

Alfred Baber Fonds

Correspondence

Birmingham, Univ. of
1995

QUEEN'S UNIVERSITY ARCHIVES	
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ALFRED BADER FINE ARTS

DR. ALFRED BADER

ESTABLISHED 1961

April 24, 1995

Professor J. Fraser Stoddard
School of Chemistry
The University of Birmingham
United Kingdom

Dear Fraser:

You must have realized how very much we enjoyed your visit to Milwaukee.

Enclosed as promised, please find the "menu" of my talks. We would love to be able to visit you late next November or early in December.

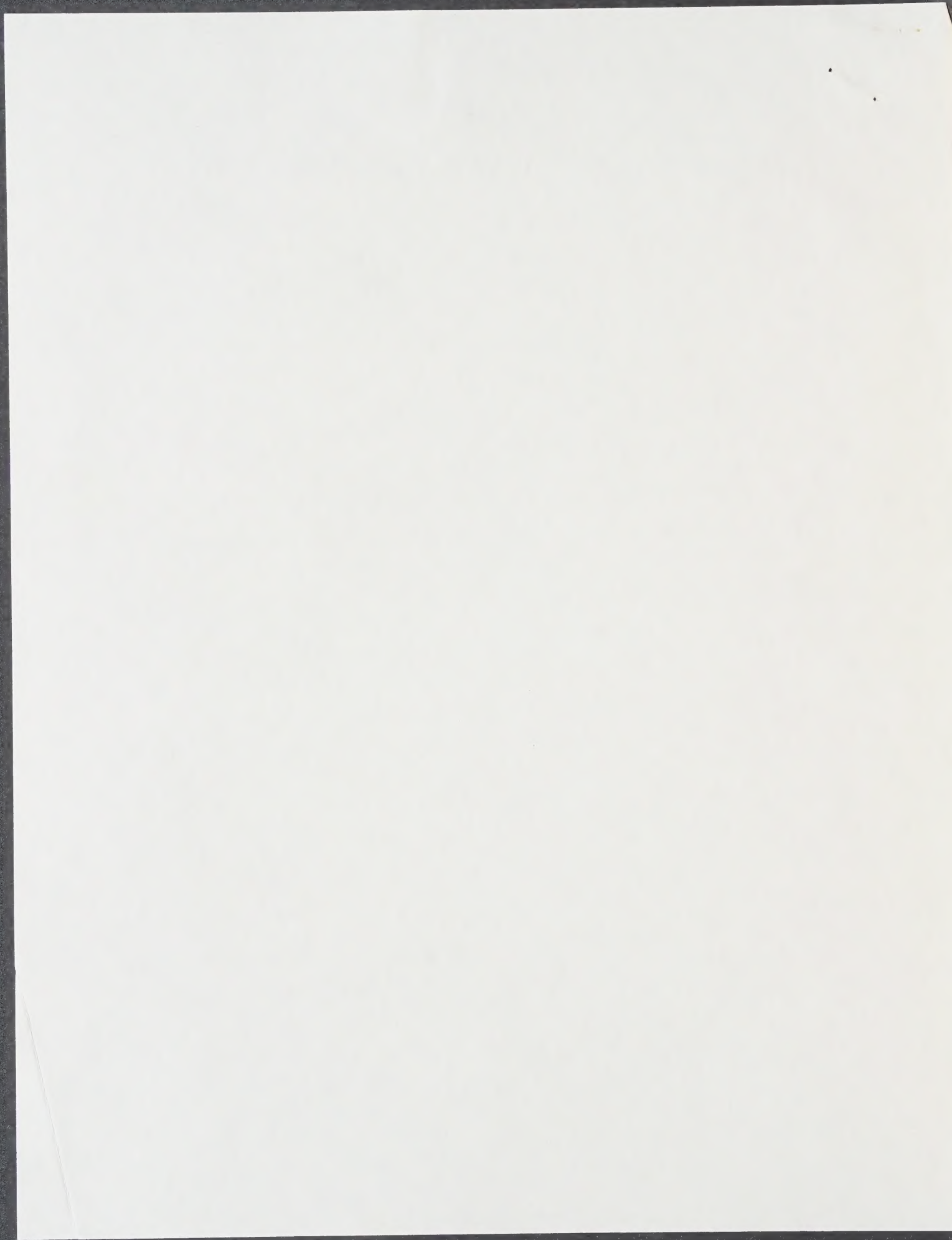
With all good wishes from house to house, I remain,

Yours sincerely,

AB/cw

Enclosure

By Appointment Only
ASTOR HOTEL SUITE 622
924 EAST JUNEAU AVENUE
MILWAUKEE WISCONSIN USA 53202
TEL 414 277-0730 FAX 414 277-0709



UNIVERSITY OF WISCONSIN-MILWAUKEE

1995 AWARD DAY LECTURE

By

Professor J. Fraser Stoddart
School of Chemistry
The University of Birmingham
United Kingdom

**Making Molecules to Order: Self-Assembly in Organic
Synthesis**

J. Fraser Stoddart has been Professor of Organic Chemistry at the University of Birmingham since 1990. He was appointed Head of the School of Chemistry there in 1993. Previously, he was a Reader in Chemistry at the University of Sheffield for eight years, where he was also Lecturer from 1970 to 1982. From 1978 to 1981, he was seconded from the University of Sheffield to the ICI Corporate Laboratory in Runcorn. He gained his BSc in 1964, his PhD in 1966, and his DSc in 1980, all from the University of Edinburgh. He was elected to the Fellowship of the Royal Society of London in 1994. He has received many awards, including the International Izatt-Christensen Award in Macrocyclic Chemistry in 1993, and has been a distinguished lecturer in many universities all around the world, e.g. Lauderman Memorial Lecturer at Washington University/St Louis in 1991, Ernest Ritchie Memorial Lecturer at Sydney University/Australia and the Walter J. Chute Lecturer at Dalhousie University/Canada in 1992, the Atlantic Coast Lecturer in 1993, Chaire Bruylants Award Lecturer at Louvaine-La-Neuve/Belgium and Sixth Henry G. Kuivila Lecturer at the State University of New York at Albany in 1994, and Adolf Steinhof Foundation Award Lecturer at the University of Kaiserslautern/Germany and Miles Lecturer at Cornell University in 1995.

Professor Stoddart has published more than 350 communications, papers, reviews, and monographs and has wide ranging interests in supramolecular science. He is at present developing the transfer of concepts such as self-assembly between the life sciences and materials science. The template-directed synthesis of unnatural products with prescribed functions is being pursued within the context of gaining fundamental understanding about the nature of the noncovalent bond.

Friday, April 21, 1995
Chemistry Building
3210 North Cramer
4:00 p.m.

Room 180

PLEASE NOTE SPECIAL DAY AND TIME.



Making Molecules to Order: Self-Assembly in Organic Synthesis

J. Fraser Stoddart

Lecture Summary

The production of molecular machines that might be able to function as information processing systems presents a considerable challenge to the chemical community. The so-called bottom-up approach to device manufacture has intrigued physical scientists and electronic engineers for many years. Only recently are chemists beginning finally to learn how to self-assemble molecular and supramolecular systems such that information might ultimately be written into them, stored in them, processed in them, transferred between them, and eventually read back out of them.

The lecture will begin by drawing attention to the fact that nature abounds with examples of self-assembly processes that operate at both the cellular and sub-cellular levels. A chemical approach to the establishment of the concept of self-assembly processes, which mimic those found in nature, will be proposed for the synthesis of ordered molecular systems and supramolecular arrays from readily available starting materials. Attention will be drawn to the fact that the order, which characterizes the unnatural products that result, could lead to the development of new materials with functions, as well as forms. The synthetic strategy, which will be described, relies upon the use of mechanically-interlocked molecular components, in the shape of catenanes and rotaxanes, to provide the means of transposing, in a reasoned way, the knowledge and experience gained from the study of relatively small supramolecular host-guest systems to much larger supramolecular and polymolecular arrays, ordered and stabilized by the mechanical intertwining and threading of molecules. Numerous examples will be presented which illustrate the growing potential of molecular self-assembly processes in the realm of organic synthesis. It will emerge *that there are inherently simple ways of making apparently complex unnatural products from appropriate substrates without the need for reagent control or catalysis.*

The all-important problem that now needs to be tackled and solved is how to transform systems that can be operated and controlled mechanically by the flux of electrons on protons at a molecular and supramolecular level into devices and machines which will function in the macroscopic world. Communication between molecular and supramolecular events on the microscopic nanoscale level and human experience in the macroscopic world must now become as important in the laboratories of the nanoscientists and nano-technologies as it is in the cells of living systems. Therein, lies one of the most exciting contemporary challenges in science and technology as we approach the turn of the millenium.



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OF BIRMINGHAM



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Edgbaston
Birmingham B15 2TT
United Kingdom
Telephone 0121 414 4360/4361
Fax 0121 414 4403

Lecturer in Bioorganic Chemistry
Dr G. J. Boons
Direct Line 0121 414 4460

Dr Alfred Bader
Astor Hotel suite 622
924 East Juneau Avenue
Milwaukee
Wisconsin
USA 53202

14 November 1995

Dear Dr Bader

Thank you for your Fax dated 10 November 1995. It seems best to me that your publisher supplies the books on a sell-or-return basis. If you wish, I can ask a student or post-doc to handle the money and make sure that sufficient change is available.

I have one more question: would it be possible to sell the book against a reduced price or should £15.00 be charged?

I am looking forward to hearing from you.

Yours sincerely

Geert-Jan Boons

THE UNIVERSITY OF
TORONTO



Faculty of Arts
Department of English
127 St. George Street
Toronto, Ontario
M5S 1A5

Dear Sir,
I am pleased to hear that you
are interested in the
position of
Assistant Professor
of English in the
Department of English
at the University of Toronto.
I am enclosing herewith
a copy of the
advertisement for the
position and a copy of
the University of Toronto
Handbook for 1967-68.
I am sure that you will
find the information
contained therein of
interest to you.
If you have any
questions or need
further information,
please do not hesitate
to contact me.
Very truly yours,
[Signature]

I am enclosing herewith a copy of the advertisement for the position of Assistant Professor of English in the Department of English at the University of Toronto. I am sure that you will find the information contained therein of interest to you. If you have any questions or need further information, please do not hesitate to contact me.

Very truly yours,
[Signature]

THE UNIVERSITY
OF BIRMINGHAM

The School of Chemistry



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Dr Paul L Coe

Reader in Organofluorine Chemistry

Dr Alfred Bader

2961 North Shepard Avenue
Milwaukee.
Wisconsin 53211
U.S.A

9 June.

My Dear Alfred.

I was delighted to read in RIE News of the award of the Lullhop-Parsons Award to you.

The recognition of your services to chemistry, particularly organic chemistry, has been long overdue. Your concern for academics both in the USA but also worldwide has never been matched and your kindness and generosity is well appreciated by many of us. We do miss your visits to us

The Bader award in this School is but one of many signposts of the reason why your work has at last been recognised

Many congratulations to you personally but I think also to Isobel too since she is surely indeed a major part of the "team"

I have not enquired of your health etc but I hope
you are both well and as active as ever.

With very best wishes

Yours sincerely
Paul Lee.

Dr. Alfred Bader
2961 North Shepard Avenue
Milwaukee, Wisconsin 53211

A Chemist Helping Chemists

September 6, 1995

Professor J. Fraser Stoddard
School of Chemistry
The University of Birmingham
United Kingdom

Dear Fraser:

As you will be able to imagine, Isabel and I much look forward to seeing you in Birmingham on November 28th and 29th.

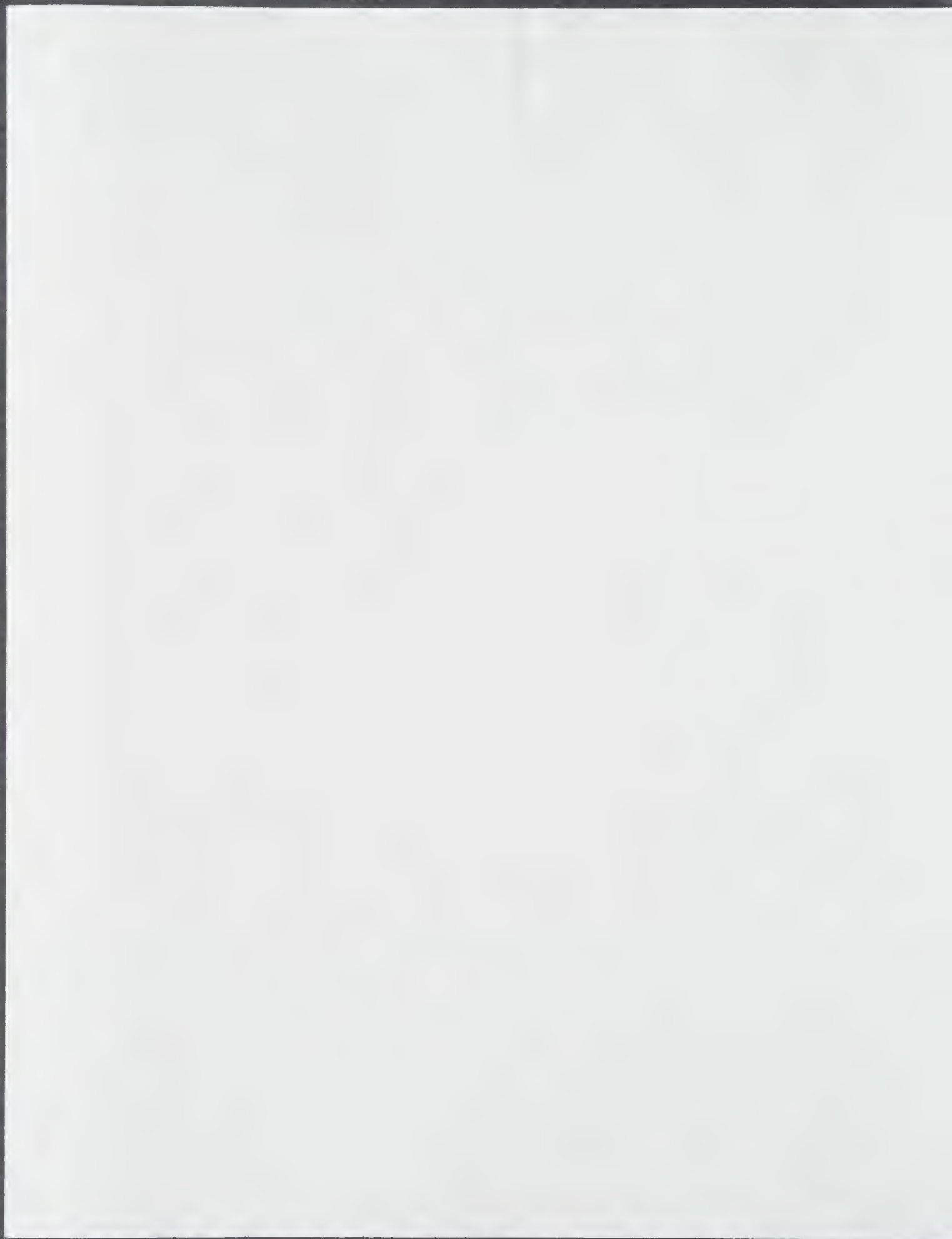
I presume that you will have seen the report in German of your important work.

With good wishes from house to house, I remain,

Yours sincerely,

AB/cw

Enclosure - copy of article



Moleküle als Bausteine für Computer

Experten berichten über Fortschritte in der Nanotechnologie: Miniaturisierung von Schaltkreisen in greifbarer Nähe

Von DETLEF ICHELN

Braunschweig - Der nächste Schritt zur Miniaturisierung von Bausteinen für technische Systeme wird durch einzelne Moleküle ermöglicht. Ihre Form ist mechanisch nicht veränderbar. Einmal durch chemische Kopplungsprozesse zusammengefügt, werden Moleküle selbst zu kleinstmöglichen Bauteilen, deren Funktion allein durch die molekulare Struktur bestimmt wird. Die sogenannte Nanowelt mit molekularen Bauteilen von wenigen Millionstel Millimetern (Nanometern) beginnt in chemischen Forschungslabors bereits Realität zu werden.

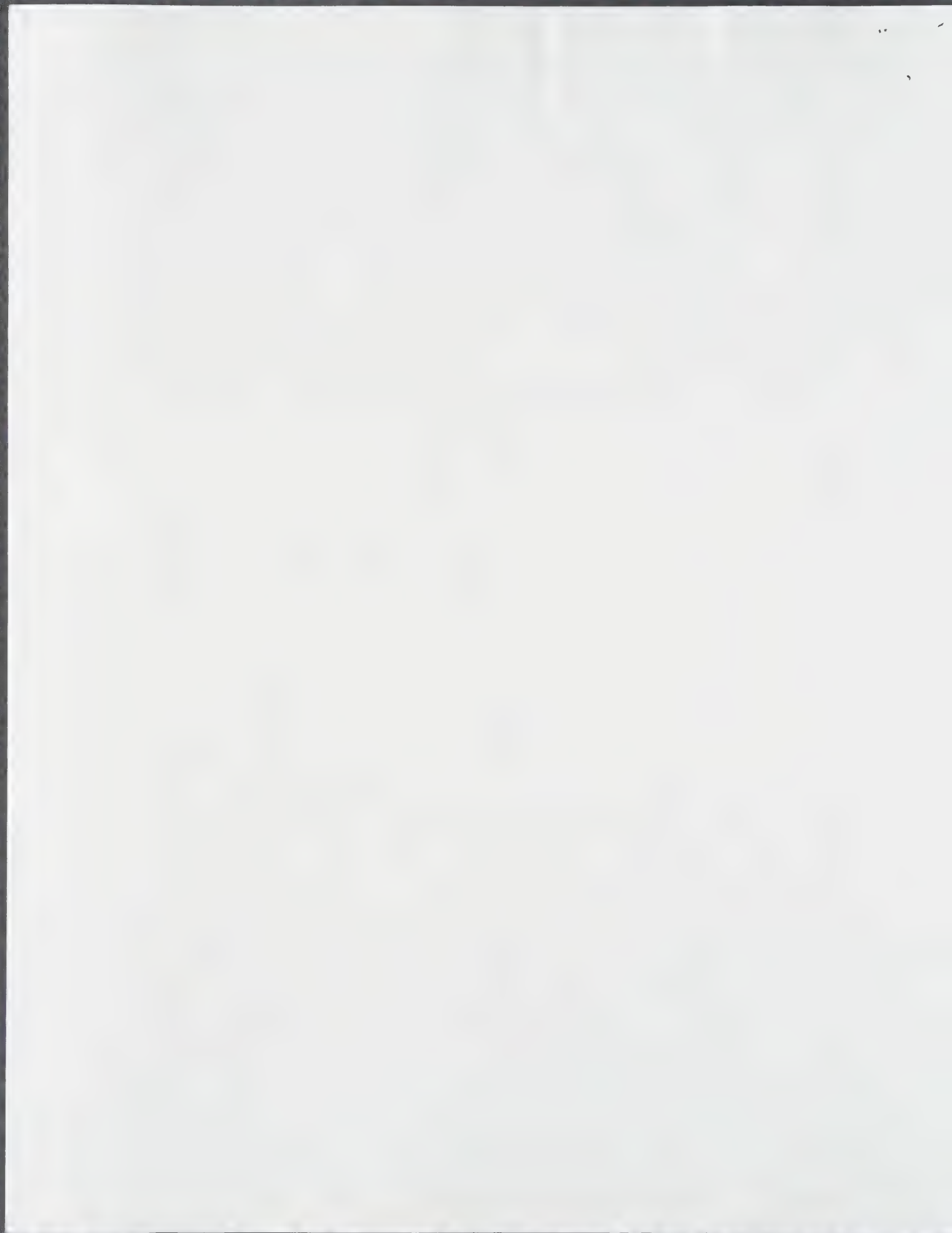
Weltweit wird derzeit an den benötigten Nano-Bauelementen gearbeitet. An Schaltermolekülen etwa, die durch Licht, Strom oder chemische Signale zwei unterschiedliche Zustände annehmen können: "an" und "aus" oder "1" und "0", den binären Code der Computersprache.

Als lichtempfindliches Schaltelement kann beispielsweise eine sogenannte Azobenzol-Einheit dienen, die von Professor Fritz Vögtle an der Universität Bonn entwickelt wurde. Derzeit wird in Bonn versucht, möglichst viele dieser Molekülschalter auf engem, geordneten Raum in einer supramolekularen Struktur unterzubringen. Als Fernziel könnte so ein optisches Speichermedium geschaffen werden.

Der Weg zu molekularen Speichern, Signalprozessoren oder kompletten Computern ist noch weit, betont Professor François Diederich aus Zürich. Dennoch sollte man sich "große Ziele setzen". Und der Schritt von der Utopie zur Realität ist, etwa für molekulare Drähte, die zur Leitung von elektrischem Strom oder optischen Signalen benötigt werden, bereits vollbracht: Auf dem 8. Internationales Symposium für Neue Aromatische Verbindungen in Braunschweig berichtete Diederich über die gelungene Herstellung eines rund zehn Nanometer langen Moleküldrahtes, mit dem sogar schon das sogenannte Kontaktproblem gelöst sein könnte. An beiden Enden des Drahtes sind chemische Kontaktstellen angebracht, die - wie Lötzinn - leitende Verbindungen zu anderen molekularen Bauelementen ermöglichen. Seitliche Ankergruppen erlauben darüber hinaus die Fixierung der molekularen Drähte auf Siliciumchips. Damit rückt eine Miniaturisierung von Schaltkreisen auf Molekülgröße in greifbare Nähe: Bereits in fünf Jahren, so Diederich, sei mit einem ersten molekularen Transistor zu rechnen, zehn- bis 100mal kleiner als heute.

Mechanische molekulare Maschinen sind ein Ziel Professor James Fraser Stoddarts von der britischen Universität Birmingham. Er gilt als einer der Väter der supramolekularen Chemie - einer Chemie, die über das einzelne Molekül hinausgeht. Supramolekulare Strukturen entstehen nicht allein durch chemische Reaktionen, bei der einzelne Moleküle wie verschiedene Metallteile aneinandergeschweißt werden, sondern auch durch schwache Wechselwirkungen, die eher magnetischen Anziehungskräften gleichen. Diese quasi magnetischen Kräfte können eine Selbstordnung von Molekülen bewirken, die es erlaubt, ringförmige Moleküle wie Perlen auf langgestreckte Moleküle zu fädeln, ohne dabei auf mechanische Führungshilfen zurückgreifen zu können, die in der Nanowelt (noch) nicht zur Verfügung stehen.

Mittlerweile, so Stoddart, gelinge es sogar, Ringmoleküle wie eine U-Bahn gezielt zwischen



verschiedenen Haltestellen hin- und herfahren zu lassen, gesteuert durch Strom, Licht oder chemische Signale. Nächstes Ziel sei es, viele solcher molekularen Ringbahnen parallel auszurichten, damit alle Einheiten gleichgerichtet funktionieren. Auch hier sollen am Ende molekulare Computer entstehen.

Mit dem Japaner Sumio Iijima war in Braunschweig der Entdecker der sogenannten Nanotubes zu Gast, röhrenförmigen Supramolekülen aus reinem Kohlenstoff, rund 1000 Nanometer lang und mit wenigen Nanometer Durchmesser. Vor kurzem sei es gelungen, eine Art molekulare Bürste aus Nanotubes zu bauen. Die Möglichkeit, die Röhren mit Flüssigkeiten zu füllen, ließe an Anwendungen bei Flachbildschirmen denken.

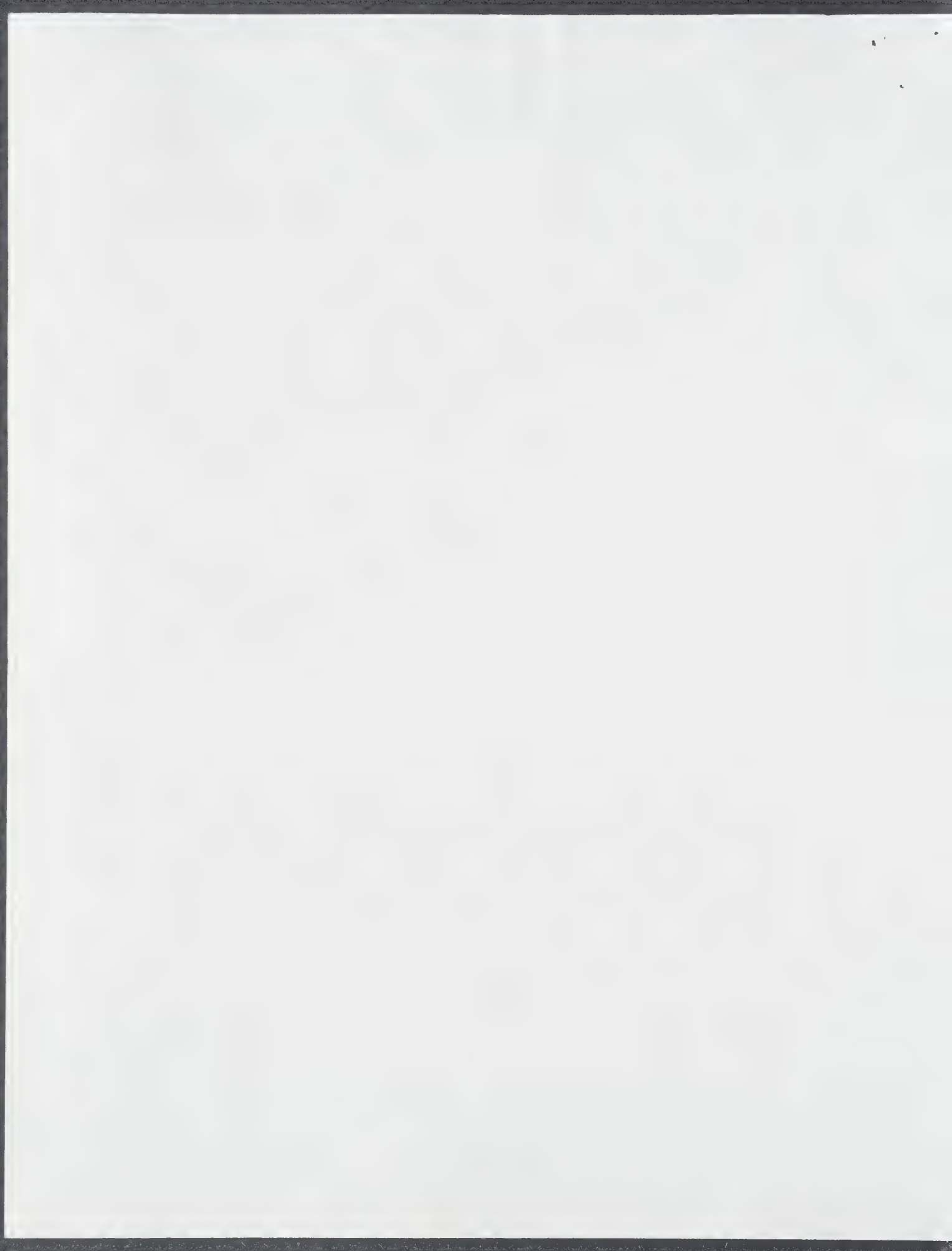
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Leserbrief

Titelseite

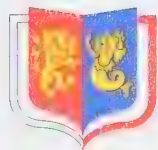
Inhaltsverzeichnis

WELTNACHRICHTEN



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The School of Chemistry



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Direct Line 021 414 4400

Dr G.J. Boons

Lecturer in Bioorganic Chemistry

Dr Alfred Bader
Astor Hotel suite 622
924 East Juneau Avenue
Milwaukee
Winconsin
USA 53202

25 July 1995

Dear Dr Bader

Thank you very much for agreeing to give two colloquia in the School of Chemistry of the University of Birmingham. I have scheduled a presentation for 11 am Tuesday 28 November 1995. This presentation will be attended by undergraduate students. An other presentation has been arranged for 4.00 pm Wednesday 29 ^{Nov} ~~December~~ 1995 and this colloquium will be attended by research students and research staff. I will also contact the Art faculty and try to arrange a talk in our museum.

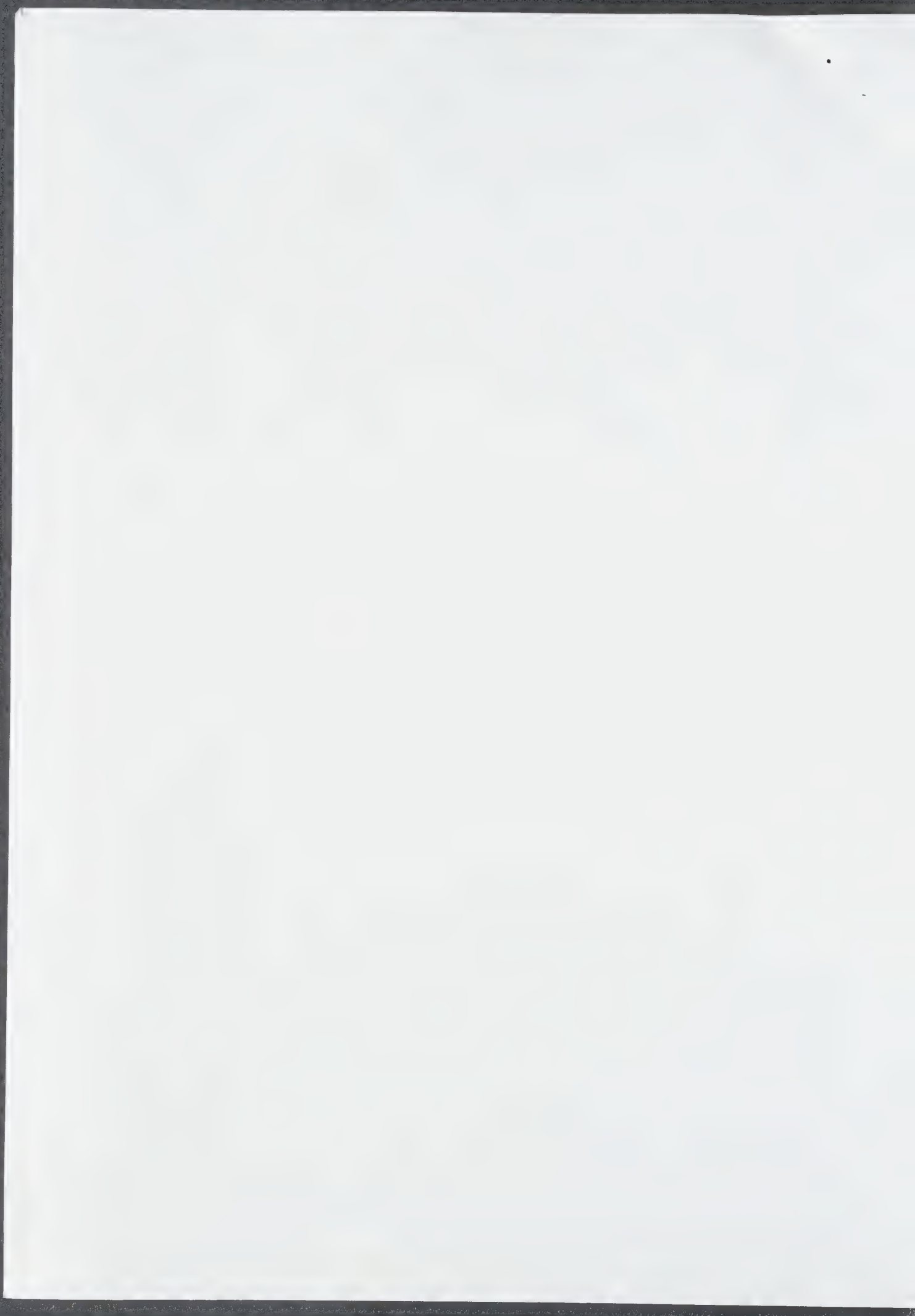
Could you please confirm the titles of the talks before 1 September.

I am looking forward to hearing from you.

Yours sincerely

Geert-Jan Boons

list to Alfred



THE UNIVERSITY
OF BIRMINGHAM



School of Chemistry

Edgbaston
Birmingham B15 2TT
United Kingdom
Telephone 0121 414 4360/4361
Fax 0121 414 4403

Professor of Organic Chemistry
Dr J. Fraser Stoddart
Direct Line 0121 414 4362
Direct Fax 0121 414 3531

JFS/NS

15 September 1995

Dr Alfred Bader
2961 North Shepard Avenue
Milwaukee
Wisconsin 53211
USA

Handwritten note:
1-20-95 JFS

Dear Alfred

Thank you for your kind letter dated 6 September and its enclosure. I had not in fact seen the piece in Die Welt but, but of course, was well aware of its source – namely a press conference I attended at a recent international meeting in Braunschweig.

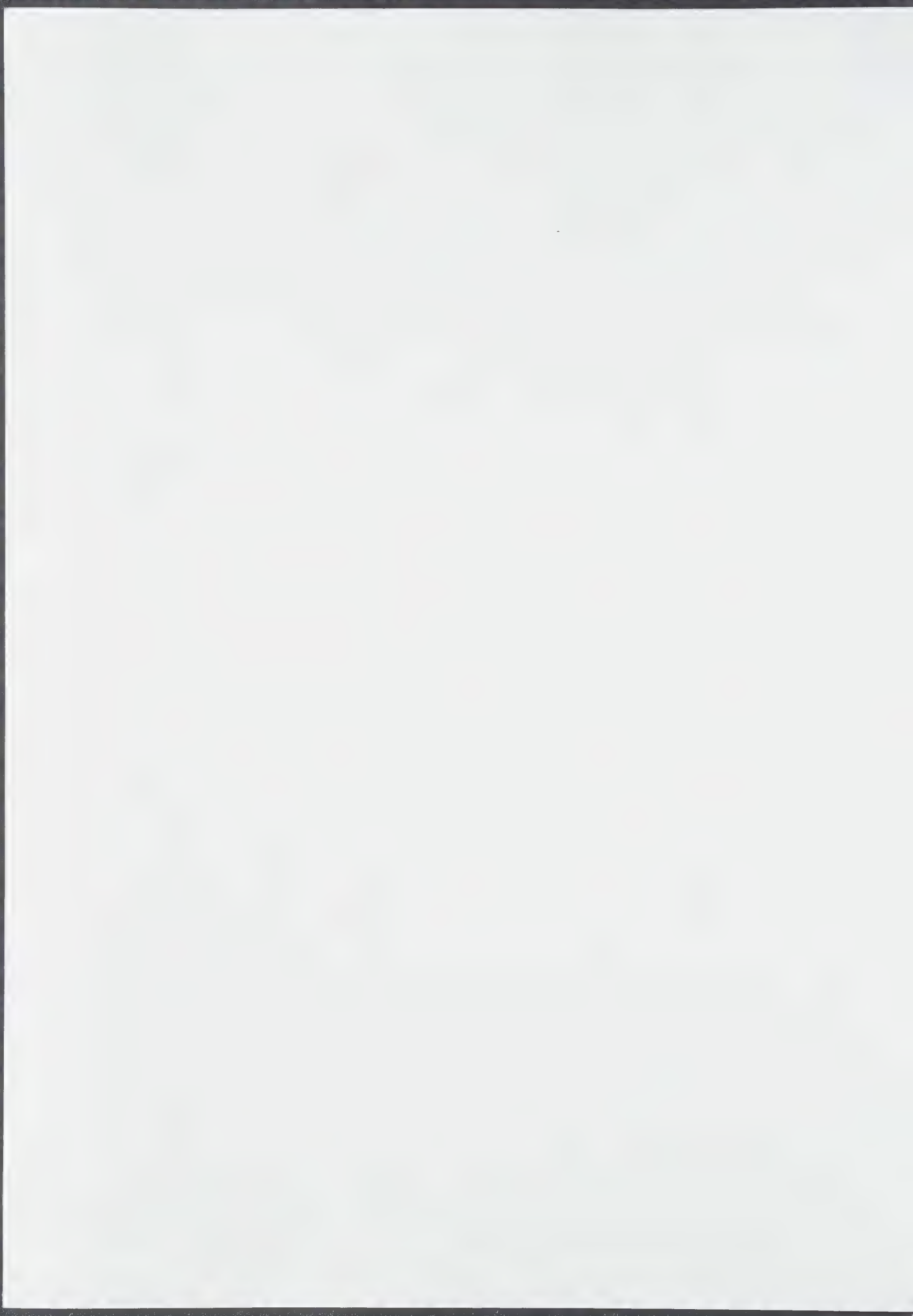
Indeed, we are all looking forward very much to your visit with Isabel to Birmingham on 28/29 November. Personally, it will give Norma and myself the opportunity to return your kind hospitality in your home during my visit to Milwaukee in the Spring.

With kind regards to both of you from the both of us.

Yours sincerely

Fraser Stoddart

J F Stoddart



Dr. Alfred Bader
2961 North Shepard Avenue
Milwaukee, Wisconsin 53211

A Chemist Helping Chemists

September 6, 1995

Professor J. Fraser Stoddart
School of Chemistry
The University of Birmingham
United Kingdom

Dear Fraser:

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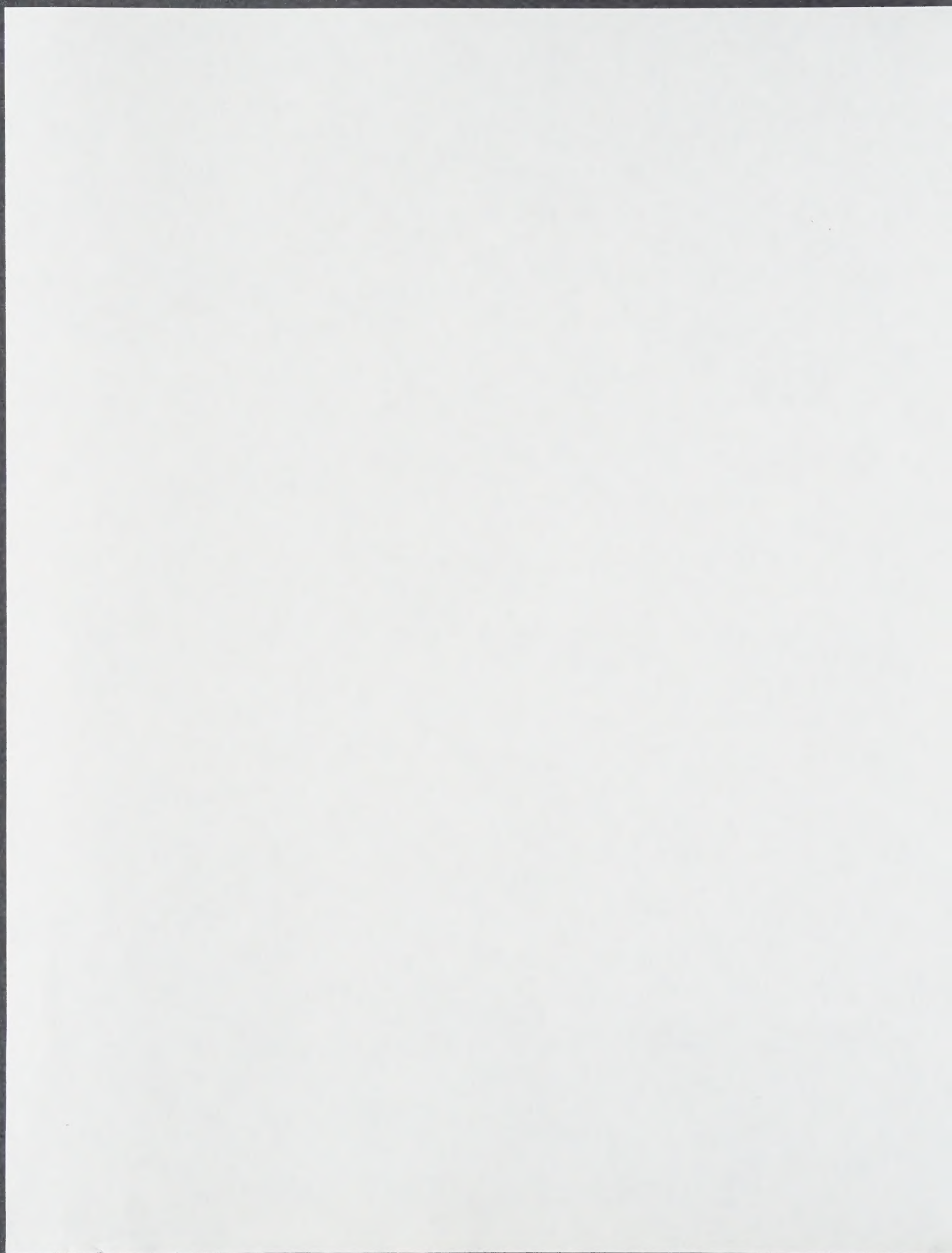
I presume that you will have seen the report in German of your important work.

With good wishes from house to house, I remain,

Yours sincerely,

AB/cw

Enclosure - copy of article



Dr. Alfred Bader
2961 North Shepard Avenue
Milwaukee, Wisconsin 53211

July 13, 1994

Dr. Paul L. Coe
School of Chemistry
University of Birmingham
Edgbaston
Birmingham B15 2TT
England

Dear Paul,

I am sorry that a long trip to England and the Continent has delayed my thanking you for your delightful letter of June 2nd.

Just last week I was chatting with Chris Hewitt in Gillingham, and of course inquired how you are.

My visit to Birmingham in December of 1991 was one of the last visits to a university before my dismissal from Sigma-Aldrich, and I remember the wonderful reception in your department.

Isabel and I continue to visit chemistry departments and try to help students. Now, we are very much involved with a scheme for bursaries for students from high schools which do not usually send any students to any university. We are trying that with the help of our old friend, Willy Motherwell, at University College. If it can work there we will go to other urban universities, such as Birmingham, to see whether they also might be interested.

I have been expanding my "menu" of lectures, a copy of which I enclosed. Should you like another two or three lectures at Birmingham late this year, I would be happy to visit you and combine a trip to Birmingham with a visit to my old friend, Willie Niesh in Sheffield, and to my sister in Burton.

Sincerely,

Enclosure

c: Dr. Chris Hewitt

