted for publication
3. But not unquestioned; for an example, see Layzer, D. *Sci. Am.* **1975**, 233 (December), 56. This subject has of course also been treated in fiction, as in the familiar Asimov short story "The Last Question."
4. Rifkin, J. *Entropy: A New World View*; Viking: New York, 1980
5. For illustrations of how this "guilt by association" can operate, see Gross, P. R.; Levitt, N. *Higher Superstition: The Academic Left and Its Quarrels with Science*; Johns Hopkins University Press: Baltimore, 1994
6. Denbigh, K. G.; Denbigh, J. S. *Entropy in Relation to Incomplete Knowledge*; Cambridge University Press: Cambridge, 1985; p 117
7. Klein, J. F. *Physical Significance of Entropy or of the Second Law*; D van Nostrand: New York, 1910; pp 89–90.
8. A number of commentators have remarked on how Shannon's connecting the concepts was rather arbitrary, based largely on resemblances between the mathematical forms of equations and von Neumann's recommendation to call an information measure entropy: "It is already in use under that name . . . and besides it will give you a great edge in debates because nobody really knows what entropy is anyway" (quoted in Ref. 6, p 104)
9. Savers, D. L. *Have His Carcase*; Avon Books: New York, 1932; p 236
10. Pynchon, T. "Entropy," in *Slow Learner*; Little, Brown: Boston, 1984; pp 88–89. In his introduction to this volume, a collection of early stories, Pynchon rather agrees with my characterization. Since then, many critics have made a small cottage industry out of tracing themes of entropy and chaos through Pynchon's later oeuvre
11. Stoppard, T. *Arcadia*; Faber and Faber: London, 1993. (Page number references to the text are given in parentheses.)
12. Prigogine, I.; Stengers, I. *Order Out of Chaos: Man's New Dialogue with Nature*; Bantam Books: New York, 1984; p 292
13. This is a paraphrase of Prigogine and Stengers, rather than a direct quote: Hayles, N. K. *Chaos Bound: Orderly Disorder in Contemporary Literature and Science*; Cornell University Press: Ithaca, 1990; pp 98–99
14. Here in my presentation I used an audio illustration—a tone that seems to be continuously descending in pitch but always returns to where it began (Pierce, J. R. *The Science of Musical Sound*; Scientific American Books: New York, 1983; pp 193–194)—which is obviously unavailable for this written argument
15. Prigogine and Stengers, Ref. 12, p 115
16. Again, a paraphrase, this time of Michel Serres: White, E. C. In *Chaos and Order: Complex Dynamics in Literature and Science*, Hayles, N. K., Ed.; University of Chicago Press: Chicago, 1991; p 268
17. Note that this "dialogue" involves characters from the two different time periods; they share the stage, but they are not speaking to each other. [This would be a good point to remind ourselves of what Stoppard has frequently stated, that a play is not a text but an event; reading it (or reading about it!) is but a pale substitute for the real thing.]
18. We learn toward the end of the play that Thomasina dies in a fire just after the final (1812) scene—that is, she suffers her own "heat death." During the discussion after the presentation of this paper, a member of the audience reported that he heard Stoppard explain in an interview that he added this touch after his son, a physics student, told him that his take on thermodynamics was rather *too* optimistic.
19. Quoted in Lévy-Leblond, J.-M. *SubStance* **1993**, 71/72, 7–26.

JAY A. LABINGER did his Ph.D. work in chemistry with John Osborn at Harvard University and a postdoctorate/instructorship at Princeton University with Jeffrey Schwartz. He was in both academia (University of Notre Dame) and industry (Occidental Petroleum, ARCO) before taking up his present position (Administrator of the Beckman Institute and Member of the Professional Staff in Chemistry) at Caltech in 1986. His research interests have concentrated in the areas of organo-transition-metal chemistry and catalysis, but in the last few years he has become increasingly distracted by literary, historical, and cultural aspects of science. Author appears in photo on page 49

Reading Between the Lines

Scientific papers are not always as objective as their authors suppose

HUGH ALDERSEY-WILLIAMS

“C₆₀: Buckminsterfullerene” [1] is an unusual paper. For a start, its title tells you what it is about only in the most oblique terms. As this announcement of the discovery of this 60-atom, spherically symmetric, chemically bonded molecular form of carbon proceeds, the authors engage in further games that not only reveal the facts of the discovery, but also convey a sense of its importance, and of the thrill they feel as they break their news.

Because of this, I thought it profitable to attempt what literary theorists call a deconstruction of the paper (published in *Nature* in November 1985 and written by Professor Harold Kroto of the University of Sussex and Professors Richard Smalley and Robert Curl of Rice University in Houston and their then research students Jim Heath and Sean O'Brien) in my recent popular book on the discovery of buckminsterfullerene [2]. This exercise revealed not exactly a hidden agenda, but it did show something of what was on the scientists' minds, their surprise and excitement at the discovery, their playful good humor, and their confidence in its significance.

I included this section in part because I wished to expose my readers to a “real scientific paper” and to demonstrate that such communications are not as impenetrable as is often thought. But I also wished to show that a “literary” technique could be applied to a “nonliterary” work. There is much current interest among literary theorists in applying their methods to scientific writing [3]. But, almost universally, these scholars have chosen to examine historic works of science where, thanks to the patina of age, it is easy to believe there is also literary intent.

Professor Gillian Beer of Cambridge Universi-

ty, for example, has made a detailed study of the writings of Charles Darwin [4]. “In its imaginative consequences for science, literature, society and feeling, *The Origin of Species* is one of the most extraordinary examples of a work which included more than the maker of it at the time knew...,” she writes in introduction. This over-inclusion of information is the temptation for such a project. But the extraordinariness of the chosen work is its weakness. *The Origin* is a book-length work, now more than a century old, written to be read not only by scientists but by educated people of all kinds.

For all these reasons, it is possible to see this work as literary as much as scientific in style. Beer discovers, for example, that Darwin “rearranges the elements of creation myths”—the Garden of Eden becomes the ocean, the tree of life becomes the evolutionary tree. At a time before scientific language had grown apart from everyday language, it was easy for such images and metaphors to pass from everyday parlance to scientific usage and back again, thus enhancing people's comprehension of the science and adding layers of complex meaning to the accounts of Darwin's simple observations. “His language is expressive rather than rigorous,” Beer writes. But how exclusively rigorous can scientific language ever be? Expression is always there; language expresses thought. Scientific language is unavoidably full of literary devices, notwithstanding that it is sometimes the scientists who deny this.

Consider one of the most famous scientific communications of this century, the announcement in 1953 by James Watson and Francis Crick in *Nature* of the famous double helix [5]. This paper has an unprepossessing title: “Molecular Structure of Nucleic Acids.” But from there on,

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modesty is cast aside. While many scientific papers uphold the ideal of supposed objectivity through anonymity, this one is written in the first person. Its first sentence could hardly be bolder: "We wish to suggest a structure for the salt of deoxyribose nucleic acid (D.N.A.)." This is the action of throwing down a gauntlet. They follow their opening declaration with a breathtaking understatement: "This structure has novel features which are of considerable biological interest."

The paper proceeds for the most part in the same tone, with many sentences beginning "We...." The great merit of the double-helix structure—literally its *raison d'être!*—was that it inherently solved the puzzle of self-replication. Watson and Crick knew this all too well and could not help but tease readers of *Nature* with the concluding litotes: "It has not escaped our notice that the specific pairing we have postulated immediately suggests a possible copying mechanism for the genetic material."

In order to further demonstrate the applicability of literary analysis to contemporary works of science, let us deconstruct the companion paper to Kroto et al.'s 1985 announcement, Wolfgang Krätschmer, Lowell Lamb, Kostantinos Fostiropoulos, and Donald Huffman's 1990 paper, once again in *Nature*, describing how C_{60} was obtained in quantity for the first time [6]. This paper has certain conscious (and some perhaps unconscious) parallels with the earlier paper as well as other elements of subtext. It is a long paper, so I have selected only parts of the paper for analysis.

In its formal composition, the title has echoes of " C_{60} : Buckminsterfullerene," although, by now, none of its mystery:

Solid C_{60} : A New Form of Carbon

The first sentence of the abstract contains a number of claims to novelty.

A new form of pure, solid carbon has been synthesized consisting of a somewhat disordered hexagonal close packing of soccer-ball-shaped C_{60} molecules.

The bald statement comes with the words *new form*. The word *solid* gives us the first new information (the room-temperature physical state of buckminsterfullerene had been unknown and presumed perhaps to be liquid). The other chosen adjective, *pure*, is gilding the lily with tautology: a new form of any element must, by definition, be pure.

The choice of *synthesized* places a further tax on our credulity. Krätschmer et al. presumably wish to distance their facile and copious technique for making C_{60} from the hopelessly impractical method of Smalley's cluster beam appa-

ratus. This is not a synthesis in terms that an organic chemist would recognize. But it is perhaps forgivable hubris from physicists who have made an astonishing chemical discovery. The remainder of the sentence is uncontroversial description; note the choice of the adjective *soccer-ball-shaped* in place of anything more "scientific," again an echo of the Kroto paper, in which a soccer ball was used as a photographic illustration of the proposed C_{60} structure.

The abstract continues:

Infrared spectra and X-ray diffraction studies of the molecular packing confirm that the molecules have the anticipated "fullerene" structure. Mass spectroscopy shows that the C_{70} molecule is present at levels of a few per cent. The solid-state and molecular properties of C_{60} and its possible role in interstellar space can now be studied in detail.

In the last sentence, the *now* is significant, with its overtone of "at last." It has been a trying five-year wait to get to this stage, and it is Krätschmer and Huffman's breakthrough, as much as Kroto and Smalley's, that will permit the resolution of these larger questions.

The paper itself begins as follows:

Following the observation that even-numbered clusters of carbon atoms in the range C_{30} - C_{100} are present in carbon vapour,¹ conditions were found^{2,3} for which the C_{60} molecule could be made dominant in the large-mass fraction of vapourized graphite.

The authors are scrupulous in referring to the sequence of events surrounding the discovery of C_{60} , conscious no doubt of the controversy that had erupted since 1985. Reference 1 is to work by researchers at Exxon who in 1984 had recorded mass spectra showing 60 carbon atoms as the dominant peak but had not singled that fact out for further examination. Reference 2 is to Kroto et al.'s *Nature* paper in 1985, and the third and fourth references are to further work in Smalley's laboratory establishing the stability of fullerene ions.

After sentences describing the torrent of calculation and speculation based upon the proposed truncated icosahedron structure unleashed by the 1985 discovery, Krätschmer and Huffman bring their readers back to reality and the merit of their discovery, which is to make possible measurement in place of mere theorizing:

Until now, it has not been possible to produce sufficient quantities of the new material to permit measurement of the physical properties, to test the theoretical calculations, or to evaluate possible applications.

It is comparatively rare in scientific papers to advertise the novelty they contain so blatantly. But here, *Until now* makes it very clear what is new.

The tone of the paper up to this point has been impersonal. Those responsible for work described are not identified except by citation. In the subsequent paragraph, the tone changes abruptly to the first person:

Some of us have recently reported evidence²¹
²² for the presence of the C₆₀ molecule in soot condensed from evaporated graphite....Here we report how to extract the carrier of the features from the soot, how to purify it, and evidence that the material obtained is in fact primarily C₆₀.

These citations are to earlier papers by Krätschmer, Fostiropoulos, and Huffman in which they had tentatively advanced the notion that certain features of spectra of laboratory-produced carbon dust might be explained by the new molecule. Without the full evidence they needed, they had confined these thoughts to obscure and slow-publishing media.

Although the authors say they will proceed in effect to give the recipe for C₆₀, they are less than detailed:

The starting material for our process is pure graphitic carbon soot...with a few per cent by weight of C₆₀ molecules, as described in refs 21, 22. It is produced by evaporating graphite electrodes in an atmosphere of ~100 torr of helium. The resulting black soot is gently scraped from the collecting surfaces ...

And that's it. That is the complete extent of the recipe that Krätschmer and his colleagues give—or are willing to give—for producing a material whose manufacture had frustrated groups around the world working with the most sophisticated apparatus. The brevity of the recipe emphasizes its simplicity and, in so doing, serves to magnify the scale of the physicists' breakthrough.

There then follows a description of the purification of the C₆₀-rich soot by means of recrystallization from various solvents, a procedure that these physicists clearly view with some distaste. With relief, they add that there is a "physical" rather than "chemical" (i.e., liquid-phase) remedy:

An alternative concentration procedure is to heat the soot to 400°C in a vacuum or in an inert atmosphere, thus subliming the C₆₀ out of the soot...

But even this requires a preparatory washing of the initial soot in ether to remove

the ubiquitous hydrocarbons...

The authors press on with empirical descriptions of the behavior of the first solid C₆₀:

Thin films and powder samples of the new material can be handled without special precautions and seem to be stable in air for at least several weeks, although there does seem to be some deterioration with time for reasons that are as yet unclear. The material can be sublimed repeatedly without decomposition. Using the apparatus described, one person can produce of the order of 100 mg of the purified material in a day.

Chemists might have speculated about reasons (oxidation? photodissociation?) for the deterioration observed. These authors, however, dwell upon the physical stability of their new substance, saying that it *can be sublimed repeatedly without decomposition*. The most significant comment comes in the last sentence of the paragraph, *Using the apparatus described...*, which lays claim to the unique efficacy of this apparatus for the production of purified C₆₀, a presage to moves to patent the process.

The following paragraph offers further description:

Studies by optical microscopy of the material left after evaporating the benzene show a variety of what appear to be crystals—mainly rods, platelets and star-like flakes.

This poetic final phrase hints at the hexagonal symmetry:

...All crystals tend to exhibit six-fold symmetry. In transmitted light they appear red to brown in colour; in reflected light the larger crystals have a metallic appearance whereas the platelets show interference colours. The platelets can be rather thin and are thus ideally suited for electron-diffraction studies in an electron microscope...

And indeed, the electron diffraction (and X-ray diffraction) patterns that accompany this statement are to be the principal new evidence for the C₆₀ structure both as molecule and in bulk. The following section of the paper, however, focuses on what historically has been the only undisputed means for characterizing C₆₀: mass spectroscopy. It begins:

The material has been analysed by mass spectrometry at several facilities.

Why *several facilities*? It does no harm to duplicate one's results of course, but this is not what is going on here. This is public (albeit coded) re-

venge taken by Huffman over a technician who wanted his name added to the paper simply for recording the spectrum. His request was refused, his spectrum omitted, and an earlier, poorer spectrum of Krätschmer's published instead.

The results confirm the constitution of the material as substantially C_{60} . They reveal that there is about 10% of C_{70} in a typical sample and that this proportion can be reduced by different means of taking the spectra, much in line with observations made during the laser vaporization experiments of Smalley's group. The section closes with a promise that

Further details of the mass spectroscopy of the new material will be published elsewhere.

What further details? Where? And why not now? This statement presumably reflects Huffman's wish still to publish the spectrum recorded by his technician.

With this confirmation out of the way, the authors proceed to do what has not been done before—to characterize C_{60} for the first time as a bulk material distinct from the discrete molecules made by Kroto and Smalley:

To determine if the C_{60} molecules form a regular lattice, we performed electron and X-ray diffraction studies on the individual crystals and on the powder....From the hexagonal array of diffraction spots..., a d spacing of 8.7 Å was deduced corresponding to the (100) reciprocal lattice vector of a hexagonal lattice.

The discussion continues with the deduction of the nearest-neighbor distance of the buckyballs and a calculation of the density of the bulk material. It is clear that

...the C_{60} molecules seem to assemble themselves into a somewhat ordered array as if they are effectively spherical, which is entirely consistent with the hypothesis that they are shaped like soccer balls.

This formulation, *is entirely consistent with the hypothesis*, rather than simply "confirms," echoes several papers of Smalley's group which were able to add layers of circumstantial evidence that C_{60} was spheroidal without quite being able to produce unequivocal proof. By now, however, there is no reasonable doubt about the shape of the individual molecules, and Krätschmer and Huffman concern themselves with the bulk material:

In summary, our diffraction data imply that the substance isolated is at least partially crystalline. The inferred lattice constants, when interpreted in terms of close-packed icosahedral C_{60} , yield a density consistent with the mea-

sured value. Further evidence that the molecules are indeed buckminsterfullerene and that the solid primarily consists of these molecules comes from the spectroscopic results.

The following section assembles infrared and ultraviolet spectroscopic results broadly in agreement with those previously observed and predicted by theory.

There then follows a discussion under the heading

Possible interstellar dust

The original stimulus for the work² that led to the hypothesis of the soccer-ball-shaped C_{60} molecule, buckminsterfullerene, was an interest in certain unexplained features in the absorption and emission spectra of interstellar matter.

By citing Kroto et al. of 1985 once again at this point, these authors indicate a shared interest and motivation.

These include an intense absorption band at 217 nm which has long been attributed to small particles of graphite³¹, a group of unidentified interstellar absorption bands in the visible that have defied explanation for more than 70 years^{31, 32}, and several strong emission bands attributed to polycyclic aromatic hydrocarbons^{33, 34}.

Reference 31 is to Huffman's own 1977 work on dust particles. It establishes his independent credentials and shows that he has a perspective on the subject that predates Kroto and Smalley's discovery. Now comes the crunch:

Based on the visible and infrared absorption spectra... , we do not see any obvious matches with the interstellar features.

This is a disappointment. The authors do what they can to leave the door open:

The ultraviolet band at 216–219 nm has a similar peak wavelength to an interstellar feature, although the other strong bands of the spectrum have no interstellar counterparts. As the influence of C_{70} absorptions on the spectrum is not yet known, a conclusive comparison with the 217-nm interstellar band is difficult. We note that the visible-ultraviolet spectrum presented here is characteristic of a solid, rather than of free molecules. In addition, these new results do not relate directly to absorption in the free C_{60}^+ molecular ion, which has been envisaged¹⁹ to explain the diffuse interstellar bands. Nevertheless, these data should now provide guidance for possi-

ble infrared detection of the C_{60} molecule, if it is indeed as ubiquitous in the cosmos as some have supposed.

Reference 19 is to a conjecture of Kroto's published in 1987. The supposition of cosmic ubiquity is Kroto's, too. Krätschmer and Huffman are gentle in their disparagement. They proceed to their own, down-to-earth summary:

To our method for producing macroscopic quantities of C_{60} , we have added a method for concentrating it in pure solid form. Analyses including mass spectroscopy, infrared spectroscopy, electron diffraction and X-ray diffraction leave little doubt that we have produced a solid material that apparently has not been reported previously.

The authors take care to separate the methods of production and purification, perhaps preparing the ground for patent applications. Their scientific discovery, the isolation of a new substance, they apparently regard as secondary to these technologies. They are nevertheless keen to lay ownership to the new solid material as well:

We call the solid fullerite as a simple extension of the shortened term fullerene, which has been applied to the large cage-shaped molecules typified by buckminsterfullerene (C_{60}).

The name *fullerite* is well chosen. It is easy to say. It sounds natural. Indeed, it sounds like a mineral. Others doubted that the solid bulk material warranted its own name. Unlike "fullerene," it has not caught on.

The various physical and chemical properties of C_{60} can now be measured and speculations concerning its potential uses can be tested.

In contrast to Kroto and Smalley five years earlier, Krätschmer and Huffman forbear to offer their own speculations. By now, there is no shortage of these.

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Three Boards and "A Bet Against the Company"

CONTINUED FROM PAGE 29

should be an insider or an outsider. The main advantage of having an outsider as Chairman is that he or she can be more objective and impartial. Let us see how an "outside" Chairman might have handled this situation.

There is a good chance that an independent, outside chairman would have proceeded more deliberately in his investigation. First, it is unlikely that he would have felt the same urgency to resolve the problem. He probably would have wanted to meet directly with Bader to investigate the incident thoroughly, to review the new legislation, to get the advice of fellow outside board members and of the company's lawyers, and to consider alternatives.

Assuming that one would reserve the severest penalty, dismissal, for the most flagrant violation (a deliberate attempt to take advantage of insider knowledge for personal gain), the Chairman

might have considered a range of alternatives: removal of the "Chairman Emeritus" title, payment of a fine to the company (say some multiple of the alleged insider profits) over and beyond any disgorgement required by law, a public apology to the shareholders, or nothing more than a slight slap on the wrist with a sharp warning never to do it again. Assuming one of these alternatives was selected by the Chairman of the Board, he would have preserved for the company's benefit one of its most important human assets and continued to reap the rewards from the lifetime association of the company with one of its founders and spokespersons. The Chairman's challenge was to find the "win win" solution that best served the interests of the company; to bet with the company. With an outsider as Chairman, the Board at least would have had the possibility of another option to consider. One outcome is certain: The confrontation between three American businessmen at the Russell Hotel in London on November 20, 1991, would not have taken place.



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From Instruments to Institutes: "Beckman" Is not only a Spectrophotometer

ISTVÁN HARGITTAI

The first part of this three-part article contains reminiscences of Dr. Arnold O. Beckman, the second focuses on the Beckman Institute at Caltech through the words of its director, Professor Harry B. Gray, and the third part, written by Dr. William P. Schaefer, is the story of the Snub Cube sculpture decorating the courtyard of Caltech's Beckman Institute. Special thanks are due to Dr. Jay Labinger, the Administrator of the Beckman Institute at Caltech, for his assistance in bringing the story together and to Ms. Shelley Erwin, Associate Archivist at the Institute, for finding the archival illustrations.

Arnold Beckman during the interview.
(photos by I. Hargittai)

Arnold O. Beckman (c. 1930) is the founder of Beckman Instruments, and his name has been associated with scientific instruments, most notably the Beckman spectrophotometer. Today, the Beckman Institutes also carry his name. The following conversation was recorded with Dr. Beckman in his office at one of the Beckman Institutes in Urbana, Illinois, on February 22, 1996.

ISTVÁN HARGITTAI (IH): How did you get into chemistry?

ARNOLD O. BECKMAN (AB): I got into chemistry quite by accident. I found a textbook in the attic that belonged to an aunt of mine. It was Steele's *Fourteen Weeks in Chemistry*. This book was published in 1861, and I was able to understand it. I was a 10-year-old, and I made simple chemicals by following the directions from the book. So that's where my interest was engendered.

IH: How about your parents?

AB: My father was a blacksmith and my mother was a housekeeper. My aunt was a professional photographer in an adjoining town. We lived in Cullom, Illinois. I entered the University of Illinois in 1919, earned a Bachelor's degree in chemical engineering in 1922, and a Master's in physical chemistry in 1925. Then I went to Caltech.

IH: How did you choose Caltech? It was not the famous school then that it is today.

AB: That's true. My professor of physical chemistry at Illinois was Professor Richard Chace Tolman



and he joined Caltech as the Head of the Science Division, and he gave me a Teaching Fellowship to go there. I've had a close relationship with Caltech from the very beginning. I came to Caltech in 1925. That was a sticky situation—a newly founded school, a very small school, to see it become such a top institute in the world. I am now Chairman Emeritus of Caltech.

IH: It doesn't require me to go to meetings but gives me an honorary status.

IH: What did your parents think about your going on to higher education?

AB: My mother died when I was 12. My father never went on to higher education but he did not object at all. He always let me do what I wanted to do. He died in 1946 when he was 85.

IH: Was he proud of you?

AB: I guess so, but we never discussed it. I didn't start out to be a businessman. I had a classmate, Glen Joseph, who had to measure the acidity of citrus juice that had been highly dosed with sul-

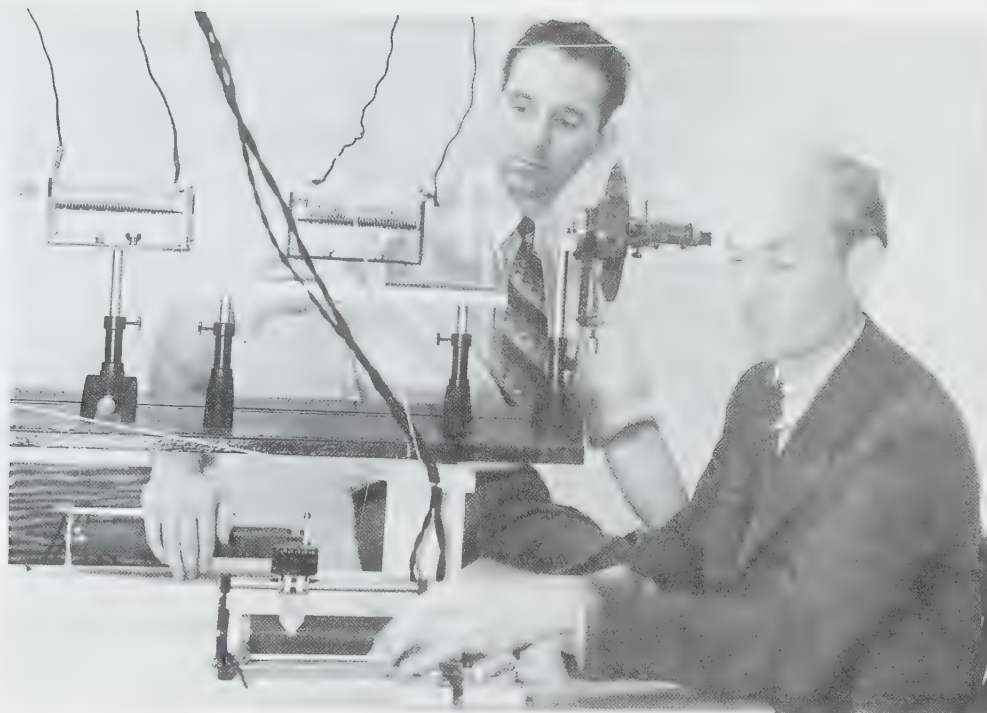
Drs. Beckman and McCulloch

in a lab at Caltech, 1934.

(Courtesy of the Archives,

California Institute of

Technology.)



fur dioxide. You can't do this with the conventional hydrogen-ion indicator because sulfur dioxide poisons the electrode. The only electrode you could use was a glass electrode. The trouble with that was that the resistance there was very high because the electricity had to flow through the glass. So he came to me and told me about his problem. This was in 1934. He was trying to use a galvanometer, which is not appropriate because of its low impedance. I told him that he had to use a glass electrode instrument, and then I made one for him. Then somebody else's laboratory wanted one also, so I made one, two, three, four, and so on, and just by that slow growth I gradually eased into business.

IH: What was your position at Caltech at that time?

AB: Assistant Professor, teaching general chemistry and doing research. In fact, I did a good job on that. At that time I was concerned about what was taught as freshman chemistry. It was mainly a rehash of what we had in high school. So I worked up a course that involved some physical chemistry experiments. I even wrote a little book, which I foolishly didn't save. We made only a small printing. That book was mostly quantitative experiments in physical chemistry. I wanted to get away from the qualitative aspects of most freshman chemistry classes.

IH: Did you take chemistry in high school?

AB: I did. I went to the University High School in Normal, Illinois, and took university chemistry instead of high school Latin. I never was very good in languages. That was a deficiency in my

background.

Let me tell you a little side story. I got an A in German and an N in French. This was because the teacher loved to sing German songs, *lieder*, and I played them on the piano. So I got an A+ for the course without learning much German. That was one of the practical aspects of life.

Our high school was part of the Illinois State system. Our chemistry teacher was Howard W. Adams. I did well, got As, and he allowed me to take, as an overload, the university chemistry courses. As a result, when I entered university, I had two years of university chemistry under my belt. He was an unusually kind and thoughtful person. We enrolled in a course on how to polish mineral specimens, etch them, and photograph them and how to examine the photographs. We did not have cameras at the high school and so on Saturday afternoons he would drive me over to Urbana, Illinois, about 50 miles away, to use the cameras there. A wonderful teacher he was. I was very lucky to have such a teacher.

Returning to my father, he was later a traveling salesman of blacksmith supplies. Originally, there were four blacksmiths in our town of 500 people. Of course, there were many horses, particularly plow horses for agriculture. They had huge horse-shoes. My father allowed me to set up a laboratory in our house, and once I almost burned the house down. That was in Bloomington, Illinois, where we moved when I was 14. In fact, we lived in Normal, which was a suburb of Bloomington.

There was a gas company in town and the sul-

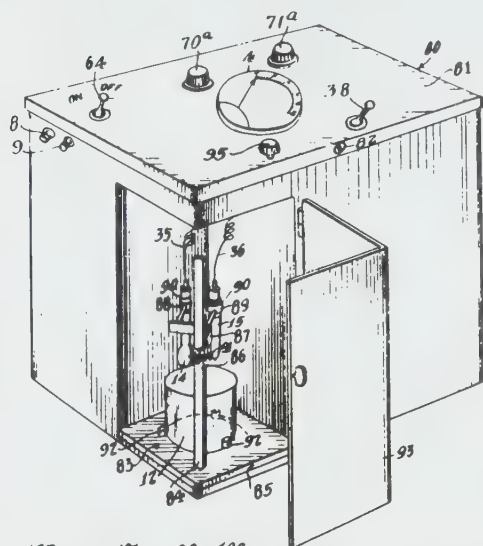


Fig 3

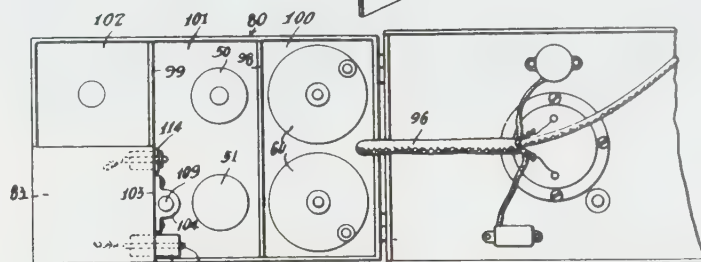


Fig. 4

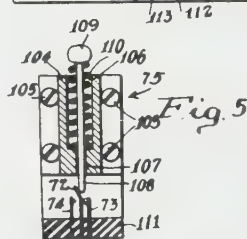


Fig. 5

Inventors
Arnold C. Beckman
Henry C. Flacker
 33, *Lyon Lyon* Attorneys

Technical illustration of an early pH meter. (Courtesy of the Archives, California Institute of Technology.)

fur had to be removed from the gas by benzene, and I analyzed the sulfur content by using ferric chloride. That was a long time ago, even before I went to university.

I was lucky in many ways in that period of my life.

IH: How did you get through college?

AB: I played the piano at the movies. They had silent movies in those days. If it was a big movie, it would have its own score, and if it was not such a big movie, I had to improvise, and I got to be pretty good at that. It all started one summer when I rode the rails west to see Yellowstone Park. To ride the rails means that you hop on the railroad trains, particularly freight trains, and try to keep from being kicked off the train. This is why they had detectives on the train, to find you and kick you off. I just had to learn how to conceal myself inside a boxcar and not to go into a

regular car. Even a car that had a closed door had to be avoided because someone might close the door and lock me inside. Later in my life I drove out there again in my Model T. I also drove from New York to California in a Model T. It was with my wife, we weren't in a hurry, and it took us several weeks. I'd been out before and met some interesting people on that trip, and I wanted her to meet the same people so we made a roundabout trip.

Back to my first trip west, I met an interesting character in Ashton, Idaho, Hexon Tom. He got his name from having been locked up in a jail in Hexon. He was a professional prize-fighter, a great big man, and he got into female problems in Chicago so he went out west, ended up in Ashton, and built himself a log cabin with a punching bag to keep himself fit. He and I got along well. At the end of the summer when I was going back to school—I was just out of high school and it was time for me to start university—he tried to persuade me to go down and investigate the cliff excursions, not coming from below but going over the top and hanging down on a rope ladder. He offered to pay my living expenses. However, I was enthused that I had to get on with my chemical education, so I didn't do it.

Then, to get through college, I had a dance band, an orchestra. That was at Urbana.

IH: How did you meet your wife?

AB: I was in the Marine Corps, Private First Class, in the Brooklyn Navy Yard. It was Thanksgiving Day and we had a Thanksgiving dinner and then a dozen of us were called out and ordered to go to the Brooklyn YMCA and eat another Thanksgiving dinner. A bunch of ladies over there had prepared a Thanksgiving dinner for the wounded Marines coming back from France, and they had made more dinners than there were wounded Marines. We were ordered to go there and eat those extra dinners. It was just my luck that I didn't get shipped out to Vladivostok that night. I almost did. Instead of that, I had to go to eat another dinner with the ladies. Some of the ladies had brought these extra dinners to this place personally, and some brought their daughters as Mabel's mother did. I was interested as Mabel was a rather attractive person, and I had the courage to arrange a date that night with her.

IH: How about the Beckman Institutes?

AB: I have five of them. The largest are the ones you visited at Caltech and at the University of Illinois at Urbana. I am happy with the way they worked out. It means that I can continue to contribute to science. Also, I had to go for this idea because Uncle Sam comes in, and that makes you change your actions a little bit. We have a Foundation for supporting these Institutes.

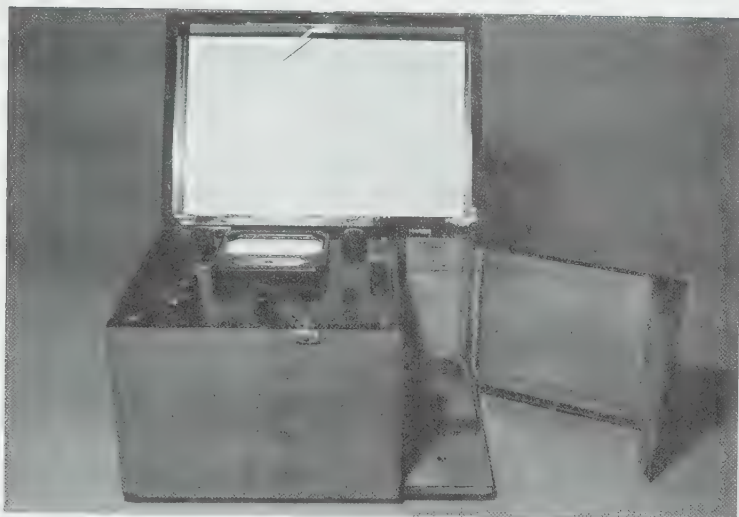


Photo of the same model of pH meter. (Courtesy of the Archives, California Institute of Technology.)

IH: How about your children?

AB: I have two children. Patty studied some chemistry in high school, and Arnold has been interested in electronics.

IH: For me Beckman used to be merely the name of a photometer, and now I know that it is also the name of a person.

AB: The Beckman thermometer goes back to the early 1800s. That was a thermometer for measuring small temperature differentials. However, that Beckman was no relation to our family. When I went to Germany, people thought that I was the Beckman of the Beckman thermometer and looked at me and said that they were amazed that an American had invented something that was better than the German equivalent and also that he was such a young person. I was about 30.

There is still a Beckman Instruments producing medical instruments. The original Beckman Instruments was sold in 1982 to SmithKline Corporation. The two companies merged. It was the biggest deal at that time, about a hundred million dollar transaction. Oh, no, it was not a hundred million, it was a billion and seventy million. After the merger SmithKline sold off a couple of sections of the company although they had promised they would not, but they did.

There are still things being produced that I invented. I'm particularly proud of the Helipot. That's a little multirange potentiometer or rheostat.

IH: At what point did you

feel that you were rich?

AB: I've never felt that. Now I have given away several hundred million dollars but I've never been concerned about the volume. Money is of no value unless it's spent. The most valuable asset a person can have is his self-respect, and that's been the fact that's governed most of my things, and I always had that. I've always tried to avoid doing anything that would diminish my self-respect.

IH: You are now 96 and look very fit. How did you achieve that?

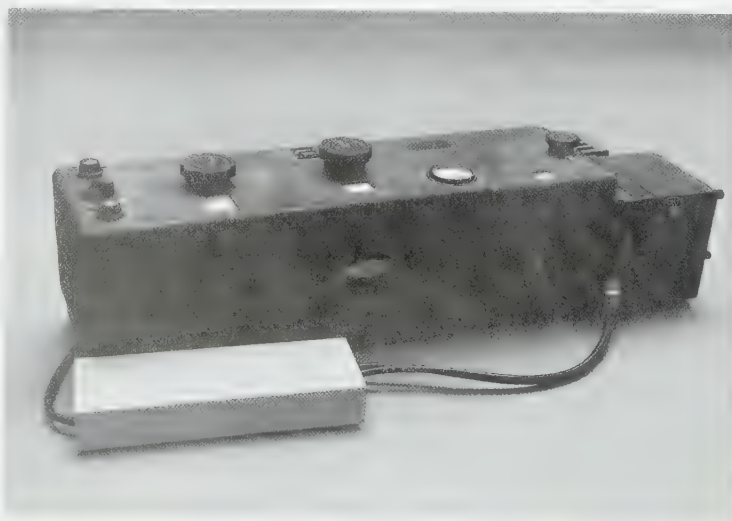
AB: I did that by avoiding the usual rules. I don't exercise. I never smoked. In World War I my tent companion was a boy from Virginia who smoked. He was addicted to smoking. When he could not get cigarettes, he was really in pain. That made such an impression on me that I never smoked.

IH: What do you like to do these days?

AB: I like to read scientific publications, not the detailed types but the summary types, like *Scientific American*. I think I'll like *The Chemical Intelligencer* too. There is nothing else but science that has captured my interest.

The one thing I am worried about, when I take the trouble to worry about things, is, are we spending too much time on physical sciences and not enough on human sciences? Are we learning any better how to get along with each other in this world of violence? I think we should put more emphasis on human relations.

I may have sometimes an unorthodox view of something. Let me give you an example. Suppose you have a volume of a gas under an isothermal condition and you dilute that. It still obeys the gas laws until you get down to a point where there aren't enough collisions any more to follow the gas law, and a discrete behavior description takes over. I think about this problem a lot. Maybe some younger person with plenty of vitality would want to carry that on.



DU spectrophotometer. (Courtesy of the Archives, California Institute of Technology.)

Interview with Harry B. Gray

Harry B. Gray (b. 1935) is Arnold O. Beckman Professor of Chemistry and Director of the Beckman Institute, California Institute of Technology.

Our conversation was recorded at Caltech on February 19, 1996.



ISTVÁN HARGITAI (IH): How did the Beckman Institute begin, and what is its main function?

HARRY B. GRAY (HG): Some years ago I felt that we needed a change in the infrastructure to support chemistry and biology. Chemistry is so driven by technology and instrumentation that the old idea of a small laboratory with an individual investigator was no longer the

best way to do research in chemistry and biology. We went through a mode of sharing equipment like NMR and X-ray instruments, we were used to that, but lots of other things were coming, all kinds of lasers, tunneling microscopes, magnetometers, and many others. I call it an instrument revolution in chemistry and biology.

At the same time Dr. Beckman came along, and we'd had a long relationship with him. He was looking for something new to do at Caltech. We started discussions with him in the early 1980s. We proposed something along the lines that Dr. Beckman had pioneered, namely, development of new instruments and methods. That's what he did in his time at Caltech. He developed, for example, the first user-friendly pH meter. Then he built the Beckman quartz spectrophotometer, and so on. This all had a big impact because chemists and biochemists could use them readily. Following in his footsteps, we proposed to build an institute, the Beckman Institute, that would put emphasis on technology, supporting basic research by individual investigators all through the Caltech campus. We wouldn't build a new institute that would have science-specific goals and new faculty members. We would propose only a modest expansion in faculty but a large expansion in infrastructure, instrumentation, methodologies, including synthetic methodologies, analytical methodologies, ways of doing science that would support the research of individual investigators. At the same time we thought, in so doing, we would promote interdisciplinary work.

The proposed institute would be organized around *resource centers*. The main operating unit in the Beckman Institute is the resource center. A resource center is a unit in which we have professionals, experts in certain technologies and certain instruments. They have themes of their own and front-line research is being done by these people, but a component of their activity entails making their instrumentation available to the community. They also have a component of developing new methods and new instruments that would push the state of the art ahead. On top of that, we have just plain *facilities* that do measurements. These facilities do no in-house research or development of new things; they are just making instruments and techniques available to the community.

IH: How about charges?

HG: Up to now we don't charge; we have an endowment from Dr. Beckman and we have support from the Beckman Foundation. Some of the facilities have charges for supplies. This is not only for Caltech people, who are about 90% of the users, but for many visitors, including industrial visitors.

We have two computational resource centers, one in chemistry and materials and the other in biology. They both have hardware and software development, computer graphics, very fancy things. Software development is going so fast that even a large company can't keep up with it, and they send people here to look at the latest methods for doing electronic structure calculations or molecular mechanics, modeling large structures, etc. One of our successful resource centers is the laser center, with all kinds of laser experiments.

We consider our Institute a model that might be useful for others of how to do chemistry and biology research in the next century, which is, you've got to share things.

We moved into our building in the summer of 1990 and it is now full. We have seven resource centers and several facilities. In addition, we have two research centers, which are smaller units that might grow into resource centers.

IH: What's your estimate of the dollar value of your present instrumentation?

HG: About \$60 million have been invested in the building and in instrumentation. We try to match Beckman money with government money, that is, funding from NSF and NIH. We don't just buy something; we write proposals and get peer reviews of projects. We are not operating in a vacuum; we like to get our stuff peer-reviewed for quality control. From the beginning we proposed to Dr. Beckman that we would use his money as matching money for government money rather than just spend his money. Both sides double their money this way. This also ensures that we don't do something second-rate

IH: How many people work in this Institute?

HG: About 250, including students and postdocs, some faculty members, technicians, etc., and I have no idea about the total budget because that includes a large number of federal research grants for the people working here. The number of staff members of the Institute itself is about 20. I myself am not a staff member, I'm Professor of Chemistry.

IH: It seems to me more like a European approach?

HG: Yes. You may consider it similar to a Max-Planck-Institute. I decided about ten years ago that we should be moving toward the European model. In the past we used to pride ourselves, especially at Caltech, on having autonomous research groups, doing everything within the group. I think this is no longer possible. You can't have large-molecule X-ray crystallography without support people, for example. You can no longer do everything with a

Harry Gray (photo by I. Hargittai)

handful of graduate students. Thus we have developed this Beckman Institute more along the lines of a European model. It's a tricky business, because we would like to develop only the best aspects of the European model and preserve the individual investigator's autonomy, the fact that a young, beginning faculty member can do whatever he or she wants to do and follow that rather than being part of some pyramid as I see all the time in Europe, which encourages inbreeding and staying in the same place and looking at the same problem. The tricky point is to build what we built here but maintain the fierce independence that our researchers, however young, have always had. They don't have any respect for the older people. I'm competing just like the youngest person for research support in Washington.

IH: Has Dr. Beckman followed your activities here?

HG: Yes, he has followed them. Of course, he is now almost 96 (Dr. Beckman turned 96 on April 10, 1996) but has remained very interested. There are several Beckman Institutes around the country, at the University of Illinois, Urbana, at Stanford, at Irvine, and some smaller ones. Ours is the only one that has this resource center concept. The others are still devoted to certain kinds of science and individual investigators.

IH: How long have you been Director of this Institute?

HG: Since 1986, from the time of planning and building it.

IH: Has your research suffered from it?

HG: No, it has benefited from it. I have used the instrumentation myself. I've also traded off teaching and other administrative tasks. I'm doing more research than I've ever done. This is not such a hard job. The tough jobs at a university are jobs where you interview and appoint faculty. I have now about 20 people in my research group, 12 graduate students, 7 postdocs, and one or two undergraduates.

IH: What is the main thrust of your research?

HG: Biological electron transfer. I'm trying to understand how proteins regulate electron flow; I'm also studying protein folding by electron-transfer methods.

We know that electrons move long distances in biological structures. We showed many years ago that electrons can move 25 angstroms from site to site in biological molecules. We would like to know how the protein structure itself can control that. We have found a big difference between alpha helix and beta sheet structures. An alpha helix in a certain orientation can be quite insulating, and it does not allow electrons to move a long way. In another orientation the alpha helix is a very good conductor. The beta sheet is the best structure for electron flow. We have found this out in very fancy laser experiments. We put electron donors and acceptors on protein structures and literally measure by laser experiments the time it takes for the electron to go 10 angstroms, and so on. Then we can change the structure by genetic engineering and find out what that change does to the electron flow. We have built up this experiment over a period of 15 years.

The most insulating medium for electron flow is water. You cannot tunnel through water. We've got a very dramatic diagram showing how long it takes an electron to go 30 angstroms through different kinds of structures. If it's just limited by electronic coupling, it takes 10 years through water, six hours through alpha helix, one millisecond through beta sheet, and a few picoseconds through a series of p bonds.

There has been an interesting debate in the field in the last few years as to whether structure is important or not in electron flow. We have been on the side of structure being critical in electron flow in proteins. Other people maintained that the specific structure was not important and that all proteins would have a certain electron flow at certain distances, if you plot the logarithm of the rate against distance, you get one line, and all is determined by energetics. We've shown, however, that there is no single curve correlating the rate to distance in proteins and that the rate is very much structure-specific, and both structure and energetics are important. You can, of course, regulate the flow with energetics, depending on the free energy in the system, but an equally important regulation comes from the structure itself.

IH: How would you put your work on electron transfer in perspective in relation to electron-transfer research over the past few decades?

HG: I think there is a progression starting with Henry Taube, who worked with simple inorganic systems and studied short-range transfer. Rudy Marcus did theory, and we've done the complex experiments on long-range flow. Our place in this picture is that we're the people who've studied flow over long distances.

IH: What will be the next stage?

HG: People now will build materials based on these findings, they will build solar-energy converting devices based on all of these ideas, they'll build sensors, there will be all kinds of applications, memory devices, catalysts that will be more efficient for redox reactions. The next level of this work will take advantage of the lessons we've learned about how to manipulate electrons. Taube learned how to manipulate electrons in small structures. We've learned how to manipulate electrons in very large biological structures. When we started our work, people weren't even sure that electrons could transfer over, say, five angstroms.

IH: Electrons seem to have dominated your career. I remember your book *Electrons in Chemical Bonding*. It came out in 1964, when you were not yet 30.

HG: I got interested very early in colors and they have to do with electronic excitation. I went to Copenhagen to study ligand-field theory. But I first got interested in chemistry when I was 10, that was when I got my first chemistry set. I also found a chemical company in Chicago that would sell me chemicals through the mail.

IH: You are currently working on a chemistry book for the general public. In view of your busy schedule, this must mean that you find it very important to reach out.

HG: I think the general public doesn't understand chemistry as much as they should. I like to say there are two words, chemistry and chemical. People think chemicals are bad but they tend to think that chemistry is good. Most people don't realize the connection between the two. I'm interested in improving publicity for chemistry. I'm interested in books that will reach high school students. In our system of education it's very difficult to see what's in a field until you have so much technical education that you have probably already left the field. We're now so tied up in small courses in mathematical detail, that students can almost be at the Master's degree level before they get a broader feeling of what's actually in the field.

I have been doing chemistry for 50 years now and I'm still enjoying it. Chemistry's fabulous.

The Snub Cube in the Glanville Courtyard of the Beckman Institute

at the California Institute of Technology

WILLIAM P. SCHAEFER

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In the central (Glanville) courtyard of the recently constructed Beckman Institute building at the California Institute of Technology is a fountain, placed there by the architect, Mr. Tim Vreeland, to create some "white noise" and thus separate acoustically four areas of the courtyard designed for conversational groups. The architect asked for help from the future occupants of the building in designing the fountain itself; several suggestions were made and rejected by the Caltech administration as not having any relationship to the purpose of the building. Arnold O. Beckman, the donor of the building, had specified that he wanted this Institute to develop new methods and instruments that would advance research in the fields of biology and chemistry, including their interface. After our latest suggestion had been rejected, Harry B. Gray, then the Director-designate of the Beckman Institute (now Director), recalled a paper [1] describing the tertiary structure of the iron-containing protein ferritin; the molecule of ferritin was found to have 432 (read as four, three, two) symmetry; i.e., it has fourfold axes, threefold axes, and twofold axes relating the 24 subunits of the protein.

Now, the ferritin protein seemed to Harry Gray to be an excellent symbol for the work that would be done in the new building. Ferritin is found in plants and animals alike; it is an iron-storage protein containing up to 4500 iron atoms

in a hydroxyphosphate complex form in the core, surrounded by the organic protein shell. Thus, the molecule can be claimed by biology, organic chemistry, and inorganic chemistry, all three fields that were to be emphasized in the Beckman Institute. Harry asked me to design something for the courtyard fountain that would capture the essence of the ferritin structure.



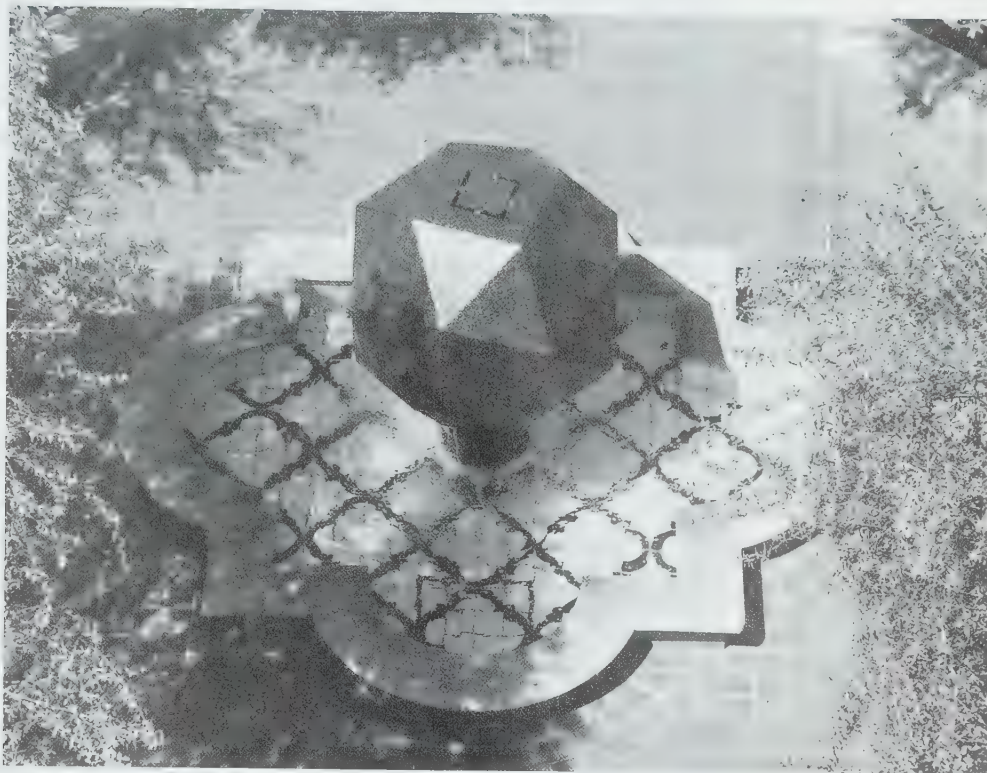
The essence of any structure is its symmetry [2]; this was the obvious starting point for the design. And because I am a crystallographer, symmetry was a handy tool for me to use. I looked in the *International Tables for X-Ray Crystallography* [3] and found the simplest space group that had 432 symmetry; that turns out to be space group #207, a cubic space group with symmetry $P432$ and 24 general equivalent positions, just the same as the number of subunits in the ferritin molecule. In order to visualize this structure, I

used the computer program ORTEP, written by Carroll Johnson [4], and placed an arbitrary atom in the unit cell. The program used the 432 symmetry of the space group to generate the other 25 equivalent atoms and then drew a picture of the result. I discovered that by joining the "atoms" I had generated by "bonds," I had the outline of a solid; I could vary the shape of the solid by changing the position of the arbitrary "atom" I started with. The solid had 6 square faces and 52 triangular ones, with 24 corners. The corners, then, would represent conceptually the subunits of the ferritin molecule. Some of the triangular

Three views of the snub
cube sculpture (1996)
pages 48-50.
Close-up.
(Photo by I. Hargittai)

With its pool and its tiling.

(Photo by William P. Schaefer)



faces could be either acute or obtuse, and I made paper models of both kinds to see which was more pleasing to the eye. I favored the solid with somewhat acute triangular faces, but my colleague Verner Schomaker pointed out that the solid with all equilateral triangles was special: it is called the snub cube, and Verner said that it was one of Linus Pauling's favorite solids. (The other was the icosahedron.) It is in fact an Archimedean semiregular solid, derived from a cube and having only two kinds of faces, squares and equilateral triangles, with all its edges of equal length.

(There are two other facts about the snub cube that may be of interest. First, despite its apparently high symmetry, with all sorts of rotational axes running through it, it has no planes of reflection; it exists in two forms, one left-handed and the other right-handed. Second, as with any semiregular solid, the snub cube can be inscribed in a sphere. In this case, the 24 points on the sphere represent the distribution for which the smallest distance between any two is as great as possible [5].)

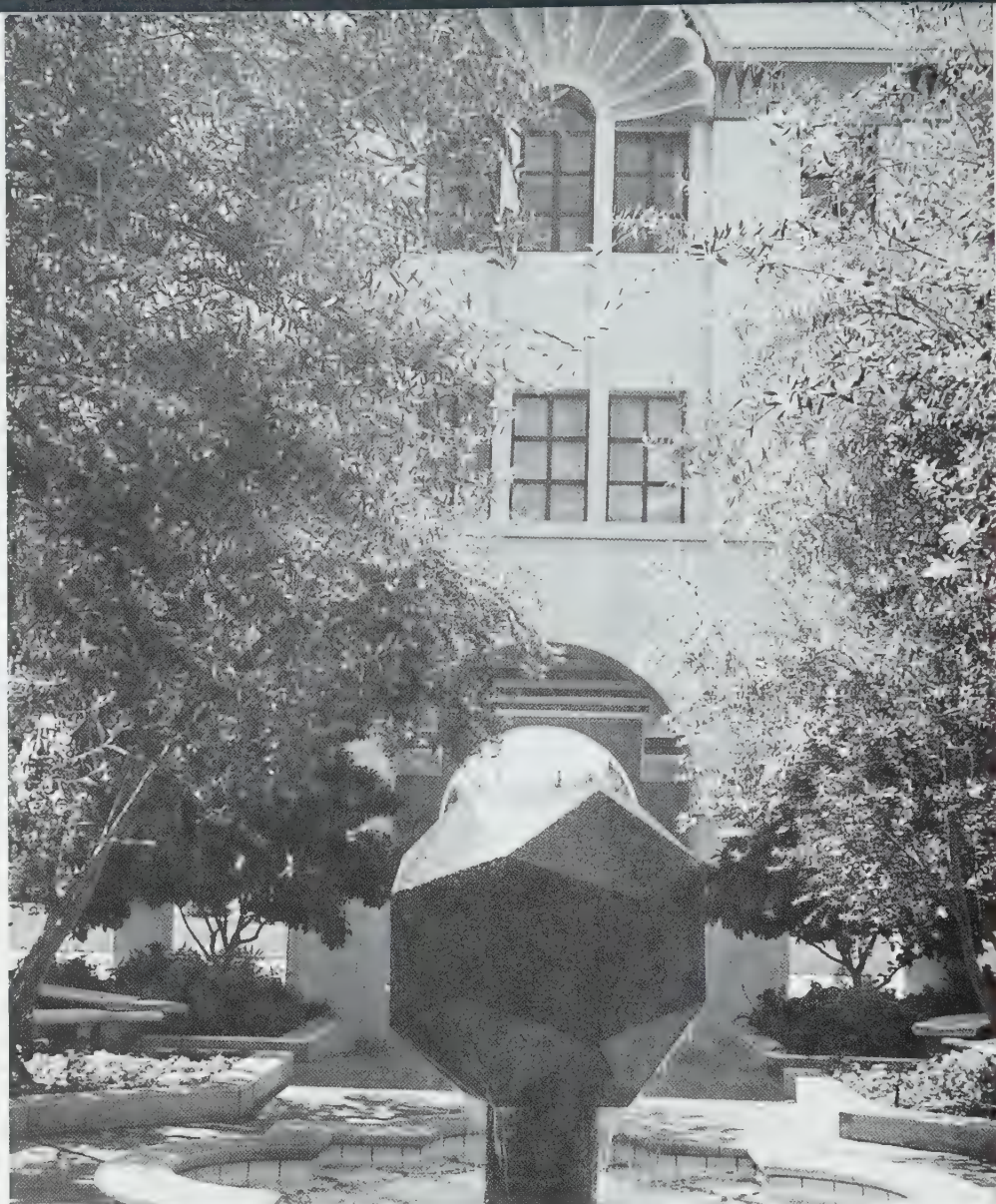
The model I made of the snub cube pleased the architect as well as the Administration, and we decided to use a snub cube as the decorative element in the fountain of the Beckman Institute. The contractor who was to build this, though, insisted on making a half-sized model first to see if water could be made to flow evenly over the sur-

face of such a solid. He was used to building much more symmetric fountains and was skeptical about this. A wooden model, though, showed that with a sufficiently strong flow, the entire surface of the solid could be wet; we were given the go-ahead to install a five-foot-tall, granite snub cube in the fountain. The granite chosen was a green variety from Africa. It was quarried there and shipped to Italy for cutting into slabs, and the slabs were shipped to California. The subcontractor charged with fabricating the actual fountain claimed not to be able to build such a complicated form, so I used the ORTEP program again to calculate all of the inter-facial angles that he needed to know, and I gave him precise measurements to work from. With these measurements and angles, the man went ahead with fabrication, first flaming the outer surface of the granite to roughen it and produce something that



*Jay A. Labinger,
William P. Schaefer, and
Verner Schomaker on
February 19, 1996.
(Photo by I. Hargittai)*

With the Beckman Institute
in the background.
(Photo by William P. Schaefer)



would be as hydrophilic as possible, and then attaching the cut slabs of granite to a stainless-steel armature he had built to my specifications. The plumbers would later run a pipe up through the snub cube to discharge water over the top, so it would flow down the sides and into the pond at the bottom, to create the white noise the architect wanted. The final granite construction is five feet across, from square face to square face, and, because of its cubic symmetry, also five feet tall. It rests on a cylindrical pedestal of green granite about 18 inches high, so the top of the snub cube is visible only to quite tall people, or from the upper floors of the building.

The fountain, with its impressive granite snub cube, has been functioning for nearly six years. The Beckman Institute building won an award given by Pasadena Beautiful for the most beautiful noncommercial building built in 1991, and

the snub cube fountain itself was recognized by the City of Pasadena in 1992 as one of the ten best examples of public art in the city. The citation recognized as "artists" of the sculpture Harry B. Gray and William P. Schaefer, the first time either of us had won such a distinction. We continue to be pleased with our work.

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The Cooking
Chemist

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Can a Cooked Egg White be "Uncooked"?

HERVÉ THIS - BENCKHARD

Egg white is a solution of proteins in water, about 6g of proteins to 34g of water. When egg white is heated, it first becomes milky and then its consistency changes: it becomes more viscous and then turns into a gel, first soft and finally rubbery. The generally accepted explanation of this phenomenon is as follows. About 70% of the proteins in egg white are globular proteins. When egg white is heated, the globular proteins uncoil: the protein has become denatured. The hydrophobic parts, which previously were hidden inside the globules, are now exposed to water, and to avoid this contact they link up with similar groupings of neighboring molecules and form a network. The protein has coagulated.

In addition to the hydrophobic bonds, there are other types of links that could lead to coagulation. They are, in ascending order of strength: hydrogen bonds between a donor atom and a hydrogen atom on a lateral group of an amino acid, disulfur bridges between two cysteine molecules, and, finally, covalent bonds. The main purpose of this investigation was to determine which of the above bonds was responsible for the coagulation and to see whether coagulation could be reversed by breaking those bonds or, in simple language, whether a cooked egg white could be "uncooked."

The following experiment

was carried out. An egg white that had been cooked was whisked. Since it is known that whisking breaks the hydrophobic and hydrogen bonds, the gel would have turned into a liquid if those bonds had been responsible for the coagulation. However, all that the whisking did was to break up the gel into tiny fragments.

To see whether the disulfur bridges were responsible for the coagulation, about 1 g of sodium borohydride, which is a strong reducing agent, was mixed with the broken-up egg white. A few seconds of whisking produced a foam containing no solid particles. After a few hours, this foam turned into a translucent liquid, which under the microscope looked identical with fresh egg white. This result proves that disulfur bonds are responsible for the coagulation of egg white and, as a corollary, that covalent bonds play no part in the cooking of egg white.

In the unlikely event that someone wants to uncook an egg white for culinary purposes, sodium borohydride **must not** be used since it is a poison. However, ascorbic acid, although a less powerful reducing agent, would do.

Finally, it should be emphasized that this experiment was not an exercise in molecular gastronomy. It was just a modest example of the endeavors to establish the scientific bases of culinary processes.

The Cooking Chemist

A message from the
Column Editors

Only a few of the previous issues of *The Chemical Intelligencer* had a contribution in this column, and none of those was contributed without a special invitation from the column editors. We hope that this is not due to a lack of interest in culinary chemistry among the readers of this magazine.

It may be that although the readers are interested passively in the subject, they do not want to participate *actively* (and publicly) in it. Or, perhaps, our aims and intentions were misunderstood; hence we enlarge on our opening announcement which appeared in the first issue of our magazine.

We would welcome contributions bearing on the preparation and enjoyment of food, provided that chemistry and/or related scientific disciplines such as physics, materials science, engineering, etc., form a more than negligible part of it. Neither the length nor the nature of the contribution is prescribed. Learned or frivolous essays of 2000–3000 words are just as welcome as short notes of just a hundred words describing some culinary surprises, containing queries, or answers to them, suggesting novel techniques, etc. If we were to receive a few spontaneous contributions for each issue, the *Cooking Chemist* section might eventually become a discussion forum, and its contributors might become an "Invisible College of Molecular Gastronomy."

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A STUDENT REMEMBERS ROBERT W. TAFT

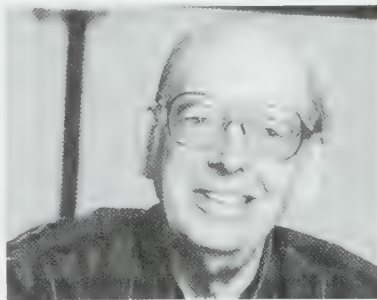
ROBERT D. SCHMIDT

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One of the pioneers of physical organic chemistry was Louis P. Hammett, whose life and work were recently discussed in a very informative and entertaining article in this journal [1]. Another key figure in this field was Robert W. Taft—also mentioned in the article for his extension of Hammett's original equation—who expanded the scope and utility of physical organic chemistry in general and helped bring it to maturity as a serious and useful discipline. Taft's elaboration of the Hammett equation by incorporating into it polar, steric, and resonance effects was only one of his many contributions to the field of physical organic chemistry, and one that kept his interest for most of his career [2, 3]. Others include the development of the first hydrogen-bond basicity scale; solution and gas-phase studies of proton transfer acidity and basicity; analysis of substituent effects on gas-phase acidities and basicities; and applications of these to chemistry and biology. A special collection of papers recently honored his work [4], and it was stated, "[t]here is hardly a significant area in this field that has not benefited from some contribution from Professor Taft,....one of the leading physical organic chemists of the last half of this Century" [5].

From 1978 to 1980, while an undergraduate at the University of California at Irvine, I had the great honor and pleasure of working for Professor Taft as a research assistant. This was one of the most enjoyable and memorable of my student experiences. As both a research adviser and

teacher, he always gave his undergraduate students the same sincere courtesy and attention as he did his graduate and postdoctoral students. Though we were novices, he trusted us with interesting and challenging research projects, and all of us gained the skill and self-confidence to pursue careers in scientific research. It was therefore with great sadness that I learned of his death earlier this year, a few weeks before he was to deliver a talk about his latest research at the March 1996 American Chemical Society National Meeting in New Orleans.



Professor R. W. Taft (ca. 1995) in his office at the University of California at Irvine. (Many thanks to Professor Harold W. Moore of the University of California at Irvine for providing the photograph.)

Robert Wheaton Taft was born in Lawrence, Kansas, in 1921, and received B.S. and M.S. degrees in Chemistry from the University of Kansas in 1944 and 1946, respectively. After receiving his Ph.D. from the Ohio State University in 1949, he did postdoctoral work for Hammett at Columbia University for a year. He was on the faculty of the Pennsylvania State University until 1965, at which time he moved to the University of California at Irvine as a founding member of the chemistry department. At the time of his death, he was Professor of Chemistry Emeritus at Irvine.

During my undergraduate years, it never occurred to me (or any of my fellow students) that Taft was in any way "famous." His manner was so friendly and he was so humble about his achievements that we knew him only as a kind-hearted professor who treated us not so much as students, but as future fellow scientists. While taking Taft's first-quarter organic chemistry course, a fellow student brought it to our attention that Taft had developed "some sort of equations" that were subsequently named after him. We were, of course, very excited that our teacher had something named after him, so after class one day, we asked him about the Taft equations. In his typically modest fashion, he replied (after blushing somewhat) that they were only a minor contribution to chemistry, but he invited us up to his office (not even during scheduled office hours!), where he explained them to us.

He was also a genuinely supportive (and infinitely patient!) research adviser. At one research group meeting, while discussing some experimental results of mine involving NMR shifts in various solvents, he asked me what I thought the results meant and what I would recommend for the next experiment. Although I had only a qualitative idea (I was not yet completely familiar with his calculations for obtaining a linear correlation), he encouraged me to present what I knew anyway and made me feel that my opinion was important to the research effort.

It was only many years later while in graduate school that I realized how significant Taft's work was. A fellow graduate student had discovered that I had worked for Taft, to which he replied (incredulously and repeatedly), "You mean, *the Taft!*?" Yes, it was *the Taft*, and I didn't even know it at the time.

I had visited Professor Taft only once since my undergraduate days, so I looked forward to seeing him in New Orleans, to hear about his latest work and to thank him for the help and encouragement he gave me nearly two decades ago. Unfortunately, fate would preclude this meeting. But I will never forget this marvelous scientist and human being, who made me feel like an important part of the research group, and who sparked my interest in research. In addition to his many important contributions to physical organic chemistry, he also generously gave inspiration and encouragement to many future chemists.

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RIDDLES FROM A CHIRAL WORLD

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The world is chiral. Chemists should know this. But for many chemists—I include myself—this knowledge does not really go beyond chiral molecules, gloves, and shoes. Chiral surprises in everyday life are rare, perhaps because many of us—again I include myself—are busy and have lost the ability to watch, marvel, and dream.

Nevertheless, from time to time, interesting objects catch our "chiral" attention. An example is the square pens of the W + W Tarkan recorders (Fig. 1). Several of these sturdy, nowadays almost old-fashioned *x-t* recorders are still in use in my laboratory for the recording of chromatograms. The pens are available in different colors,

so they are coded with a red, blue, or black stripe on one side; this is the left view in Fig. 1. When not in use, the pens should be taken out of their holder in the recorder and covered with a cap in order to prevent them from drying up. With slight irritation, I began to note that by far more than half of the pens that are not in use do not show their colored side, so that it is necessary to pick them up and turn them if one wants to select one of a certain color. Should there not be a fifty-fifty chance for a pen to lie on either side? Then you would at least see half of the colors available.

Later I realized that a pen of this shape and having a color code on one side is a chiral object and is handled by another chiral object (i.e., a person). I am right-handed, and usually I grasp the pen with my left hand if I want to cover the tip. The right hand takes the cap and puts it over the tip. This is easier done if the pen is positioned in the left hand with the tip on the right side—and the color code upside down. Therefore, the mark is not visible unless I lay the pen down with an extra turn. Obviously this type of pen is designed for left-handed people. Since the day when I realized this, I am no longer irritated but I wonder why it took me so long to find out the chiral relationships in this case.

This was a real-life chiral riddle. Another one is presented here for the diversion of the readers. Figure 2 shows six stars. There is no question to answer but the reader is invited to take

Fig. 1. Two views of a recorder pen. With the tip on the left side, the color bar is visible.

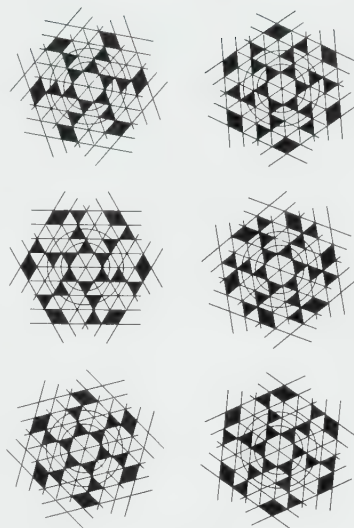
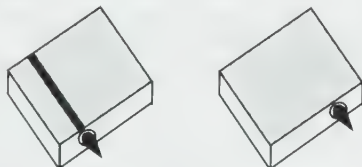


Fig. 2. Six stars—and chirality?

a "chiral look" at them. My comments on this figure appear later in this issue. Have fun and don't mix up your gloves.

Solution to puzzle on page 61

THE DREAMS OF STARS: THE CHEMISTRY OF IMMORTALITY

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"Moreover, from first to last, Sung Wu-ji, Jeng Bo-chiao, Chung Shang, and Sien-men C'kao, were all people from Yen who practised the method of [becoming] immortals [by the use of magical] recipes, so that their bodies would be dispersed, dissolved, and metamorphosed, relying for this upon their service to the spirits and gods." Ssu-ma Ch'ien (163-85 B.C.): *Schih chi* (Historical Records)

All our lives we have a sky over our heads but never know what is above it... These words are by Ko Hung (A.D. 280?-340),

a prominent figure in Chinese Taoistic science and philosophy. His book *Nei P'ien* [1], dated circa A.D. 320, is an encyclopedia that preserved the colorful picture of an ancient civilization. The teachings of the wise master Ko Hung are not easy to understand.

The book has interesting chemical implications. Chinese alchemists spent their days and fortunes in vain attempts to reveal the highest secret—how to become a genie, an immortal, like the four ancients whose names were recorded in Ssu-ma Ch'ien's chronicle. Some of their approaches bring us back into the darkness of shamanistic rites—"medicines of the highest type put the human body at ease and protract life so that people ascend and become gods in heaven, soar up and down in the air, and have all the spirits at their service. Their bodies grow feathers and wings,... The various excrescences, mushrooms, lichens, etc. may be nibbled, and cinnabar, jade flakes, laminar malachite, realgar, orpiment, mica, and brown hematite may be taken singly, and any of them can enable a man to fly." There were many immortals, as can be found in *Lieh Hsien Ch'üan chuan* (Complete Biographies of the Immortals), an account probably written by an alchemical adept in the period A.D. 200-420. According to this source, square eyes were the common feature of immortals.

Let us look closely at the chemistry of immortality. As is obvious from Ko Hung's words, the Chinese supposed the existence of certain "medicines" that could turn normal humans into immortals. The wise master mentioned in his book yet another way to reach this unique state: physical exercise combined with the necessary psychological training; this approach is well known at present as the basis of the various fighting techniques of the Far East.

The chemical route to immortality included medicines of vegetable or mineral origin. With several herbs, intoxicating effects can be easily expected. These recipes were probably inherited from shamanistic predecessors. Many plants, however, could hardly have had any significant mind-altering effects, such as, for example, asparagus or mulberries. Yet there are several cases describing strong effects of such herbal medicine: Chao T'o-tzu, after he had taken cinnamon for 20 years, could walk 500 miles a day. However, the soles of his feet became hairy. The effect of asparagus was not less dramatic. Tu Tzu-wei had allegedly 150 sons with 80 concubines and could walk 300 miles a day. Lin Tzu-ming took thistle for 11 years, making his body light enough to fly and his ears grew to five inches. K'ang-feng Tzu's elixir could be prepared by mixing blood from the chick in a crane's egg with the juice of aconite. Then, according to Ko Hung, "take a gill of it and increase your longevity by a hundred years; a quart will increase it by a thousand." The last-mentioned ingredient, the juice of aconite, casts serious doubts concerning the promised immortality.

The inorganic pharmacopoeia of immortals can be traced back to the first Chinese alchemists. One of them, [Li] Shao-jün, active in the second century B.C., gave advice to the Emperor on how to achieve immortality. As the first step in this process, he suggested summoning spiritual beings [2]. Once they are present, "cinnabar powder can be metamorphosed into gold; when this gold has been made, it can be used for vessels for drinking and eating, and will increase the length of your life." His teaching survived and was widely accepted in spite of the fact that he became ill and died eventually.

Thus, solely artificial gold was said to protract human life and even help achieve immortality. Why only artificial gold? This question cannot be answered easily. The extreme chemical stability of natural gold made it a symbol of eternal life in many cultures. The oldest Chinese alchemical treatise, *Ts'an Tung Ch'i*, was ascribed [3] to a mysterious Wei Po-Yang, who was presumed to have written it in A.D. 142. Chapter XXV says: "When gold is placed in a hot fire it is not deprived of the brilliancy of its color. Since the days of the unfolding of the universe [creation], the sun and the moon have not diminished in brightness nor has gold lost any weight." Given the immortality of gold, described in this poetic style, the same effect in humans was expected, as stated in Chapter XXVII: "Longevity is of primary importance in the great triumph. Huan-tan [Returned Medicine] is edible. Gold is non-corruptible in its nature and is therefore the most valuable of things. The shu-shih [men of the art; alchemists] feeding on it attain longevity." As is apparent, no explanation was given as to why just artificial gold was stressed by Chinese alchemists.

Judging from Shao-jün's advice, cinnabar was particularly important in achieving immortality. This compound was perhaps the first in history whose chemistry was thoroughly investigated. As is apparent from Ko Hung's book, it was known in his time that mercury can be extracted from cinnabar, or, conversely, it was known that cinnabar is a compound of mercury. At that time, however, no such term as "compound" existed yet.

The chemistry of mercury led to confusion. Ko Hung stated that "when roasted, all herbs turn to ashes, but cinnabar produces mercury, which after a number of successive transformations

reverts to cinnabar." The transformations described here could have been the oxidation of mercury to red oxide.

All this was of little consequence, compared with the view that cinnabar leads to gold. This statement might be strange to modern chemists, but it is only the beginning of the story. It turns out that Ko Hung distinguished nine cinnabars! The first cinnabar, known as Flowers of Cinnabar, could be made from realgar, kaolinite solution, Turkestan salt, arsenolite, oyster shells, white lead, etc. This mixture should be put in a crucible, the walls of which had been coated with tin and mercury. There was even a quality test of the product. Mixed with human feces and put into a raging fire, it yielded gold in a short time. This was an infallible sign that "medicine" was made.

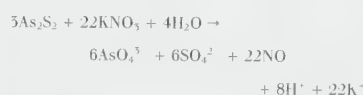
Realgar is another compound appearing repeatedly in Chinese recipes. According to Ko Hung, realgar mixed with chicken, dog, or pork should be nibbled, and this medicine would bring Fullness of Life, immortality: "Gray hair turns black; and lost teeth are regenerated. After a thousand days fairies will come to serve you." Quite opposite accounts, however, can be found in old Chinese chronicles [4]: at least six emperors died from consuming the alleged elixir of life between A.D. 820 and 859.

According to Ko Hung, prior to mixing with meat, realgar should be liquefied. The recipe for liquefying realgar can be found in the compendium *San-shih-liu Shui Fa* (Thirty-six Methods for Bringing Solids into Aqueous Solutions), which cannot be dated unambiguously; Ko Hung's allusion to dissolution of realgar shows, however, that this text must have been known in his time.

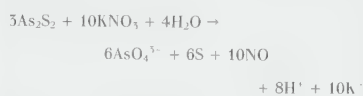
The recipe is as follows: "(a) 1 lb. of realgar and 4 oz. of nitre are enclosed in a freshly-cut bamboo tube,

which is sealed with lacquer and placed in vinegar for 30 days. An aqueous solution will be formed. (b) [The realgar] is mixed with 2 oz. of nitre and vinegar in a porcelain jar, which is then sealed and buried 3 ft. below ground. After 20 days an aqueous solution with a sweet taste and a turbid yellow color will be formed."

According to the authors [5] who examined this Chinese manual, use was made of the acidity of the acetic acid. Together with potassium nitrate (nitre), it allowed slow oxidation of various substances originally insoluble in water. They explained recipe (a) by the reaction:



and recipe (b) as follows:



(For a more detailed discussion of this process, see Butler et al. [6].) Lu-Ch'iang and Davis [5] supposed that sulfur is not oxidized to sulfate in this reaction, but merely turns into colloidal sulfur. This colloidal state could explain the turbidity of the final solution.

Clearly, neither of the methods cited here could have helped to make anybody immortal. Chinese alchemical recipes are difficult to decipher; they were not written for the broad public. Quite the opposite—Ko Hung told his readers that his book was intended for the initiates only. Therefore, the original meaning of words was kept secret, in a similar manner as in the alchemy of other cultures. Many Chinese recipes thus remain unclear. Although they evidently describe chemical processes, almost no ingredient can be identified. The treatise *Ts'an Tung Ch'i* is a striking example of this corrupted language

of ancient alchemy. The preparation of medicine (huan tan) is described in Chapter XXXIII: "Treatment and mixing will bring about combination and rapid entrance to the scarlet portal. The escape must be firmly blocked. Below plays the dazzling flame, while the Dragon and Tiger keep up a sustained vociferation. The flame at the start should be weak....As the breath expires, life is ended. Death expels the spirit. The color changes into a purple. Behold! the huan-tan is obtained." Some attempted explanations identify dragon with mercury and tiger with lead, but no chemical process can be proposed based on this text.

Ko Hung himself wavered between belief and skepticism. The latter feeling was reflected by the story of a certain Hsiang Wan-tu. He studied geniehood with his son, deep in the mountains. Ten years later, back at home, they reported that after three years of efforts they were visited by a genie—"and we all mounted to heaven on a dragon. After a while I lowered my head to look at the earth which was far, far away and invisible. We were not yet reaching anywhere above, and we were very far from earth." This story, which reads like the report of an astronaut leaving our planet, had a rather unexpected ending. Hsiang Wan-tu eventually reached a seat of the Emperor of Heaven, but due to a small mistake during the ceremony, he was sent back to earth. He proved not to be ready yet to attain geniehood.

What were Ko Hung's comments about this story? "There are many liars of this class in the world, and they come in various types. I cannot list them all. This is exactly how their mad talk goes, and yet some people still do not feel that it is all imagination."

It should not be forgotten that the

CONTINUED ON PAGE 59



Please forward books,
software, models, etc.,
for review to I. Hargittai,
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Reviews

I S T V Á N H A R G I T T A I

Perfumery: Practice and Principles

BY ROBERT R. CALKIN AND
J. STEPHAN JELLINEK

JOHN WILEY & SONS, NEW YORK, 1994. 287 PP.
\$80.50. ISBN 0-471-58934-9

REVIEWED BY P. LASZLO, DEPARTEMENT
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Perfumery is a sister science to chemistry. It has been around for centuries. Long associated with the pomp of kings and with the rituals of religion, perfumery remains a luxury industry that generates a huge income worldwide. As soon as a Third World country achieves some measure of affluence, as seen presently in the New Tigers of Southeast Asia, new markets open, with spectacular annual rates of increase. The globalization of the industry will undoubtedly change it. It remains highly ethnocentric, offering to Asian men and women perfumes based on the same European floral bases—rose, jasmine, lilac, lily of the valley, carnation, violet, hyacinth, etc.—that have been used for centuries.

A perfume is a complex formulation, with hundreds of components. The overall composition has a tripartite structure. A base note, with low-volatility materials, often recalls the smell of flowers. For instance, *L'Air du Temps* (Nina Ricci, 1948) is built over rose and jasmine absolutes. A middle note has materials of intermediate volatility. And a high note contains substances of high volatility.

The technology has undergone a revolution with the introduction of gas chromatography as an adjunct to the nose. Now, it is possible to determine quickly by GC-MS the composition of any

perfume, thus breaking the secrecy that for centuries was deemed an essential part of the craft. It thus becomes possible to divulge in print the essential components of some of the greatest commercial successes and to set up classifications of major perfumes based on their organization into families, such as floral aldehydic, floral sweet, oriental, patchouli floral, classical chypre, and so on.

Another recent trend in perfumery, dictated by marketing needs (duty-free shops in airports), has been linear perfumes whose odor remains invariant for several hours after their initial application on the skin. Sophia Grojsman has pioneered the use of as few as four or five materials in a simple blend that represents up to 80% of the formula. *Trésor*, *Dune*, *Eternity*, and *Spellbound* are members of this new generation.

The book by Calkin and Jellinek, both of Dragoco, a major international perfume manufacturer, is a pleasure to read, for a single reason: the enthusiasm of the authors for their craft shines through. The book would be of most use to students considering a career in perfumery, as the methodologies employed in the industry are presented clearly. The field remains both an art and a science. Just like universities, it mixes tradition and innovation. The good fortune of the perfumery industry is its billion-dollar business status. Since "one does not change a winning formula," success has translated into a certain degree of conservatism, to the detriment of some obvious avenues of research. Were one to set up from scratch a perfumery R&D Institute today, most probably the emphasis would differ

markedly. I'll attempt at the end of this review to indicate some of the directions in which modern perfumery may want to move.

This very clearly written and comprehensive book should prove useful to chemists as well. Even though chemistry is mostly excluded from the training of perfumers, the two disciplines have much in common, and they stand to gain from mutual penetration. In a similar manner organic synthesis has thrived on multistage elaboration of complex structures endowed with pharmacological activity, design of relatively small (C_6 - C_{15} , typically) volatile molecules give rise to specific olfactory sensations providing it with a spectacular challenge.

Perfumery is replete with fascinating questions. For instance, the usual distinction between quality and quantity does not hold. Various components make extremely different impressions on the brain when they are used at different levels. Thus, a mixture containing 50% methyl salicylate and 10% menthol has a pungent and rather crude odor of liniment, while with more sparing use by one or two orders of magnitude, the former will sound a tuberose note, and the latter a fresh note. Another question is, why is it that eugenol and benzyl salicylate form such a handsome and classical blend?

Other notions that can be seen as crucial to the future of perfumery as a science, both pure and applied, are the use of enzymes, lipases for instance, in order to generate volatile components *in situ*, in order to prolong the effect of the initial "high note"; recourse to automated production of chemical libraries; design of simple biological tests in the manner of the Ames mutagenesis test; systematic use of groups such as the trimethylsilyl group to increase volatility of higher molecular weight components; and the investigation by

objective means, such as real-time magnetic resonance imaging of the brain, of what constitutes the accord between individual ingredients, so crucial to perfumery, and that comes close to harmony for musicians.

Of the 20 chapters in this book, every one says something worth saying, and my review copy is heavily annotated. I can recommend it highly as the work of two professionals who do a beautiful job of explaining their craft to the lay public.

Braving the Elements

BY HARRY B. GRAY (CALIFORNIA INSTITUTE OF TECHNOLOGY), JOHN D. SIMON (UNIVERSITY OF CALIFORNIA, SAN DIEGO), AND WILLIAM C. TROGLER (UNIVERSITY OF CALIFORNIA AT SAN DIEGO)

UNIVERSITY SCIENCE BOOKS, SAUSALITO, CALIFORNIA
1995. XI + 418 PP. ISBN 0-935702-34-2

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B*raving the Elements* combines a catchy title with a very readable and fascinating survey of a broad array of topics in chemistry. Starting with the early Greeks' notions, such as Democritus's "Nothing exists except atoms and empty space; everything else is opinion," the historical development of chemical concepts is traced through the contributions of Lavoisier, Dalton, Avogadro, Bragg, Rutherford, Bohr, Planck, Einstein, de Broglie, Schrödinger, and others.

The central focus of the book is on molecules that affect our lives in one way or another. Some chapters bear unexpected titles, such as "Newsworthy Molecules," which discusses molecules in the atmosphere, chemicals in the body (vitamins, cholesterol, fats), fragrances, medicinal chemicals, chemical dependence (caffeine, nicotine, alcohol, THC, mescaline, amphetamines, co-

caine, and designer drugs, among others), and molecules of war (explosives and chemical weapons).

Another intriguingly titled chapter is "Wall Street Chemistry," which deals with the industrial and business aspects of chemistry: commodity chemicals and how they are prepared industrially, plus petrochemicals, including catalytic processes for modification of petrochemicals.

Another chapter is devoted to synthetic materials, including petroleum-based polymers and their consumer end uses as rubber, textiles, and plastics. Throughout the book are woven personal stories of chemists, their struggles, triumphs, and sometimes tragedies, as in the case of Wallace Carothers, discoverer of nylon and father of the polymer age.

Braving the Elements reads like a novel and is full of fascinating tidbits of chemical information such as the metabolic fate of ethylene glycol, once added to wine to enhance its sweetness. (It is oxidized by the enzyme alcohol dehydrogenase to form oxalic acid, which is toxic.) A discussion of the photochemistry of vision leads first into the chemistry of photography, including how color film works, and then into sunscreens and light-sensitive sunglasses. A chapter on atmospheric chemistry includes discussions of the chemistry behind ozone depletion, global warming, photochemical smog, and acid rain.

Throughout the book, photographs, chemical structures, line drawings, graphs, and charts are interspersed to more than adequately illustrate the topic of discussion. Appendixes, a glossary of nearly a thousand terms, an index, and a list of suggested readings are included.

Braving the Elements was written for nonchemists and is a good choice as a text for a

course in chemistry for nonmajors. The book is an impressive collection of how, in the authors' words, modern chemistry "relates to the environment, energy, health, and other areas of human concern." It should also serve as a useful resource for those teaching high school or college chemistry and wanting to enliven their presentations with interesting and relevant information.

There are a few errors: D is used for the Greek upper case delta in naming THC; trans double bonds are represented instead of cis in the structure of vegetable oils; some structures have unusual bond lengths or angles, or misplaced bonds, or are represented in atypical ways, such as MPPP, which is shown with adjacent carbonyl groups represented differently. Amine hydrochlorides are represented unusually and inconsistently, with a bond to HCl from the nitrogen. These slight errors aside, *Braving the Elements* is well written and informative. It is a fresh look at the contributions chemists and chemistry have made to modern life through dedicated research. I recommend reading it.

Eighty Years

BY JOSEPH S. FRUTON

EPIKOUROS PRESS, NEW HAVEN, CONNECTICUT, 1994
XI + 346 PP. LIMITED EDITION OF 350 COPIES AVAILABLE FROM THE AUTHOR. ISBN 0-640467-0-9

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When he turned 80, Joseph Stewart Fruton, Eugene Higgins Professor Emeritus of Biochemistry and Professor Emeritus of the History of Medicine at Yale University, who was born on May 14, 1912, as Joseph Fruchtgardien in Czestochowa, Poland, began to write this autobiography, "which is largely an account of my experiences as a moderately successful re-

search worker and university teacher in the area of the natural sciences concerned with what has been called 'the chemistry of life' and "which occupied my days and awakened memories which caused sleepless nights." Young Joseph and his parents lived from 1913 to 1917 in New York City, to which they had emigrated with thousands of other Eastern European Jews. In 1917 the family returned to Europe to live in Russia and Poland before returning to New York in 1923. His father then changed the family name to Fruton, and while in high school, Fruton adopted the middle name "Stewart," possibly influenced by his reading of Sir Walter Scott. Later, when questioned about his family background, he did not conceal the fact that his forebears had been Jews, but he did not advertise either his Jewishness or his atheism. His skepticism, socialism, and atheism, deeply ingrained from his youth, caused him, despite his numerous successes and awards, to regard himself as "an alien intruder into an established society." Considering himself *heimatlos*, his primary loyalty, other than to his wife and parents, "has not been to any nation or to its political system, but to the community composed of [his] fellow-scientists and scholars the world over."

After receiving his B.A. with honors in chemistry (1931) and his Ph.D. in biological chemistry (1934) from Columbia University, Fruton worked in Max Bergmann's laboratory at the Rockefeller Institute for Medical Research until 1945, when he went to Yale University, where he served as Chairman of the Department of Biochemistry (1951-1967) and Director of the Division of Science (1959-1962) before retiring in 1982. He describes in detail his research and that of his students and colleagues on protein chemistry, with special

emphasis on the use of synthetic peptides to determine the specificity and mechanisms of the catalytic action of proteolytic enzymes such as pepsin, a field in which he became world famous. He pays tribute to his wife and co-worker, Sofia Simmonds, known to family and friends as Topsy, "a wonderful young woman," whom he married in 1956, "who taught [him] to live a better life," and who accompanied him on his personal and professional travels, which are recorded in great detail, down to the menus of memorable dinners, programs of concerts, and paintings viewed at museums. The two co-authored *General Biochemistry* (1953, 1958), which 1959 Nobel laureate Arthur Kornberg called "the best biochemistry textbook of that time."

Although Fruton had long been interested in the history of science, toward the end of his academic career he changed from a talented amateur to a true professional. Despite the favorable receptions accorded to his books *Molecules and Life* (1972) (History of Science Society's Pfizer Award) and *Contrasts in Scientific Style* (1990) (American Philosophical Society's John Frederick Lewis Prize), and his receipt of the 1993 Dexter Award in the History of Chemistry, he modestly titles his final chapter "A Historian of Science? 1970-1992," and he cites negative reviews of some of his books that still rankle him.

Fruton includes sketches, some quite extensive, of persons who played significant roles in his life and career. As a man of strong opinions and scrupulous honesty, he does not overlook what he considers their faults and shortcomings. His unsparing criticism extends to himself—his "arrogance, discourtesy, and impatience" and "oversensitivity to personal slight, and deficiencies as an administrator and as an

academic politician," which "had gained [him] an unsavory reputation in some quarters" at Yale. Much of his account is devoted to anti-Semitism and to academic politics at Yale and his "misguided attempts to contribute to the improvement of the sciences at Yale," which did not compare with its eminence in literary and historical scholarship, and to his eventual decision to withdraw from university politics.

Early in his career, Fruton participated in "movements opposed to the rise of fascism, militarism, and anti-Semitism," and he "found merit in the Marxist interpretation of history." During the McCarthy era, his refusal to attest to his loyalty led to his resignation from the Biochemistry Section of the National Institutes of Health (1952) and to his cancellation of travel plans to attend the Third International Congress of Biochemistry in Brussels (1954). Containing 27 illustrations and a bibliography of Fruton's works (1934-1992), this meticulously documented autobiography depicts the transformation of biological chemistry into modern biochemistry and its rise in institutional prominence at a major American university as seen through the eyes of a major participant.

Chemistry and Light

BY PAUL SUPPAN

SOCIETY OF CHEMISTRY, CAMBRIDGE, 1994. XIV
SOFTCOVER ISBN 0-85186-814-2

REVIEWED BY THOMAS B. BRILL,
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Chemistry and Light is an ambitious title for a book with 282 pages of text. In this space, Paul Suppan mentions a large range of topics in physics, chemistry, biology, medicine, and industry. Five and a half pages are required in the Table of Contents just to outline the book. The back cover, which is fre-

quently written by the publisher, incorrectly states that all aspects of light-induced processes are covered. Suppan pitched the level of the book to late undergraduate and early postgraduate students and based it on a course taught at the University of Friebourg. He is careful in his preface not to use the term "textbook," although the back cover does. If used as a textbook, it could in my view probably frustrate both instructor and student for its brevity in all but a few subjects. This book is a concise explanation of terms used in the interaction of light with matter along with collected examples of reactions and processes. Readers will find it informative when viewed in this context. I enjoyed the relatively easy style of writing for it gives one the feeling of being ready to participate in the next seminar or discussion on photochemistry. The reader will shine on organic photochemistry, which dominates the book. Eagerness will be short-lived, however, if the topic, for example, happens to involve photoactivated surfaces to destroy pollutants and odors, Fenton chemistry, or transition-metal complexes. There is no discussion of the first topic, which is actively being pursued in Japan. There is little discussion of pho-

togenerated OH radicals related to the second topic. Slightly more than seven pages are devoted to the large area of metal complexes. As long as no misconception about depth of coverage exists, this book is quite worthwhile to have. It is readable, interesting, and a handy source of information on many aspects of chemistry with light.

Linus Pauling: Scientist and Advocate

BY DAVID E. NEWTON

FACTS ON FILE. NEW YORK, 1994. 136 PP. HARDBACK
\$16.95 ISBN 0-8160-2959-8

REVIEWED BY ZELEK S. HERMAN,
LINUS PAULING INSTITUTE OF SCIENCE
AND MEDICINE, PALO ALTO,
CALIFORNIA 94306

Part of the series "Makers of Modern Science," intended for young adults, this concise book is well written and presents a biography of Linus Pauling that is also of interest to scientists. A glossary, notes, and recommended sources for further reading are valuable parts of the book. The biography was written before Professor Pauling's death in August 1994 and does not cite from two significant biographies published in 1995 (Thomas Hager, *Force of Nature: The Life of Linus Pauling*; Simon and Schuster: New

York, 1995, 721 pp; Ted and Ben Goertzel with the assistance of Mildred Goertzel and Victor Goertzel, *Linus Pauling: A Life in Science and Politics*; Basic Books: New York; 1995, 300 pp), but it does make reference to two earlier biographies (Anthony Serafini, *Linus Pauling: A Man and His Science*; Paragon House: New York, 1989, 310 pp; Florence M. White, *Linus Pauling: Scientist and Crusader*; Walker & Co.: New York, 1980, 90 pp). The final chapter, "Linus Pauling: The Man and the Legacy," is a well-rounded assessment of the consequences for prosperity of Pauling's life. The only two glaring errors in the book are the reference on p 90 to Pauling's arrival in Stockholm to receive the Nobel Peace Prize (it is presented in Oslo) and the reversal of the photographs of the former and present homes of the Linus Pauling Institute of Science and Medicine in Menlo Park and Palo Alto, California, respectively, on pp 100-101.

Other volumes in the series include biographies of Niels Bohr, Werner von Braun, Charles Darwin, Enrico Fermi, Alexander Fleming, the Leakey Family, J. Robert Oppenheimer, Jonas Salk, James Watson and Sir Francis Crick, and Robert Goddard.

Notes

CONTINUED FROM PAGE 55

road to stars was, at the beginning, paved by dreams, superstition, and magic. All those who initiated modern science were not only looking at heaven, they were also asking what was above it. One of the attempts to answer this question came unexpectedly from alchemy, which is better known in the European version where dreams of genuine gold made with the philosopher's stone prevailed. In China, the goal was immortality and the possibility of ascent to heaven.

Another lesson of Ko Hung's book should make this Taoistic encyclopedia immortal indeed. At the end of the third chapter of *Nei P'ien*, the wise master warned: "Those wishing

to become earth genii must do three hundred consecutive good deeds; those wishing to be heavenly genii must acquire twelve hundred. If, after acquiring 1199, one commits a single bad deed, all the ones previously acquired are lost, and one must begin anew."

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Book Watch

Sugarless— Towards the Year 2000

EDITED BY ANDREW J. RUGG-GUNN
(UNIVERSITY OF NEWCASTLE
UPON TYNE, U.K.).

THE ROYAL SOCIETY OF CHEMISTRY, CAMBRIDGE, U.K.
1995. VI+197 PP. ISBN 0-85186-495-3



The "happy tooth" logo for dentally safe confectionery was introduced in 1982 in Switzerland, and, by 1993, 85% of Swiss consumers recognized the pictogram and understood its significance for their personal oral health. By the early 1990s sugar-free chewing gums accounted for well over 50% of chewing gum sold in the United Kingdom. These are but two examples of progress cited in this book, which contains the proceedings of an international symposium, "Sugarless—Towards the Year 2000," held in September 1995 at the University of Newcastle upon Tyne. Various chapters deal with sugar eating habits, diet and dental problems, consumer choices, production of sugar-free confectionery, and related topics. The book is of interest to nutritionists, dentists, food scientists, industrialists, and experts on food legislation as well as to the rest of us who may be interested in reducing our sugar intake.

The Chemistry of the Fullerenes

BY ANDREAS HIRSCH (UNIVERSITY
OF TÜBINGEN, GERMANY)

GEORG THIEME VERLAG, STUTTGART, 1994. XI+203 PP.
DM 80.00. ISBN 3-13-136801-2 (SOFTCOVER)

This is a volume in the Thieme organic chemistry monograph series. When C_{60} became available in bulk, the author started his chemical research on it immediately. His interest, however, extended over the whole field, and hence this single-author monograph of this

very young field. The introductory chapter describes the discovery and production of fullerenes, and the last chapter discusses general principles and charts expected developments. The eight chapters in between deal with reduction and oxidation, addition reactions, hydrogenation, and complex formation, all indicative of the already rich fullerene chemistry.

Container Molecules and Their Guests

BY DONALD J. CRAM AND
JANE M. CRAM (UNIVERSITY OF
CALIFORNIA AT LOS ANGELES)

THE ROYAL SOCIETY OF CHEMISTRY, CAMBRIDGE, U.K.
1995. VI+197 PP. ISBN 0-85186-972-6

Donald Cram, co-recipient of the 1987 Nobel Prize in chemistry, coined the expression host-guest complexation. It was inspired by the realization that the receptor sites of evolutionary biological molecules have concave surfaces and the substrates binding to them have convex surfaces. The general aim was to mimic these biological systems by simpler synthetic systems. Not only a whole new chemistry has emerged. The book discusses the synthesis, reactions, energetics, properties, and structures of corands, spherands, cavitands, vases, kites, velcands, carcerands, hemicarcerands, and other container molecules and their complexes. There are 10 chapters in this book densely packed with scientific information. The separate chapter-opening paragraphs make an autonomous system of statements about research philosophy that are also very informative and allow the reader a rare glimpse into the thinking and strategies of the authors. The book is a great source of information for those working in supramolecular chemistry, and it is of definite interest to all other chemists as well.

Formulation and Delivery of Proteins and Peptides

EDITED BY JEFFREY L. CLELAND
(GENENTECH, INC.) AND
ROBERT LANGER (MASSACHUSETTS
INSTITUTE OF TECHNOLOGY)

ACS SYMPOSIUM SERIES, VOL. 567. AMERICAN
CHEMICAL SOCIETY, WASHINGTON, D.C., 1994. XI +
364 PP. HARDBACK, \$89.95. ISBN 0-8412-2959-7

The success of most peptide and protein drugs is dependent upon their delivery to the site of action in their biologically active form. According to the editors of this volume, until recently protein and peptide drug formulation had not been well developed and drug delivery had not been sufficiently investigated. However, there has been rapid progress lately in these areas.

This book was developed from a symposium sponsored by the Division of Biochemical Technology at the 205th National Meeting of the American Chemical Society, Denver, Colorado, March 28–April 2, 1995.

The book consists of three sections. The first section (Chapters 1–7) addresses formulation of proteins and peptides. The second section (Chapters 8–14) deals with lyophilization, which may be necessary before storage if the protein or peptide is not sufficiently stable in aqueous solution. The third section (Chapters 15–20) discusses delivery, its routes and methods, biodegradability of carriers, aerosol formulation, and pulmonary delivery.

The Language of Biotechnology. A Dictionary of Terms (Second Edition)

BY JOHN M. WALKER AND
MICHAEL COX (UNIVERSITY OF
HERTFORDSHIRE, U.K.)

ACS PROFESSIONAL REFERENCE BOOK. AMERICAN
CHEMICAL SOCIETY, WASHINGTON, D.C., 1995. VIII+296
PP. ISBN 0-8412-2982-1 (SOFTCOVER)

Biotechnology involves the practical application of biological systems to the manufac-

turing and service industries and environment management. The recent commercial success of biotechnology in health care and agriculture has further enhanced its importance. The first edition of this book appeared in 1988. The present second edition has 450 new definitions and even includes pronunciations. The definitions are clear yet concise, and, when necessary, sketches, diagrams, and structural formulas accompany the text. This dictionary is not only useful for looking up terms used in biotechnology, but it also provides instructive and entertaining browsing for readers not directly concerned with the field.

Laboratory and Scientific Computing: A Strategic Approach

BY JOE LISCOUSKI (LABORATORY AUTOMATION STANDARDS FOUNDATION, GROTON, MASSACHUSETTS)

JOHN WILEY & SONS NEW YORK, 1995 X+212 PP \$44.95 ISBN 0-471-59422-9

This book takes a truly broad view of the potential benefits and problems of scientific computing in the laboratory. It even discusses the possible problems that may be caused by e-mail replacing human interactions. This volume is the first in Wiley-Interscience's new *Series on Laboratory Automation* (Series Editor W. Jeffrey Hurst, Hershey, Pennsylvania). It surveys laboratory computer tech-

nology both in relation to the present-day needs of the lab and in terms of the opportunities the new technologies provide. The first main part deals with creating a computer strategy, and the second discusses the actual technology for laboratory automation and computing. The book will be of interest to chemists, especially analytical chemists, and to all other laboratory professionals.

Structure and Reactivity in Aqueous Solution. Characterization of Chemical and Biological Systems

EDITED BY CHRISTOPHER J. CRAMER AND DONALD G. TRUHLAR (UNIVERSITY OF MINNESOTA)

ACS SYMPOSIUM SERIES, VOL. 568 AMERICAN CHEMICAL SOCIETY WASHINGTON, D.C., 1994 IX + 438 PP \$99.95 ISBN 0-8412-2980-5

The book was developed from a symposium sponsored by the Division of Physical Chemistry at the 207th National Meeting of the American Chemical Society, San Diego, California, March 13-18, 1994. Following an overview by the editors, the remaining 27 contributions are grouped into five parts, Model Development, Nonequilibrium Solvation, Organic Reactions, The Hydrophobic Effect, and Biopolymers and Interfaces. The book demonstrates well the extent to which modeling and computational work have become a common chemical tool and practice. The theoretical

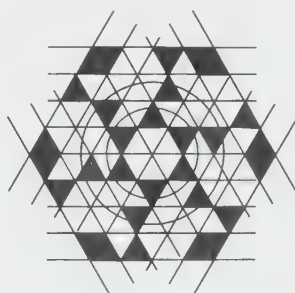
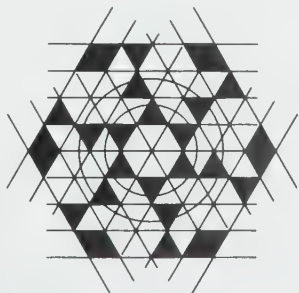
and experimental studies blend nicely in this collection. Several contributions deal with topics that may be labeled as supramolecular chemistry.

Nothing Is Too Wonderful to Be True

BY PHILIP MORRISON (MASSACHUSETTS INSTITUTE OF TECHNOLOGY)

AIP PRESS (THE AMERICAN INSTITUTE OF PHYSICS) WOODBURY, NEW YORK, 1995 XI + 446 PP ISBN 1-56396-363-9

When Kodak started making the first batches of photographic film, gelatin was produced from the bones of local cattle. Some batches of film appeared to be faster than others. Eventually it was discovered that the faster film was made with gelatin from cows that ate wild yellow mustard. Of course, once this had been realized, film speed could be regulated by adding the corresponding chemicals. This story, incidentally told by Phyllis, rather than Philip, Morrison is typical of what makes this book, by a theoretical physicist, captivating reading. It is a compilation of articles, radio speeches, and TV lectures spanning several decades, yet they make a consistent collection that is informative and entertaining. The topics include physics and philosophy, astronomy and cosmology, education and futurology, the lives and achievements of several noted scientists, and many more.



Chiral World: Solution (Stars)

Riddle appears on page 53

The drawing showed six different stars (if they are taken as two-dimensional objects on paper). They all are chiral, and two of them form a pair of enantiomers

The two stars which are a pair of enantiomers.



Petra Jungmayr,
Heusteigstrasse 61,
D-70180 Stuttgart 1,
Germany

Portraits of Paracelsus on Stamps

P E T R A J U N G M A Y R

Interest in the works and the life history of Paracelsus—physician, scientist, lay theologian, and philosopher—remained unabated for close to five centuries, as evidenced not only by an overwhelming secondary literature but also by numerous portraits of the great man. His likeness, originally in the form of portraits, engravings, and woodcuts, found its way onto medals, coins, reliefs, and finally stamps.



Theophrastus Bombastus von Hohenheim was born toward the end of 1495 or early in 1494 in Einsiedeln, Switzerland, close to Lake Zurich, and died in 1541 in Salzburg. The name "Paracelsus," by which he is commonly known, was a nickname given to him in a later period of his life. Its precise meaning is unknown, but it is generally assumed to be a latinized form of "Hohenheim." Because many of the biographical sources have not been critically assessed, his known biography is still fragmentary.

Only a small part of his considerable oeuvre, which covered medicine, natural science,

theology, and philosophy, was published in his lifetime, and many of the posthumous books and pamphlets ascribed to Paracelsus may well be apocryphal. In addition, the host of legends that have been woven around him over the centuries make it rather difficult to properly assess his personality and his true place in the history of science. As a consequence, posterity's attitude toward Paracelsus changed over the course of time, and this change is also reflected in the different portraits that have reached us.

There are only two authentic portraits of von Hohenheim, dated 1538 (Fig. 1) and 1540 (Fig. 2), and signed "AH." The widespread assumption that the artist was Augustin Hirschvogel, who was born in 1503 in Nuremberg and died in 1553 in Vienna, is not supported by recent research. It is therefore appropriate to assign these two copperplate prints to an otherwise anonymous "monogramist AH." Of these two portraits, created shortly before von Hohenheim's death, only a few signed originals have survived. The stamps on the first-day cover (1) issued by the Swiss PTT in 1995 on the occasion of the 500th anniversary of von Hohenheim's birth are exact copies of the 1538 print (Fig. 1), which shows him at the age of 44 and includes his motto *alterius non sit, qui suus esse potest*, which means that one should not be another's slave if one can be one's own master.

AH's engravings have been copied repeatedly. An early ex-



ample is the anonymous woodcut shown in Fig. 3, which was used after 1565 by the Cologne doctor and publisher Theodor Birkmann in leaflets dealing with Paracelsus. This woodcut, which is the mirror image of AH's 1538 print (Fig. 1), was used in 1993 by the artist who designed the stamp on the first-day cover (2) issued in 1995 by the German Post Office. The stamp includes some alchemical symbols, and the artwork on the cover represents, in the center, the original coat of arms of the von Hohenheim family, to which Paracelsus added the eight surrounding crosses. The cancellation shows Paracelsus's signature, which reads "Theophrastus von Hohenheim, der heiligen Schrift und beider Arzney Doktor" (loosely translated: Th. v. H., doctor of the holy script and of both medical sciences).

The stamp (3) issued in 1949 by the German Post Office is

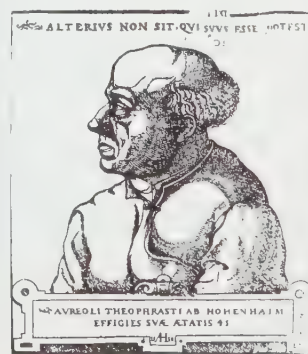


Fig. 1. Portrait of Paracelsus by "AH," dated 1538.

Fig. 2. Portrait of Paracelsus by "AH," dated 1540.

Fig. 3. Woodcut of Paracelsus.



TOP: Fig. 4. Painting of Paracelsus by Rubens.

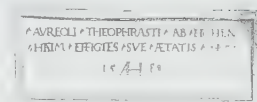
ABOVE: (3)

RIGHT: (1), (2), (4)

based on AH's engraving of 1540 (Fig. 2), albeit in a somewhat stylized and smoothed representation, similar to that in some versions of Paracelsus's portrait appearing after 1600. Later, AH's 1540 engraving served as a basis for paintings of Paracelsus which, in contrast to the original version, represent him in accordance with the then traditional conception of his personality. One such painting by an unknown artist of the seventeenth century is shown on the first-day cover (4) issued by the Austrian Post Office on the occasion of the 450th anniversary of Paracelsus's death and served as the model for the stamp in the upper right-hand corner of the cover. The cancellation again represents the modified coat of arms of the von Hohenheims.

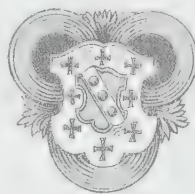
During the seventeenth century, "Rubens type" portraits of Paracelsus made their appearance. The painting by Peter Paul Rubens (1577-1640) shown in Fig. 4 is a copy, with only marginal variations, of an earlier version by the painter Quentin Massys, which is shown on a first day cover issued by the German Post Office (5). Massys (or Matsys) was born in 1465 or 1466 in Louvain, but spent most of his life in Antwerp, where he died in 1530. In these paintings, Paracelsus has changed into a well-nourished man in full bloom with a fur cap covering his abundant curls, and there is little that reminds one of the true von Hohenheim depicted in AH's original engravings (Figs. 1 and 2). A stylized version of these paintings appears on a Russian cover (6), together with a somewhat naive picture of an alchemical laboratory.

An even stronger departure from what is presumably a true likeness of Paracelsus appears on a Hungarian stamp (7) issued in 1989, on which he seems to be using a balance with two un-



PARACELSIUS
1493 Einsiedeln †1541 Salzburg

Ersttagsbrief
First Day Cover



500. Geburtstag
PARACELSIUS



450. TODESTAG
VON PARACELSIUS



equal arms. Finally, only the abstract-minded reader will recognize our hero in the wrought iron sculpture shown on the Croatian stamp (8), which was given the title "Paracelsus-Paraduchamp" by the artist Mirko

Zrinščak (b. 1953) in honor of both von Hohenheim and the French painter Marcel Duchamp (1887-1968), the inventor of the "ready mades," which obviously inspired the object shown on this stamp.



1993



Куда _____

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Индекс предприятия связи и адрес отправителя

Пожмите индекс предприятия связи места назначения

ABOVE: (5), (6)

OPPOSITE: (7), (8)

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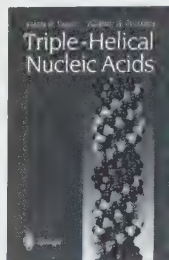
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PETRA JUNGMAJR was born in 1955 in Göppingen, Germany. She studied pharmacy at the universities of Heidelberg and Marburg. Her thesis, in the field of history of pharmacy, deals with the alchemist of Welling and with Count Karl Wilhelm's alchemical studies at the court of Karlsruhe (Petra Jungmayr, *Georg von Welling (1655-1727), Studien zu Leben und Werk*; Franz Steiner Verlag: Stuttgart, 1990). Dr. Jungmayr works as a pharmacist and as a freelance contributor to various pharmaceutical journals

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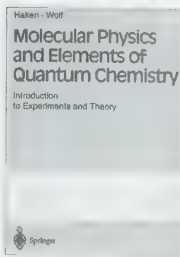
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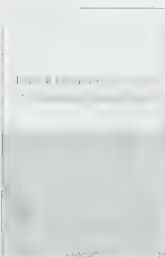
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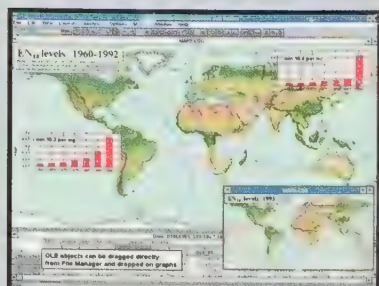
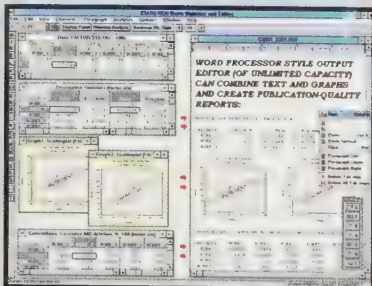
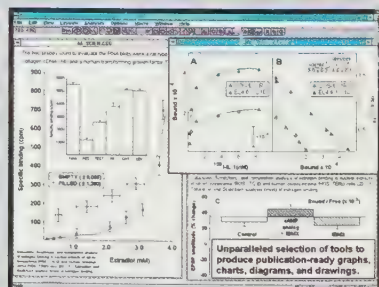
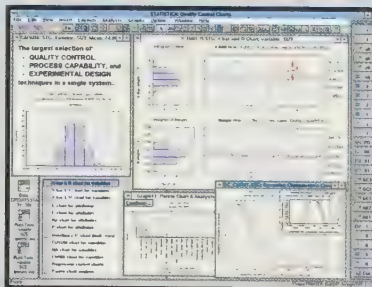
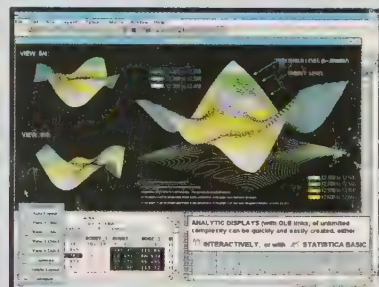
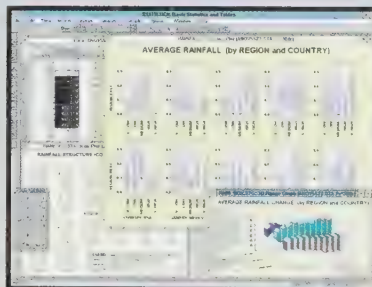
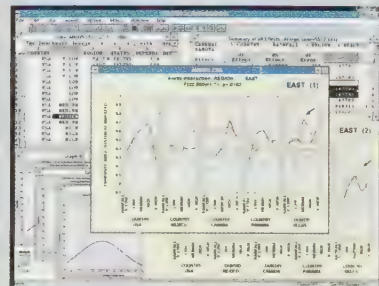
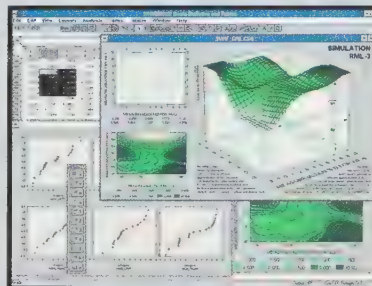
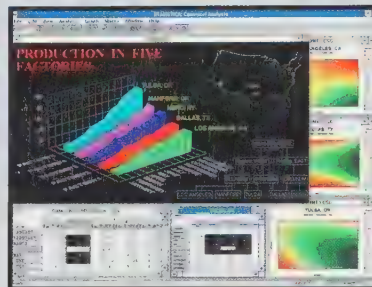
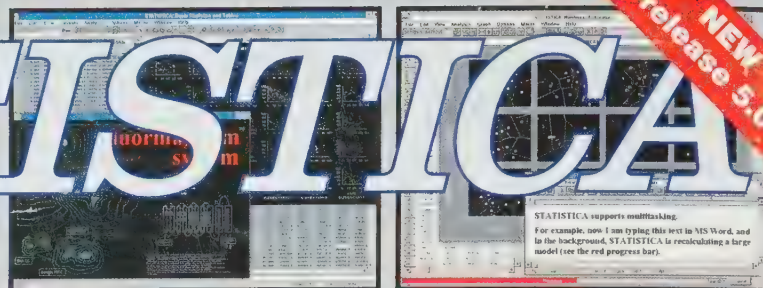
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INSTRUMENT & EQUIPMENT NEWS

TK Solver Release 3—More Powerful, Easier to Use and More Useful than Ever: For more than a decade TK Solver has been the mathematical modeling software of choice for tens of thousands of engineers and scientists. The evolution to Release 3 for Windows takes this multifunctional product to a dynamic new level.

In today's competitive marketplace, companies are looking for powerful, yet cost-effective, tools for design engineering and sales engineering automation. There are numerous issues, such as porting legacy FORTRAN and C applications into Windows and integrating with the Internet and company "intranets." Companies are looking to move their knowledge bases out of the textbooks, engineering standards, design manuals and mainframe computers where they reside, and onto PC networks.

TK Solver was first released in 1983 by Dan Bricklin and Bob Franksten, the creators of the first spreadsheet, VisiCalc. Since then TK has continually improved, while remaining a reliable tool that delivers practical results. Now the rich set of new features in TK Solver Release 3 and a savvy site licensing plan from Universal Technical Systems, Inc. (UTS) combine to form the solution that meets the needs of today's marketplace. Visit UTS's World Wide Web site at <http://www.uts.com>.

Universal Technical Systems, Inc.
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Demo Disk For Capillary Electrophoresis Training Available: A demo disk illustrating the computer-based training program

First Reply Card Winner Drawn

At 12:00 noon on July 3, 1996, CIC Accountant selected the name of the first winner of the ACCV Reader Reply Card contest. **V. Zitko**, FCIC, of the Department of Fisheries and Oceans Biological Station in St. Andrews, NB was the happy winner of a 1997 paid full-fee membership in The Institute (value of \$128.40). Request information on products/services in this and upcoming issues of ACCV with the Reader Reply Card and you will qualify for our next draw.

Introduction to Capillary Electrophoresis is available from SAVANT Audiovisuals, Inc.

Contained on the disk are samplings from three program modules. The first, *Principles of CE*, teaches fundamental concepts of FSCE (Free Solution Capillary Electrophoresis), MECC (Micellar Electrokinetic Capillary Chromatography) and CGE (Capillary Gel Electrophoresis) instrumentation. Sample introduction and detection systems are also covered. Module two, *FSCE Method Development* discusses techniques for detection, sample preparation, buffers, capillaries, method development and optimization. Module three, *MECC Method Development*, discusses similar subjects for the MECC technique.

The demo disk illustrates the involvement and feedback offered by computer-based instruction. Animated graphics clearly illustrate the concepts presented, while "hot words" and a glossary provide instant on-screen definitions of important terms. Quizzes and answers are included for enhanced subject under-

standing. Computer-based training offers one-on-one learning in the lab, office or home.

The demo disk as well as the full program requires a Windows-compatible PC with a 386 or higher processor; at least one megabyte of RAM, preferably more; a hard disk with two megabytes of free space; colour VGA adapter and monitor, Windows 3.1 or later and mouse.

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Designing Software for Research Chemists: Demonstration versions of Advanced Chemistry Development, Inc.'s products can be downloaded from their web site at www.acd.labs.com. You will also find product information and shareware. Products include: fast drawing and reliable property predicting software for Windows including ACD/ChemSketch 1.0.

Advanced Chemistry Development, Inc.
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BOOK REVIEWS

Edited by Ian Brindle

Reviews for ACCV should include some synoptic information, such as the major areas covered, the depth of coverage, and the point to which the literature has been covered. The reader should also be informed of the usefulness of the book to the area of discussion. A review would normally be a paragraph or two. Please return your book review to: **Ian Brindle**, *Canadian Chemical News*, Department of Chemistry, Brock University, St. Catharines, ON, L2S 3A1.

A list of books received will be published in some of the upcoming issues of ACCV. If you are interested in reviewing one of the books listed or another volume, please contact Ian Brindle at Brock (Tel: 905-688-5550, ext.3545; Fax: 905-688-2789; e-mail: ibrindle@spartan.ac.brocku.ca).

Adventures of a Chemist Collector. By Alfred Bader. Published by George Weidenfeld and Nicholson Ltd, UK, 1995. Available in

Canada from Dawn-Marie Desjardins, Summer Hill, Queen's University, Kingston, ON, K7L 3N7. It is also available from Little, Brown in Toronto, ON.

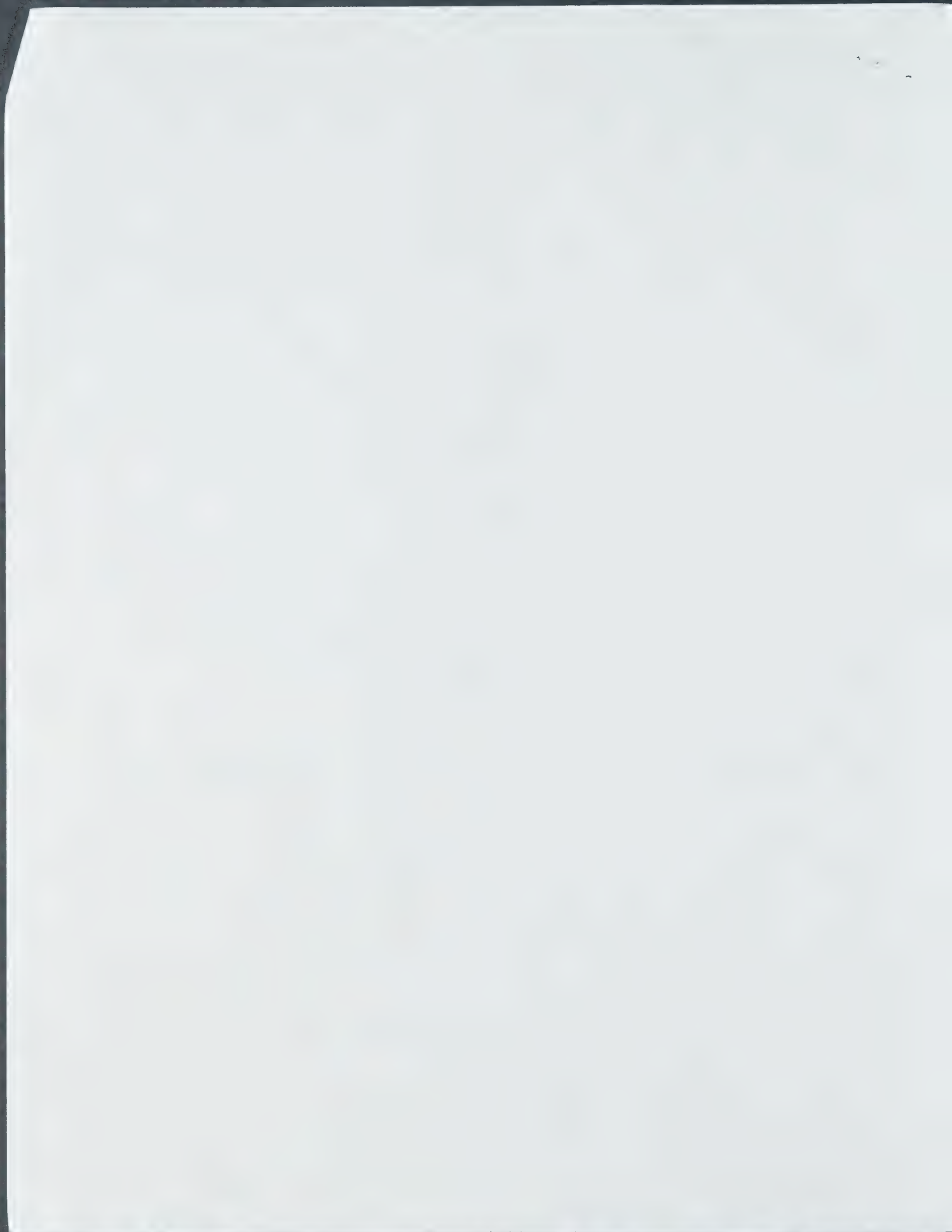
Alfred Bader is a true Renaissance man. He would have been at home and at ease in the company of Michelangelo and Leonardo da Vinci discussing literature, engineering scientific technology, art collection and restoration, and the business world. In this stimulating autobiography, he outlines for us his thoughts and adventures in the world of today.

I have been fortunate in being able to share in some of Bader's activities since we first met at Queen's University in a student-professor relationship during World War II. I will start by recording Bader's early life in Europe and the harrowing events which brought him to Canada. Actually, he owes much to protective actions by the Canadian government, though the motivation was not apparent at the time. In his autobiography Bader is to be commended for the frankness with which he

deals with these events over which he had no control and the lack of rancour with which he discusses them.

Bader came from a typical central European intellectual family. He was born in Vienna in 1924. His early life was influenced by the difficulty in reconciling the fact that his father was Jewish and his mother Catholic. Their religious differences caused a partial breakdown of relations between the parents' families. The Jewish male side of the family dominated to the extent that Bader became separated from his mother in early childhood and his care and education were passed over to his father's sister, Aunt Gisela. During this time however, he was able to maintain some social relationship with his true mother.

Bader was sensitive to these religious differences and he identified himself strongly with Judaism. Much of the early section of the book deals with these problems, the relationships he established with Jewish scholars, and his earnest participation in the rites of the Jewish religion.



BOOK REVIEWS

This was a widely held social pattern in Europe during the 1920s and 1930s but looming in the background was Hitler's anti-semitism. Then came the Anschluss with the Nazi soldiers marching into Vienna. For Bader, the main consequence was that because of his Jewishness he was denied access to his school. In 1938 the British Government allocated 10,000 visas to enable Jewish children to come to Britain. In his book, Bader poignantly describes the scene at the Vienna Westbahnhof where he and other children were parted from their families and left for London. In the single small suitcase allowed him it was a typical Baderism that he packed his album of rare Greek stamps. After some temporary billeting in the south of England he was finally allocated to the Scharff family in Hove and duly registered at the East Hove Senior School for Boys. Bader's account of these meanderings makes fascinating reading.

In 1941 when the threat of a German invasion of Britain became serious, the British government rounded up all refugees from Nazi-occupied Europe. Bader was swept up in this internment and he found himself sailing westward on the S.S. Sobieski to a destination unknown. His description of the events before and after their arrival at Quebec City is lucid, particularly in the manner in which he recounts how he helped to build up good social relations between the guards and the prisoners. This made it possible for the large shipboard Jewish community to continue to practice their religious rituals.

On November 2, 1941, he was released from internment and was accepted to live with the family of Martin Wolff in Montréal. Bader identifies Martin as the first father figure in his life. He was most anxious to complete a university education and he felt himself very fortunate, with Martin's help, to gain admission to Queen's University. At that time I was a member of the Queen's faculty and taught the first year course in organic chemistry. Bader's prominent personality combined with his strong German accent soon made his presence felt in the heterogeneous wartime student body. This relation was augmented when he became the secretary of the university photographic society which met regularly at my home.

The undergraduate years at Queen's were happy times for Bader. He completed his bachelor degree in engineering chemistry in 1945. The post war reorganization of academia saw me move from Queen's to the National Research Council at Ottawa, but this did not seriously effect our relations. In his final undergraduate year Bader was required to undertake a "research project". This centered around the use of ultraviolet spectroscopy to study the structure of unsaturated fatty acids and it may have been prophetic that the removal of these substances is a critical step in the restoration of old oil paintings, an activity which became important to him later on.

Bader writes explicitly about his financial affairs at this time. He was very appreciative of the financial help he received from the University, from the Wolff family and others. Later, when he became a very wealthy industrial chemist he did not forget this. He donated lavishly to Queen's including, in addition to many priceless oil paintings, the fabulous Herstonceux Castle as an International Study Centre for Queen's University and other students in England. This is all described in the latter part of the book.

In fact the book is so detailed that much of its contents are best left for the reader to explore himself. From here on, we can only note some of the highlights in general terms. Those seeking a detailed account of the latter part of the book can best look up the articles by J. Emsley in *Chemistry in Britain* (p.557, (1995)) and Ernest Carpenter in *Chemical and Engineering News* (pp.41-42 (1995)).

During his later undergraduate years Bader held summer jobs with the Murphy Paint Company. Here, his potential as an industrial chemistry salesman became apparent. This much impressed Harry Thorp, the President of Murphy Paint, and he set Bader on the path which ultimately led Bader to establishing the multi-million dollar Aldrich Chemical Company.

With support from Thorp, Bader continued at Queen's to take a Master's degree under the direction of A.F. McKay. This was the top of the academic ladder at Queen's, but with Thorp's encouragement and financial support he continued his graduate education for two more years to acquire a doctorate at Harvard. I like to feel that at this time I had some influence in steering Bader to the laboratory of Louis and Mary Fieser. As you would expect, Bader gives us a detailed and stimulating account of his life at Harvard and thumb nail sketches of the many eminent chemists he met there.

With the doctorate diploma stuffed safely in his pocket, Bader entered on the entrepreneurial phase of his activities. Following the Harvard academic phase Bader felt an obligation to return to the Murphy Paint Company. This company had, in the meantime, been acquired by the Pittsburgh Plate Glass Company and moved to Milwaukee. Accordingly, we next find Bader established in Milwaukee which remained the geographic center of his activities for the rest of his business career. This lasted until 1991 when, to deep chagrin, he got caught up in a web of financial complications. This led to his being forced to relinquish many of his business occupations. However, his personal fortune was not significantly at risk and he entered on the third phase of his life style centered on his interest and activity in art restoration (notably Rembrandt) and extremely generous philanthropic actions.

The founding of the Aldrich Chemical Company and its ramifications occupies the main body of the book. Space limitations prevent us

reviewing this in detail, but it is all there centered around The Aldrich Chemical Company, its expansion to become Sigma-Aldrich and their business relations with Sandoz, Fluka, Ciba-Geigy, Eastman Kodak, and with the Chemistry Departments of most European and North American Universities. Bader pulls no punches in discussing the cut and thrust of the business relationships controlling the pharmaceutical industry.

An activity close to his heart was the publication by the Aldrich Chemical Company of the magazine *Aldrichimica Acta*. We can see that Bader was proud of this achievement and he used it skillfully to keep alive his interests in the more academic side of organic chemistry. We should note here his interests in the history of organic chemistry and particularly his publications concerning the contributions of Kekulé, Loschmidt and others concerning the establishment of the true structure of benzene. Again we can only urge the reader to seek out the parts most relevant to his personal interests.

In the latest phase of his activities, we have noted above that seeking out and restoring old paintings, particularly oil paint and still more particularly the school of Rembrandt and the other contemporary Dutch painters came to preoccupy his activities. As would be anticipated most of the final chapters center on these activities. This section of the book is lavishly illustrated.

Bader first met his wife Isabel (née Overton) in 1949 on what developed into a shipboard romance on the S.S. Franconia when he was making his first postwar visit back to Europe. There were however religious incompatibilities that postponed any thought of marriage for many years. In the meantime Bader met and married Helen Ann Daniels (Danny) by whom he had two children, David and Daniel in 1958 and 1961.

A whole chapter of the book meticulously describes the unusual but basically amicable relations maintained by Bader with both Danny and Isabel over this long period of time. It finally ended with a divorce from Danny in 1981. She died six years later. Alfred and Isabel married and continue to live in good harmony. She deeply involves herself in Alfred's philanthropic and art restoration activities.

R. Norman Jones, FCIC
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LEE PARPART
Special to *The Globe and Mail*, Toronto

William Randolph Hearst built La Casa Grande at the height of his 30-year affair with Marion Davies. Mark Antony handed over large portions of Syria and Lebanon to Cleopatra. On a slightly different scale, Milwaukee philanthropist Alfred Bader is building a theatre in honour of his wife Isabel.

The retired chemical supplier, who now buys and sells Old Master paintings, recently donated \$6-million to the University of Toronto's Victoria University to build a new, 500-seat venue to be called the Isabel Bader Theatre. Born in Kirkland Lake, Ont., Isabel Overton Bader graduated from Victoria in 1949 before going on to teach, design costumes and run a theatre group in England for 25 years. "I like Victoria college very much," Alfred Bader, 75, said, "but I would never have given this money if not for Isabel."

Construction on the theatre got under way in late July on a quiet stretch of Charles Street, in the heart of Victoria's downtown Toronto campus. The building is expected to open as a combined lecture hall and performance space in the fall of 2000. The gift is Victoria University's single largest in a long history of hefty donations by alumni and supporters, including the Massey family, Northrop Frye and the mother of former Ontario lieutenant-governor Hal Jackman.

Bader, who founded Aldrich Chemicals in a Milwaukee garage in 1951 and saw it grow into a \$500-million-a-year business by the early 1990s, is already well known as a generous benefactor to his alma mater, Queen's University. He has donated more than \$20-million in cash and kind to the Kingston, Ont., university over the years, showering it with Old Master paintings, scholarships and even a 15th-century English castle, Herstmonceux, once owned by the ancestors of Hollywood star Ralph Fiennes.

Victoria University president Roseann Runte, who is editing a book of the couple's letters, to be

published by the University of Toronto Press, said she views the theatre as a remarkable expression of a husband's love for his wife. "When he gave us the money for the theatre, it is was because he wanted to make a gift to her. It's a kind of a double generosity, and a true love story."

The details of that story — a chance meeting on a ship to Europe in 1949, a quick marriage proposal, a separation of 25 years and a reunion in the mid-1970s — are described in Bader's 1995 autobiography, *Adventures of a Chemist Collector*, which also chronicles his life as an Austrian refugee.

Bader, a Jew, escaped to Britain as a teenager with the first *Kindertransport* group from Vienna in 1938, the British effort to rescue children from Hitler's European expansion. But he was later shipped to Canada when the British government developed cold feet about harbouring possible fifth columnists among its refugee population. Bader, two weeks past his 16th birthday, was reclassified as a prisoner of war, along with hundreds of other male refugees aged 16 to 65. He was sent to Canada in July of 1940, and spent 16 months interned in a camp on Ile aux Noix, just off Montreal.

When he was released in 1941, Bader began applying to Canadian universities. Queen's University accepted him and Bader graduated with a degree in chemistry in 1945, a master's degree in 1947, and eventually received his PhD in organic chemistry from Harvard University in 1950.

It was on a break during his doctorate that Bader first encountered 22-year-old Isabel Overton in 1949. The two were on a ship bound for England; Bader was seeking relatives who might have survived the war; Isabel, a new Victoria graduate, was looking for a teaching post in England.

Bader proposed after only nine days, but Isabel hesitated. They travelled together briefly that summer and Isabel wrote 82 letters to Bader after accepting a teaching job in Sussex. But religious differences finally pulled them apart. Bader

had stressed how much he wanted a Jewish family, and Isabel, a strong Protestant at the time, was not ready to convert. "I was not absolutely against the idea," she recalled recently. "But it wasn't something I could do in a hurry." (She later converted to Judaism in 1991, nine years after the couple were married in a civil ceremony).

After Isabel turned down his proposal, Bader returned to Milwaukee, started a business and, eventually, married a Jewish woman, with whom he had two sons. But Bader says he never forgot Isabel. His book says he imagined her "happily married to a WASP ... with six children, occasionally laughing at the fool Jew who had fallen so head over heels in love with her." And he admits to "masochistically" rereading her letters to him every year on her birthday.

In 1975, when Bader tried to track Isabel down, he was amazed to find her still teaching at the Bexhill Grammar School in Sussex where he had left her in 1949. She had stayed there, hoping he would come back, but when he did, it was traumatic. In 1981, after many tearful rejections ("She kept saying, 'You're married, go away,'" Bader recalled) and, finally, an uncontested divorce from Bader's first wife, Alfred and Isabel started their life together.

Since marrying in 1982, the two have been inseparable. While Bader was still working for Sigma-Aldrich (his company had merged with another chemical supplier in 1975), Isabel joined him on trips to labs and universities around the world. When Bader was voted off the company board in 1992 for an alleged financial indiscretion, the couple switched gears.

Bader, who had been running a small art dealership on the side since 1961, stepped up his activities and moved Alfred Bader Fine Arts into a small space in Milwaukee's historic Astor Hotel. On his first foray into high-stakes dealing, he sold a Rembrandt portrait to the Rijksmuseum in Amsterdam for \$10-million (U.S.); the business now handles roughly 200 paintings a year.



The Baders have become an unlikely fixture on the British and New York auction scenes — down-to-earth multimillionaires who prefer public transit while travelling, shun vacations ("Cape Cod is for rich people," Bader smiles) and dress in department-store chic.

But if their fashion sense is understated, their money talks. Last year, at Sotheby's in New York, they bought Rembrandt's 1633 *Portrait of a Bearded Man in a Red Coat* for \$9-million (U.S.) and Rubens's c.1609 work, *The Head of St. John the Baptist Presented to Salome*, for \$5.5-million (U.S.). Both paintings have since been sold to Las Vegas casino director, Steven Wynn, for what Bader described as a "comfortable profit."

While he treats the multimillion-dollar art purchases as "selling potatoes," Bader is also an avid collector. He thrives on the hunt and loves finding dirty, damaged and moderately priced work lying around in antique shops. He has discovered more than one diamond in the rough, including a valuable 1646 still life by Pieter Claesz that he purchased for a mere \$250.

Every dollar he saves by chasing down bargains, however, is another 50 cents the couple chooses to give away. Some of the couple's income goes toward left-leaning interna-

tional causes, such as Middle East peace initiatives and financial support for the former Czechoslovakia's Roma population. Smaller amounts go to keeping up the Baders' memberships in the American Civil Liberties Union and the National Association for the Advancement of Coloured People. The rest goes to universities.

And for that, Victoria president Runte is grateful. While the college has no drama school that would require it to own a theatre, it hosts what Runte calls "the oldest living dramatic revue in North America," an annual comedy show called *The Bob*. And along with its strong tra-

dition of literary criticism (Northrop Frye studied and later taught at Vic and Margaret Atwood is a graduate), the school has a history of fostering dramatic talent. "We have a number of distinguished directors and actors, including Norman Lewison and Donald Sutherland" as graduates, and they've never had a stage to practise on," said Runte.

The theatre is being designed by Toronto architect Peter Smith, who has drawn plans for 40 other performing-arts facilities, including Toronto's Princess of Wales Theatre. Smith described the Vic project as an "intimate" two-level theatre; it will have basic staging

and audio-visual equipment in the first year, with room to grow in future years.

As for any future philanthropic gestures, Bader admits to not liking being solicited for money. But husband and wife insist that giving it away is one of their prime pleasures in life.

"We can't take it with us," Bader is fond of saying, "so why shouldn't we have fun while we're alive?"

"We could spend it on riotous living, which many people do," Isabel adds, "but neither one of us likes to live riotously. Or at least, our type of riotousness is rather different."

100