

ALFRED BADER

General Correspondence

1991

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Aug. 9. 90

Dear Alfred,

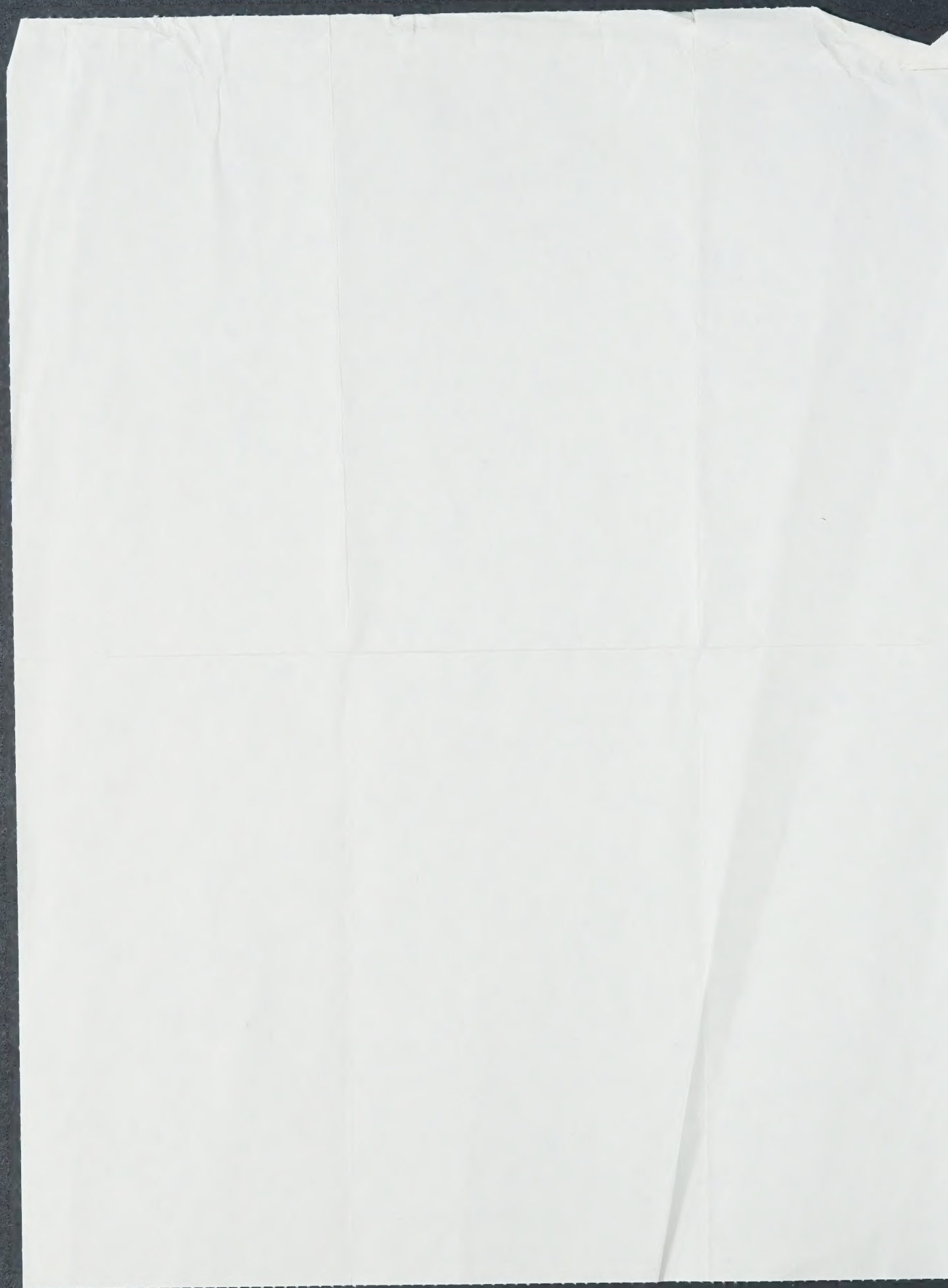
Your letter of July 23 was forwarded to me in Johnson, Vermont where Barry has been teaching! I'm sorry that my letter caused you such concern - I could tell that writing ~~it~~ <sup>the reply</sup> was not easy <sup>for you</sup>. One of the hardest parts of my new job is that it forces me to ask friends for financial help - it was hard to ask you and I hope you understand.

If at some point you feel inclined to support the museum in any way, I shall be profoundly grateful - if not, I understand and it will, without saying, never alter the esteem or affection I feel for you and Isabel.

I'll write again from Bloomington.

Here it has been peaceful, beautiful and spiritually renewing. The earth, sky, and vegetation somehow more than usually blessed by the maker. It fills me with joy for being here and sadness for having to leave.

Thanks for writing Alfred - Barry and I both send you and Isabel much love! Your Heidi







Department of Chemistry  
Otto Maass Chemistry Building  
McGill University  
801 Sherbrooke Street West  
Montreal, PQ H3A 2K6

Département de chimie  
Pavillon Otto Maass de chimie  
Université McGill  
801, rue Sherbrooke ouest  
Montreal, PQ H3A 2K6

Tel: (514) 398-6999  
Fax: (514) 398-3797

September 12, 1991

Ms. Sandra Hollingshead, Editor  
Canadian Chemical News  
130 Slater Street, Suite 550  
Ottawa, ON  
K1P 6E2

Dear Ms. Hollingshead:

I wish to submit the article, "The Aldrich Story", for consideration for publication in Canadian Chemical News. Enclosed also are two photographs and a slide for illustrations for the article. Dr. Bader has no other copy of the 1951 photograph of himself, and is concerned that it be returned to him; I hope that care will be taken that this is done.

Yours truly,

A handwritten signature in cursive script that reads "John T. Edward".

John T. Edward  
Emeritus Professor of Chemistry

JTE/cm





### The Aldrich Story

JOHN T. EDWARD, FCIC

Department of Chemistry, McGill University, Montreal, Que.

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, and the scorn of 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 down to thermostats and Macleod gauges. Nowadays 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 ten-step syntheses starting with simple compounds found in the Eastman Chemical Co. catalogue, which listed 4000 chemicals. Nowadays organic chemists routinely carry out fifteen- and twenty-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. Truly, life for the chemist has become vastly easier.

THE UNIVERSITY OF CHICAGO  
PH.D. THESIS

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PH.D. THESIS

The first part of this thesis is devoted to a study of the structure of the group of automorphisms of a certain class of groups. It is shown that this group is isomorphic to a direct product of a free group and a certain subgroup of the symmetric group. The second part of the thesis is devoted to a study of the structure of the group of automorphisms of a certain class of groups. It is shown that this group is isomorphic to a direct product of a free group and a certain subgroup of the symmetric group.

The third part of this thesis is devoted to a study of the structure of the group of automorphisms of a certain class of groups. It is shown that this group is isomorphic to a direct product of a free group and a certain subgroup of the symmetric group. The fourth part of the thesis is devoted to a study of the structure of the group of automorphisms of a certain class of groups. It is shown that this group is isomorphic to a direct product of a free group and a certain subgroup of the symmetric group.



By what providence 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. Parts of it have appeared recently in several sources (1 - 3), and have important lessons on how new science-based corporations can emerge.

The story begins with Alfred Bader, born in Vienna in 1924. Bader's father died when he was two weeks old. In 1938 Nazi racial laws forced him to drop out of school, and he spent six months making some money buying and selling stamps before being sent by his mother to England. In 1939 he entered Brighton Technical College, but on 12 May 1940 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 in days or weeks 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, the British government arrested on May 12 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 thirty thousand refugees were interned (4).

In July 2,290 refugees were sent to Canada on three boats, the Ettrick, the Sobieski, and the Duchess of York. Another boat, the Arandora Star, was sunk with many lives lost, and a fifth, the Dunera, went to Australia.

The boats coming to Canada brought perhaps the most impressive group of immigrants ever landed on Canadian soil: twenty or thirty years later many would rank among the outstanding academics, artists, and musicians in Canada (4). But that was for the future. The Canadian government had been persuaded to accept custody of seven thousand "dangerous Nazis", and did not realize that the British government had shipped out of the country not only three thousand 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 story of their captivity



The first paragraph of the document discusses the importance of maintaining accurate records of all transactions. It states that this is essential for the proper management of the organization's finances and for ensuring that all activities are properly documented and reported.

The second paragraph outlines the specific procedures that must be followed when recording transactions. It emphasizes the need for consistency and accuracy in all entries, and provides detailed instructions on how to format and categorize each record.

The third paragraph discusses the role of the accounting department in ensuring that all records are properly maintained and updated. It highlights the importance of regular audits and reviews to identify any discrepancies or errors in the data.

The fourth paragraph provides a summary of the key points discussed in the document. It reiterates the importance of accurate record-keeping and the need for strict adherence to the established procedures.

The fifth paragraph concludes the document by expressing the organization's commitment to transparency and accountability. It states that the information provided in this document is intended to guide all employees in their record-keeping activities.

The sixth paragraph discusses the consequences of failing to follow the established procedures. It notes that any errors or omissions in the records could lead to financial misstatements and legal liabilities for the organization.

The seventh paragraph provides a final reminder of the importance of accurate record-keeping. It encourages all employees to take the necessary steps to ensure that all transactions are properly recorded and reported.



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 Ettrick (4).

Bader arrived in Canada on the Sobieski, along with Walter Hitschfeld, later Vice-Principal of McGill University and Ernest Eliel, President-elect of the American Chemical Society. Also arriving in Canada at this time were Max Perutz and Hermann Bondi, who had been working in Cambridge. On their release they went back to Cambridge, where Perutz won the Nobel Prize with Kendrew in 1962.

The prisoners were sent to various camps: Eliel to one deep in the forests of New Brunswick, where he cut wood (5); Bader to an old fortress on an island in 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." (6)

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 need. 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, Mr. Harry Thorp, then gave him \$1800, suggesting that he get his Ph.D. and become an even more useful paint chemist. Bader decided to get an M.Sc. first, and went to Queen's to work with A.F. McKay. McKay had obtained his Ph.D. with George Wright at the University of Toronto, and like Wright had become something of a fanatic in the dedication and long hours in





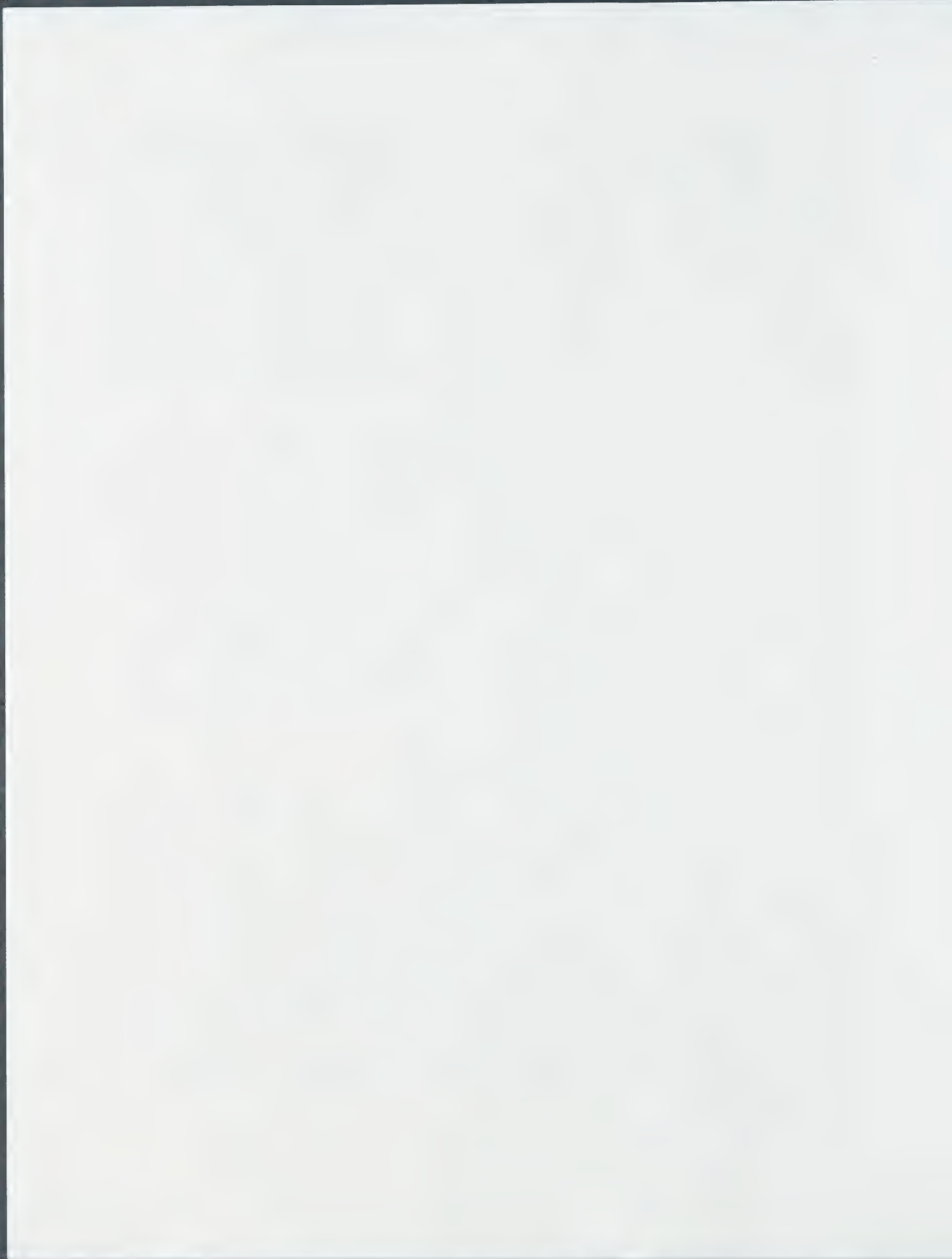
the laboratory that he demanded of himself and his students. Bader enjoyed working beside McKay in the laboratory and became a skilled and enthusiastic experimentalist. In 1948 he published with McKay in the Journal of Organic Chemistry his first paper, describing the eight stereoisomers of 9,10,12,13-tetrahydroxystearic acid obtainable by oxidizing linoleic acid.

Bader found that he liked making compounds, and decided to continue to the Ph.D. 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 Ettlinger, and others, and graduated with a Ph.D. in two years. During this time he taught everyone in the organic laboratories to make diazomethane 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 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." (1).

Bader and a Milwaukee attorney, Jack E., decided to start a company of their own to sell research chemicals not offered by Eastman. They incorporated on 17 August 1951 with the minimum required capital of \$500, each of them putting in \$250. They tossed a coin for the name of the company. Jack E. 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, "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 Jack E. had any money to put into the company, and so they persuaded a friend to buy 1/3 of the company for \$25,000: \$5000 immediately, then \$1000 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 Ettliger without consulting him or Jack E. The incident high-lighted 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 Jack E., and had sole control.

This must have been a difficult time for Bader. The buyouts 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 thousand square foot 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 rest is history. 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) (7). The company employs about 4100 people: about 3000 in the USA and 1100 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. I have not described the financial steps in his long climb: they are described in his article in the New Journal of Chemistry (1), and make fascinating reading.

What is the lesson? The first is that capitalism works if there are people willing to work hard and take risks. 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





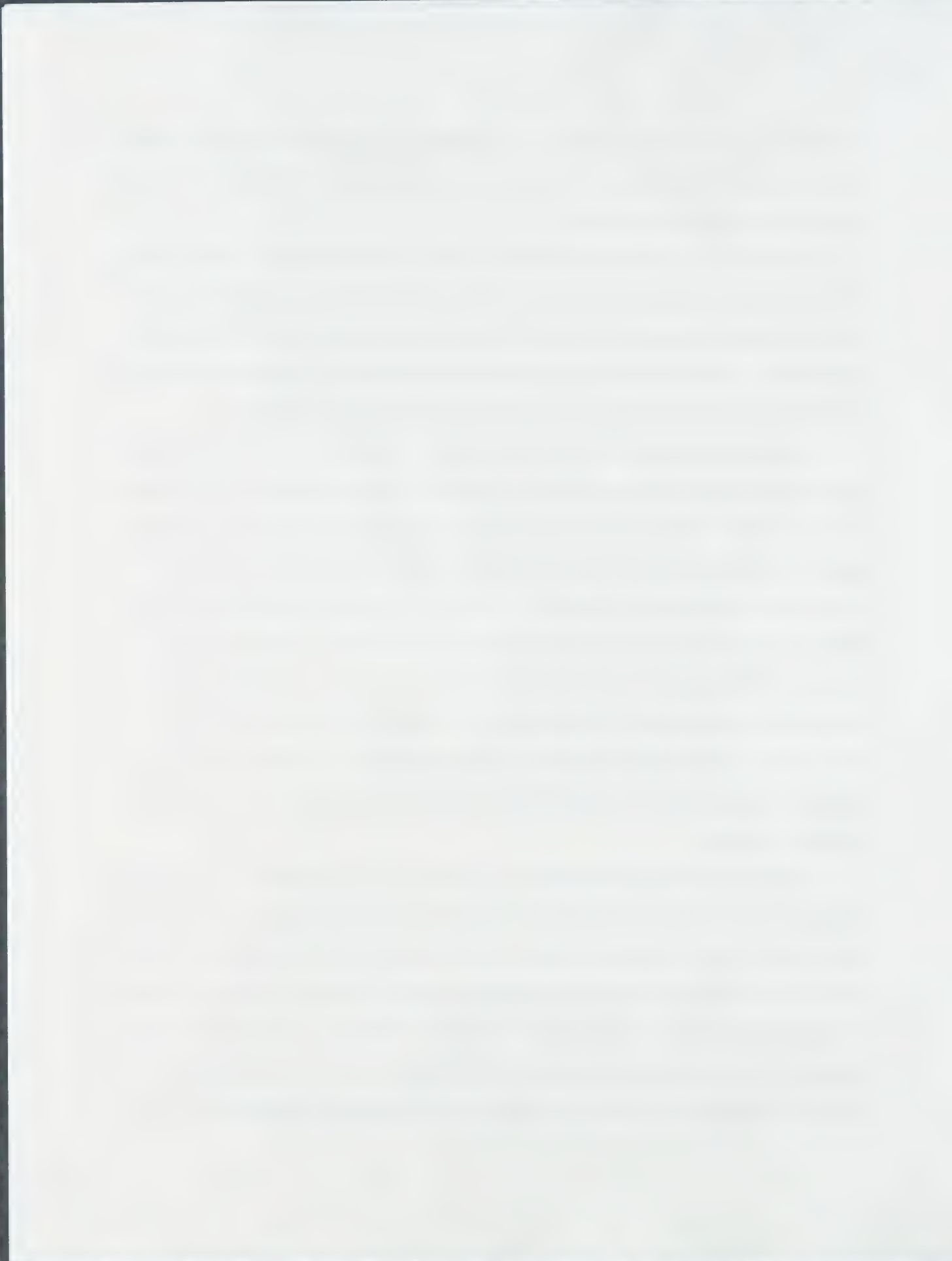
me that when he receives his copy of the Journal of Organic Chemistry, he first reads the Aldrich advertisement at the back: this is often more important than any article in the journal. No other advertisements teach so much chemistry.

All of 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 the labs of active organic chemists, listening to them describe their work, interested in their problems, and (of course) interested in buying any compound they had 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. (The account in most textbooks is wildly inaccurate.) 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 vigour the claims of the Austrian chemist and physicist Loschmidt. I am unconvinced, but at least 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. "I 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". Well, some forty years later I still haven't and I am much the happier for it" (5). He



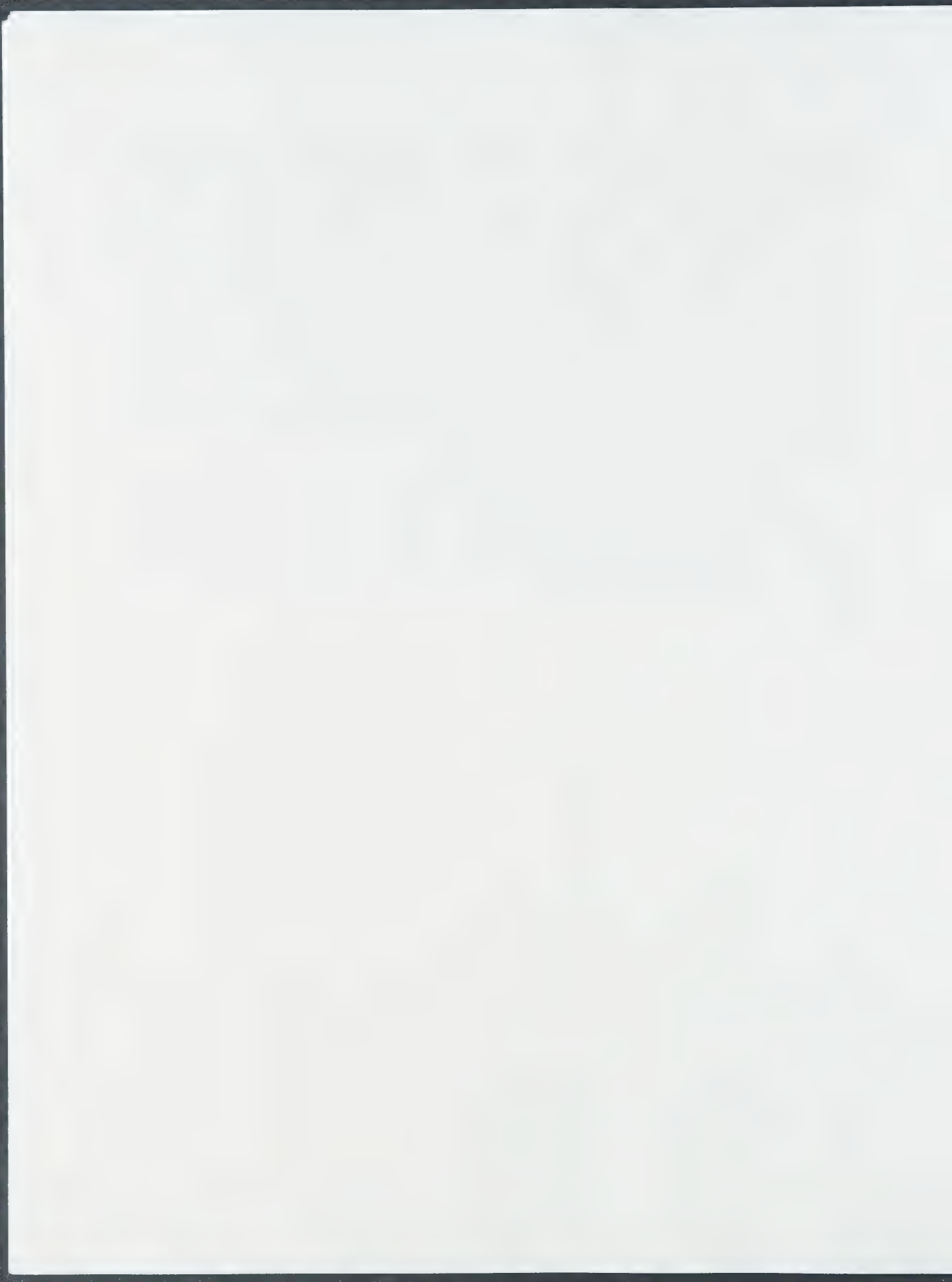


is a subtle and perceptive critic of Dutch painting, and his gifts to the Agnes Etherington Arts Centre of Queen's University help to make it the finest collection of any university in Canada.

All of this adds up to a picture of a happy, busy, and successful man, but leaves out the B from Bader's ABC (art, Bible, chemistry). Although friendly with orthodox neighbors 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, and to thrill to the simplicity and majesty of its language. 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 will become a classic case for study in business schools, and we can wonder: how will they choose to explain it? What weight will they give to Bader's ABC?

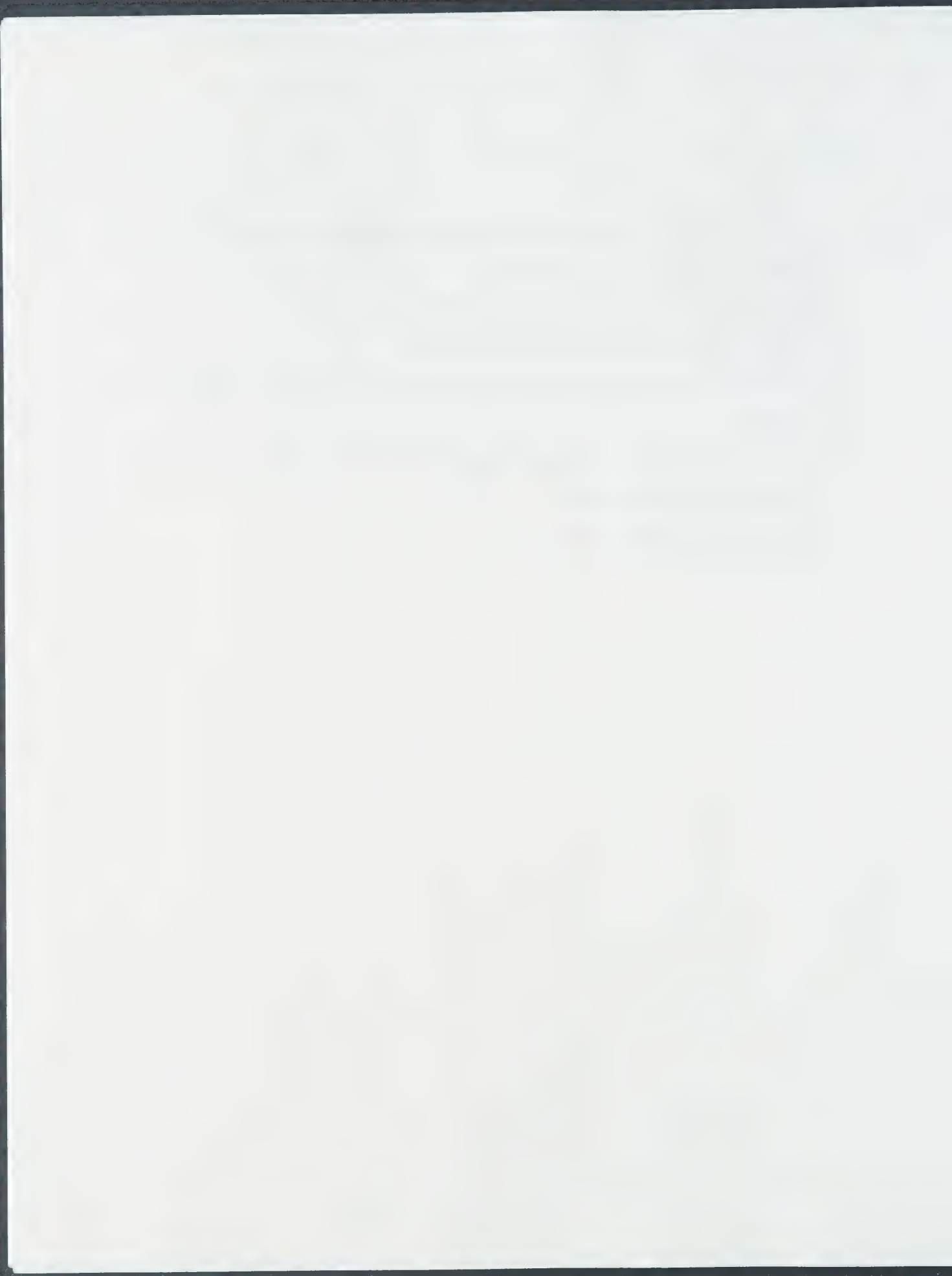




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6. A. Bader, address to the Academy of Letters and Science, University of Wisconsin - Stevens Point, October 1, 1987.
7. Chem. Eng. News, May 6, 1991, p. 13.





(Legends)

Fig. 1. Alfred Bader in 1951, when Aldrich Chemical Co. was founded, and today.

Fig. 2. The Aldrich plant at Sheboygan, Wisconsin. (There is no picture of the garage in Milwaukee where the company started its operations.)







*Daisy*

**ROMA PITTORESCA**



ROMA  
Fontana di Trevi  
Fontaine de Trevi  
The Trevi Fountain  
Der Trevi Springbrunnen

4-Sept, 1991



Dear Dad & Sis;

Michelle & I are staying in a little hotel near the Trevi Fountain. We spend all day looking at Art & Architecture and experiencing Roma. Michelle is a very thorough guide book reader and there isn't much that is important that we overlook. Compodoglio designed by Michaelangelo has a nice painting museum that we saw a few nights ago. Two days ago we were at a Italian wedding in the south of Italy - that was an experience. The Italians eat all day long at a wedding.

© copy by PLURIGRAF - Narni (VT) - Italy

love David

MICHELLE & SIS BADER

296 N. Shepard Ave

Milwaukee, WI 53211

USA

Non scrivere sotto questa linea - ne écrire au-dessous de cette ligne - Do not write below this line - Schreiben Sie nicht unter dieser Zeile - No escribir por debajo de esta línea

Hi!  
We're having a wonderful time. We stopped in at a painting gallery - saw paintings like the ones Italians were buying at Gillinghurst. Some looked fake, too. See you in Oct. Love, Michelle



The Fourth  
Chemical Congress  
of North America

El Cuarto  
Congreso de Química  
de América del Norte

Le Quatrième  
Congrès Nord-  
Américain de Chimie

August 25-30, 1991

New York, New York, U.S.A.

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September 30, 1991

Dr. Alfred Bader  
Sigma-Aldrich  
540 W. St. Paul Ave.  
Milwaukee, WI 53233

Dear Dr. Bader:

Our fall semester is now under way and so I have a few minutes to reflect back on the wonderful experience that was the Opening Symposium of the Fourth North American Chemical Congress.

I would like to personally thank you for being a part of the Congress Symposium on Chemists and the Arts. Many comments have been shared with me by attendees expressing their appreciation for your presentation. Those who had heard you before indicated that it was delightful to hear you again and each appreciated the information that they hadn't remembered from previous talks. Those who had not previously heard you expressed fascination with your experiences and the variety of examples you shared. Many expressed appreciation for the copies of the paintings that you so thoughtfully made available at the Symposium.

Having the opportunity to share lunch with you and your lovely wife made the whole day a special experience for me. I feel honored to have had that special time with you and Dr. Kasha.

I have forwarded your travel reimbursement request to the ACS Offices. You should shortly be receiving your reimbursement check.

Thank you very much for your enthusiasm and your willingness to share.

Sincerely,

Janan M. Hayes  
Vice President, Instruction.  
Member of Congress Organizing Committee



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The first part of the report is devoted to a description of the work done during the year. It is divided into three main sections: the first section deals with the work done in the laboratory, the second section deals with the work done in the field, and the third section deals with the work done in the office. The first section is the most important, as it contains the results of the experiments. The second section is also important, as it contains the results of the field observations. The third section is less important, as it contains the results of the office work. The report is written in a clear and concise style, and it is well organized. It is a good example of a scientific report.

The second part of the report is devoted to a discussion of the results of the work. It is divided into three main sections: the first section deals with the results of the laboratory work, the second section deals with the results of the field work, and the third section deals with the results of the office work. The first section is the most important, as it contains the results of the experiments. The second section is also important, as it contains the results of the field observations. The third section is less important, as it contains the results of the office work. The report is written in a clear and concise style, and it is well organized. It is a good example of a scientific report.

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