Alfred Bader fonds

Chemistry and Art
More Adventures of a Chemist

Misc. Correspondence
1999-2007

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18

Alfred Bader Fine Arts

From: Damborsky Jiri [Damborsky.jiri@seznam.cz]
Sent: Wednesday, September 19, 2007 11:13 PM
To: Alfred Bader Fine Arts
Cc: Yechiel Bar Chaim; Christian Noe
Subject: Re:

personally

Dear Alfred:
I would like to please you to modify following sentence:

On 4 October 2007 Mirek Topolanek, the Prime Minister of the Czech Republic, visited the Loschmidt Laboratories to congratulate the team working on development of patented technology ~~personally~~.

the

(we are collaborating with people from another institute on the project and Prime Minister will of course congratulate to all of us).

I like the new text more then that before. I hope this will not be too discouraging as it was correctly pointed our by Prof. Noe - our country was living for 40 years under communist government and this had an impact on us. The Chair Professorship was something very new and not easily acceptable.

I also agree with Prof. Noe's view, that the whole project has not been unsuccessful, even though the situation is not still completely stable, yet. The promotion of Josef Loschmidt is going well, many good students are working in our group and we try to do research as good as we can. Current working conditions, in terms of the labs and facilities, are excellent. We have enough funds to develop the projects as needed. Of course, all this took us all a lot of effort, more then would be needed for implementation of the Chair in the country with some tradition of this type of positions.

I would like to thank you, Isabel, Yechiel, Prof. Noe and Skursky for your exceptional and continuous support. Without this support, we would not get where we are now.

Best wishes,
Jiri

P.S. Professor Skursky is sending his best regards. He called me just yesterday and asked about you and Isabel.

> ------------ Původní zpráva ------------
> Od: Alfred Bader Fine Arts <baderfa@execpc.com>
> Předmět:
> Datum: 19.9.2007 19:31:36
> --
> Dear Jiri,
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> The end of September is the deadline for submitting my manuscript to
> be published by Weidenfeld & Nicolson next May.
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> I have changed what I have written about you on p. 22 of Chapter 18
> as

> follows:
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> "Professor Damborsky is an excellent teacher who has done world-class
> research that has been published widely. Through his Web site,
> www.loschmidt.cz, he has made Josef Loschmidt well known. He was
> promised tenure, and now he would be asked to leave in August 2008.
> If this happens, there will be no point in the Dean looking for
> another chair, because we will take the position that the university
> has broken the contract and we will not continue to support it.
>
> What a nightmare! Isabel and I were so proud to help
> establish the first chair in the Czech Republic funded by an outsider.
> An excellent scientist and great teacher was found, and the
> university administrators do not understand their good fortune. This
> is such a mystery to us. On 15 August 2007 a very important patent
> was issued to Professor Damborsky and his group and later that month
> the university organized a press conference about this patent and the
> projects going on in the Loschmidt Laboratories. On 4 October 2007
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> the Loschmidt Laboratories to congratulate Professor Damborsky
> personally. Yet he has still not been assured that he will receive
> tenure! And as of this writing, we still do not know whether the
> Loschmidt Chair will survive beyond the August 2008 expiration of Professor Damborsky's
initial contract. "

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>
> Of course if the visit does not take place on October 4th or on some
> other date we can change the manuscript.
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>
> Please let me know if you approve.
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> Best regards,
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> Alfred
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Jiri Damborsky, EMBO/HHMI Scientist
Josef Loschmidt Professor of Chemistry
Masaryk University, Faculty of Science
Kotlarska 2, 611 37 Brno, Czech Republic

ph 420-5-49493467, fax 420-5-49492556

Alfred Bader Fine Arts

To: Jiri Damborsky (Damborsky.jiri@seznam.cz)
Cc: Yechiel Bar Chaim (yechiel@jdceurope.org)

Dear Jiri,

The end of September is the deadline for submitting my manuscript to be published by Weidenfeld & Nicolson next May.

I have changed what I have written about you on p. 22 of Chapter 18 as follows:

"Professor Damborsky is an excellent teacher who has done world-class research that has been published widely. Through his Web site, www.loschmidt.cz, he has made Josef Loschmidt well known. He was promised tenure, and now he would be asked to leave in August 2008. If this happens, there will be no point in the Dean looking for another chair, because we will take the position that the university has broken the contract and we will not continue to support it.

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Of course if the visit does not take place on October 4th or on some other date we can change the manuscript.

Please let me know if you approve.

Best regards,

Alfred

[illegible]

p.22

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On October 4th 2007 Mirek Topolanek, the Prime Minister of the Czech Republic visited the Loschmidt Laboratories to congratulate Prof. Damborsky personally. Yet he has still not been assured that he will receive tenure! And as of this writing ...

Charles DARROW ✓

Dates

E: JD XBC

Alfred Bader Fine Arts

From: Damborsky Jiri [Damborsky.jiri@seznam.cz]
Sent: Tuesday, September 04, 2007 2:42 PM
To: baderfa@execpc.com; yechiel@jdcparis.org
Subject: a visit of Prime Minister to Brno

Dear Alfred and Yechiel:
I would like to share with you good news related to our work.

I was called today by the Office of the Prime Minister of the Czech Republic, that Prime Minister Mirek Topolanek, wants to visit our laboratory and congratulate us to award of a patent and transfer of results of basic research to practise. The visit will take place on October 4th.

It is a big honour for our group and the University. For me it is a good opportunity to thank YOU again for your support - we would not succeed without it.

Best wishes,
Jiri

P.S.1. The patent was awarded on August 15th. Masaryk University organized a press conference dedicated to this event last week and the information about the projects on-going in Loschmidt Laboratories and Enantis was presented in all major news papers in the country.

P.S.2. We will meet with people from US biotechnology company Genencor International and discuss joint project on development of new decontamination mixture against warfare agents on September 10th. This project can be very important for future development of Enantis.

****
Jiri Damborsky, EMBO/HHMI Scientist
Josef Loschmidt Professor of Chemistry
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http://loschmidt.chemi.muni.cz/peg
http://www.loschmidt.cz

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for him and there is no administrative barrier to have this contract for much longer time even for life.

After this correspondence and our meeting in Brno in June 2005, we assumed that Professor Damborsky would receive tenure, and were truly staggered by a letter from the vice-rector for science, Jana Musilova, sent in January 2007 advising us that Professor Damborsky's employment contract expires on 31 August 2008 and that "the Dean of the Faculty of Science is bent on to open a competition for Loschmidt chair."

Professor Damborsky is an excellent teacher who has done world-class research that has been published widely. Through his Web site, www.loschmidt.cz, he has made Josef Loschmidt well known. He was promised tenure, and now he would be asked to leave in August 2008. If this happens, there will be no point in the Dean looking for another chair, because we will take the position that the university has broken the contract and we will not continue to support it.

What a nightmare! Isabel and I were so proud to help establish the first chair in the Czech Republic funded by an outsider. An excellent scientist and great teacher was found, and the university administrators do not understand their good fortune. Thus [illegible]

and ~~A~~as of this writing, we still do not know whether the Loschmidt Chair will survive beyond the August 2008 expiration of ~~Dr~~ Prof Damborsky's initial contract.

One of our ongoing gifts that brings us a lot of pleasure is to Project SEED (Summer Educational Experience for the Disadvantaged) of the American Chemical Society, about which I wrote in some detail in my first *Adventures* (pp. 263-266). Project SEED provides economically disadvantaged high school students with opportunities to

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One of our ongoing gifts that brings us a lot of pleasure is to Project SEED (Summer Educational Experience for the Disadvantaged) of the American Chemical Society, about which I wrote in some detail in my first *Adventures* (pp. 263-266). Project SEED provides economically disadvantaged high school students with opportunities to conduct mentored research in academic, industry, or government laboratories during the summer. The original program was for one summer. Because we believed that it would be a great advantage to offer these students a second summer's research, we helped start the SEED II program, and have recently given funds that the ACS has matched for about twenty college scholarships to support former Project SEED students who are accepted at universities. We have been so happy to see how well many of these students are doing, most in chemistry and chemical engineering, but some also in other disciplines, medicine and dentistry for instance.

In Milwaukee, we have been really impressed by the many educational efforts of Chabad, the Lubavitch organization. Two of my grandsons, Carlos and Alex, have gone to their nursery school. Chabad now directs the Hillel Academy, one of the local Jewish day schools, and one of the rabbis, Mendel Shmotkin, has become our good personal friend. We have been able to help to get them completely out of their debt, and Rabbi Shmotkin has guided us to help elsewhere, for instance the Chabad orphanage in Dnepopetrovsk.

Establishing bursaries for able students who need some financial help seemed eminently sensible to Isabel and me, because both of us benefited from scholarships and bursaries when we were students. Isabel established the first such bursaries at Victoria University in Toronto where she graduated in 1949. Bursaries at University College in London, at Edinburgh University, and the University of Glasgow followed. Victoria and Edinburgh have been clear and punctual in their reporting to us, and it gives us such pleasure to see how well some of the students have done. At University College, the funds for the bursaries were mixed up with the funds for an annual prize I had given earlier, but that has now been straightened out. With Glasgow, we have had the surprising problem that time and again we do not receive its promised annual reports about the students receiving the awards.

We have often said that of my four jobs, three are easy; the fourth, giving money away sensibly is the most difficult.

Helping the ablest is *relatively easy*. Bursaries, scholarships, and fellowships help the ablest and most, though not all, are easily monitored. Problems can arise in the most surprising places, totally unexpectedly. For instance, I made two gifts to the Department of Chemistry of the University of Sussex. In 1990 I gave the funds for an annual prize in organic chemistry and in 1992, funds for another in organometallic chemistry. I urged the University to invest the capital in long-term government bonds then yielding well over 12 percent so that the awards would be assured. This the university did not do. Interest rates declined, as did the capital, and by 2001, the funds had declined to the point where it was no longer possible to make the awards; the university last gave them in 2001-2 and then stopped. Although I visit the Chemistry Department each year, no one

mentioned this to me until I inquired about the prizes in 2006. Professor Philip Parsons wrote to me in November:

> During 2003-04 Robert Smith, the then Dean of Chemistry, Physics and Environmental Science, was informed by Finance Administration that the capital value of the fund was being eroded given that the annual interest no longer covered the annual prizes of £1k. It was therefore felt that the prizes could not be covered from interest alone and the option of offering a prize every third or fourth year was considered. However, it was felt that this was not in line with your intention that a £1k prize should be awarded annually. It was therefore concluded that these funds would have a finite life and be treated as donations. However, the records held do not indicate precisely what was agreed finally.

Of course, I was really saddened and annoyed. I asked whether I could not increase the capital so that the interest would be sufficient to give the two awards in perpetuity. I have been told that this is possible and made this gift in December 2006. Naturally, from now on I will inquire every year who the award winners are.

Caveat donor.

How to we help the neediest? Again, in Milwaukee it is relatively simple, particularly with the advice of Linda and Daniel and the Helen Bader Foundation. But in the world, in Africa and Asia? In the Balkans we have the help of Yechiel and Paul Polansky, and there even fifty or a hundred thousand dollars help. But in Africa, our gifts would be drops in a bucket and we feel so helpless.

Still, Isabel and I are so happy that we have been able to help many of the neediest and the ablest.

businesswise. Some of his checks bounced, although eventually he always made good on them and once gave me a beautiful painting by Aert de Gelder in lieu. Life for his second wife, Roxane, a New Zealander, may have been difficult, since Christophe seemed to have no idea of how to manage his financial affairs and make regular, adequate provisions for his home life. However, Roxane was always charming, and they were a fun couple to be with. Eventually, in 1985, they left New York; Christophe undoubtedly hoped to do better in Paris.

Once they moved to France, we saw each other less frequently. However, early in December 1996, I met him in London, viewing the old master sales. He urged me to look at and bid on lot 36 in the Phillips sale on December 10, a charming study of a Chihuahua, a Mexican dwarf dog in a mountainous landscape, from the studio of Velazquez. Interestingly the painting was on the catalogue cover(fig.) of the Phillips sale on December 10, 1985, and the American collector who bought it then was now offering it eleven years later. The date 10 December has been an important one in my life - it was my last day in Vienna in 1938, and somehow, I have always been sadly alert on December 10. I really liked that little oil on canvas, just 47 x 37 cms., but so did several others, including Rob Noortman, and I had to go to a hammer price of £30,000, way above the estimate of £6,000-8,000.

If Christophe had not brought the painting to my attention, I would not have noticed the little gem, and so I promised him that if I could sell it profitably, we would share the profit equally. The painting was in very good condition. It just needed a simple cleaning by my friends Charles Munch and Jane Furchgott, and Charles found a decent frame for me.

Subject: Rembrandt/ Not Rembrandt chapter
From: David de Witt <3dad5@post.queensu.ca>
Date: Mon, 23 Oct 2006 10:38:35 -0400
To: Alfred Bader Fine Arts <baderfa@execpc.com>

Dear Alfred,

I just have a few details to comment on, in this chapter of your autobiography. I hope you do not mind me listing them in point form:

p. 1: -you could give the first name of S.H. Levie: Simon ✓
-perhaps: put the C in quotation marks: "C" numbers, for clarity ✓

p. 3: - line 5: "mistake about the right in authorship" should be "mistake about the authorship"

p. 6: end of 2nd paragraph: should end in a closing quotation mark ✓

p. 7: 2nd paragraph, 3rd line: "van de Wetering": the "van" should be capitalized ✓
-3rd paragraph: "Ernst writes..." instead of "Ernst wrote"

p. 8: 4th paragraph, 2nd sentence: it might help to preface "In this volume Van de Wetering..." with "As copies of a now-lost self-portrait,"
-also, "van" of Van de Wetering should be capitalized

With all best wishes,
David

David A. de Witt
Bader Curator of European Art
Agnes Etherington Art Centre
Queen's University
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e. 3dad5@post.queensu.ca

Disputing (Peter and Paul),
m, National Gallery of Victoria,

206 Rembrandt, *Family Portrait*, *c.* 1665, oil on canvas, 126 x 167 cm, Herzog Anton Ulrich-Museum, Brunswick.

of Abraham (detail), 1635,
, The State Hermitage Museum,

able to determine by visual imagination alone the transitions between light and shade – on the cheek, the neck, around the mouth and the nose (see figs. 202 and 204). Only patient study of a model posing under the correct lighting would have made such a rendering possible.

LIGHTING STUDY OF AN OLD MAN IN PROFILE

Rembrandt also used an oblique lighting from behind in two other paintings, which, it is argued in this essay, were also preparatory oil studies. One of these is the *Lighting study of an old man in profile* in the collection of Isabel and Alfred Bader (fig. 208).[15] This small painting, which is evidently related to Rembrandt's *Circumcision of Christ in the stable* from 1661 in Washington (fig. 209),[16] originated rather late in Rembrandt's career. In the *Circumcision*, several old men – including the Mohel who carries out the circumcision and a man who writes in a book – are depicted in roughly the same way as the man in this study (figs. 210

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[15] Bredius 261.

[16] Bredius 596.

and 211). Although he was not aware of what painting it was a study for, Bredius had already designated the *Lighting study of an old man in profile* as a study of a head. Subsequently, the painting's authenticity was increasingly put in question, although Bauch and Gerson, neither of whom had seen it, still gave it the benefit of the doubt, if only on the basis of a photographic reproduction.[17] After this, the painting disappeared from the Rembrandt literature.

Now that the painting has been freed of its thick layer of varnish, it can be seen as a small masterpiece, both as regards colour and *peinture.* It has been executed at a high tempo, wet in wet. With all its dynamism, it betrays such an astonishing control of the pictorial means available and, as a result, such a supreme sense of form on the part of its author, that one can scarcely imagine it could have been painted by a pupil. Nor could it be a copy, executed by a pupil, after one of the figures in the Washington *Circumcision*: the visual 'information' in the *Circumcision* is simply too scant for that (cf. figs. 209-211).

In its execution and colour scheme, the *Lighting study of an old man in profile* shows a striking resemblance to Rembrandt's *Self-portrait as Paul* from 1661 in the Amsterdam Rijksmuseum (fig. 212).[18] Confrontation between these two paintings leaves no room for doubt as to the study's authenticity. On this basis alone, it may be assumed that the study originated around 1661, the year in which the Washington *Circumcision* originated according to the date applied to that painting. We can safely accept, therefore, that the small painting from the Bader collection was a preparatory study for the *Circumcision.*

This case of the *Lighting study of an old man in profile* also corroborates the contention: that in a head lit obliquely from behind, the rendering of light and shade with correct and convincing boundaries and transitions between them constitutes a problem that could only be solved with the help of a posing model. The forms at the back of the head and body are lit in a way that is simply impossible to evoke unaided in the mind's eye. In the *Lighting study of an old man in profile*, the back, the shoulder, the neck and the back and top of the cap catch the full light. The locks of hair protruding from beneath the cap are fully lit too, but they screen part of the face (the ear, the cheek, the temple) from the directly incident light. The main beard remains in the shadow of the shoulder and trunk, while the side-whiskers again catch a strong light from behind. The forehead, the root of the nose and the moustache are dimly lit by reflected light that sustains the legibility of the forms in shadow.

REMBRANDT'S STUDY OF THE LIGHTING OF A WOMAN WITH A WHITE BONNET REDISCOVERED

A newly discovered oil study by Rembrandt, I am convinced, also belongs to this category of lighting studies (fig. 213). In the scarce early literature on this painting it was taken to be a portrait, and after 1931 it dropped out of sight altogether.[19]

What we have here, therefore, is the rediscovery and reattribution of a virtually forgotten work by Rembrandt. But because during its recent restoration it also underwent such a radical transformation, and because we are now clearer about the possible function of the work, one may even speak of a new discovery.

In view of the lighting, which leaves the woman's face for the most part in shadow, it is difficult to see that we could be dealing with a formal portrait. Moreover, the woman's clothing betrays her social class: she does not belong to the class that has its portraits painted. She wears a bonnet whose point, normally stretched over the cheek, is folded back in an informal fashion so that the supporting metal structure – the *oorijzer*, or 'ear iron' – is partially visible. (For comparative purposes, one should also see Rembrandt's drawing of the *Painter's studio with model* in Oxford (fig. 216)[20]). As the restoration shows, the painting has been extremely cursorily executed in places. It would seem that we must be dealing with a study, for which, perhaps, one of the painter's domestic servants sat as a model; and once again, it is evidently a study of lighting. Just as in the Amsterdam study for the *Judas*-painting (fig. 202) and the *Lighting study of an old man in profile* (fig. 208) the light falls obliquely from behind, so that here too

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[17] Bauch 1966, Gerson 1968, no Bredius/Gerson 261.

[18] Bredius 59;

[19] See notes 24

[20] Benesch 116

Chapter IV

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Rembrandt/Not Rembrandt[1]

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Ever since listening to Jakob Rosenberg's lecture on Rembrandt, at Harvard in 1948, I hoped that some day I would be able to acquire one of Rembrandt's paintings. The first opportunity arose when the Viennese owner of a small work on copper depicting *A Scholar by Candlelight* (Fig.1) sold this to me in 1959. I bought it subject to Jakob Rosenberg's accepting it as a Rembrandt, which he did after close inspection at Harvard during a week I left it with him.

Simon H. Levie

Two members of the Rembrandt Research Project (RRP), S.H. Levie and Ernst van de Wetering, examined this painting in my house in September 1972 and told me during their visit that they believed it to be an early work by Rembrandt, in paint handling very similar to that of Rembrandt's *Flight into Egypt* in Tours. The RRP then asked me to bring it to Amsterdam in 1973, and in Volume 1 of the Corpus that appeared in 1982, gave both my painting and that in Tours C numbers (not by Rembrandt), C18 and C5, probably by the same artist from Rembrandt's immediate circle.

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From November 2001 to May 2002, the museum in Kassel and the Rembrandthuis in Amsterdam held an exhibition, The Mystery of the Young Rembrandt, which included the *Flight into Egypt* as a Rembrandt and my painting hanging next to the *Flight* as a Rembrandt or Circle of Rembrandt.

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[1] I want to thank Walter Liedtke for allowing me to use the title of his great exhibition in the Metropolitan Museum in 1995–1996 for the title of this chapter.

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The history of this painting and the question of attribution have been described clearly in David de Witt's *2007 Bader Collection Catalogue*.

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My next Rembrandt acquisition, again initially C22 in the Corpus, was the *Head of an Old Man in a Cap*, (Fig.2) which I was able to purchase very inexpensively at Christie's in London in March 1979. I was convinced of its authenticity, but as the Christie's catalogue stated that the RRP did not accept it, there was little competition. Volume I of the Corpus, published in 1982, gives a three-page discussion of the painting beginning with the summarized opinion that describes C22 as "a well preserved painting from Rembrandt's immediate circle, reproduced in 1634 as his invention in an etching by J.G. Van Vliet". Following Section '4. Comments' is a note, "December 1979: one of the authors (Ernst van de Wetering) does not rule out the possibility of no. C22 being an autograph work by Rembrandt."

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As David de Witt has pointed out in the *2007 Bader Collection Catalogue*, "The turning point came with the 1996 exhibition on Rembrandt and Van Vliet in the Rembrandthuis in Amsterdam, where it was proven that Van Vliet and Rembrandt collaborated on some prints, and that the watermarks appearing in the paper on some examples also appeared in impressions of Van Vliet's print after the present painting. Evidently, Rembrandt returned regularly to Leiden to direct the work of Van Vliet, and so there would not have been a mistake about the ~~right in~~ authorship of the present painting. Since the 1996 exhibition, scholars have generally voiced approval of the attribution to Rembrandt." Isabel and I gave this painting to Queen's University in 2003, the first of several Rembrandts to go to Queen's.

In his two-volume work on Rembrandt published in 1949, Jakob Rosenberg illustrated two heads of old men (Figs. 3 & 4) side by side on one page. Both of these subsequently came up at auction. The one I liked particularly (fig. 100 in Rosenberg's book) was offered in the sale of the famous Alfred W. Erickson collection at Parke-Bernet in New York in November 1961. There it was one of three Rembrandt's, the most famous of which, *Aristotle Contemplating the Bust of Homer*, was purchased by the Metropolitan Museum for $2,300,000. The other two Rembrandts were estimated very reasonably, and so I flew to New York to bid for the *Old Man*, signed and dated Rembrandt f. 1659.(Fig. 3) I was not the only one to love this work, however, and Derek Cotton, a collector in Birmingham, England, bought it for $180,000. This was far more than I was able to pay. My salary was very modest; Aldrich was still a small company, and had not yet gone public. In the 1970s, the Rembrandt Research Project must have indicated that they did not accept it as genuine, and when Derek Cotton's son offered it at Christie's London in April 1993, it was described as Circle of Rembrandt, with an estimate of £60,000–80,000. I was at the sale, once again hoping to buy it, but when I noted that no one was bidding, I decided not to bid either. I made a much lower bid after the sale, and that was accepted. Both of my sons, David and Daniel, are serious collectors of paintings, and each will have two of my best paintings. Daniel has really loved this *Old Man*, and so I gave it to him. The painting has again been carefully examined by van de Wetering, who has told us that he is now certain of its authenticity. He borrowed it with three other works for a small exhibition in Amsterdam in 2005 titled Rembrandt's Studies: New Light on an Old Problem. In 2006, it was included in the great Rembrandt exhibitions in the Rembrandthuis and in Berlin in celebration of four hundred years since

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Rembrandt's birth. Is it by Rembrandt? I am not totally certain, as I am not certain of some of van de Wetering's other new attributions, but I love it, as does Daniel. Again, this painting is carefully described in David de Witt's Bader catalogue, which contains descriptions of two paintings that will not come to Queen's because this is Daniel's, and a second, a *Joseph and the Baker* by a Delft Rembrandt student will ~~also~~ go to David.

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The second of the two paintings illustrated by Jakob Rosenberg (fig. 99) is *Head of a Bearded Man: Study for St. Matthew*, (Fig.4) which I bought as Circle of Rembrandt at Christie's London in February 1995.

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David de Witt has described this painting in his *2007 Bader Catalogue* clearly: "This little panel displays the moving visage of a man in robust middle age, with a heavy, thick beard. He turns to the right and looks off to the side. His lowered eyelids, furrowed brow, pursed lips, and empty gaze suggest that he is absorbed in thought. His expression connects him directly to Rembrandt's well-known depiction of *St. Matthew Inspired by the Angel* in the Louvre, as do his features, such as his prominent brow and cheekbones, and the pronounced *levator labii* muscles flanking the nose. This painting does not appear to be derived from the St. Matthew, however. In the Paris painting, the figure is seen more on a level, draws his hand to his chin, and wears a turban-like headdress. Here the figure wears a simple soft cap and a heavy smock. The differences between the two could reflect the transformation of a head study from a model into a finished history painting. The simple costume in the small panel is derived from contemporary dress, bereft of any historical allusions. The lack of any sign of Rembrandt's inventive elaboration of St. Matthew's figure again indicates that it is not a copy after it. It is nearly certain that the present work reflects Rembrandt's study of a

figure in preparation for the St. Matthew. The question remains whether it is an original sketch, or a copy after one, by Rembrandt. Depictions by him of Jeremiah and of Jesus seem to have been proceeded by painted studies in a similar fashion.

“Bredius identifies it as autograph, but groups it with three other small panels showing the same model in slightly varying views. However, none of these other works approaches its decisive handling and structure. One of them, a panel in Washington, is an exercise in direct impasto strokes, but does not yield a strong impression.”

Isabel and I took this painting to the National Gallery in Washington, where the curator Arthur Wheelock allowed us to compare it with their version (Bredius 302). His comments were, “I cannot tell you whether your version is by Rembrandt, but I can tell you that yours is much better than ours.” Rembrandt/Not Rembrandt: clearly the jury is still out, but whether by the master or one of his students, it has given us a good deal of pleasure.

Perhaps my happiest acquisition was that of a *Small Head of an Old Man in Profile* (Fig.5) on panel, offered from the John Hay Whitney collection at Sotheby’s in New York in May 2000. Described as Circle of Rembrandt, it was estimated at only $40,000–-60,000. Bidding by telephone, I was prepared to go very high, as I believed that there was a good chance that it was an original Rembrandt, and I was very happy when the auctioneer, George Gordon, knocked it down to me for $125,000. Our good friend, George hand-delivered it when he came to Milwaukee on a visit to the Midwest after the sales.

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Removing the dirty old varnish was very easy; Charles Munch told me that he had seldom worked on a seventeenth century panel in such good condition. I was eager

to show it to Ernst van de Wetering and offered to take it with us when we went to Amsterdam in November. He spent a long time with the little panel when we showed it to him, and Peter Klein from Hamburg, who happened to be visiting him at the time, took a small sample of the wood and was able to determine by dendrochronology that a date around 1661 was likely. Ernst asked us to bring the panel to the Rijksmuseum the next day so that he could compare it with Rembrandt's *Self-Portrait as the Apostle Paul*, which is signed and dated 1661.

In *Rembrandt Quest of a* Genius, the catalog of the Rembrandthuis exhibition of 2006 where our paintings were exhibited, Ernst ~~wrote~~ writes, "This small painting, which is evidently related to Rembrandt's *Circumcision of Christ in the Stable* in 1661 in Washington, originated rather late in Rembrandt's career. In the *Circumcision*, several old men — including the Mohel who carries out the circumcision and a man who writes in a book — are depicted in roughly the same way as the man in this study…" "…Now that the painting has been freed of its thick layer of varnish, it can be seen as a small masterpiece, both as regards colour and *peinture*. It has been executed at a high tempo, wet in wet. With all its dynamism, it betrays such an astonishing control of the pictorial means available and, as a result, such a supreme sense of form on the part of its author, that one can scarcely imagine it could have been painted by a pupil. Nor could it be a copy, executed by a pupil, after one of the figures in the Washington *Circumcision*: the visual 'information' in the *Circumcision* is simply too scant for that. In its execution and colour scheme, the *Lighting Study of an Old Man in Profile* shows a striking resemblance to Rembrandt's *Self-Portrait as Paul* from 1661 in the Amsterdam Rijksmuseum. Confrontation between these two paintings leaves no room for doubt as to the study's

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authenticity. On this basis alone, it may be assumed that the study originated around 1661, the year in which the Washington *Circumcision* originated according to the date applied to that painting. We can safely accept, therefore, that the small painting from the Bader collection was a preparatory study for the *Circumcision*."

This painting was also in Van de Wetering's small 2005 exhibition and in the Rembrandt exhibition in Berlin in 2006.

One of the best dealers in old master paintings I have ever known was Neville Orgel in London. Despite his great knowledge, he was pessimistic and so self-effacing that he asked me not to mention his name in my first autobiography. I bought many paintings from him before he moved from London to Israel, where he died in 2003. In 1977, on one of my rare visits to his home in Golder's Green, I saw a fine portrait of *Rembrandt Sketching*, (Fig.6) much like Bredius 46 in Dresden and Bredius 47 in San Francisco. In 1970, Neville had sent a photograph of his painting to Dr. Kurt Bauch, the great Rembrandt expert in Germany, who had replied that he preferred Neville's portrait to those in Dresden and San Francisco, but did not believe that Neville's was by Rembrandt. I loved the portrait. Neville was not keen to sell it (he had never taken it to his gallery), but he said he would sell to me if I paid him enough to buy an apartment he wanted in Israel—£40,000.

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Since then, it has hung over my desk at home and given me a great deal of pleasure. It has graced the cover of an Aldrich catalogue and has been in two exhibitions at Purdue, two at Queen's University, and one titled The Detective's Eye at the Milwaukee Art Museum.

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There are six versions of this portrait of Rembrandt, and at first I had hoped that mine might be the original. It is not. Volume IV of the Rembrandt Research Project deals only with Rembrandt self-portraits. In this volume, Van de Wetering has written about all six versions including mine, which he has illustrated extensively with one full color illustration and one black/white and two color illustrations of details [confusing wording], coming to the conclusion that it is a period portrait of Rembrandt, but not even painted in Rembrandt's workshop.

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Over the years, I kept Neville informed about my findings, and shortly before he died, he offered to repurchase the picture for $100,000. I declined. I just like it too much, no matter who painted it.

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The last Rembrandt/Not Rembrandt painting I acquired was the *Portrait of a Woman* (Fig.7), perhaps Hendrickje Stoffels, Bredius 112, the purchase of which I have described in chapter 3.

Who painted Lucille Simon's favorite portrait? In 1979, when I purchased *The Head of an Old Man*, RRP C22, at an auction at Christie's London, I was convinced that it was by Rembrandt, although the RRP was not. Now it is universally accepted as by Rembrandt. With Bredius 112, however, I am not convinced, but I love it and, like the four dealers who owned it until February 2003, I have been searching for a name. It is certainly period. Drost has been suggested, but it is not like any of the thirty-eight works accepted by Jonathan Bikker. David de Witt (the Bader curator at Queen's) thought briefly of Abraham van Dyck, and that is close. But I have two of his signed works at home, and the paint handling is not quite the same. Now David has considered the possibility that it might be by Jacobus Leveck, working in Rembrandt's studio in the

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1650s. Again, a detailed history and description of this painting is given in David's *Bader Collection Catalogue of 2007*.

Ernst van de Wetering has told me that he hates the painting. What a strange reaction to a painting, which Jacob Rosenberg had loved and considered a great Rembrandt, and which was the frontispiece in color of the catalogue of the Rembrandt exhibition in Chicago in 1969. Paintings do cause strong emotions, and I buy only paintings I really love for my own collection. This is one of them.

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Hope you [illegible]

love [illegible]

the massacres and destruction caused by the Crusader conquest, and the subsequent process of reconstruction, affected the Jewish communities, and provides vivid descriptions of conditions in both rural and urban districts. 310 pages with maps.
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From Larry at War in Humour.

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Dr. Alfred Bader
924 East Juneau, Suite 622
Milwaukee, Wisconsin 53202
Phone: 414/277-0730
Fax: 414/277-0709

A Chemist Helping Chemists

June 10, 1999

Ms. Madeleine Jacobs
Editor in Chief, *C&E News*
1155 Sixteenth Street, N.W.
Washington, D.C. 20036

Dear Madeleine,

In your response to letters from Professor Herbert C. Brown and myself regarding your sudden change in policy on the listing of the top U.S. Chemical companies, you indicate that you had only two alternatives. One of these, if you continued to list Sigma-Aldrich in accordance with prior practice, on the basis of total sales, would require "opening the door for re-sellers, distributors, recyclers, and others" who do not produce. The other would list Aldrich with 44% of its sales, thus causing it mysteriously to fall off the list on which it had appeared in increasingly higher ranking over a period of many years. You chose the latter, notwithstanding the material damage inflicted upon Sigma-Aldrich's reputation.

Your response is reminiscent of the old Danny Kaye movie, *Jacobowsky and the Colonel*, in which the Colonel consistently observed "we have only two alternatives" – both of which were bad, and Jacabowsky replied, "there must be a third alternative" and came up with an appropriate solution to their dilemma. Clearly, there are many other alternatives to either including in the listing non-producers or including that portion of chemical sales which is produced internally thus giving the false impression that there was a sudden change in Sigma-Aldrich's position in the chemical industry. Over the years Sigma-Aldrich always made it clear which products were produced internally

and which were not – so the 10-K filing to which you referred disclosed nothing new. Further, no reader of C&EN would assume that a company offering close to 100,000 compounds could possibly manufacture them all internally. Yet, throughout the years no nonproducing company claimed the right to be listed, if indeed there exists any which would make the list.

If you will seriously reconsider the matter I am sure you will realize that there are any number of satisfactory alternatives preferable to either of the two which you set forth. To suggest but a few:

1. Continue doing what you had been doing over the years.

2. Establish some reasonable minimum of production facilities as an eligible criteria.

3. Simply footnote the portion of sales which are not internally produced.

4. Any reasonable combination of the above.

In the light of past practice and common sense, the course you have chosen is both misleading and unfair.

I trust you will see fit to correct this injustice to a company which contributes so much to the development of the entire chemical industry, from the top down.

Yours sincerely,

Alfred Bader
AB/az
By e-mail, US mail and fax

ULYOTT
address & phone
JACOBS
direct line
2p. letter

Subject: **Re: Your letter**
Date: Fri, 11 Jun 1999 14:54:32 -0500
From: Alfred Bader <baderfa@execpc.com>
Organization: Alfred Bader Fine Arts
To: Madeleine Jacobs <msj95@acs.org>
BCC: Marvin Klitsner <klitsner@mail.inter.net.il>

Dear Ms. Jacobs,
Dr. Bader was very happy that you printed Prof. Brown's and his first letter, but feels that the response is unfair to the company. He would like to telephone you on your direct line -- please e-mail this to me. And, of course, he hopes that you read his second unpublished letter and wonders whether you will list Sigma-Aldrich next year -- as you did for so many years.

Best wishes,
Ann Zuehlke

Madeleine Jacobs wrote:

> *Dear Ms. Zuehlke:*
>
> *I think Dr. Bader can wait until he returns from England to talk with me.*
> *I have a very heavy travel schedule myself in the next two weeks and I*
> *wouldn't want him to miss me, since the time difference is substantial. I*
> *have tremendous respect and admiration for Dr. Bader, but I honestly cannot*
> *understand why Dr. Bader feels the response in C&EN was "hurtful." We have*
> *rules in terms of how we list the Top 75 and we clearly explained them. I*
> *showed this to a number of people and they have confirmed that we handled*
> *this appropriately. And, I should point out, it was Dr. Bader who strongly*
> *urged me to publish his letter; I wanted to simply respond to him with our*
> *explanation, but he insisted that it be made public.*
> *No useful purpose would be served in extending this conversation in print*
> *in C&EN. Our letters page is limited and we've covered the topic adequately.*
> *Sincerely,*
> *Madeleine Jacobs*
> *Editor-in-Chief*
> *Chemical & Engineering News*
> *At 02:08 PM 6/10/99 -0500, you wrote:*
> >*Dear Ms. Jacobs,*
> > *Dr. Bader left just before your e-mail arrived and is on his way to*
> >*England.*
> > *He will undoubtedly try to telephone you from England.*
> > *I know that he felt your response in the June 4 issue of C&E News was*
> >*unsatisfactory and very hurtful. I believe that he will ask you to*
> *publish his*
> >*second letter.*
> > *Thank you for your understanding.*
> >*Very sincerely,*
> >*(Mrs.) Ann Zuehlke, Secretary*
> >
> >*Madeleine Jacobs wrote:*
> >
> >> *Dear Al,*
> >>
> >> *With all respect intended, I'm sorry you don't like the way we handled your*
> >> *letter and the response. But I truly believe we have devoted enough space*
> >> *and attention to this in C&EN.*
> >> *Sincerely yours,*
> >> *Madeleine Jacobs*
> >> *Editor-in-chief*

Subject: Re: Your letter
Date: Fri, 11 Jun 1999 16:12:50 -0400
From: Madeleine Jacobs <msj95@acs.org>
To: baderfa@execpc.com

Better call her now if you can!

Dear Ms. Zuehlke:

My phone number is (202) 872-6310. However, next week I will be in and out of the office constantly and it will be hard to reach me. I really do suggest that Dr. Bader wait until he returns from England to talk to me.
Madeleine
At 02:54 PM 6/11/99 -0500, you wrote:
>*Dear Ms. Jacobs,*
>*Dr. Bader was very happy that you printed Prof. Brown's and his first*
>*letter, but*
>*feels that the response is unfair to the company. He would like to*
>*telephone you*
>*on your direct line -- please e-mail this to me. And, of course, he hopes*
that
>*you read his second unpublished letter and wonders whether you will list*
>*Sigma-Aldrich next year -- as you did for so many years.*
>
>*Best wishes,*
>*Ann Zuehlke*
>
>*Madeleine Jacobs wrote:*
>
>> *Dear Ms. Zuehlke:*
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>> *I have a very heavy travel schedule myself in the next two weeks and I*
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>> *urged me to publish his letter; I wanted to simply respond to him with our*
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>> *No useful purpose would be served in extending this conversation in print*
>> *in C&EN. Our letters page is limited and we've covered the topic*
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>> *Madeleine Jacobs*
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>> *Chemical & Engineering News*
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>> >*Madeleine Jacobs wrote:*
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>> >> With all respect intended, I'm sorry you don't like the way we handled
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>> >> Editor-in-chief
>> >> Chemical & Engineering News
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Dr. Alfred Bader
924 East Juneau, Suite 622
Milwaukee, Wisconsin 53202
Phone: 414/277-0730
Fax: 414/277-0709

A Chemist Helping Chemists

To Ms. Madeleine Jacobs
Editor-in-Chief, C&EN

3 pages

fax 202 872 8727

Dear Madeleine

I am really upset by the response to my letter, on p. 4 of your June 7 issue; and hope that you will print the enclosed in full, and then reconsider.

Best regards

10 VI 99

Dr. Alfred Bader
924 East Juneau Avenue
Astor Hotel - Suite 622
Milwaukee, WI 53202
Ph: 414 / 277-0730
Fax: 414 / 277-0709
e-mail: baderfa@execpc.com

February 21, 2005

TO: Ms. Alice Smith
Weidenfeld & Nicolson

Page 1 of _1_

FAX: 011 44 207 836 4266

Dear Ms. Smith,

I enjoyed meeting you by telephone today and want to thank you for giving permission for the publication of one chapter, that of Josef Loschmidt, into German. This is chapter #16 in *Adventures of a Chemist Collector,* published by you some ten years ago.

I was very happy with your work and enjoyed working with Mr. Michael Dover. Please give him my regards.

I do believe that it makes very good sense to have this chapter published in German. Of course the publication will state that this is chapter 16 of my book published by you.

With best regards I remain

Yours sincerely,

Alfred Bader

Alfred Bader
AB/az
C: Professor H. Groessing (By e-mail)
Dr. Robert Rosner (By e-mail)

Steward L. Stafford, EA
15951 North Florida Avenue
Lutz, Florida 33549
(813) 963-5577

January 18, 2006

Dr. Alfred Bader
940 West St. Paul Avenue
Milwaukee, WI 53233

Dear Dr. Bader:

This is a letter I have tried to write before, and should have.

It has a single purpose - to apologize for my unforgiveable insult to your friendship and hospitality. There has probably not been a month these last 35 years that I haven't thought of it, and desparately wished that I could relive that summer of 1971.

I am not asking forgiveness. My purpose is only to let you know that I do recognize and forever regret the grave injustice to you that I committed that year.

Sincerely,

department of Chemistry

UMR Chemistry Department Establishes the Richard K. Vitek/FCR Endowed Chair of Biochemistry

The Department of Chemistry is pleased to announce the new Richard K. Vitek/FCR Endowed Chair in Biochemistry. The chair was made possible by the generous donations of Richard K. Vitek, a 1958 UMR chemistry alumnus, and the Foundation for Chemical Research Inc. (FCR). The chair carries a very generous endowment of $2.8 million dollars, which will be used to help support the research of a distinguished scientist in modern biochemistry. We are presently advertising the new position, which we plan to fill by September, 2006. The new chair will provide important guidance for UMR's targeted growth in the Biosciences. We seek an individual who will attract and inspire superior graduate students, maintain external support for a vigorous research program, serve as a standard of excellence in teaching, and collaborate with faculty and students in other departments and research centers at UMR. The successful candidate will have a doctorate in Chemistry, Biochemistry, or a related field, and a substantial record of extramural funding and publications in leading scientific journals.

Richard K. Vitek has a long history of distinguished service to UMR and the Chemistry department. He served as Vice President and President of the UMR Board of Trustees, and as the Chairman of the Advisory Board for the Foundation for Chemical Research Inc. Dick received his M.S. in Chemistry from UMR in 1958, following his B.S. degree in Chemistry from Albion College in 1956. He was awarded the Professional Degree in Chemistry in 1994. Dick worked as an Analytical Chemist for the Atomic Energy Commission on the production of uranium from ore. In 1959 he joined Allied Chemical Corporation where he worked on solid oxidizers for U.S. rockets and missiles. In 1964 he joined what is now Sigma-Aldrich Chemical Company. Dick created and was publisher of Aldrichchemical Acta which today, with few modifications, is the most highly regarded commercial chemical publication in the world. Another career shift occurred in 1968 when Dick Vitek established his own company to represent a Swiss scientific instrument manufacturer. In 1980 he started a new venture of manufacturing and marketing laboratory scientific instruments primarily targeted towards biotechnology. Until his retirement in 2002, he was the principal owner and Chief Executive Officer for well-known FOTODYNE Incorporated. His rapidly growing company entered into the listing of the top 10% in revenues of all corporations in the State of Wisconsin.

The chemistry department is very proud of the accomplishments of alumnus Dick Vitek, and we are very appreciative of his generosity in providing the funds to establish the Richard K. Vitek/FCR Endowed Chair in Biochemistry. We are certain that the Richard K. Vitek/FCR Endowed Chair in Biochemistry will allow us to attract a superstar Biochemist to the UMR Chemistry Department.

Application information can be found here.

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950 Walnut Ridge Drive
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Brian Walsh,
President & CEO

Corporate Information

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We are committed to understanding our customers' needs and advanc
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and education.

Innovative Products for Molecular Biology Research

Established in 1980, FOTODYNE Incorporated is the worldwide expert
photodocumentation of life science data. FOTODYNE transilluminators
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Early History of the Foundation for Chemical Research, Inc.

Photo Courtesy of Joseph Counsil

The Foundation for Chemical Research, Inc., was officially established as a not for-profit organization on 29 September 1983 with the Great Seal of the State of Missouri and the signature of the Secretary of State, James C. Kirkpatrick. The legal paperwork had been drawn up by a young attorney in Rolla, Mr. J. Kent Robinson. The founding members of the FCR Board were:

1. Terry L. Brewer
2. Stig E. Friberg
3. H. Neal Grannemann, President of the Board
4. William J. James
5. Oliver K. Manuel
6. J. Kent Robinson
7. Robert R. Russell

The first meeting of the Advisory Board occurred on October 26 and 27, 1984. The founding members of the Advisory Board were:

1. Richard D. Beaty
2. Thomas E. Burchfield
3. Jim D. Christen
4. Thomas H. Dunning, Jr.
5. Jeff T. Fenton
6. Jagdish M. Mehta
7. Melvin L. Rueppel

8. Kay E. Thornton Sooter
9. Robert A. Steinkamp
10. Larry F. Thompson
11. Richard K. Vitek, President

Records indicate that Drs. Steinkamp and Thompson were unable to attend the first meeting. They also show that the financial framework of FCR started almost a year earlier, on November 2, 1983 with two donations of $250 each from Professors Robert R. Russell and Oliver K. Manuel.

FCR started to campaign actively for funds in the summer of 1985. That year it received contributions from Attorney J. Kent Robinson, Dr. H. Neal Grannemann, and several other former students - David M. Beem, Chin-Yuan (Golden) Hwaung, Gary L. DeClue, Mabel Phillips, Cary B. Bottom, Richard K. Vitek, Thomas Birchfield, Kay Thornton Sooter, Melvin Rueppel, and Rodney B. Hawkins, and Professors Robert Russell and Oliver Manuel.

See WHAT FCR DOES FOR UMR CHEMISTRY ...

richard k. vitek

Richard K. Vitek
Chairman and Chief Executive Office
Fotodyne Inc.
Hartland, Wisconsin

Albion College
1956 A.B. Chemistry

University of Missouri-Rolla
1958 M.S. Chemistry
1994 Professional Degree

Richard K. Vitek

[back to "board of trustees"]

Dear Ken,

Thank you for your e-mail of December 13th to which I am responding only now because we have just returned from England.

Yes indeed I am working on a second autobiography, probably to be entitled *More Adventures of a Chemist Collector*. You have already published one chapter in your Summer 2003 *Alumni Review* entitled "Double Theft, Triple Trouble".

A good chapter to publish in the *Alumni Review* might be one about museums deaccessioning paintings. The Milwaukee Art Museum deaccessioned a painting by Joseph Wright of Derby for which the artist received more money than any other of his paintings. This is *The Battle of Gibraltar* which is just being conserved at the Agnes and which will, I hope, be ready for publication next summer. In your article there should be a good photograph of the conserved painting. Please let me know what you think.

With all good wishes for a happy and healthy 2006 I remain

Yours sincerely,
Alfred Bader

Ken Cuthbertson wrote:

> Hi Alfred,
> I hope this e-mail finds you and Isabel healthy and well and enjoying your time in the U.K..
>
> Judith Brown mentioned to me that you are busy working on a second volume of your memoirs and that there might be a chapter (or an excerpt from one) that you might consider letting us publish in the Alumni Review. If you are amenable to that idea and have a spare moment, I would appreciate it if you'd shoot me an e-mail with a few details about your book. (Is there a specific chapter that you think would be suitable for the Review?)
>
> By the way . . . congratulations on your honorary degree from Simon Fraser University. I have passed the news along to Sarah Withrow, our Keeping in Touch notes editor, and asked her to include an item in our upcoming Winter issue. Speaking of winter . . . it is snowy, cold, and looking very winter-like here these days. It was sunny but - 20 C. here this morning. How I envy you being in balmy England!
>
> I'm in touch with Cathy Perkins via e-mail almost daily, and we regularly talk on the telephone. I will share with her the news about your book. Cathy is alive and well, although she was saddened recently by the death of her favourite cat--who was old enough top have used up all of his nine lives and one or two borrowed ones.
>
> Best wishes for the holiday season and for a happy, healthy, and prosperous New Year. -- Ken Cuthbertson, Editor, Alumni Review *< : -)

Subject: symposium
From: "Jiri Damborsky" <jiri@chemi.muni.cz>
Date: Tue, 4 May 2004 22:17:53 +0200
To: "Bader Alfred & Isabel" <baderfa@execpc.com>

Dear Isabel and Alfred:
I am sending regards from Brno. In a one month a one week we will meet again. I am looking forward to it very much.

Now, I would like to send you up-to-date information about the preparation of the symposium and birthday party in Hotel International. In the attached document, please, find the final program of the symposium. As you can see, many Bader Prize Holders and Bader Fellows decided to participate.

Alfred, your lecture will be scheduled at the beginning of the symposium. I have allocated 40 min for your presentation, including discussion (I hope this is OK), as I tried to fit all presentations and two breaks (during which people can meet and socialize) within 3h. For this part of the meeting, all staff chemists working at our Faculty and some students will be invited. Also some representatives of the artists from the Philosophical Faculty will participate.

Videoconference will be organized after the second coffee break. Although, this should originally be a little surprise for you, I think it is better that you know about it in advance and can prepare for it. Within this videoconference, Dean of the Columbia University in New York want to tell you a few words. Then, you can have a short conversation with three Bader Fellows based in USA.

The symposium should finish in about 17.15. Then we will move to the Hotel International (3 min walk from the Museum of Applied Art), where we can make a little celebration with about 30 people - your friends, all speakers from the symposium and a few University representatives. I hope we will manage to create an informal atmosphere that you can enjoy the evening and talk to people you like.

Now I have one question - after this evening, I planned to invite you to our apartment? You would be more then welcome. But, I realized that this will be a long day for you and you might be tired after the symposium and birthday party (my apartment is located outside the city while Hotel International is in the centre). I would like if the visit to our home would become "a duty" for any of you. We could probably leave it for your next visit to Brno to make sure it is enjoyable for you. Please, send me openly your decision. I would also appreciate your comments on the program, etc. I am keeping in mind rest for Alfred before beginning of the symposium. The Museum of Applied Art was selected with this respect - it is so close to the Hotel, that Alfred can have a rest in hotel room.

I am looking forward to hearing from you.
Best wishes,
Jiri

P.S. Last week I met with Rector, Vice-Rector and our Dean on the occasion of organization the symposium (it was my first face-to-face discussion with Rector). Besides the symposium, we have also discussed acceptance of a new faculty staff and establishment of The Loschmidt Laboratories. I think things are moving in a right direction

and of course I am happy for that. Also, I used this possibility to mention, that Dr. Kamil Paruch will be attending the meeting and is interested to enter Masaryk University in the future - that University should make clear its interest in Dr. Paruch while he is in Brno. I think it will be very useful to introduce Dr. Paruch to some of the Professors during the meeting.

****

Jiri Damborsky, EMBO/HHMI Scientist
Josef Loschmidt Professor of Chemistry
National Centre for Biomolecular Research
Masaryk University, Faculty of Science
Kotlarska 2, 611 37 Brno, Czech Republic

ph 420-5-41129377, fax 420-5-41129506
e-mail: jiri@chemi.muni.cz
http://ncbr.chemi.muni.cz/~jiri
http://www.loschmidt.cz

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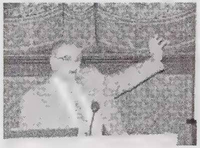
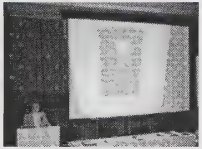
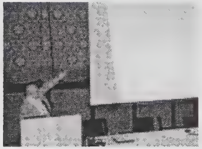
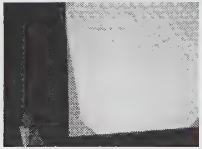
Photogallery

Symposium on 80th birthday of Alfred Bader
Brno, June 14, 2004








Add to birthday chapter









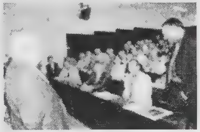









Lecture at the Faculty of Science of Masaryk University
Brno, June 14, 2001



Presentation of the Honorary Doctor of Masaryk University
Brno, June 12, 2000



Lecture at the Faculty of Science of Masaryk University
Brno, June 3, 1996



Subject: Requests
From: "Yechiel Bar-Chaim" <yechiel@jdcparis.org>
Date: Thu, 4 Mar 2004 08:51:42 -0000
To: "Alfred BADER \(E-mail\)" <baderfa@execpc.com>

Dear Alfred,

Concerning our upcoming visit to the Czech Republic I need help to put the various arrangements in place.

First, my assistant is now undergong a second major operation and will be away for some time. Before she left on medical leave, she was unable to get a good price for you and Isabel at Hotel Ungelt. KCZ 5,900 for a double room was what they offered. But I know you did much better last year. If you can let me know how much you paid in the end, I will pick up the cudgel and try to obtain the same reduced price for this year.

Second, I will have a big conference to attend in Prague on June 14th (concerning JDC's first big non-sectarian project there a decade ago retraining/reorienting the whole approach to handicapped/retarded children and the role of NGO's --- From Communist policies of isolation and exclusion to a democratic effort for inclusion and participation. So will you forgive me if I don't join the celebration that Jiri Damborsky is preparing for you on that day in Brno?

Third, I am keen to set up two dinners for you and Isabel in Prague. One is with the Bader Art History group to celebrate your 80th and present you with the new publication --- Milena and Martina are counting on it and are keen to fix the date asap. The second is with the outstanding group of individuals with whom we are working on the various non-sectarian aid projects --- Jiri and; Tana from Nadace Via; Gwen Albert; Simon Panek and his colleagues from People in Need. Can I have your permission to set up these dinners for the evenings of the 15th and the 16th, and then we would leave open the 17th for you and your chemical friends to do your own thing?

Then on a more personal note I have a friend living in Europe who is interested in adopting a child from South America. I was wondering, would your son Daniel have any contacts that might be useful to share?

Looking forward eagerly to our meeting in London.

Many thanks.

Warmest regards,

Yechiel

Dear Jiri,

Thank you for your long e-mail of yesterday.

Let me answer your questions one by one:

As you would like my lecture on Loschmidt to be only 40 minutes I plan to leave out all of the material on Couper, Is that all right with you?

I have no problem with video conferencing.

In your biography you mention my trying to help Czech chemists through awards, fellowships and Loschmidt Chair. But I have also tried to help Czech art historians and over 30 have received Bader fellowships. I believe that Zora Worgotter was one of these and she will be able to put you in touch with Dr. Milena Bartlova who is in charge of selecting the students. Milena's e-mail is Bartlova.M@seznam.cz

We had so looked forward to meeting your wife and son in your apartment. I understand that to travel there takes about half an hour by car. I have the very singular ability of leaning back in a car, sleeping for 20 or 30 minutes, and then being very much refreshed. Hence, if it is all right with your family, we would love to come with you. But keep in mind that after such a day of festivities, undoubtedly with much too much to eat, we should really only have a bowl of soup for supper. That is exactly what I had yesterday evening and what Isabel will give me this evening and if you and your family do not mind, a bowl of soup will be just right.

Best wishes,
Alfred

Jiri Damborsky wrote:

> Dear Isabel and Alfred:
> I am sending regards from Brno. In a one month a one week we will meet again. I am looking forward to it very much.
>
> Now, I would like to send you up-to-date information about the preparation of the symposium and birthday party in Hotel International. In the attached document, please, find the final program of the symposium. As you can see, many Bader Prize Holders and Bader Fellows decided to participate.
>
> Alfred, your lecture will be scheduled at the beginning of the symposium. I have allocated 40 min for your presentation, including discussion (I hope this is OK), as I tried to fit all presentations and two breaks (during which people can meet and socialize) within 3h. For this part of the meeting, all staff chemists working at our Faculty and some students will be invited. Also some representatives of the artists from the Philosophical Faculty will participate.
>
> Videoconference will be organized after the second coffee break. Although, this should originally be a little surprise for you, I think it is better that you know about it in advance and can prepare for it. Within this videoconference, Dean of the Columbia University in New York want to tell you a few words. Then, you can have a short conversation with three Bader Fellows based in USA.

The symposium should finish in about 17.15. Then we will move to the Hotel International (3 min walk from the Museum of Applied Art), where we can make a little celebration with about 30 people - your friends, all speakers from the symposium and a few University representatives. I hope we will manage to create an informal atmosphere that you can enjoy the evening and talk to people you like.

Now I have one question - after this evening, I planned to invite you to our apartment? You would be more then welcome. But, I realized that this will be a long day for you and you might be tired after the symposium and birthday party (my apartment is located outside the city while Hotel International is in the centre). I would like if the visit to our home would become "a duty" for any of you. We could probably leave it for your next visit to Brno to make sure it is enjoyable for you. Please, send me openly your decision. I would also appreciate your comments on the program, etc. I am keeping in mind rest for Alfred before beginning of the symposium. The Museum of Applied Art was selected with this respect - it is so close to the Hotel, that Alfred can have a rest in hotel room.

I am looking forward to hearing from you.
Best wishes,
Jiri

P.S. Last week I met with Rector, Vice-Rector and our Dean on the occasion of organization the symposium (it was my first face-to-face discussion with Rector). Besides the symposium, we have also discussed acceptance of a new faculty staff and establishment of The Loschmidt Laboratories. I think things are moving in a right direction and of course I am happy for that. Also, I used this possibility to mention, that Dr. Kamil Paruch will be attending the meeting and is interested to enter Masaryk University in the future - that University should make clear its interest in Dr. Paruch while he is in Brno. I think it will be very useful to introduce Dr. Paruch to some of the Professors during the meeting.

****
Jiri Damborsky, EMBO/HHMI Scientist
Josef Loschmidt Professor of Chemistry
National Centre for Biomolecular Research
Masaryk University, Faculty of Science
Kotlarska 2, 611 37 Brno, Czech Republic

ph 420-5-41129377, fax 420-5-41129506
e-mail: jiri@chemi.muni.cz
http://ncbr.chemi.muni.cz/~jiri
http://www.loschmidt.cz

****

Subject: Re: Thank You
From: "Klitsner Jane" <klitsner@zahav.net.il>
Date: Wed, 14 Dec 2005 08:18:54 +0200
To: "Alfred Bader" <baderfa@execpc.com>

Dear Alfred and Isabel,

I want to thank Isabel for her thoughtfulness in remembering my asking about the fish flatware. I purchased a set some years ago from a man who was in the silver business in England. I am sure the set at auction are lovely but a dozen are all that I need.

Did Betsy tell you that Rachel gave birth to a BABY GIRL yesterday? I hope to get to the Hospital today.

Have a nice Chanukah and all good wishes to you and family.

Fondly, Jane

Subject: (no subject)
From: GuiRochat@aol.com
Date: Wed, 14 Dec 2005 08:11:29 EST
To: baderfa@execpc.com

Dear Alfred,
I do not know if you are back in Milwaukee from London, and I hope that you are happy with your purchase of the Saint Jerome (which I did not see as I did not get the Christie's South Kensington catalogue), but I do know it went amazingly enough through sale once as attributed to Natoire . In any case I wanted to reply to a comment you made after you were told that I offered my share in the Langlois portrait to Otto and Clovis. Here are two major dealers, majors sharks who have been pressing me on your advise to transfer the painting to them for sale because they have access to a gallery and the Maastricht fair, neither of which would factually promote a direct sale of this remarkable portrait which can be easily marketed without exhibiting it. I do understand however the power of it hanging in Otto's gallery and/or being included in Clovis's booth at Maastricht, so in that respect I fully understand your advise to let them have it. But asking me if I do not enjoy working with you is incorrect as factually you show me that by asking me to work with Otto and Clovis that you have doubts about my handling the painting despite the contract which you very kindly signed with me. My response to the pressure put on me by Otto and Clovis was my somewhat facetious offer to sell my share, because if they are so eager to handle this portrait, they should have a real interest in it (my costs are well over $ 5,000 at this point which is not a great amount, but for me it is). Why should either of them be given the courtesy of being able to sell it and make some profit for no particular effort on their part ? That is what I feel at this moment and I would very much appreciate your comments.
With all kindest best wishes,
Gui

414-277-0709

BULLETIN FOR THE HISTORY
OF CHEMISTRY
Division of History of Chemistry American Chemical Society

Dr. Paul R. Jones, Editor
Department of Chemistry
University of Michigan

930 North University
Ann Arbor, MI 48109-1055
FAX: (734) 647-4865
prjones@umich.edu

January 27, 2006

Dr. Alfred Bader

Dear Alfred:

Sorry for my oversight! Of course, you have permission to reprint your article on Loschmidt from No. 22 of the Bulletin, pp 21-26

Sincerely,

Paul

FAX FROM:

Dr. Alfred Bader
924 East Juneau Avenue
Astor Hotel - Suite 622
Milwaukee, WI 53202
Ph: (414) 277-0730
Fax: (414) 277-0709
www.alfredbader.com
e-mail: baderfa@execpc.com

A Chemist Helping Chemists

January 27, 2006

TO: Dr. Paul R. Jones

Page 1 of _1__

FAX #: 1-734-647-4865

Dear Paul,

Many thanks for your letter of January 20th and the four missing issues of the *Bulletin*. I look forward to reading these during the next two weekends.

But turning to my letter to you of January 17th, may I have your permission to reprint the article entitled “The Wisswesser Loschmidt Connection” in my next autobiography?

With best wishes I remain

Yours sincerely,

Alfred Bader
AB/az

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BULLETIN FOR THE HISTORY
OF CHEMISTRY
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Department of Chemistry
University of Michigan

930 North University
Ann Arbor, MI 48109-1055
FAX: (734) 647-4865
prjones@umich.edu

January 20, 2006

Dear Alfred,

Of course, you should complete your set of the *Bulletin* with the enclosed:

Vol. 29(1,2) 2004
Vol 30(1,2) 2005

— especially inasmuch as the last issue includes a cumulative author/subject index. — compliments of HIST.

Your request to ACS will probably not be reflected in the set of labels about to be sent. So, I'll be sure you receive Vol. 31(2) in February.

With very best regards.

Paul

January 17, 2006

Dr. Paul R. Jones, Editor
Bulletin for the History of Chemistry
Department of Chemistry
University of Michigan
930 N. University Avenue
Ann Arbor, MI 48109-1055

Dear Dr. Jones,

Does it happen to you occasionally that you wake up in the middle of the night and remember that you are missing something important in your life?

This happened to me the other day when I woke up at 3 AM and said to myself that I hadn't seen the *Bulletin for the History of Chemistry* for quite some time.

When I checked and found that I have four copies of Vol. 28, No. 2 of 2003, undoubtedly because it contains a small review written by me.

What must have happened is that I forgot to renew my membership in the Division of the history of chemistry, and I have just written to the ACS asking that I be reinstated.

Would it be possible to send me one copy of each volume that has appeared after Vol. 28, No. 2, and of course bill me for these?

As you probably know, I wrote an autobiography entitled *Adventures of a Chemist Collector*. In there is a chapter on Josef Loschmidt. Now I am working on a second volume which will probably be entitled *More Adventures of a Chemist Collector*.

Now there is a Loschmidt Professorship at the Masaryk University in Brno and a Loschmidt website, www.loschmidt.cz

Not a great deal has been published about Loschmidt, though now a number of textbooks are describing his work correctly.

In this next autobiography may I reprint the article "The Wisswesser Loschmidt Connection" which appeared on p. 21 of No. 22 of 1998? Of course I would state that this is reprinted with permission from the *Bulletin for the History of Chemistry*.

With many thanks for all your help and best wishes I remain

Yours sincerely,

Alfred Bader
AB/az

One of the most interesting and in some ways most difficult dealers I have ever known is Christophe Janet. French born, into a wealthy family, educated at the Institute of Fine Arts in New York, he has a fine eye for old masters and led me to some beautiful works. He also bought several paintings from me but was totally unreliable businesswise. His checks always bounced, though eventually he always made good and once gave me a beautiful painting by Aert de Gelder in lieu. Life for his second wife, Roxane, a New Zealander, must have been very difficult since Christophe seemed to have no idea of how to manage his financial affairs and make regular, adequate provisions for his home life. However, Roxane was always charming and they were a fun couple to be with. Eventually, in 1995 they had to leave New York; perhaps Christophe owed too much to too many people.

Once they moved to France we saw each other less frequently. However, early in December 1996 I met him in London, viewing the old master sales. He urged me to look at and bid on lot 36 in the Phillips sale on December 10, a charming study of a Chihuahua, a Mexican dwarf dog (Fig.) in a mountainous landscape, from the studio of Velazquez. Interestingly the painting had been offered by Phillips on December 10, 1985 when it was on the catalog cover and the American collector who bought it then was now offering it eleven years later. December 10th has been an important date in my life – my last day in Vienna in 1938, and somehow, I have always been sadly alert on December 10th. I really liked that little oil on canvas, just 47 x 37 cms., but so did several others, including Rob Noortman, and I had to go to a hammer price of £30,000, way above the estimate of £6,000-8,000.

If Christophe had not brought the painting to my attention, I would not have noticed the little gem and so I promised him that if I could sell it profitably, we would share the profit equally.

The painting was in very good condition. It just needed a simple cleaning by my friends Charles Munch and Jane Furchgott, and they found a decent frame for me.

Naturally I sent photographs to many art historians and received very diverse replies. Werner Sumowski wrote that he had no doubt whatever that this was painted by Velazquez. He believed that the animal must come from the same hand as the dog in the portrait of the *Infant* Don Fernando, painted around 1632/36. And not just the dog but the landscape! But he concluded that sadly he was just Sumowski and not a Velazquez-dictator.

William Jordan, one of the great experts of Spanish 17th century paintings, thought differently. He remembered the little painting of a dog which he had seen at both Phillips sales, "It is a very beautiful painting, and one filled with charm and vitality. I can understand how anyone might speculate about the painting's relation to the art of Velazquez . Nevertheless, I do not feel it is by him. It is no closer to his style than the work of any numbers of painters of the following generation whose styles were profoundly affected by Velazquez's. Although the free brush work in the modeling of the dog's body is reminiscent of Velazquez (that is what these artists were known for), the conception and execution of the landscape are quite different from his . . .Your painting does not appear to be a fragment but is instead an intimate portrait of a dog. As such it departs from any painting known to have been painted by Velazquez…The one artist who is known to have painted such pictures of animals is **José Antolínez (1635-**

1675), one of the extremely talented generation of younger artists who followed Velazquez at the Court and who are regrettably too little known by the general public today."

A beautiful painting, in fine condition, painted by whom? Velazquez or José Antolínez? The difference in value was a million dollars or two.

George Gordon, Senior Director of Old Master Paintings at Sotheby's in London, conducts some of the auctions in New York as well as London and over the years we have become very good friends. He is always as kind and helpful as he is knowledgeable about old masters and so I showed him this portrait of a dog and mentioned the varied opinions I had had. He thought that there was a good chance that it could be by Velazquez. The key would be the opinion of the world expert on that artist, Professor Perez-Sanchez in Madrid. And so, in April 2000 we signed an agreement that Sotheby's would ship the painting to Madrid for Professor Perez-Sanchez's opinion. If he said yes, Sotheby's would offer it as a Velazquez. If no, Sotheby's would try to ascertain the correct name and offer it as such. I suggested that Sotheby's insure it for one million dollars, a modest price for a Velazquez in great condition. But George explained that a courier would have to accompany a million dollar painting, at considerable expense. The maximum that Sotheby's would insure it at its expense was $150,000, and so, not being a prophet, I agreed. The specialist of Spanish paintings at Sotheby's, James Macdonald, who was to liaise between the Madrid office and Professor Perez-Sanchez, faxed me on January 12, 2001, "As you are aware the painting is currently safely stored in our office in Madrid. Sadly Professor Perez-Sanchez had to cancel my meeting with him during my last sojourn to Spain, however he has kindly agreed to come into the office on Monday of

next week (15th January) to inspect the picture. Although I will not be there in person I will discuss the matter with him over the telephone." 'Safely stored' until Professor Perez-Sanchez's visit on January 15. But on Saturday, January 13, Sotheby's office was broken into and our dog and some other works of art were stolen.

The insurance agent, Iain Fairley International, advertised the theft, offering a reward, as did the IFAR Journal – all to no avail.

Sotheby's insurance paid us $150,000 with the understanding that if the painting should be recovered within five years we would have the option to purchase it for $150,000. Were it recovered after five years we would have the option of acquiring it for $150,000 "in addition to a reasonable sum to reflect interest and expenses relating to recovery." The five years have passed, and we haven't yet had to make the decision whether we want to repurchase it.

The payment of $150,000 gave us a "profit" of close to $70,000, half of this Janet's. But Christophe had turned his interest over to a former business partner, Paolo Affif, resident in Ireland. Affif told me that Janet owed him a considerable sum of money and was hoping that our gem would yield a great deal. So first, Affif decided not to accept the half 'profit' but hope for recovery and sale. But eventually, in September 2002, he decided that a bird in hand is better than two in the bush and accepted his share of the 'profit', $34,646.00.

Will I ever know whether I owned a real Velazquez? Probably not.

Alfred Bader Fine Arts
924 East Juneau Avenue
Astor Hotel - Suite 622
Milwaukee, WI 53202
Ph: 414-277-0730
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www.alfredbader.com
E-mail: alfred@alfredbader.com

March 6, 2006

TO: George Gordon, Vice President
Sotheby's London

Page 1 of _1_

FAX #: 011 44 207-293-5943

Dear George,

Thank you so much for your comments about my essay on Velazquez for the next book.

My comments about Christophe Janet are correct but of course I have sent him a copy and we have chatted about some changes. He has a very good eye and now in Paris he is doing very much better.

With thanks for all your help and with best wishes I remain

Yours sincerely,

Alfred Bader
AB/az

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Sotheby's EST 1744
34-35 NEW BOND STREET LONDON W1A 2AA
+44 (0)20 7293 5000 F +44 (0)20 7293 5989 WWW.SOTHEBYS.COM

23rd February 2006

Dr Alfred Bader
Alfred Bader Fine Arts
Astor Hotel Suite 622
924 East Juneau Avenue
Milwaukee
Wisconsin 53202
USA

Per mail and fax: 00 1 414 277 0709

Dear Alfred,

Both Richard and I very much enjoyed our stay in Milwaukee after the January sales, and Isabel and you looked after us extremely well. I felt much more rested when I left, and it was very nice to see you both again. Of course I will come again next year.

I read your latest extract with mounting horror – but then concluded that there would not be much point in worrying about it. How M. Janet will feel when he reads it is another matter, and I suspect that your publisher will have something to say about your observations about him, however accurate they may very well be. My concern regarding Sotheby's has to do with insurance matters and how we arrange them, since every case is different, and I would not want anyone to draw conclusions from this example, or to regard it as a precedent. I have decided not to run your extract past the relevant departments, since I can guess what they will say. All I would ask is that you do not indicate that I or Sotheby's have approved the text. !

For the record, however, the Spanish police did thoroughly investigate the break-in in our former offices in Madrid, which was quite a sophisticated operation involving high-tech cutting gear etc, and I have some recollection that they may have made arrests, though no stolen property was recovered. Apart from your picture, one very minor Old Master was taken, plus some other non-Old Masters. You mention Iain Fairley, whom I have found very helpful and easy to deal with on (occasional) other occasions. He could not bear a more appropriate surname.

Like you, I certainly hope the little dog will turn up one day

With Best Wishes,

George

George Gordon
Board Director, Sotheby's Europe
Old Master Paintings and Drawings department
Direct Line: 020 7293 5414
Direct Fax: 020 7293 5943
Email: george.gordon@sothebys.com

Unknown

Full Name: Mr. Christophe Janet
Last Name: Janet
First Name: Christophe

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78490 Bazoches sur Guyonne
France

Business: 01133148245366
Business 2: 0113337820933
Home: 011 33 134942447
Mobile: 011 33 622493819
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E-mail: christophejanet@hotmail.com
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David C. Williams, Esq.
8, Brook Lane
Cortland Manor
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fax.: 1(914)737-8628

13 bis, passage Verdeau
75009 PARIS

Wife: Roxane
Son: Alexander
Daughter: Diana

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Will I ever know whether I owned a real Velazquez? Probably not.

WILLIAM B. JORDAN

March 6, 2006

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

Dear Dr. Bader:

In response to your letter of February 16, 2006, I have no objection to the way in which you cite my letter of April 30, 1997, in your manuscript. Please, feel free to proceed as you have planned.

With regards and all best wishes,

Sincerely yours,

Wm Jordan

William B. Jordan

Velazquez file

3601 TURTLE CREEK BOULEVARD DALLAS, TEXAS 75219 TELEPHONE 214-855-5185 FAX 214-855-5016

historians of netherlandish art
NEWSLETTER

Dedicated to the Study of Netherlandish, German and Franco-Flemish Art and Architecture, 1350-1750

Vol. 16, No. 1, Supplement April 1999

The HNA Review of Books

New Titles in Seventeenth-Century Dutch Art

and

Supplement to *The HNA Review of Books*, November 1998: Manuscripts, Drawings, and Prints

Rembrandt Harmensz. van Rijn, Writer by Candlelight (*also known as* The HNA Book Reviewer Sharpening His Pen), *c.1635. Pen and ink and wash. Kunstsammlungen zu Weimar, Graphische Sammlung, exh. Museum Het Rembrandthuis, Amsterdam.*

The drawing was owned by Johann Wolfgang von Goethe, no mean critic himself. It is presently on view at the Rembrandthuis.

Dutch Art. An Encyclopedia. Edited by Sheila D. Muller (Garland Reference Library of the Humanities, 1021). New York and London: Garland Publishing, Inc., 1997. 489 pp, 16 colour pages, 152 b&w illus. ISBN 0-8153-0065-4.

Sheila Muller is a well-known specialist in seventeenth-century Dutch art. Thus one does not immediately associate with her the cover of her 'Encyclopedia', decorated with the severe, rectangular shapes of one of Mondrian's compositions and De Stijl-type lettering. But this is, of course, an encyclopedia of Dutch art, not a survey of the famously productive Golden Age. Nor is it a biographical dictionary, but rather an interdisciplinary, multi-perspective encyclopedia which, as the publisher advertises, "explores developments in art, art history, art criticism, and cultural history of the Northern Netherlands, from the artists' workshops for the Utrecht 'Dom' in 1475 to the latest movements of the 1990s." The extensive list of contributors is not only international but also interdisciplinary, comprising art historians, artists and art critics, historians, sociologists and literary historians. Approximately one-third of the 'Encyclopedia' is devoted to biography; another third offers narrative art history with artists, places, events, and stylistic arguments examined from different viewpoints. The remaining third is devoted to topical and thematic essays. As a result, many artists, places, events, and stylistic issues reappear in several discussions, offering a diversity of viewpoints.

There are 410 signed entries, arranged alphabetically and followed by cross-references and selected bibliographies. Entries range from 100 to 3000 words in length. The book includes a comprehensive index of names, places, events, movements, concepts and individual works and a glossary of terms. With the help of these tools, readers will be able to find many ways of looking at and understanding how art was inspired and created, how it functioned and how it was received in the Netherlands throughout its 500 years of history.

On a more personal note, to anyone as closely linked to the study of Netherlandish art as I am, this book has many pleasant associations: the opening sentence makes reference to HNA's 1993 conference in Boston and its distinguished keynote speaker and honorary member, Seymour Slive (whose Pelican volume on Dutch painting has just been reissued in paperback, see below); almost half of the contributors are members of HNA, as is the editor. Thus I look upon this truly impressive work with a certain amount of pride – that of *L'Éminence grise,* perhaps, or, more aptly, den mother. The real accomplishment goes of course to Sheila Muller and her contributors.

Seymour Slive, *Dutch Painting, 16001800* (Yale University Press Pelican History of Art). New Haven and London: Yale University Press, 1999. 392 pp, 321 b&w illus., 111 colour pages, ISBN 0-300-07451-4.

Paperback edition of the 1995 hardback edition, reviewed in this *Newsletter,* November 1996. – *KLB*

Hans Fransen, *Michaelis Collection. The Old Town House, Cape Town.* Zwolle: Waanders Publishers, 1997. 204 pp, 236 illus. ISBN 90-400-9872-7.

This volume contains a number of informative essays outlining the history of the Michaelis collection and the building that houses it. In addition, the book includes a catalogue of over 100 paintings and a selection of works on paper. Much of this information is indebted to initial research conducted by the late Professor Dirk Bax, former head of the Department of Netherlandish Cultural History at the University of Cape Town and noted Bosch scholar. His catalogue of the collection was published in 1965, and updated in 1981. Included here is his essay on the history of the museum building, the Old Town House, in which he describes the transformation of the structure from a civic centre to a cultural institution. Hans Fransen, the current director, has compiled this latest edition with a professed desire to make the collection accessible to both an international scholarly audience and the wider public.

The history of the collection is fascinating, and it is discussed at length by Michael Stevenson. Stevenson is currently writing his dissertation on the collections of 'Randlords' who exploited South Africa's mineral wealth in the late nineteenth century. Chief among these men was Sir Max Michaelis (1852-1932), a German by birth, who came to South Africa in 1876 to make his fortune from diamonds. He became a benefactor of the arts and higher education, and was knighted for these efforts in 1924. The collection was initially formed by Sir Hugh Lane, director of the Dublin Municipal Art Gallery, and purchased by Michaelis in 1914 as a gift to the Union government of Cape Town. Lane was first enlisted by Lady Florence Phillips, wife of a wealthy mining magnate, to assist in collecting paintings for the Johannesburg Art Gallery. After visiting Cape Town, and with the encouragement of Lady Phillips, Lane sought to provide the city with its own art collection. He succeeded in gathering a group of paintings that reflected the artistic patrimony of Cape Town's original Dutch settlers; Lady Philipps then convinced her friend to buy the collection for the municipality. The interior restoration of the Old Town House, intended to mirror typical period Dutch interiors, borrowed design elements from Guild Halls and private homes. The room that houses the collection of prints and drawings, for example, recreates a kitchen setting, replete with blue and while tiles and mantelpiece.

The Michaelis collection contains primarily minor Dutch and Flemish masters, including many studio productions, and they clearly reflect the prevailing taste at the turn of the century. Genre subjects are favoured to the near exclusion of mythological and religious scenes. There are no works by Haarlem mannerists or Utrecht Caravaggisti. As Fransen notes in his introduction to the catalogue section, the collection was not intended to compete with the major European institutions; rather it was established to be "for the benefit of a population far removed from the centres of world culture." Though the shaping of the Michaelis collection betrays a certain ideal image of the seventeenth-century Dutch, Lane was nevertheless able to obtain many exemplary works. Of particular note are the half-length *Portrait of a Woman,* by Frans Hals, an early monochrome landscape by Aelbert Cuyp and a lively *Concert of Birds* by Frans Snijders.

The catalogue contains a section of excellent colour repoductions, and each entry includes a black and white photo. Although the collection has not grown much since the original gift – only fourteen paintings have been acquired since 1933 – the museum has amassed over 100 prints and drawings since 1956 through variuous gifts and acquisitions. There are many gems to discover in this catalogue; it is worth perusing not only for the works of art but also for the fascinating story it relates of patronage in an uncommon land.

Phoebe Avery
University of Maryland

Looking at Seventeenth-Century Dutch Art: Realism Reconsidered. Edited by Wayne Franits. Cambridge and New York: Cambridge University Press, 1997. 274 pp, 122 illus. ISBN 0-521-49609-8. Now also available in paperback: ISBN 0-521-49945-3.

This worthwhile volume is devoted to a survey of the literature surrounding the highly-contested notion of "realism" in Dutch art from the late 1960s to the present. It contains fourteen articles by German, Dutch and American scholars and includes ample illustrations and a useful bibliography. The first eight essays will be familiar to some; they have appeared in previous publications or have been presented as papers at symposia. Some of them, however, appear in English for the first time; others have been revised and expanded for this volume. The remaining six articles were newly commissioned and articulate the continuing vitality of the debate over approaches to realism and the need for further exploration of the topic.

As Franits states in the introduction, the aim of this collection is to "explore . . . the significance of seventeenth-century Dutch art for its original audience." Both Franits and Konrad Renger review the historiography of research with a particular eye toward the developments in contextual approaches to the field. Eddy de Jongh's seminal essay "Realism and Seeming Realism in Seventeenth-Century Dutch Painting" is included here, representing the early interpretive breakthroughs. The efficacy of his iconologic approach is bolstered by the addition of J. A. Emmens's fascinating discussion of the underlying meaning of Gerard Dou's *Lying-in Room.*

The method of De Jongh's uses is not without its detractors. In their respective discussions of genre, Eric Jan Sluijter and Peter Hecht treat his approach with a critical eye. Svetlana Alpers, who has argued against the iconologic approach, asserts her stance that the contemporary fascination with mapping led artists to similarly reconstruct the visible world in their paintings. Her view is best reflected in Celeste Brusati's consideration of still-lifes, where Brusati analyses the ways in which objects are reflected in paint as they themselves reflect the world beyond the picture plane.

While the more recent essays acknowledge a debt to prior methodologies, each author takes a slightly different and innovative approach. Ivan Gaskell explores contemporary cultural norms surrounding the use of tobacco in the North and the negative portrayal of smokers. In a similar vein, Alison McNeil Kettering examines the underlying social structures represented by the specific interaction of figures in Ter Borch's paintings of "ladies in satin." Both Ann Jensen Adams and Herman Roodenberg treat the seventeenth-century view of the body and acceptable sexual roles as expressed in portraits and conduct books. Walter Liedtke takes a more traditional view, calling for a reconsideration of style as a means of interpretation, and Lawrence Goedde uses this type of approach to examine the conventions of style that created the appearance of 'natural' landscapes. Elizabeth Honig closes the collection with her insightful exploration of the ways in which artists consciously shaped gender roles in their depiction of figures interactive in seemingly everyday spaces.

Although no single volume can claim to be comprehensive considering such a broad and seemingly limitless topic, Franits has gathered an exemplary collection of essays that tantalizes the reader to probe further into this fascinating subject. What this volume so clearly brings to the fore is that the room for interpretative strategies brought to bear on the notion of realism in Dutch painting is forever expanding. However, it is also important to look back at past approaches while continuously exploring new methods.

Phoebe Avery
University of Maryland

Dennis P. Weller, *Sinners and Saints; Darkness and Light. Caravaggio and His Dutch and Flemish Followers.* With essays by Leonard J. Slatkes and Roger Ward [Exhibition catalogue]. Raleigh: North Carolina Museum of Art, 1998. 256 pp, 50 colour plates and 240 b&w illus. ISBN 0-88259-980-1.

The vogue for Caravaggio and his followers continues apace. And with exhibitions, populism is the order of the day. The Raleigh, North Carolina, Museum's exhibition, which moved to Milwaukee on January 29 and will then proceed to Dayton on May 8, is shadowed by the similar-sounding "Saints and Sinners: Caravaggio and the Baroque Image" in Boston (Boston College).

Dennis Weller's handsomely produced catalogue, with fine colour illustrations (including some splendid new details) makes a good job of introducing the public to Dutch and Flemish Caravaggism as exemplified in American collections together with a single work by Caravaggio (the Kansas City *St. John)* and a couple by Manfredi, who was arguably the crucial link between Caravaggio and his Northern followers. However, the book is also a valuable reference work for students and scholars. The useful, illustrated checklist of paintings by Caravaggio's Dutch and Flemish followers in American public collections carries us way beyond the 39 works in the exhibition (some of them from Raleigh's own impressive cluster) to tabulate 133 from across North America. While the stimulating essays on Italian Caravaggism, by Roger Ward, and Netherlandish Caravaggism, by Leonard Slatkes, are supplemented by Weller's own interesting piece on the history of Caravaggesque collecting in America. Ter Brugghen and Honthorst led the way, followed closely by Stom and Bijlert. Ward's essay, with its sensitive comments on colour and its deft articulation of the highlights of Caravaggesque dissemination, especially in Roman altarpieces of the second decade, is an authoritative and thought-provoking contribution. Slatkes too offers a challenging thesis, which includes an upgrading of the importance of Rubens for the spread of Caravaggism in the north (especially the internally-lit variety) and a return to his admirable previous exploration of the probable significance, and possible priority, of the Malines painter Adam de Coster as an exponent of candlelight. But his convincing reattribution to de Coster of the Dresden *Luteplayer,* still sometimes referred to Finson, shows that this enigmatic figure also executed daylight pictures.

The catalogue entries are thorough and informative, occasionally innovative – even if they are sometimes almost too measured, failing to take sides in important debates. Thus, for example, no view is expressed on Maurizio Marini's to my mind convincing designation of Mary Jane Harris's *St. Januarius,* currently on extended loan to the Palmer Museum of Art in Pennsylvania, as a copy of a lost, Neapolitan-period Caravaggio. On the other hand, Weller's preference for tentatively attributing this copy to Finson, rather than one of the several Italian names that have been proposed, may well be correct.

If this excellent catalogue whets the appetite for more research on the Netherlandish Caravaggists not least through its beautiful colour plates of, and pertinent observations on, that masterly but now neglected Antwerp contemporary of Rubens, Theodoor Rombouts one note of regret should also be sounded. For two of the most problematic and interesting Caravaggesque pictures in the United States, both of them indebted to famous compositions by the master, were conspicuous by their absence from the exhibition. Such an omission may have been unavoidable, but had they been there, we should have been better able to decide, through comparison with works by Régnier, van Oost the Elder and Gerard Seghers in the show, whether the *St. Matthew and the Angel* from the Ringling Museum is by Regnier or van Oost (or neither), and whether the dextrous *Taking of Christ* from the Boston Museum of Fine Arts is French (close to Valentin and Vouet) or, in fact, Flemish (with similarities to Seghers), as several scholars are now beginning to suspect.

John Gash
University of Aberdeen

Natuur en landschap in de Nederlandse kunst 1500-1850. **Eds. Reindert Falkenburg, Jan de Jongh, Mark Meadow, Bart Ramakers, Herman Roodenburg, Frits Scholten (Nederlands Kunsthistorisch Jaarboek/Netherlands Yearbook for History of Art, 48, 1997). Zwolle: Waanders Publishers, 1998. 317 pp, with illus. ISBN 90-400-9991-x.**

Within the past two decades no subject in Netherlandish art has received more creative scholarly attention than landscape. Within the intense and ongoing interpretive debates about symbol and meaning, representations of nature have especially benefitted from the application of new ways of thinking, launched by such groundbreaking studies as David Freedberg's *Dutch Landscape Prints* (1980), Lisa Vergara's *Rubens and the Poetics of Landscape* (1982), and Peter Sutton's Dutch landscape exhibition of 1987. This collection of eight essays offers diverse approaches to the topic, opening with Antonia Boström's discussion of a previously unpublished letter describing the acquisition of Flemish painted maps for the Tornabuoni Palace in Florence – a study that opens up broader consideration of the Antwerp art market and Italian admiration for Flemish landscape painting and cartographic prints whose decorative quality, the author argues, relates to an established Florentine taste for Flemish tapestries.

Joaneath Spicer's essay finds a repertory of figural and landscape motifs (first developed in Bohemia and the Alps by Roelandt Saverij) in the paintings of Adam Willaerts and his sons in Utrecht where they function as a conventional pictorial code (exotic rock formations, buildings, costumed figures) to denote foreignness in scenes with non-Dutch locales. This use and re-use of a set vocabulary borrowed from another artist demonstrates, in a highly unusual manner, the extent to which Dutch landscape often melded fabricated and observed motifs.

An extensive article by Huigen Leeflang on urbanisation and the parallel growth of Dutch landscape discusses Haarlem's history and the exceptional beauty of its local scenery as reasons for its preeminence in landscape production. Comparisons to other cities are drawn, while city descriptions, songbooks, topographical views, and Calvinist doctrines are explored as further evidence of Dutch attitudes toward nature. Haarlem is also the focus of Catherine Levesque's discussion of early seventeenth-century Dutch maps and print series, as they construct the notion of prosperous peace. Earlier peace *topoi* of gardens and triumphal processions are examined, in comparison to images by Buytewech and Visscher, among others, that use the pacific bounty of the land (more than the representation of a ruler) to encourage political identity, social harmony and appreciation for freedom in a newly independent Dutch nation.

Reindert Falkenburg's examination of Jan van Goyen's landscapes with thunderstorms assesses the notion that Dutch landscapists used such innovative themes as marketing strategies in a highly competitive art market, concluding that general viewers of the time probably did not regognize distinctions between subjects. Thus, such scenes (thought to be the most difficult to paint) probably appealed to a smaller audience of connoisseurs who were able to recognize and appreciate the notion of artistic competition or *aemulatio* as a stimulus to excellence.

An examination of Rembrandt's hidden lovers by H. Rodney Nevitt Jr., considers the motif in *The Three Trees* and *The Omval* within the context of songbooks and amatory poems of the time which, for example, compare fishing and boating to the process of amorous pursuit, describe courtship outings in the countryside, and associate storms in nature with the turbulance of love.

Julie Berger Hochstrasser, observing the pervasive Dutch landscape motif of a road receding into space as if from the observer's feet, surveys the development of recessional schemes, arguing that in seventeenth-century paintings such roads express the new mobility of travel, as well as a new national fascination with exploring one's homeland, also manifested in maps and city views of the time. The fact that such landscapes show a highly selective, even unrealistic view of nature without human industry (most travel was done on the more easily navigated network of Dutch canals), underlines the Dutch craving, in an increasingly urban society, for the rural outings that these quiet country roads invoke.

The volume concludes with Toos Streng's account of the revival of esthetic and theoretical interest in Dutch landscape after 1850, following a decline in its ranking in the hierarchy of genres during the second quarter of the century. The author finds reasons for this shift in the growing recognition of observers' capacities for non-verbal experience, as indicated by the new popularity in art criticism of the word "stemming" (attuned, subjective mood), a term first applied to music.

Susan Donahue Kuretsky
Vassar College

***Ruïnes in Nederland.* With contributions by M. J. Kuipers-Verbuijs, H. Klomp, N. C. M. Maes, J. Michels, A. G. Schulte, A. de Vries, R. J. Wielinga. Zwolle: Waanders Publishers, 1997. 333 pp, with illus. ISBN 90-4009974-x.**

This handsome and extremely useful volume, produced by the Rijksdienst voor Monumentenzorg in Zeist, provides a fully illustrated catalogue of the best-known ruin-sites in the Netherlands, with chapters on monuments in Gelderland, Limburg, North Brabant, North Holland, Overijssel, Utrecht, Zeeland and South Holland. Each ruin is meticulously documented with both verbal and photographic description of its present state, discussion of its location and history, explanation of its stages of restoration (in many cases illustrated by elevations and ground plans of the sites), and an individual bibliography.

For art historians, an especially welcome feature of this book is its copious illustration of paintings, prints and drawings of ruins, dating from the fifteenth through the nineteenth centuries - many, novel examples that have been culled from private collections, provincial museums or town archives. Some record particular monuments; others were probably artistic inventions. All, however, demonstrate the range of meanings and associations this evocative motif had for Netherlandish artists, from the ruined shed of the Nativity, suggesting the collapse of the Old Era, to the crumbling vanitas motifs that appear in both portraits and landscapes until well into the nineteenth century.

As a whole, this volume has an unexpectedly complex and diverse intellectual scope, for the eight thoughful essays that precede the catalogue define and discuss ruins from multiple perspectives: cultural and historical (also covering examples in England, France, Germany and Belgium), artistic (encompassing the use of ruin motifs in literature and garden design), and scientific (a consideration of conservation and restoration to demonstrate how natural processes and the workings of mosses, birds and small creatures can act upon brick or stone structures).

Even beyond its great documentary importance, the book is beautifully produced. The exceptional quality of its black and white and colour photographs actually allows the reader, in many cases, to experience something of the haunting, mysterious lure of these fragmentary structures as they continue to endure within nature.

Susan Donahue Kuretsky
Vassar College

Delft Masters, Vermeer's Contemporaries: Illusionism through the Conquest of Light and Space. By Michiel C. C. Kersten, Daniëlle H. A. C. Lokin, with the cooperation of Michiel Plomp [Exhibition catalogue]. Zwolle and Delft: Waanders Publishers and Stedelijk Museum 'het Prinsenhof', 1996. 224 pp, 205 illus. ISBN 90-400-9829-8 (hardcover), ISBN 90-400-9828-x (softcover)

In the foreword to this handsome volume, which was published to complement the 1996 exhibition of the same title at the Stedelijk Museum 'het Prinsenhof' in Delft, Daniëlle Lokin states that "the book you are holding is an attempt to make the fruits of this [recent Delft-focused] scholarship accessible to a broader audience." In this respect the book succeeds admirably. The four essays that comprise the volume provide an excellent overview of artistic development in Delft. They are, moreover, illustrated with a generous number of good colour plates.

Delft Masters, Vermeer's Contemporaries is not strictly an exhibition catalogue, although a checklist of works in the show is included at the end of the book. The first essay, by Michiel Plomp, is a general sketch of the artistic traditions in Delft from 1600-1650. His overview introduces the main focus of the book: the period of Delft's greatest artistic achievement, 1650-1675. Daniëlle Lokin's two essays deal with paintings of public spaces in Delft. Her first essay surveys the fascinating development around 1650 of paintings of church interiors by Gerard Houckgeest, Emanuel de Witte, and its continuation by Delft native Hendrick van Vliet. In the second essay Lokin treats representations of the Delft townscape from 1650-1675. Much of the chapter is devoted to Pieter de Hooch's courtyard scenes, which, however, are sometimes only tangentially related to townscapes through the appearance of a segment of the Delft city wall or a church tower. Lokin's discussion of the artists Daniel Vosmaer and Egbert van der Poel is particularly useful given the lacunae of information on these two Delft artists.

The final essay, by Michiel C. C. Kersten, on Pieter de Hooch and Dutch genre painting is the most problematic of the surveys in this book. Although Kersten rightly focuses on the work of De Hooch as instrumental in the development of the Delft genre piece in the 1650s, he does not really assess Vermeer's contribution to genre painting in Delft throughout the period under discussion. This omission is partly explained by the fact that the Delft show coincided with the Vermeer exhibition at the Mauritshuis in The Hague, but more discussion of Delft's most important artist would seem to be warranted. Instead, Kersten expanded his discussion to include artists influenced by or loosely grouped with De Hooch, even those who never worked in Delft. Unfortunately, the overview of Delft genre paintings that results from this essay is both incomplete and misleading.

Quint Gregory
University of Maryland

Wim Klooster, *The Dutch in the Americas 1600–1800, A Narrative History with the Catalogue of an Exhibition of Rare Prints, Maps, and Illustrated Books from the John Carter Brown Library* [Exhibition catalogue]. Providence, RI: The John Carter Brown Library, 1997. 101 pp, 9 colour plates, 75 b&w illus. ISBN 0-916617-50-5 (cloth), 0-916617-51-3 (paper).

Situated in a resplendent Neo-classical building on the College Green of Brown University, the John Carter Brown Library is an independently administered and funded research collection dedicated to American history pre-1830. Home to 45,000 rare books and 20,000 reference works, the Library bills itself as a center for advanced research in history and the humanities. Historians of Netherlandish art should take note of this institution, both for its treasure trove of original sources, and for the short- and long-term research fellowships it offers. (Rebecca Parker, a graduate student in Netherlandish art history at the University of Chicago and HNA member, will be a fellow there in the summer of 1999.) The importance of this resource for Neerlandica, despite its American focus, was demonstrated in 1997-98 with an exhibition of books from the Library's collection that chronicle Dutch exploration, colonization and trade in the New World. The connection, of course, is the early presence of Dutch settlers in southern New England and New York, but the catalogue demonstrates that the Library's holdings on this theme are hemispherical in scope.

Wim Klooster was a research fellow at the John Carter Brown Library, investigating Dutch smuggling in the context of European mercantilism in the early modern period, when the Library's director decided to mount an exhibition of the Library's holdings on the Dutch empire and its commercial and military activities in the Western hemisphere. Klooster was asked to survey the collection and select the best 175 items for the exhibition. (The catalogue gives no precise information about the total number of relevant materials in the collection, but implies that there is much more.) After two years of preparation, the show opened in Providence in May 1997 and moved from there to the Equitable Gallery in New York, closing in April 1998. Klooster also wrote the accompanying volume, *The Dutch in the Americas 1600-1800,* which is the subject of this review.

Exhibitions of books are problematic in that the tactile pleasure of leafing through the pages, so essential to bibliophilia, is necessarily prevented by enshrining the volumes behind glass. Even as objects of aesthetic display, books remain tantalizingly elusive, revealing only a page or two at a time. That being said, the catalogue of such an exhibition, especially if well-illustrated, might often serve as well or better than the show itself to indicate the appearance and content of the books presented.

In the present case, however, the organizers made the decision to depart from the traditional exhibition catalogue format (by which I mean a sequence of substantive entries on individual objects) and to commission from Mr. Klooster "a short narrative history on the Dutch ventures in the West during the colonial period." Accordingly, the volume consists primarily of a sequence of chapters following Dutch progress through the Strait of Magellan to Brazil, North America and the Caribbean. Dutch attempts at colonization and, more successfully, trade are set against the background of a concise historical summary, charting the rise of the Republic, the foundation of the West India Company, the short-lived governorship of Johan Maurits in Pernambuco, and the rise and fall of Dutch map- and atlas-makers, who dominated the market in the seventeenth century for both accurate seafaring charts and fanciful profiles of newly established colonies, with their exotic flora and fauna. Art historians will be especially interested in Chapter 4, which surveys both mapmaking and book illustration, noting the importance, and varying reliability, of visual imagery and eye-witness accounts for transmitting geographical, botanical and anthropological discoveries.

The narrative is illustrated throughout with plates from volumes included in the exhibition. Among the nine full-page color plates is a fascinating 1673 map of the Northeast, showing "Nieu Jarsey"," 't Lange Eylandt" , and environs, with a celebratory panoramic view of "Nieuw Amsterdam", all too soon to be re-christened as New York. All this is familiar, but who knew that Cape Cod (just north of "Roode Eylant") was once dubbed "Nieuw Hollant", and Martha's Vineyard "Texel"?

The illustrations reproduced here are more significant as historical artifacts than as aesthetic objects. In some cases, the artist's struggle to reconcile representational convention with wildly unfamiliar content is so apparent as to provoke humor. But these images of rapidly changing lands and peoples also inspire curiosity to understand more about the multi-cultural forces at work in the volatile colonial environment they depict. Unfortunately, however, Klooster's historical survey does little to engage the substantive issues raised by both the pictures and their texts. Unfortunately, too, the catalogue presents only the most basic information about the books themselves: the narrative essay is followed by a checklist that cites only the author's name, complete title (most are in Dutch), and publication data for each volume.

Ultimately, this book is most useful as a concise illustrated summary of Dutch colonial expansion, written in an accessible style, and as an indication of the rich resources available at the John Carter Brown Library in Providence, Rhode Island. As interest in Dutch colonial history and its pictorial record continues to grow, this underutilized research collection should prove a territory worth exploring.

(Inquiries: The John Carter Brown Library, Box 1894, Providence, RI 02912.)

Stephanie Dickey

Herron School of Art, Indiana University-Purdue University, Indianapolis

Rembrandt's Bathsheba Reading King David's Letter. Edited by Ann Jensen Adams (Masterpieces of Western Painting). Cambridge and New York: Cambridge University Press, 1998. 214 pp, 35 b&w illus. ISBN 0-521-45391-7 (hardcover), ISBN 0-521-45986-9 (paperback).

This book of six essays plus introduction serves as the Rembrandt volume in the series 'Masterpieces of Western Painting', whose purpose is to take canonical works of Western European art (in this case Rembrandt's 1654 *Bathsheba* in the Louvre) and present them for the undergraduate level (and beyond), with varied methodologies and interpretations. These six essays present a dazzling range of associations with cultural values, gender studies, and documentation. Ann Adams's introduction deftly presents current Rembrandt studies and critical presentation of the following essays, making the connections and distinctions in their approaches.

As representative of the Rembrandt Research Project (now its chairman), Ernst van de Wetering discusses the painting as a process of realization in the first chapter 'The Object and its Transformations'. He offers many technical observations, of which one is that the letter was added very late in the making of the painting (p. 40). However, technical aspects of the painting are treated lightly, no doubt because they will be extensively discussed in the RRP forthcoming publication. The premise throughout the volume depends upon the RRP certification that the painting is "unquestionably authentic" (p. 40). Using Junius as a theoretical frame, Van de Wetering proposes Rembrandt here represents no single moment in the narrative, but the entire story; he points out that Bathsheba's story presented a range of interpretations, from promiscuous woman to venerated ancestor of Christ.

In 'Conventions of a Seductive Theme', Eric Jan Sluijter continues the first chapter's indication of the broad range of meanings in the visual tradition of Bathsheba, the nude, and morality. Rembrandt's departure from idealized nudes toward acute expressiveness, from his earliest renditions *(Andromeda)* to his later works, is a means by which the viewer is able to respond with empathy. The beholder, therefore, becomes more of a participant in the depicted event. Sluijter also examines the phenomenon of sight as a masculine process, related to Christian morality, the woman as seductress, and the roles of men as voyeurs and old women as procuresses.

As one who has studied two of the most examined aspects of the *Bathsheba,* crossed legs and women reading, Leo Steinberg seems to have taken delight in writing 'An Incomparable Bathsheba'. Taking as his point of departure the propensity of scholars to find similarities in dissimilar things (homeosis), he takes aim at those who have presumed Rembrandt knew and used the Perrier etching as a source for the pose of the Bathsheba, a source first proposed in 1953. (See further the essays by Sluijter and Carroll, where Rembrandt's use of the relief is discussed with respect to its thematic appropriateness. The Perrier print, published 1645, reproduces a small marble relief now in the Palazzo Altemps, of a bride who "wipes away her tears with her wedding veil.") His points are well taken. By using the example of a lekythos, however, he somewhat undercuts his argument; the differences between the lekythos, which shows a woman bathing with a servant (titled 'The Toilet of Helen' [or Aphrodite]), and the 1654 *Bathsheba* are greater than those between the Perrier print and the painting.

Mieke Bal, in 'Reading Bathsheba: From Mastercodes to Misfits', analyses categories into which the painting fits: realistic depiction; the nude; the story. She discusses three modes of meaning production: genre labels, signs, and iconographic precedent. This essay provides an interdisciplinary approach that blends literary criticism and the visual arts.

The fifth chapter is one essay divided into two parts, with the goal of exploring the roles of the lead character and those around her, both according to the biblical text and to Rembrandt's household. Svetlana Alpers discusses the biographical circumstances of Rembrandt, with Hendrickje as his partner, who, while pregnant, was summoned to the church council. Placing *Bathsheba* in the category of historiated portraiture, she examines Rembrandt's habit of placing himself, Saskia, and Hendrickje in roles of biblical or other characters. Margaret Carroll discusses the "alternative set of correspondences based upon an identification of Hendrickje with Bathsheba in her role, not as a monarch's mistress but as Uriah's wife; and upon an identification of Rembrandt with Uriah." (p. 161)

The last chapter, 'Though Deficient in Beauty', is by Gary Schwartz, and provides a welcome documentary history of the 1654 *Bathsheba,* with reference to the appreciation for Rembrandt's other nudes, most especially the 1643 *Bathsheba* and the *Susanna* of 1647. The critical appraisal of the 1654 *Bathsheba* over the years reveals as much about the painting as about the viewers' expectations for Rembrandt in their own time.

The book is an introduction to current methodology on many levels: literary theory and semiotics (Bal, Alpers, Carroll); documentation and technical analysis (Van de Wetering, Schwartz); and iconography, visual patterns, and interpretation (Steinberg, Sluijter). For students, this sampling of approaches with respect to a single art work is a rich opportunity to gain access to the discipline of art history, which is, by its definition and essence, interdisciplinary in material and methodology.

Amy Golahny
Lycoming College

Ivan Gaskell and Michiel Jonker, eds., *Vermeer Studies: Symposium Papers XXXIII. Studies in the History of Art, 55. Center for Advanced Study in the Visual Arts, National Gallery of Art, Washington, DC.* New Haven and London: Yale University Press, 1998. 372 pp, 272 b&w illus., 48 colour. ISBN 0-300-07521-9.

This invaluable volume brings together twenty-three papers from two symposia organized for the Vermeer exhibition: the first co-sponsored by the Center for Advanced Study in the Visual Arts and the Department of Art History at the University of Maryland took place in December of 1995; the second, in May of 1996, was organized by the Mauritshuis and the Netherlands Institute for Art History (RKD). An opening discussion by Ivan Gaskell situates the essays within a larger art historical context, describing the varied approaches that have been taken to Vermeer, whose resistance to definitive interpretation is perhaps the most distinctive quality of his art.

The essays are grouped in three categories: Part I ('Constructing Vermeer'), primarily historiographic, includes articles by Ben Broos (malice and misconception in the history of Vermeer scholarship, including the myth of the "Sphinx of Delft", and comments on the van Meegeren scandal); Frances Suzman Jowell (the recovery of Vermeer's reputation in the nineteenth century by Thoré-Bürger); J. M. Nash (on the Rembrandtian emphasis on thoghtfulness in works such as the Dresden *Letter Reader* and the Berlin *Woman with a Pearl Necklace);* Marten Jan Bok (an examination of the Utrecht painter Johannes van der Meer, often confused with Vermeer by early scholars); Leonard Slatkes (on Delft's culture of Caravaggism and connections between Utrecht and Delft that affected Vermeer); and John Michael Montias (recent archival research on Vermeer, including further evidence on the van Ruijven family and Pieter Teding van Berckhout's accounts of his visits to the painter).

Part II ('The Construction of Vermeer's Paintings') has essays by Jean-Luc Delsaute (a study of the sixteenth- and seventeenth-century use of the camera obscura suggests that although Vermeer was interested in the device, he did not necessarily use it); David Bomford (a study of perspective, anamorphosis and illusion in seventeenth-century Dutch peep shows in the National Gallery, London, the Bredius Museum in The Hague and the Detroit Institute of Arts); Koos Levy-van Halm (Vermeer's purchases of painting materials from the shops of apothecaries and grocers); Nicola Costaras (a technical study of the canvasses, grounds and paints used by Vermeer); Karin M. Groen, Inez D. van der Werf, Klaas Jan van den Berg and Jaap I. Boon (scientific examination of *Girl with a Pearl Earring);* E. Melanie Gifford (Vermeer's techniques for painting light); and Jorgen Wadum (Vermeer's handling of light sources and renderings of softened contours).

Part III is devoted to 'The Construction of Interpretation'. Ivan Gaskell's introduction enumerates the three interpretive approaches (associative, contextual and generative) used by Vermeer scholars, but argues that the real issue is manipulation of visual fiction or artifice, through which both artist and viewer are distanced from the pictorial world; Lisa Vergara (the pictorial structure of *Lady Writing a Letter with Her Maid* invokes an ideal of femininity in the lady's juxtaposition with *The Finding of Moses,* the still life on the floor, and the maid); Irene Netta (the phenomenon of time in Vermeer's work, as temporal permanence within the depicted moment); Eric Jan Sluijter (identifying the model in the *Art of Painting* as an *historia* whose structure may be read in rhetorical terms); Gregor J. M. Weber (Vermeer's pictures within pictures related to the rhetorical use of exempla for argumentation); Nanette Salomon (recognition of the shift in tone from sexuality to civility in depictions of women after mid-century leads to new readings of several Vermeers); Marieke de Winkel (interpretation of dress in Vermeer's paintings with illustrations of actual costumes of the period); Daniel Arrasse (Vermeer's allegories as reflective of his own private conceptions about painting); Eddy de Jongh (an assessment of recent notions of masking and multivalence in Vermeer, with a discussion of *Woman Holding a Balance* as a possible personification of conscience).

This banquet of Vermeer scholarship reveals that just as this artist continues to stimulate innovative scholarly research, the debates about his intentions remain equally lively and, often, equally unresolved.

Susan Donahue Kuretsky
Vassar College

Mariët Westermann, *The Amusements of Jan Steen: Comic Painting in the Seventeenth Century* (Studies in Netherlandish Art and Cultural History, 1). Zwolle: Waanders Publishers, 1997. 365 pp, 15 colour plates, 192 b&w illus. ISBN 90-400-9915-4.

Mariët Westermann's *The Amusements of Jan Steen* casts Steen's brilliant comic art in a dazzling new light. Comedy of earlier eras is notoriously both deceptively universal and supremely difficult to understand because of its grounding in the nuances of its time and place. Westermann's erudite and entertaining study provides new access to the ways Steen's genre paintings, portraits, and histories appealed to and functioned for seventeenth-century viewers by situating them firmly in the contexts of comic literature and performance, of rituals and social practices. Impressive new documentation gives a clearer picture than ever before of Steen's audience of prosperous urban connoisseurs. Insightful analysis of Steen's career, his conception of himself as an artist, his highly creative response to the art of his times, and his critical reputation results in a new understanding of this unique artistic personality. Further, Westermann's book is a model of how the methods of art history can be integrated with those of social and cultural history.

The book begins and ends with historiography, which is fitting given the contradictions embodied in Steen's legendary personality and shifting critical reputation. Chapter One sets the stage by examining Steen's early *fortuna critica* "to see if and how his paintings themselves might have structured particular interpretations of the pictures and their maker." Here, Westermann deftly analyzes Arnold Houbraken's witty biographical conflation of Steen's art and his life and then assesses its legacy. In the book's Epilogue, she turns to the more recent vicissitudes of Steen's reputation in the Netherlands to suggest how they manifest changing notions of Dutch national identity.

The body of Westermann's text studies Steen's paintings thematically, all the while drawing on new material to provide a rich context for getting at the complexities of his art and its reception. Chapter Two first explores Steen's development and formation as a comic painter within his culture, arguing that he set out to fashion himself as the Pieter Bruegel the Elder of his age, and then looks closely at exactly who constituted the market for Steen's particular brand of farce. In Chapter Three, 'The Pictorial Poetics of Comedy', Westermann examines seventeenth-century comic practices from joke books to plays to answer the question how Steen's imagery of lovesickness and unruliness were funny to his contemporaries, and she sets out the various comic pictorial strategies Steen employed. The next two chapters examine Steen's genre pictures. Chapter Four looks at those dealing with the rituals of social life – the *rederijker* gatherings, Twelfth Night feasts, and St. Nicholas Day celebrations – against the background of the fair, the theatre, and the nuances of Catholic and Protestant practices. Chapter Five, 'Painter's Wit', takes a different tack to address Steen's erudite, sometimes archaizing emulation of past art, from his initial insertion of himself into the lineage of Bruegel to his irreverent inversions of the likes of Raphael, and the range of his witty responses to the works of such contemporaries as Rembrandt and Frans van Mieris. Chapter Six examines "how Steen's four genre-like portraits were informed by his identity as a comic painter, and what advantages their precarious position at the limits of portraiture could have offered to him or his sitters." Chapter Seven, 'History as Tragicomedy', is a thoughtful analysis of the ways in which Steen's unconventional approach to history painting, his choice of subjects, and his highly theatrical historical mode are informed by his unique brand of comedy.

Westermann's book is the auspicious first volume in a welcome new series, "Studies in Netherlandish Art and Cultural History," edited by Reindert Falkenburg, Herman Roodenburg, and Frits Scholten.

H. Perry Chapman
University of Delaware

Nanette Salomon, *Jacob Duck and the Gentrification of Dutch Genre Painting* (Ars Picturae, 4). Doornspijk, The Netherlands: Davaco Publishers, 1998. 192 pp, 12 colour plates, 122 b&w illus. ISBN 90-70288-56-7.

Nanette Salomon's *Jacob Duck and the Gentrification of Dutch Genre Painting* successfully accomplishes the dual, interesting goals of the author: "One is the analysis of visual culture's role in the construction and reconstitution of social values, the other is the investigation of an individual painter's oeuvre (p. 19)". Although based to some degree on her doctoral dissertation, which examined aspects of sleep in Dutch art, the author successfully subordinates the topic of the sleeping figure – especially the sleeping woman – a specialty of Duck's, to a balanced examination of the various themes in Duck's paintings. The book includes six chapters: 1. Introduction; 2. The League of Men: The *Cortegaerdje* (Guardroom Scene); 3. The League of Women: The *Bordeeltje* (Bordello Scene); 4. Men and Women Together: The *Geselschapje* (Merry Company Scene); 5. "Others"; and 6. Conclusion. The volume also includes a brief biography of Jacob Duck (c.1600-1667), a previously insufficiently studied seventeenth-century Dutch painter who worked predominantly between the late 1620s to 1650. Although Utrecht was Duck's hometown, the records of painters' guilds in Utrecht, Haarlem and The Hague cite him. A checklist includes those paintings considered to be authentic by Salomon, as well as those works that she analysed in researching and writing the book.

Each of the volume's chapters concludes that the subjects of the paintings under consideration, that is, soldiers, prostitutes and gypsies, who lived on the fringes of society and thus possessed a quality of "otherness", enjoyed the license to engage in behaviour that was inappropriate for the middle-class viewer. Citing the previous scholarship of anthropologists and other art historians, Salomon writes that "society often constructs the image of an 'outsider', or 'other', as a means of defining itself (p. 26)." Through the depiction of various scenarios typical, in particular, of soldiers, prostitutes and their customers, Duck's paintings both reflected and at the same time helped to codify real contemporary social attitudes towards hierarchies of gender and sexuality, as well as of attendant class structure in the case of the bordello scenes. From such paintings the middle-class viewer was taught moralizing lessons concerning the pitfalls of the traditional vices of anger, intemperance and negligence in the case of the guardroom scenes, and of vanity, lust and worldliness in the case of the bordello scenes. The presence of sleeping figures in both contexts further evoked the vice of sloth. Simultaneously, the same middle-class viewer vicariously enjoyed the very illicit behaviour acted out by those safely distanced on the fringes of society from the viewer's own identity.

Salomon also analyses the changes over the course of time in Duck's conception of such subjects, and the artistic style he employed. In so doing, the moralizing pictorial and literary traditions to which she relates Duck's imagery are extensive and impressive. Early examples of Duck's paintings from the 1620s and 1630s depicted overtly comic, bawdy and caricatured figures. Such paintings were also often characterized by the old-fashioned inclusion of a figure who functioned as the moralizing narrator by directly addressing and instructing the viewer. In this sense, the earlier paintings were not only more referential, but were also consciously self-referential. In contrast with such early, "closed" works, that is, predetermined in their specific moralizing and didactic meaning, Duck's later paintings are characterized by the author as "open", that is, lending themselves to multivalent interpretations by the middle-class viewer.

In the early 1640s Duck began to gentrify his earlier illicit conceptions resulting in paintings of acceptable human relationships in normalized settings that had greater aesthetic appeal. The viewer was invited to supply the meaning of such later pictures resulting in "self-regulation" (p. 137), rather than being instructed by a pictorial narrator. Salomon argues that the gentrification of Duck's paintings both reflected and helped to define the contemporary gentrification of his middle-class patron and viewer. Further, Duck's later paintings of Merry Companies, in particular, played a role in the evolution of the societal conception of leisure as enjoyable, even funny.

Jacob Duck and the Gentrification of Dutch Genre Painting makes a highly significant contribution to the Davaco series of monographs on seventeenth-century Dutch artists, and to our understanding of pictorial and cultural issues raised by such prevalent scenes in Dutch art of guardrooms, bordellos, merry companies and gypsies.

Linda Stone-Ferrier
The University of Kansas

Lyckle de Vries, *Gerard de Lairesse. An Artist between Stage and Studio.* Amsterdam: Amsterdam University Press, 1998. 212 pp, 70 illus. in colour and b&w, ISBN 90-5356-250-8.

In late seventeenth-century Holland the paintings, engravings and treatises of Gerard de Lairesse (1640-1711) were influential among artists and connoisseurs who admired classicizing styles. His paintings adorned not only several grand homes along the Herengracht but also public buildings in both Amsterdam and The Hague. His decorative works set the pace for other artists. In three sections, Lyckle de Vries discusses the place of Lairesse's visual *oeuvre* within the Dutch artistic tradition, the features distinguishing his theoretical stance in *Grondlegginge der Tekenkonst* (1701) and *Groot Schilderboek* (1707) from the positions of other authors, and the impact of his engagement with Amsterdam's theatre and its rhetorical ideals. In the process, De Vries highlights several of Lairesse's decorative works and selects other paintings and prints from his *oeuvre* to bolster specific points.

Together De Vries's three sections argue that Lairesse was in accord with the trend toward classicism in Dutch art, art theory and theatre but that his ultimate artistic ideal was the *gesamtkunstwerk.* The argument commences with a discussion of Dutch artistic 'classicism'. Referring to Flemish paintings as models of 'classicism', the author concludes that the artist's style was neither unrelentingly 'classicist' nor completely 'baroque'. This definition accomodates his argument that the *gesamtkunstwerk,* generally considered a patently baroque invention, was Lairesse's highest artistic ideal. De Vries also contends that Lairesse's moderate style was in keeping with the dominant tradition for history painting in Holland. He categorizes that tradition as an adaptation of Italian training and inspiration to local demands for classicism.

Similar logic underlies the second section. It commences with a summary of late-seventeenth-century art treatises that provides De Vries with the means to integrate Lairesse's texts with the Dutch tradition for writing about art. The same treatises also serve as touchstones for the discussion of Lairesse's art theory. In that discussion, De Vries seeks to establish that Lairesse again struck a compromise between classicist and baroque extremes. Although De Vries agrees with Emmens that Lairesse's treatises were the most classicizing of those written in the Netherlands in the seventeenth-century, he ties Lairesse's unique statement that painting and sculpture depend upon architecture to the *gesamtkunstwerk.*

De Vries closes the *gesamtkunstwerk* argument in the last section by focusing on the lost stage sets that Lairesse painted for the now destroyed Amsterdam theatre. Using previous scholarship on the artist's association with *Nil Volentibus Arduum,* a reform-minded group of largely classicist playwrights who 'perfected' and published both translations and original plays, De Vries asserts that the painter quite literally adopted their goals. Accordingly, when the sets were combined with actors and narratives they realized Lairesse's ideal, the *gesamtkunstwerk.* The *ut pictura poesis* tradition surely yielded strong parallels between theatre and art. Both Lairesse's career and treatises, however, posited the depiction of figures and the communication of narrative as a painter's highest reachable goal. Could the theatre, an art form with different parameters, thus serve as a 'realisation' of his ideals?

In this book De Vries takes the first steps toward resuscitating Lairesse as a Dutch artist. The three sections establish points of contact between Lairesse's *oeuvre* and seventeenth-century Dutch artistic ideals. As De Vries notes at several points, however, both Lairesse's *oeuvre* and art in late seventeenth-century Holland merit further research.

Melinda K. Vander Ploeg Fallon
University of Delaware

Shorter Notices

Friso Lammertse, with contributions by Jeroen Giltaij and Anouk Janssen, *Dutch Genre Paintings of the 17th Century: Collection of the Museum Boijmans van Beuningen.* Rotterdam: Museum Boijmans van Beuningen, 1998. 209 pp, 32 colour, 70+ b&w illus. ISBN 90-6918-194-0.

Dutch Genre Paintings of the 17th Century is the eleventh of a series of catalogues of the paintings and sculptures in the collection of the Museum Boijmans van Beuningen. Its publication coincided with a fine exhibition of the museum's genre holdings. This volume's brief introduction comments on the problems of defining "genre" and outlines the history of the collection. Useful catalogue entries, which are arranged alphabetically by artist, provide thorough information on provenances, attributions, and datings, and also include complete bibliographies and lengthy examinations of the meanings of the pictures. The emphasis here is on tracing "at least some of the associations these pictures would have conjured up in the 17th century." The seventy works catalogued range from some of the best known, most written-about Dutch genre paintings, Gerard Dou's *Quacksalver* and Emanuel de Witte's *Interior with a Woman at the Virginal* for example, to such unusual pictures by well-known artists as Gerard ter Borch's *Procession of Flagellants,* to works by less familiar artists that are rarely on display. Substantial, informative texts on individual paintings provide useful new information and sensibly summarize the existing scholarship, for the most part critically assessing proposed interpretations with a healthy degree of scepticism.

H. Perry Chapman
The University of Delaware

Gian Casper Bott, *Stilleben* [Exhibition] (Bilderhefte des Herzog Anton Ulrich-Museums Braunschweig, 10). Braunschweig: Herzog Anton Ulrich-Museum, 1996. 72 pp, 28 colour plates, ISBN 3-922279-35-X.

Still-lifes, including the sub-category of flower painting, have become a popular subject in the last years – for viewers and scholars alike. The trend will reach one of its peaks in the soon-to-open still-life exhibition in Amsterdam and Cleveland (see above). This popularity however is not confined to today. Princely collections such as the House of Braunschweig-Lüneburg contained large numbers of still lifes: 54 in Braunschweig, to be exact, of which only a small selection is on permanent view (though Herzog Anton Ulrich, founder of the collection, purchased only one still life; most were acquired in the eighteenth century by Herzog Carl I). For the exhibition which gave occasion to the present publication, 28 still life paintings were on display (August 15 – October 20, 1996).

This modest booklet, seemingly so unlike the 'pronk-stilleven' it discusses, is full of fascinating information as well as being surprisingly attractive (given its small size) in its visual presentation. Gian Casper Bott provides a lively and refreshingly different view of his subject. Besides turning to emblems and contemporary literature, he also draws on his thorough knowledge of ancient literature and mythology in his interpretation of individual still lifes. Thus in Jacob van Walscapelle's *Garland of Flowers* the numerous butterflies may be seen as a reference to Jupiter painting butterflies, as described by Alberti and famously painted by Dosso Dossi (Kunsthistorisches Museum, Vienna). – *KLB*

Arthur K. Wheelock Jr., *From Botany to Bouquets. Flowers in Northern Art* [Exhibition]. Washington, DC: National Gallery of Art, 1999. 88 pp, numerous illus. in colour and b&w. ISBN 0-89468-238-5.

This small publication, essentially an extensive essay rather than a catalogue, was published in conjunction with the exhibition at the National Gallery which closes in May (January 31 – May 31, 1999). Much research has been done recently on the symbolism and meaning of flower paintings, and on their popularity, market value and prices (eg Taylor, Brenninkmeijer-de Rooij). Arthur Wheelock admirably summarizes this research as well as presents an interesting and useful survey of the origins of flower painting, from the border decorations of medieval Books of Hours to botanical treatises and prints and watercolours. Paintings from the National Gallery are augmented with loans from North American museums and libraries and from private collections. Despite their much-cited underlying message of 'doom and gloom' (death, decay, vanity), I must agree with Cardinal Federico Borromeo, enthusiastic patron of Jan Brueghel the Elder: "Then when winter encumbers and restricts everything with ice, I have enjoyed from sight and even imagined odor, if not real fake flowers . . . expressed in painting (p. 15)." Far from warning me of the end of my life, the decay of my body and the futility of the pursuit of earthly pleasures, these gorgeous bouquets of flowers do just that: they give pleasure, as I am sure they did to their seventeenth-century owners. – *KLB*

Kahren Jones Arbitman, *Rembrandt Etchings from the Carnegie Museum of Art* [Exhibition catalogue]. Jacksonville, FL: The Cummer Museum of Art & Gardens, 1997. 120 pp, 51 b&w illus. ISBN 0-915135-05-1.

The superb collection of Rembrandt etchings in the Carnegie Museum of Art in Pittsburgh (on view at the Cummer Museum, February 11 – April 12, 1998) was the bequest of Charles J. Rosenbloom, a Pittsburgh financier and collector of art, with a special passion for Old Master prints. Kahren Arbitman recounts in her Foreword visiting Mr. Rosenbloom in 1973, shortly before his death, in the company of Julius Held, a visit which instilled in her a lasting appreciation of Rembrandt prints as well as of those who collect and study them. Having been introduced to Rembrandt's etchings in the personal setting of the Rosenbloom home, Kahren Arbitman used her own personal connections to Pittsburgh, where she worked many years ago, to bring the collection to the Cummer Museum in Jacksonville, where she now is the director.

The volume opens with an introduction to Rembrandt's etchings: technique, style, subject matter, the history of the copper plates. This is followed by the catalogue proper. On leafing through the illustrations, one cannot help but notice the absence of Old Testament scenes, until one finds out from the Foreword that Charles Rosenbloom had made very careful decisions about the dispersal of his Rembrandt prints: Old Testament subjects, portraits of Jewish theologians and genre scenes like *Jews in the Synagogue* were bequeathed to the Israel Museum in Jerusalem; New Testament scenes and portraits of Christian clerics went to the Carnegie. Other subjects, eg portraits and landscapes, were divided between the two. It is to be hoped that the two collections will be exhibited together some day. – *KLB*

Liesbeth Heenk, *Rembrandt and His Influence on Eighteenth-Century German and Austrian Printmakers/Rembrandt – Seine Verwandlung in der deutschen und österreichischen Graphik des 18. Jahrhunderts* [Exh. cat.] (Studies from the Rembrandt Information Centre, 1). Amsterdam: Museum Het Rembrandthuis – Rembrandt Information Centre, 1998. 92 pp, 77 b&w illus. ISBN 90-74310-49-4.

This bi-lingual catalogue was published in conjunction with the exhibition in the Museum Het Rembrandthuis, Amsterdam (August 1 – September 20, 1998; the exhibition did not travel to Salzburg and Freiburg as originally planned and announced in the catalogue). Exhibition and catalogue demonstrate the enormous influence Rembrandt's innovative etchings had on later generations of printmakers, especially in

Austria and Germany. It was a fortunate coincidence that Rembrandt's etchings from the Carnegie Museum and this catalogue of his imitators landed on my desk at the same time.

To generations of artists, art-lovers and collectors, Rembrandt was first and foremost an etcher. Artists borrowed compositions, or parts of them; imitated his sketchy style of drawing; were intrigued by his *chiaroscuro* effects; took inspiration from his subjects, or copied his technique. Others imitated his habit of changing and reworking his copper plates. Rembrandt's influence can be found throughout Europe, but it was above all in Germany and Austria that artists started to work in his style. To them, as a contemporary put it, Rembrandt was God, his pupils were the apostles, and those who worked in his style the scholars.

The different ways in which Rembrandt influenced the work of his imitators are discussed in separate sections of the catalogue (eg Technical Influence; Stylistic Influence; Influences in Motifs; Reproductive Prints). Each section has a brief introduction and is preceded by one or more genuine Rembrandt prints. The book also contains a general introduction and biographies of the most important artists. In putting together the exhibition/ catalogue, use was made of the research done by Anne Röver and Gerhard Gerkens for the exhibition "In Rembrandts Manier. Kopie, Nachahmung und Aneignung in den graphischen Künsten des 18. Jahrhunderts", which was shown in Bremen and Lübeck in 1986-87. To some extent, the present exhibition continues this work.

This is the first volume in a series of exhibition catalogues published by the newly-established Rembrandt Information Centre. Volume 2 is reviewed below. – *KLB*

Buiten tekenen in Rembrandts tijd. With contributions by Bob van den Boogert, Leendert D. Couprie, Leonoor van Oosterzee, Rob Ruurs, Ernst van de Wetering [Exh. cat.] (Studies from the Rembrandt Information Centre, 2). Amsterdam: Museum Het Rembrandthuis - Rembrandt Information Centre, 1998. 72 pp, 10 col. plates, 38 b&w illus. ISBN 90-74310-41-9.

This catalogue of an exhibition at the Rembrandthuis (September 30 – November 28, 1998) features sixty drawings, most from the Rijksprentenkabinet, the Amsterdams Historisch Museum and the Gemeentearchief, Amsterdam. The focus is the special category of seventeenth-century Dutch landscape drawings which were made outdoors and/or represent artists in the process of drawing directly from nature. Five concise, well-selected essays consider this important material from diverse points of view. Ernst van de Wetering places Dutch examples within a wider context of eighteenth- and nineteenth-century painters and draughtsmen in France, England, Germany and Scandinavia who worked from "le motif"; Bob van den Boogert discusses drawing after nature (understood to encompass all living things in Creation) as a feature of artistic training that could also include copying of drawn or painted landscapes; Leonoor van Oosterzee analyses the materials that Dutch landscape draughtsmen used; Rob Ruurs discusses strategies of spatial construction employed by Simon de Vlieger and Willem van de Velde the Younger; and Leendert Couprie establishes the site of a Ruisdael drawing of the Schermerpoort in Alkmaar, reconstructing its relationship with a sketch of the same site attributed to the young Jan van Kessel. The contributors to this catalogue demonstrate how important direct stuady of nature was for both amateur and professional landscapists, while raising further questions about the function of such "buiten tekenen" and their role within the entire creative process of seventeenth-century Dutch artists.

Susan Donahue Kuretsky
Vassar College

Albert Blankert, editor, *Rembrandt: A Genius and His Impact.* Melbourne: National Gallery of Victoria; Zwolle: Waanders Publishers, 1997. ISBN 0-7241-0196.

This exhibition catalogue, reviewed in the previous *Newsletter,* was published without an index due to time restraints. An index has since been compiled, by Melanie Mathijsen, and is available on the Internet on three locations: http://www.nga.gov.au/Exhibitions/rembrandt.html

http://www.let.uu.nl/kunst/Rembrandt/index.html

http://www.dutchpaintings.com/book.html

If printed double-sided, this Index (plus a few *corrigenda)* takes 10 sheets which can easily be inserted into the book.

Manuscripts, Drawings and Prints

Supplement to *HNA Review of Books*, vol. 15, no. 2, November 1998

Alain Arnould, O.P., *De la production de miniatures de Cornelia van Wulfschkercke au couvent des carmélites de Sion à Bruges* (Elementa Historiae Ordinis Praedicatorum, 5). Brussels: Vicariat Général des Dominicains, 1998. 92 pp, 35 b &w illus. Numéro de compte 310-1143817-79.

Since the researches of W.H.J. Weale in the nineteenth century, historians have known of the existence of a group of miniaturists working in the Carmelite convent, known as Sion, of Bruges. From Weale's publications in *Le Beffroi,* we know that a professional woman painter, Grietkin Sceppers, commenced the decoration of a Temporale (a choral book) for the convent, but died before completing it; and that the book was "voortvoldaen" by a sister of the convent, Cornelia van Wulfschkercke. If this document provided an abstract proof of women's activities as artists, the present book offers the exciting prospect of the rediscovery of Cornelia van Wulfschkercke as an artist. Starting from Weale's documentation, Alain Arnould identifies a surviving manuscript as the very Temporale under discussion; the book is in the Bibliothèque Mazarine in Paris (Ms. 432, Hors Format). This manuscript bears a colophon proclaiming that it was "illuminavit" by Cornelia van Wulfschkercke, but making no mention of Grietken Sceppers. Arnould sees a change of style in the decorative initials after folio 194v in the manuscript, and from this concludes that the filigreed inititals after this point were the work of Sister Cornelia. He further concludes, on grounds that are difficult to follow, that Sister Cornelia was the artist responsible for all six historiated initials in the Temporale.

Having made this key identification, Arnould proceeds on stylistic grounds to attribute to Sister Cornelia twelve other books or fragments of books. These books include other choral books, devotional and theological texts, books of hours and prayer books. Representative miniatures are reproduced from each of them but because of the quality of the reproductions, one must rely solely on the author's judgment regarding the attributions. These books display at least three different styles of border treatments, and from what I can see, some additional variety in their spatial and compositional styles. It would be helpful to have better illustrations of these interesting books to confirm the author's hypothesis. While most of the books he associates with Sister Cornelia have links to Ghent or Bruges, Arnould recognizes the hand of this artist in five miniatures inserted into a Book of Hours (in Newfoundland) whose calendar and text indicate an origin in Northeastern France. Arnould suggests that the inserted pages were acquired at the Pand market in Bruges, where the nuns of Sion are known to have rented stalls. He sees Sister Cornelia as the centre of a workshop at the convent making books for other religious houses, private clients, and the open market. The workshop borrowed compositions from prints, incunables, and the great store of miniatures circulating among the workshops of Ghent and Bruges.

The recovery of an *oeuvre* for a nun of this documented workshop is an important event. I only wish that the author had had the opportunity to develop his evidence more; the brief text and poor illustrations don't go far enough to support his argument. The 50 page text is accompanied by several appendices. One of these is a catalogue with brief descriptions of the books, a concordance of themes common to this group of manuscripts, and a list of other books that once belonged to the convent.

Ann Roberts
Lake Forest College

Xanthe Brooke, *Mantegna to Rubens. The Weld-Blundell Drawings Collection* [Exhibition catalogue]. London: Merrell Holberton, 1998. Distributed by University of Washington Press, Seattle. 208 pp, 350 illus., 80 in colour. ISBN 1-85894-052-4.

I first came across the Weld-Blundell collection in an article by Michael Jaffé on Rubens's drawings after sixteenth-century northern masters *(Art Quarterly,* 21, 1958). I didn't (and still don't) accept Rubens's authorship of the drawing in question, but I was intrigued by the collection of which I had never heard before. The drawing – a group of figures copied from a woodcut by the enigmatic Petrarch Master, sometimes identified with Hans Weidit – is included in the present catalogue (no. 76), and is still called Rubens, though, curiously, Jaffé is only mentioned as having annotated the mount of the sheet but not as having published it. Such quibbles aside, this is a welcome publication, bringing a relatively unknown, splendid collection of over 300 old master drawings to the much-deserved attention of a wider audience. It was occasioned by the acquisition of the collection, in 1995, by the Walker Art Gallery in Liverpool, and the subsequent exhibition of a selection of the drawings at the Walker (June 26 – September 20, 1998) and the British Museum (October 10, 1998 – January 10, 1999).

The Weld-Blundell collection was formed mostly from two important eighteenth- and early nineteenth-century collections: that of William Roscoe of Liverpool (1753-1831), botanist, lawyer, banker, anti-slavery campaigner, poet, historian, and biographer of Lorenzo de' Medici, and that of Henry Blundell (1724-1810) and his son, Charles Robert Blundell (1761-1837). Roscoe's Italian and Flemish pictures are the basis of the Walker's paintings collection. The acquisition of such a large group of drawings with Roscoe provenance keeps faith with his wish for his collection to be publicly available in his native city. The connection of the Weld-

Blundell family with Liverpool is also strong. The Blundells were an old Lancashire Catholic family residing at Ince Blundell Hall, north of Liverpool. In the eighteenth century Henry Blundell visited Italy on the Grand Tour where he purchased antique and contemporary sculpture (today divided between the Liverpool Museum and the Walker), as well as drawings, a pursuit continued by his son Charles who was responsible for buying the Roscoe drawings as part of a bankruptcy deal. The Blundell drawings were kept at Ince Blundell until the Weld family, descendants of the Blundells, moved to Dorset in 1960.

As most English collections of the time, the bias is in favour of Italy: there are splendid drawings by Mantegna, Correggio, Fra Bartolommeo, the Carracci, Parmigianino, Vasari, Tintoretto, Barocci, Domenichino and Reni. But the collection also contains striking works by northern arists, among them, besides Rubens (also represented by 'genuine' examples and a Zuccaro drawing retouched by him), are Cornelis Dusart, Maarten de Vos, Joseph Heintz and one of Rembrandt's pupils, possibly Willem Drost.

The collection bears the marks of a large number of highly distinguished collectors, such as Resta, Crozat (as well as the so-called Pseudo-Crozat identified with the Comte Caylus), Richardson, Lely, Mariette, Gabburi, John Barnard and Joshua Reynolds. Charles Blundells's main acquisition, besides the Roscoe collection, were 61 drawings bought from the estate of the American painter Benjamin West who had succeeded Reynolds as President of the Royal Academy in 1792. Short biographies of the identified collectors through whose hands the drawings passed, compiled by Miranda Stacey, follows the introductory essay on the history of the collection by Xanthe Brooke. The book discusses in full and illustrates in colour 80 of the finest drawings in the collection, with an appendix providing the essential details and black and white illustrations of the remaining 231 drawings. – *KLB*

Thomas Döring, *Van Dyck und sein Kreis. Zeichnungen und Druckgraphik aus dem Kupferstichkabinett des Herzog Anton Ulrich-Museums* [Exhibition catalogue]. Braunschweig: Herzog Anton Ulrich-Museum, 1999. 75 pp, 8 colour and 26 b&w illus. ISBN 3-922279-44-9.

Using only works from its own collection, the Herzog Anton Ulrich-Museum in Braunschweig celebrates the 400th anniversary of the birth of Anthony van Dyck with an exhibition of drawings and prints by the artist, his contemporaries and followers (March 18 – June 20, 1999). Of the seven autograph drawings by Van Dyck, the most exciting discovery is unquestionably a wonderfully dramatic rendering in pen and wash of *Venus Disarming Mars.* This preparatory sketch in reverse for a lost painting executed by Van Dyck during his second Antwerp period and known through various copies, entered the collection at an unknown date and has only recently been published (Christian von Heusinger, *Die Handzeichnungssammlung.* Sammlungskataloge des Herzog Anton Ulrich-Museums, vol. 3, Braunschweig, 1997), unfortunately under the incorrect title of *Rinaldo and Armida.* The drawing is stylistically close to Van Dyck's *Diana and Endymion* (New York, Pierpont Morgan Library).

Rubens is represented with two sketches from his earliest period, *The Crowning with Thorns* and *Sine Cerere et Baccho friget Venus.* Thomas Döring reattributes the latter to Rubens and suggests a date of 1597/98 on the basis of close similarities with Rubens's studies after Mantegna's *Bacchanal.* The argument for such an early date finds further support in the statuesque female figure who appears twice on the sheet and is clearly derived from Marcantonio's engraving of the *Judgement of Paris* after Raphael; Rubens's painted adaptation of this print was, in my opinion, painted before his departure for Italy in 1600. A number of copies after drawings and paintings by Van Dyck document the interest generated by his draughtsmanship, while sheets by Thomas Willeboirts Bosschaert, Abraham van Diepenbeeck, Jan Boeckhorst and Paul de Vos illustrate his influence on contemporary and succeeding generations of artists in Antwerp and, indeed, Holland where Govaert Flinck and Gerard Pietersz. van Zyl satisfied the public demand for painting in the Flemish manner.

The second part of the exhibition/catalogue is devoted to prints. The section on Van Dyck as etcher is particularly instructive, as it not only includes his *The Mocking of Christ* and the so-called *Titian and His Mistress,* but also the only five etchings for the *Iconographie* to remain unaltered: all others were subjected to additions and alterations after Van Dyck's death and in preparation for the second edition of 1645-46. A large number of other portraits from the *Iconographie* are included. The final section comprises reproductive prints after Van Dyck's painted *oeuvre.*

Fiona Healy
Freie Universität Berlin

Herbert Wilhelm Rott, *Albrecht Dürer. Druckgraphik. Eine Auswahl aus den Beständen der Staatlichen Graphischen Sammlung München* [Exhibition catalogue]. Munich: Staatliche Graphische Sammlung, 1998. 47 pp, 15 b&w illus. ISBN 3-927803-24-3.

Munich's Graphische Sammlung owns a nearly complete collection of Dürer's graphic art, the nucleus of which was assembled in the eighteenth century by the Elector Carl Theodor in Mannheim (1758). This is the catalogue of the exhibition of a selection of fifty of the artist's works from the print room's own holdings, on view in the Neue Pinakothek from April 3 – June 7, 1998, to accompany the exhibition of Dürer's paintings from the Bavarian State Collections celebrating the restoration of the 'Paumgartner Altar' and 'Glimm

Epitaph' (see review below). Its text consists of a general essay characterizing the artist's contribution to the development of engraving, etching and woodcut, and the role played by the graphic arts in the development of his own career. A brief (11 pp) annotated handlist of the prints follows, giving inventory numbers, collectors' mark and watermark designations, provenance, and brief paragraphs of commentary. Of particular interest is the complete *Life of Mary,* each sheet in proof state and all but one from the collection of Vinzent Mayer, and the iron etching plate for the *Agony in the Garden,* on loan from the Staatsbibliothek Bamberg, which was discovered in the eighteenth century by the Innsbruck painter/etcher Joseph Schöpf (1745–1822) in the possession of a local blacksmith. It was subsequently owned by the painter Johann Georg Schedler (1777–1866), from whom the Dürer scholar Joseph Heller acquired it and published it in his famous *oeuvre* catalogue (Bamberg, 1827: v. 2, part 2, p. 390), before willing it to the Bamberg State Library.

Jane Campbell Hutchison
University of Wisconsin – Madison

Jan van der Stock, *Printing Images in Antwerp: The Introduction of Printmaking in a City, Fifteenth Century to 1585.* Translated from the Dutch by Beverley Jackson (Studies in Prints and Printmaking, 2). Rotterdam: Sound & Vision Interactive, 1998. 508 pp, 18 colour plates, 109 figures, ISBN 90-75607-13-x.

The product of nearly twenty years of archival research, this densely informative book presents an insightful view of the emergence of the new medium of printmaking in fifteenth- and sixteenth-century Antwerp. The book examines issues such as the way the old Antwerp guild structure incorporated the printer-publishers, how and where printers and publishers established themselves in the city, how cheap printed images were consumed (sometimes even literally!), and how print publishers acted as entrepreneurs and offered politically charged images. Van der Stock clarifies many aspects of early print production. He points out, for instance, that woodcuts were frequently commissioned for small, specific groups such as the Onze-Lieve-Vrouwe-Lof Guild and the Schoolmaster's Guild, and highlights the great range of cheap printed images that were available in Antwerp playing cards, magical-religious images, shields, pilgrimage pennants, printed wrapping paper, advertisements, and ceiling coverings. Many of these types of prints have been studied by folklorists but have not, until this study, been incorporated into the larger context of the history of the Renaissance print.

Whereas art historical studies have tended to focus on the artistic print, and on, as Van der Stock notes, celebrities such as the peintre-graveurs Jan Gossaert and Dirk Vellert, the book deliberately refrains from viewing these works as sharply separate from the so-called "folk" or popular (the term Van der Stock prefers) prints. Van der Stock offers nuanced interpretations for numerous frequently repeated assumptions. He argues persuasively against the common view, held for instance by Hans Belting and William M. Ivins, that while expensive printed images were targeted to the elite, inexpensive prints were intended for the most unsophisticated clientele, that they were cheap, crude, and effective products created specifically for the "simple folk," as Robert Scribner wrote. Van der Stock shows that inexpensive prints were very varied in their function and that they were not intended for a single group, but for the community at large. They were, as he argues plausibly, purchased according to their intended use. For instance, a Plague print was expected to protect its owner, no matter what his or her social status, while guild prints served as insignias or perhaps as proof of guild membership.

This is a carefully researched book filled with interesting information and persuasive arguments. It will be a standard work for all students of the Renaissance print.

Ellen Konowitz
Vanderbilt University

Christiaan Schuckman, *Maarten de Vos (1532-1603). Hollstein's Dutch and Flemish Etchings, Engravings and Woodcuts, 1450-1700,* vol. XLIV (Text), vols XLV and XLVI (Plates). Ed. by D. de Hoop-Scheffer. Rotterdam: Sound & Vision Interactive, 1996. Text 336 pp, 1,598 b&w illus. ISBN 90-75607-01-6 (Text), 90-75607-02-4 (Plates I), 90-75607-03-2 (Plates II).

This major tool has been worth waiting for. We had a glimpse of its contents and significance when many of the overlapping images, those engraved after De Vos by the Wierix family, were published in the exemplary catalogue by Marie Mauquoy-Hendrickx *(Les Estampes de Wierix,* 4 vols, Brussels, 1978-83 [d. 1993]). But of course other printmakers, led by the Sadeler family, also worked after the seemingly limitless designs by Maarten de Vos (1532-1603), whose prolific output in Antwerp, particularly in the religious sphere of the Catholic Counter Reformation, deserves comparison with Rubens. The history of printmaking has often looked disparagingly at collaborations between designers and professional printmakers, so it is hardly surprising that the print output after De Vos as designer has never been systematically catalogued before this overdue publication

Many of the prints survive in albums, and the author has helpfully provided shelf-marks and pages from major collections for direct consultation. Even more indispensable is the concordance section at the end of the text volume. Listed first is the Index of Engravers after De Vos, which is staggering in its range, led by the more familiar names of Wierix (Antonie, Hieronymus,and Johan) as well as Sadeler (Johannes I and II, Raphael I and II, Aegidius, Johannes Baptista I) and de Passe (especially Crispijn), and lesser contributions by Jan Theodor de Bry, Cornelis Galle I and Nicolaes de Bruyn. We have returned to the world that Hans Mielke introduced in his 1975 article *(Zeitschrift für Kunstgeschichte)* on the 1585 Antwerp biblical *Thesaurus* by Gerard de Jode. This turns out to be a representative volume but one of several, making the apparatus all the more important, especially the Index of Publishers, which runs to five pages with the Index of Dedicatees. The list of dated prints, keyed to the numbers of the catalogue, runs from 1573 onwards, and there is an extensive concordance to earlier catalogues, by Mielke, other Hollstein volumes, the Reinsch catalogue dissertation on De Vos drawings (Tübingen 1967; Carl Depauw is mentioned in the introduction as currently working on this material), as well as Zweite's monograph on De Vos paintings.

For this material the conventional Hollstein organization by iconographic type is helpful, since one can use the index to dated prints to establish issues of chronology and since series are kept together. The labour involved in producing such definitive volumes is evident when one inspects entries with different states or copies, arranged according to collection (and, where relevant, publication, such as the 1585 *Thesaurus).*

What is impressive about this catalogue is how much of it goes beyond the basic recounting of biblical narratives. Over half of the images (the entirety of the second plate volume) is subsumed under the following additional religious headings: Devotional subjects (figures of Christ and the Virgin), Angels, Evangelists, Apostles, Fathers of the Church, Hermits and Saints. followed by a generic category of Moralistic Subjects (Repentant Sinners, Virtues, Vices, Four Last Things, Seven Gifts of the Holy Spirit, Divine Charge to the Three Estates, Sorrows of the World). Not onle does De Vos populate his composite religious print world with all of the characters of the Ghent Altarpiece vision of All Saints; at the same time, he produces edifying allegories of moral instruction, such as the ones on the work ethic analyzed recently by Ilja Veldman *(Simiolus*, 1992).

De Vos also produced a suit of more wordly subjects, ranging from Bruegelian Satires to Mythology, Wonders of the World, Ancient History, and even historical prints recounting the events of the year 1577 in Antwerp. Finally, one surveys a vast compendium of allegories and systems of knowledge organization: Elements, Winds, Planets, Continents, Seasons, Months, Zodiac, Times of Day, Ages of Man, Senses, Liberal Arts. In this respect, De Vos continues the precedent of mid-century designers and print publishers, including both Floris and Heemskerck. While this compendium ends in predictable fashion with book illustrations, chiefly of Catholic religious texts, one could even find here the single print made for Ortelius's history atlas, or *Parergon,* a 1586 map of the Life and Travels of Abraham (no. 1344, with bibliography).

While the nature of Hollstein catalogues precludes analysis of the content of these many prints, all students of Antwerp visual history of the Counter Reformation will now depend utterly on this invaluable resource. It is a singular virtue of the new Hollstein series that it is willing to consider print designers as well as professional engravers as major figures in the history of printmaking; so now the contribution of Maarten de Vos can be properly assessed at last.

Larry Silver
University of Pennsylvania

Peter Fuhring, *Vredeman de Vries. Hollstein's Dutch and Flemish Etchings, Engravings and Woodcuts, 1450-1700,* vol. XLVII and XLVIII (Part I, 1555-1571; Part II, 1572-1630). Ed. by Ger Luijten. Rotterdam: Sound & Vision Interactive, 1997. Part I, 292 pp; Part II, 295 pp, 663 b&w illus. in total. ISBN 90-75607-10-5 (Part I), 90-75607-09-1 (Part II).

With the publication of some handbooks on prints, we seem to receive systematic and rigorous updates of printmakers' *oeuvres,* but we really are only refining what we already know well. With the appearance of other catalogues, we get the welcome sense of completion and exposure to what was only known partially and can now serve as the basis of rethinking our entire appreciation of prints. Such a work is the new Hollstein volume on Vredeman de Vries.

Of course, the family Vredeman de Vries (father Hans and son Paul) is familiar to certain specialists, particularly students of the history of perspective. Hans plays a significant role in Martin Kemp's *The Science of Art* (1990), and a Dover edition of his influential publication, *Perspectiva* (1604-05, The Hague) remains in print. He is equally renowned to connoisseurs of ornament, particularly of the grotesque and strapwork ornament promulgated in Antwerp after the middle of the sixteenth century. Finally, Hans Vredeman is inevitably cited as the progenitor of the later subgenre of Dutch art, the architectural painting, carried on by his son Paul; this contribution was recently delineated within the framework of the School of Prague by Thomas DaCosta Kaufman (1988). Prior to Peter Fuhring's exhaustive volumes the standard treatment was the fabled dissertation of Hans Mielke (1967, unillustrated) and those within larger studies such as Timothy Riggs's on Hieronymus Cock (1977).

This is the art of pattern-books, so it is almost a by-way even among print specialists, but of course almost no prints were more influential (translations included Latin, French and German). Fuhring's useful introduction provides a context for viewing some of these projects, including dedications to influential patrons, such as Cardinal Granvelle or Count Ernst of Mansvelt, as well as William the Silent (the presentation copy of the 1577 treatise on architecture is newly published here) and Prince Maurice *(Perspectiva,* 1604-05). Publishers included Hieronymus Cock, Gerard de Jode, Philips and Theodor Galle, Hendrik Hondius and Johannes Janssonius, a veritable who's-who of print production in Antwerp and Amsterdam at the turn of the sixteenth century. Etchers featured the Van Doetecum Brothers, noted for their work of Bruegel's *Large Landscapes* of the mid-1550s, and Frans Huys, producer of the ships series of Bruegel for Cock. The publication is noteworthy for its careful bibliography of reissues, togethere with library numbers for consulting the volumes directly.

In contrast to most Hollstein volumes, this set sagely is organized in chronological order rather than according to some arbitrary iconographical scheme, which is not sensitive to projects such as those by Vredeman. Projects by Hans precede the joint works of Hans and Paul, and finally end with Paul's exclusive work. One notes at the outset the important early contribution by Hans to (and variation on) Cornelis Floris's inventions of strapwork and cartouche designs (first issued by Gerard de Jode in 1555). The first perspectives, *Sceographiae,* followed in 1560 (Cock), along with designs for oval intarsia works. An often overlooked publication of 1563 (Cock) is *Coenotaphiorum,* consisting of models for tombs and funeral monuments. Concurrent with the diffusion of Renaissance-style designs by Cornelis Floris and others across the Baltic region, this compendium merits closer examination. In similar fashion, the 1565 book of architectural details, both of columnar orders and gable tops (Cock) complements a publication of caryatids (de Jode) to disseminate classicizing designs to a wider audience of princely designers, then climaxes with the 1577 publication of *Architectura,* as well as later compendia for gardens (1583) and furniture.

Some elements of Vredeman's prints have not been properly appreciated, for example the influence of his small-figure narratives within courtyards and park settings (*The Life of Man,* 1577, Pieter Baltens, nos. 435-41), which led other Flemish artists of the same generation, such as Hans Bol or David Vinckboons, to restaging of their own religious and mythological dramas, especially in prints. Of course, mysteries still remain concerning the precise origins and detailed history of strapwork ornament, which cannot be taken up here in a monographic publication. And while the Hollstein format cannot permit extended analysis of influence or application of these pictorial ideas, there is now ample opportunity with this well-produced and complete set of illustrations to assess anew Vredeman's vast contribution to the Renaissance style in Northern European architecture (including façades, furniture and gardens) and ornament, including applications of these fruitful designs in decorative arts (as well as much of the apparatus of printed maps). All this and *Perspectiva,* too!

Larry Silver
University of Pennsylvania

Nadine M. Orenstein, *Hendrick Hondius and the Business of Prints in Seventeenth-Cenury Holland* (Studies in Prints and Printmaking, 1). Rotterdam: Sound & Vision Interactive, 1996. 246 pp, 107 ills. ISBN 90-75607-04-0.

The Dutchman Hendrick Hondius was a prolific engraver, etcher, calligrapher and print publisher. Like many others operating in the print trade at the time, he was omni-competent and commercially adept, supplementing his income through book printing, dealing in other works of art, and making investments on the side. For over half a century (1597-1650) Hondius plied his trade in Antwerp, Cologne, Amsterdam, Leiden and possibly Delft, but principally in The Hague where, at least by 1606, he settled for good. Although his own skill as a designer and printmaker was modest, he reprinted plates by contemporary engravers of exceptional caliber including Hendrik Goltzius, Jacques de Gheyn II and III, Jacob Matham, Esias van de Velde, Jan Saenredam, Aegidius Sadeler, Jacob Savery and many others. Thus, the prints issued under Hondius's name extend to the wider latitudes of northern European taste and topical interest during the period of his activity.

From its electric pink jacket cover to the crisp and engaging illustrations this is altogether a handsomely designed and finely printed volume. Orenstein's concise and very readable text concentrates primarily on Hondius's activities as a printmaker and publisher. The context for this is set in three initial chapters that discuss his various predecessors in the business, provide an account of what is known of his life, and trace the development of his professional career. Hondius's own particular qualities as a printmaker are then examined, followed by a selective consideration of the several etchers and engravers who worked for him, and finally a chapter on the business of printmaking in early seventeenth-century Holland. An appendix establishes a catalogue of the works of other printmakers published under his address to complement the Hondius volumes in the New Hollstein. Over the course of Orenstein's narrative we are brought to good acquaintance with an exemplary figure in an influential, intensely active and competitive field. In all these respects the book offers a valuable measure for assessing the practical and aesthetic aspects of print publishing at a critical stage in the history of the Dutch Republic and of the northern European art market.

Hondius, it seems, was relatively inclusive in his choice and commissioning of works for publication, exercising only limited formal control over his own engravers but guarding the subject matter of his publications in accord with the prevailing climate of religious and political intolerance. As a strict Protestant his issue of political and religious broadsheets was aimed at a Dutch audience, and in one instance at least he became openly involved in religious and political dispute. Like his forerunners and contemporaries in Italy and Holland, Hondius both made and commissioned new designs, acquired used plates from the sale of dismantled households, reprinted a number of plates, and commissioned copies of prints by earlier masters. Among the prints issued under Hondius's address are several copies and a handful of restrikes of works by Albrecht

Dürer, Lucas van Leyden, Heinrich Aldegrever, Hans Holbein and Pieter Bruegel the Elder, all of whose works were still highly valued at the time. Hondius was also engaged in book publishing (mainly restricted to heavily illustrated texts on geometry, architecture and perspective, including Vredeman de Vries's influential *Perspectiva* of 1604-05). And he composed and published a treatise of his own on perspective, a domain in which Hondius was more than merely an amateur since, according to Martin Kemp, he provides an original demonstration for constructing a vertical vanishing system. Such tracts were an acknowledged means of establishing one's 'scientific' credentials as an artist/printmaker.

There is much enlightening information here about the financial side of print publishing and distribution, in particular the means and expense of obtaining copyright privileges and the rewards for dedicating prints to individuals or institutions. Orenstein stresses the importance of gaining commissions for prints, a practice that appears to have been a significant source of income for print publishers. Hondius's commissions and dedications were directed to institutional patrons such as cities as well as to private individuals. In such cases the income could be quite substantial, although these were typically one-time transactions since commissioned plates were normally retained and controlled by the patron rather than the publisher. This material offers a useful corrective to the assumption that the financial rewards of printmaking depended largely on an ability to speculate in the open market.

Orenstein's discussion of Hondius's career provides a very useful measure for understanding a major commercial dimension of seventeenth-century Dutch art production. The documentation underpinning this study is culled almost entirely from published sources, the archives having yielded little new material. However, what is known about Hondius is judiciously assimilated and analysed in ways that provide a point of reference for future studies of printmaking and publishing in the period. Orenstein centers her attention on the activities of the workshop, especially its technical and stylistic repertoire. In this context she draws sound inferences about Hondius's formal preferences, the effects of local religious politics and the vague implications of his repertoire for collecting interests. Although the orientation of Orenstein's study is centripetal, her observations might be extrapolated to more comprehensive readings of the evolution of the Dutch art market during the first half of the century.

Hondius was typical of his profession in that he published a wide range of printed subjects extending from documentary images such as portrait series, broadsheets, and a good many maps, to landscapes and allegories as well as religious and secular themes. Many of his prints were issued in sets and many presumably in single sheets. That there are few surprises here is not greatly surprising. Hondius's interests were roughly encyclopedic, but not in a recognizably systematic way. Rather he was an opportunist in the practical sense that he followed visible trends and took advantage of what was available to him. In this respect Hondius was more an agent of tastemakers than a tastemaker in his own right. Can Hondius's output be more precisely mapped onto the development of print collecting and the construction of what has now come to be termed 'visual culture'? This is a difficult question perhaps better left to a time when further studies of print publishing and other relevant dimensions of seventeenth-century Dutch art fill out the picture. Meanwhile Orenstein's monograph sets a standard for careful and clearly presented research on an important commercial phenomenon relevant not only to the history of prints but to the development of the European art market in general.

Peter Parshall
Reed College

Other Titles

Kathryn Brush, *The Shaping of Art History: Wilhelm Vöge, Adolph Goldschmidt, and the Study of Medieval Art.* Cambridge and New York: Cambridge University Press, 1996. 276 pp, 28 b&w illus. ISBN 0-521-47541-4.

Kathryn Brush's juxtaposition of her broad title, *The Shaping of Art History,* with her more narrowly focused subtitle, *Wilhelm Vöge, Adolph Goldschmidt and the Study of Medieval Art,* is deliberate. Her examination of the intellectual and methodological constructs that shaped the early scholarship on medieval monuments concentrates primarily on Vöge (1868-1952), whose *Die Anfänge des monumentalen Stiles im Mittelalter* was the first critical account of the origins of Gothic sculpture in France, and secondarily on Goldschmidt (1863-1944), who is best known for his four-volume corpus on Carolingian, Ottonian and Romanesque ivories. In the last decades of the nineteenth century, Brush argues, the study of medieval art in Germany achieved a status comparable to the study of the antique and the Italian Renaissance. Consequently the scholars in this field played a considerable role in establishing the questions raised by the discipline as a whole.

The first chapter, which surveys medieval art history prior to 1880, is actually the conceptual heart of the book. Brush focuses on two significant mentors: the art historian Anton Springer, with whom Goldschmidt studied in Leipzig, and the charismatic and controversial cultural historian Karl Lamprecht, who deeply influenced Vöge. In *The Critical Historians of Art,* Michael Podro casts Springer as a descendant of Schiller in that each man saw art as an activity strongly affected by both human relations and social constructs. But Brush points out that Springer's work underwent a marked change around 1860 when he was appointed to the chair of art history at Bonn. In his desire to elevate art history among the academic disciplines, Springer turned to a 'scientific' approach, *Detailforschung*, or connoisseurship along Morelli's model. Eventually Springer moved to Leipzig, and Lamprecht arrived in Bonn where he would do battle with German idealist historians by advocating increased attention to social history in the study of both politics and art history. An 1888 seminar in

German culture attended by Vöge, Aby Warburg and Paul Clemen, for example, ranged broadly over linguistics, literature, art history, economics and social psychology as Lamprecht sought to uncover the evolution of the German national consciousness.

In his study of the origins of gothic sculpture at Chartres, Vöge visualized individual greater and lesser masters, lead by the dominant personality of the *Hauptmeister.* Brush demonstrates that Vöge was stimulated by Lamprecht's investigation of collective mentality, but also drew from a wide variety of other sources, most notably Robert Vischer's essay on Dürer's creative nature as it was evidenced in his 'style-forming power' *(stilbildende Macht).* Here and in later writing Vöge tried to maneuver between scientific stylistic analysis and questions surrounding the nature of medieval artistic 'creativity'. On the other hand, Goldschmidt approached his objects primarily from the vantage point of style. Significantly, most of Vöge's readers were drawn to his stylistic approach at the expense of the more expressive material. With Vöge's retirement from the academic community in 1916 after a nervous breakdown, and Goldschmidt's long and illustrious career at the University of Berlin, positivist stylistic criticism set the standard for the study of medieval art in Germany and subsequently on the far side of the Atlantic.

This is a carefully documented examination of a seminal moment in the evolution of art history. Brush has made excellent use of archival material and personal papers to contextualize her readings of these hallmark texts on medieval sculpture and manuscript illumination. Nonetheless, the context might be enlarged. Although Brush mentions Hegel, and acknowledges Nietzsche's influence on Vöge, she does not venture into the stormy politics of German idealist history in the closing decades of the nineteenth century. In those years today's radical distinction between philosophy and history simply did not exist. Historians and philosophers were one and the same. And as we have since learned, ignoring Hegel is risky business.

Nina Serebrennikov
Davidson College

Gisela Goldberg, Bruno Heimberg and Martin Schawe, *Albrecht Dürer. Die Gemälde der Alten Pinakothek.* With a foreword by Georg, Prinz von Hohenzollern. Munich: Bayerische Staatsgemäldesammlungen, 1998. 600 pp, many illus, both colour and b&w. ISBN 3-89466-216-6.

This very substantial volume serves as both a collection catalogue and the catalogue of the exhibition celebrating the completion of ten years' restoration work on the paintings damaged in 1988 by an acid attack: the 'Paumgartner Altarpiece', and the Glimm *Lamentation.* (It has not been possible to restore the third painting the *Mater Dolorosa,* which formed the centre of an altarpeice with the *Seven Sorrows* panels now in the Dresden museum.) The full conservation history is documented. Infrared reflectography was performed on all of the Munich Dürers, as well as on the Augsburg Staatsgalerie's *Portrait of Jacob Fugger* and Nuremberg's *Hercules and the Stymphalian Birds* (or Harpies?) All photography and pigment analyses were placed on display with the paintings, which also included Munich's undamaged Dürers: the 1500 *Self-Portrait,* the *Four Holy Men* (or Apostles), the *Lucretia,* the Holzschuher *Lamentation,* the *Portrait of Wolgemut,* and the *Madonna with the Carnation.* The catalogue contains seven essays: two by Martin Schawe on aspects of the Munich collection; Bruno Heimberg's on Dürer's painting technique; Andreas Burmeister and Christoph Kalkel on Dürer's pigments; Ursula Baumer, Irene Ficaler and Johann Koller on his binding medium; Andreas Burmeister on retouching the damaged areas. A catalogue section follows, with full scholarly apparatus for each of the fourteen paintings. Other useful features include a catalogue of copies after Dürer, and concordances to the catalogue and the inventories. The extensive bibliography is invaluable for its references to exhibition catalogues.

Jane Campbell Hutchison
University of WisconsinMadison

Hana Seifertová, with the assistance of Anja K. Sevcík, *Dialog mit Alten Meistern. Prager Kabinettmalerei 1690–1750* [Exhibition catalogue]. Braunschweig: Herzog Anton Ulrich-Museum; Prague: Národni Galerie, 1997. 249 pp, 100 colour illus., 111 b&w illus., 7 diagrams. ISBN 3-922279-38-4.

The catalogue (and exhibition, seen in Prague, March 20 – May 18, 1997, and in Braunschweig, June 5 – August 17, 1997) surveys an unusual artistic revival within Bohemia during the late seventeenth and eighteenth centuries: that of the genre known as cabinet painting. Drawing inspiration from mannerist predecessors in Prague, such as Roelandt Savery, Jan Brueghel the Elder, and from leading German and Netherlandish artists of the first half of the seventeenth century, artists like Johann Michael Bretschneider, Johann Rudolf Byss, Franz Anton Hartman and Norbert Grund, worked to satisfy the renewed desire for collectable paintings among the Bohemian and Moravian aristocracy.

The introduction and two essays that follow were written by Hana Seifertová, the leading authority on these painters and a co-author of the 1993 exhibition catalogue, *Georg Flegel – Stilleben* (Frankfurt, Historisches Museum und Schirn Kunsthalle). Seifertová's introduction presents an overview of the history of the genre, as well as of patterns in collecting cabinet paintings between the sixteenth and eighteenth centuries. The information on Bohemian and Moravian collectors is a valuable addendum to the 1993 Prague exhibition catalogue on the Bohemian aristocracy and its art patronage: Ludomir Slavicek, et al., *Artis Pictoriae Amatores* (Prague: Narodní Galerie, 1993). Two further essays by Seifertová explore the paintings of picture galleries made in Prague after Antwerp prototypes, as well as the late seventeenth- and eighteenth-century interest in pendants, such as paired mythological figures, hunting pieces and still lifes. In the following pages, Anja Sevcík investigates the background of a seventeenth-century cabinet (now in the Museum of Decorative Arts, Budapest) in which miniature Rococo landscapes by Norbert Grund were later mounted. Sevcík's second essay discusses the survival of sixteenth-century concepts of collecting and knowledge, in the book of drawings of the *Kunstkammer* of Johann Rudolf Graf von Sporck. Sporck, the creator of an extraordinary collection, palace and programmed sculpture garden, was a significant figure in the proto-Enlightenment in Central Europe.

The quality of the paintings selected is very high. Though little known outside of Central Europe, these works are novel and exquisite variations on the conversation pieces, *memento mori* tableux, mythologies and panoramas of previous generations in the Low Countries, Germany and Prague. The catalogue was produced for one of the joint exhibitions between Prague and Braunschweig that highlight the artistic connections between these two centres of patronage. The exhibition itself brought together paintings from collections in the Czech Republic, Germany, Liechtenstein, Switzerland and the United States.

Dorothy Limouze
St. Lawrence University

Journals and Series: Call for Articles

Antwerp Jaarboek

In 2000, a special issues of the *Jaarboek* of the Koninklijk Museum voor Schone Kunsten in Antwerp will be dedicated to the topic "Gender & Making in Flemish Art." This is being organized in conjunction with the exhibition "Women Artists in the Netherlands, c.1450-1950," to be held at the museum in the fall of 1999. Both the exhibition and the *Jaarboek* issue will span Flemish art from the Middle Ages until the present day: papers dealing with any period within this range are thus solicited.

We are interested in articles that address the many ways in which gender affects acts and objects of visual representation. This might include, but is not limited to, the following issues. In what ways does the gender of the artist – be it masculine or feminine – inform visual production? Does it affect the types of work produced ("high art" vs. "craft", iconographic choices), how they are made (materials, studio possibilities), how they are marketed (access to markets, patronage)? Does the maker's gender affect the way in which works are consumed, used, viewed, appreciated? How is gender constructed, questioned, or manipulated through acts of artistic making? In what ways do artists/crafts people draw upon prior social and artistic constructs of gender in developing visual vocabularies, expressive means? Do beholders of different genders "remake" works of art differently in viewing them with varying expectations, interests, desires?

Please submit proposals of 1-2 pages by June 15, 1999. We will inform those whose proposals are accepted by July 15. Final papers will be due in February 2000. Copies of the proposals should be sent to both of the editors: Paul Vandenbroeck, Koninklijk Museum voor Schone Kunsten, Plaatsnijdersstraat 2, B-2000 Antwerpen, Belgium; Elizabeth Honig, Prinsengracht 508B, NL-1017 KH Amsterdam, The Netherlands.

Nederlands Kunsthistorisch Jaarboek/Netherlands Yearbook for History of Art

The Culture of Home in the Netherlands, c.1400-1800

The *NKJ (Nederlands Kunsthistorisch Jaarboek/Netherlands Yearbook for History of Art)* offers space to contributions based on traditional art historical methods such as style analysis and iconology, and it also encourages submissions that exemplify the increasing diversity of approaches to the study of Netherlandish art, including cultural, literary, and socio-economic history. Contributions to the *NKJ* (in Dutch, English, German, or French) are limited to a maximum length of 7500 words, excluding the notes.

Volume 51 of the *Nederlands Kunsthistorisch Jaarboek,* to be published in 2000, will have as its theme the domestic culture of the Low Countries and its ramifications for early modern identity and sociability.

In the past two decades, historians of early modern Europe have begun to study the genesis of modern ideals of home life and its attendant notions of family, privacy, intimacy, and domesticity. Writers such as Witold Rybczynski and Simon Schama have emphasized the seminal impact of Netherlandish social conditions on these developments. Volume 51 of the *Nederlands Kunsthistorisch Jaarboek* will assess the contributions of Northern and Southern Netherlandish architects, artists, patrons, collectors, and home dwellers to the layout, appearance, and myriad functions of the early modern home from the fifteenth through the eighteenth centuries. We encourage submissions that take widely varied but historically specific approaches to the material culture of the Netherlandish home and its relationships to the social and psychological structures of early modern life.

Possible themes include the place of domestic housing in urban planning; the spatial organization and decorative schemes developed in theory and practice for different types of dwellings; the relationships between forms and functions of objects of 'applied art' made for or displayed in the home; artistic evidence of the sentiments attached to notions of home; the disposition and viewing of paintings and sculptures in the home; the diverse representations of the home in townscapes, genre scenes, and portraiture; the relationships between, on the one hand, the ideal homes of architectural theory, paintings, plays, and conduct books and, on the other, the actual home; the ways in which the material culture of home shaped or incorporated prevalent notions of family, domesticity, and private life; the (semi-)public functions of the home; and the interactions between domestic material culture and personal, class-based, local, or proto-national identities. As cultural historians of domesticity and private life have concentrated efforts on the Dutch urban home in the seventeenth and eighteenth centuries, prospective authors are encouraged to submit proposals for studies of the Southern Netherlandish and/or rural home, and to consider domestic culture in the fifteenth and sixteenth centuries.

Proposals for papers should be sent before September 1, 1999 to the secretary of the Editorial Board: Dr. Jan L. de Jong, Department for the History of Art and Architecture, Groningen University, PO Box 716, NL–9700 AS Groningen, The Netherlands. Email: J.L.de.Jong@let.rug.nl

Journals, Series and other Publications: News

A New Bibliography

On November 14, 1998, the first copy of the *Bibliografie van Nederlands onderzoek (1993-1997) van beeldende kunst en kunstnijverheid uit de periode 1550-1750,* was presented to Cynthia Schneider, US Ambassador to The Netherlands. The bibliography is compiled by Anna Bavinck, with a commentary by Eric Jan Sluijter, and published under the auspices of the Vereniging van Nederlandse Kunsthistorici (VNK; Association of Dutch Art Historians). Copies of this bibliography, which includes a report on the state of research, can be obtained by transferring Dfl 20 to the postbank account of the VNK, no. 569560. Please add your name and address, or write to the secretary of the VNK at PO Box 1410, NL-3500 BK Utrecht, The Netherlands. Also available are previous bibliographies of Dutch publications on architecture (1990-1995), 19th-century art (1990-1996), and medieval art (1991-1996).

It is now also possible to become a member of the VNK, which, since 1997, has opened its membership to include art historians of all nationalities. The VNK organizes an annual congress, awards various prizes for art historical publications, and publishes a bi-monthly newsletter *(Kunsthistorici).* Members with employment pay Dfl 45, without employment Dfl 30.

Please contact: Jan L. de Jong, Institute for History of Art and Architecture, Groningen University, PO Box 716, NL-9700 AS Groningen, The Netherlands, tel: 31 (0)50-363 60 91, fax: 31 (0)50-363 73 62, email: J.L.de.Jong@let.rug.nl

Imago Figurata

Imago Figurata is a new series which deals with all forms of multi-media verbal and visual communication: emblems, impresa, illustrated pamphlets, theatre and festivities, art and architecture, etc. It is published by Brepols.

Imago Figurata Editions:

Vol. 1: Antonius à Burgundia, *Linguae vitia et remedia* (Antwerp, 1631), with an introduction by Toon van Houdt. 1998. ISBN 2-503-50774-3, BF 2,300.

Vol. 2: Johannes Kreihing, *Emblemata ethico-politica* (Antwerp, 1661), with an introduction by G. Richard Dimler. 1998. ISBN 2-503-50775-1, BF 3,000.

Vol. 3: Hieronymus Ammon, *Imitatio Crameriana* (Nuremberg, 1649), edited by Sabine Mödersheim. 1998. ISBN 2-503-50780-8, BF 2,250.

Imago Figurata Studies:

Vol. 2: Hans J. Böker and Peter M. Daly, eds., *The Emblem and Architecture: From the Sixteenth to Eighteenth Century.* 1998. ISBN 2-503-50776-X, BF 3,500.

Simiolus

Simiolus, v. 26, no. 3, 1998, published the proceedings of the Symposium held November 8, 1996, at the University of Utrecht, in honour of the publication of Seymour Slive's *Dutch Painting, 1600-1800,* and the then soon to be published Pelican volume by Hans Vlieghe on Flemish painting (the volume has since come out and will be reviewed in this *Journal).* Papers are by, besides the honorées, Bart Cornelis, Peter Hecht, Christopher Brown and Lyckle de Vries.

Annales de la Société Royale d'Archéologie de Bruxelles, Vol. 62, 1998

From the contents:

János Vegh, "Mains jointes tournées vers le bas". De Roger van der Weyden à Paul de Levoca: itinéraire d'un motif.

Didier Martens, La "Sainte Anne trinitaire au chartreux" de Poznan: primitif hollandais ou primitif flamand?

Laura Traversi, Il tema leonardesco dei "Due Fanciulli che si baciano e abbracciano": il dipinto di Chatsworth e una proposta attributiva a jan Massys.

Martin Madl, Une rondache flamande du XVIème siècle conservée au Musée National tchèque.

Ria Fabri, L'"occasion favorable" de Henri van Soest à Bruxelles en 1716. Ou comment un ébéniste anversois tenta de duper ses collègues bruzellois.

New Titles Listing

Ainsworth, Maryan W., *Gerard Devid. Purity of Vision in an Age of Transition.* Ghent: Yves Gavaert/Ludion, 1998. ISBN 90-5544-238-0. To be reviewed.

Albrecht, Anna Elisabeth, and Stephan Albrecht, *Die mittelalterlichen Flügelaltäre der Hansestadt Wismar.* Kiel: Ludwig, 1998. ISBN 3-9905480-2-3, EURO 13.

*The **Album** Amicorum of Jacob Heyblocq.* Ed. by Kees Thomassen and J.-A. Gruys. Zwolle: Waanders, 1998. ISBN 90-400-9204-4, DFL 350. - Facsimile edition published on the occasion of the 200th anniversary of the Koninklijke Biliotheek in The Hague. Jacob Heyblocq (1623-1690) read theology at Leiden and later became rector of the Grammar School in Amsterdam. He was an accomplished poet and played an active role in Amsterdam's social and cultural life.

***Arent** de Gelder (1645-1727). Rembradts laatste leerling.* Ed. by Dirk Bijker. Ghent: Snoeck Ducaju, 1998. ISBN 90-5349-282-8, EURO 41. – Exhibition held in Dordrecht and Cologne.

Augustin, Roland, *Der Geschmack des Neuen. Das Motiv des Tabakrauchens und seine Modernität in der Niederländischen Kunst* (Europäische Hochschulschriften, Reihe XXVIII: Kunstgeschichte, 330). Bern: Lang, 1998. ISBN 3-631-32740-4, EURO 57.

Backer, Anne Mieke, Eric Blok and Carla S. Oldenburger–Ebbers, *De natuur bezworen. Een inleiding in de geschiedenis van de Nederlandse tuin- en landschapsarchitectuur van de middeleeuwen tot het jaar 2005.* Rotterdam: De Hef, 1998. ISBN 90-6906-027-2, EURO 16.

Bätschmann, Oskar, and Pascal Griener, *Hans Holbein.* Princeton: Princeton UP, 1997, paperback edition 1999. ISBN 0-691-00516-8. The book was reviewed in the May 1998 *Newsletter.*

Bavelaar, Hestia, *Kroniek van kunst en Kultuur.* Leiden: Primavera Pers, 1998. ISBN 90-74310-45-1, EURO 27. ISBN 90-74310-45-1, EURO 27. – History of the Dutch art journal *Kroniek van Kunst en Kultuur,* 1935-65.

Beck, Hans-Ulrich, *Pieter Moleyn, 1595-1661. Katalog der Handzeichnungen.* Doornspijk: Davaco, 1998. ISBN 90-70288-76-1, EURO 146.

***Bedevaartplaatsen** in Nederland.* Part II: *Noord-Brabant.* Ed. by Peter Jan Margry and Charles Caspers. Hilversum: Verloren, 1998. ISBN 90-6550-567-9, EURO 65.

*De **beurs** van Judocus Vijdt. Kunstkapitaal in Gent.* Openbaar Kunstbezit in Vlaanderen in association with the Gentse Stedelijke Musea, 1998. – Published in conjunction with the exhibition of the same title, Bijlokemuseum, Ghent, October 11 – December 20, 1998. With contributions by Johan Decavele (Geld en geest. De beurs van Judocus Vijdt), Roger H. Marijnissen (Judocus Vijdt en de kunsthistoriografie), Erik Duverger (Gentse kunstverzamelingen vóór 1797), Laurens de Keyzer (De' beurs' van de Gentse museumsynergie). To order: Transfer BF 325 to account number 448-0007361-87 (OKB), marked "Judocus Vijdt".

Biesboer, P., *et al., Vlamingen in Haarlem.* Haarlem: De Vrieseborch, 1996. ISBN 90-6076-400-5, EURO 13. – Flemish immigrants in Haarlem from c.1578 until World War I.

*Das **Bild** der "Niederländischen Sprichwörter". Pieter Bruegels verkehrte Welt.* Ed. by Michael Philipp. Amsterdam: Castrvm Peregrini, 1999. ISBN 90-6034-102-3, EURO 13.

Boogert, Bob van den, et al., *Buiten tekenen in Rembrandts tijd* (Studies from the Rembrandt Information Centre, 2). Amsterdam: Museum het Rembrandthuis – Rembrandt Information Centre, 1998. ISBN 90-74310-41-9, EURO 16. Reviewed in this issue.

Boom, Eva, *"Van oog zoo fiks, van hand zoo juist". Achttiende-eeuwse prenten en tekeningen uit de collectie van het Rijksmuseum Twenthe.* Enschede: Rijksmuseum Twenthe, 1998. ISBN 90-72250-21-4, EURO 16.

Boschman-Aarnoudse, C., *Het Sint Jans Gasthuis te Hoorn. Den Oudtgeworden Mensch, die men in dit laat woonen* (Bouwhistorische reeks Hoorn, 8). Hoorn: Publicatiestichting Bas Balthus, 1998. EURO 25.

***Bruges** and the Renaissance. Memling to Pourbus.* Ed. by Maximiliaan Martens. Ghent/Bruges: Ludion/Stichting Kunstboek, 1998. ISBN 90-5544-233-X, EURO 27. – Exhibition catalogue, available also in Dutch, French and German. To be reviewed.

***Cornelis** de Bruijn. Reizen van Rome naar Jeruzalem en van Moskou naar Batavia/Voyages from Rome to Jerusalem and from Moscow to Batavia.* Ed. by Geralda Jurriaans-Helle. Amsterdam: Allard Pierson Museum, 1998. ISBN 90-71211-28-2, EURO 9.

De Mecheleer, Lieve, *Rekening van de kerkfabriek van de Sint-Leonarduskerk van Zoutleeuw (1405, 1452-1599).* (Fontes Historiae Artis Neerlandicae, III). Brussels: Academie voor Wetenschaap, Letteren en Schone Kunsten van België, 1997. ISBN 90-6569-661-X, EURO 89.

Dessens, Henk, and Elisabeth Spits, *Schepen in het klein. Geschiedenis en typologie van het Nederlandse scheepsmodel.* Zutphen: De Walburg Pers, 1998. ISBN 90-5730-046-X, EURO 27.

***Dirk** Bouts (ca. 1410-1475), een Vlaamse primitief te Leuven.* Ed. by Maurits Smeyers. Leuven: Peeters, 1998. ISBN 90-429-0661-8, EURO 89. – Exhibition catalogue. To be reviewed.

Dudok van Heel, S. A. C., et al., *Nicolaes Tulp. The Life and Work of an Amsterdam Physician and Magistrate in the 17th Century.* Amsterdam: Six Art Promotion, 1998. ISBN 90-71056-10-4, EURO 43.

***Dutch** Poetry in Translation --Kaleidoscope.* Translated by Martijn Zwart, with Ethel Grene. Fairfield, IL: Fairfield Books, 1998. $22 (hardcover), $15 (paper). – From middle ages to the present. Available from www.Amazon.com, or 888-242 9379.

Frenssen, Birte, *Von Stutzern, Philosophen und Kesselflickern. Malerei des Barock in Hamburg.* Hamburg: Hamburger Kunsthalle, 1998. ISBN 3-922-909-36-1, EURO 16. – The painters David Kindt, Jacob Weyer, Otto Wagenfeldt, Jürgen Jacobs, Matthias Scheits, Georg Hinz and Dominicus van der Smissen.

Frijhoff, W. T. M., *et al., De Sint-Walburgiskerk in Zutphen. Momenten uit de geschiedenis van een Middeleeuwse kerk.* Zutphen: De Walburg Pers, 1998. ISBN 90-5730-041-9, EURO 36.

*"... **gantz** Verheeret!" Magdeburg und der Dreißigjährige Krieg* (Magdeburger Museumsschriften, 6). Halle: MDV, 1998. ISBN 3-932776-62-3, EURO 18.

***Geschiedenis** van Dordrecht van 1572 tot 1813.* Ed. by Willem Frijhoff, Hubert Nusteling and Marijke Spies. Hilversum: Verloren, 1998. ISBN 90-6550-601-2, EURO 38.

Glancey, Jonathan, *Van Dyck. Gemälde und Zeichnungen.* Munich: Prestel, 1999. ISBN 3-7913-2132-3 (German), ISBN 3-7913-2090-4 (English), DM 50.

*The **Golden** Age of Dutch Painting in Historical Perspective.* Eds.: Frans Grijzenhout and Henk Van Veen, translated by Andrew McCormick. Cambridge and New York: Cambridge UP, 1999. ISBN 0-521-49621-7, $75.

Hagnau, Carola, *Der Meister der Lindauer Beweinung. Das Kölner Tafelgemälde "Christus als Schmerzensmann und die Stigmatisation des Hl. Franziskus" in Werk und regionalem Kontext* (Akademische Abhandlungen zur Kunstgeschichte). Berlin: VWF Verlag für Wissenschaft und Forschung, 1998. ISBN 3-89700-047-4, EURO 29.

Hannema, K. H., and N. Klaversma, *Catalogus van de collectie boeken, geïllustreerd en/of geschreven door Jan en Caspar Luyken, in de bibliotheek van het Amsterdams Historisch Museum.* Hilversum: Verloren, 1999. ISBN 90-6550-581-4, EURO 56.

Heenk, Liesbeth, *Rembrandt and his Influence on Eighteenth-Century German and Austrian Printmaking/ Rembrandt und seine Verwandlung in der deutschen und österreichischen Graphik des 18. Jahrhunderts* (Studies from the Rembrandt Information Centre, 1). Amsterdam: Museum Het Rembrandthuis – Rembrandt Information Centre, 1998. ISBN 90-74310-49-4, EURO 22. Reviewed in this issue.

Heise, Karin, *Der Lettner des Hildesheimer Domes.* 2 vols. (Der Hildesheimer Dom. Studien und Quellen, 2). Hildesheim: Olms, 1998. ISBN 3-487-10554-3, EURO 75.

Herrmann, Barbara, *Johann Hulsman. Ein Kölner Maler des 17. Jahrhunderts* (Europäische Hochschulschriften, Reihe XXVIII: Kunstgeschichte, 314). Bern: Lang, 1998. ISBN 3-631-32731-5, EURO 41.

Heublein, Brigitte, *Der "verkannte" Joseph. Ein Beitrag zur mittelalterlichen Ikonographie des Heiligen im deutschen und niederländischen Kulturraum.* Weimar: Verlag für Datenbank für Geisteswissenschaften, 1997. ISBN 3-932124-17-0, DM 69.

***Hof-**, Staats- en Stadsceremonies.* Nederlands Kunsthistorisch Jaarboek, 49, 1998. Zwolle: Waanders, 1998. ISBN 90-400-9266-4, Dfl 225. To be reviewed. See the review of vol. 48 in this issue.

***Huizen** & hun bewoners. Een 16de-eeuwse stadswandeling door Brugge.* Openbaar Kunstbezit in Vlaanderen, 1998. To order: Transfer BF 300 to account number 448-0007361-87 (OKB).

Huizinga, Johan, *Nederlands beschaving in de zeventiende eeuw. Een schets.* Ed. by Anton van der Lem. Amsterdam: Contact, 1998. ISBN 90-254-1255-6, EURO 22. – New and illustrated edition of Huizinga's famous lecture, given in Cologne for the Dutch-Netherlandish Institute in 1932.

***In** Detail. New Studies of Northern Renaissance Art.* Ed. by Laurinda Dixon (Museums at the Crossroads, 5). Turnhout: Brepols, 1998. ISBN 2-503-50746-8, EURO 74. To be reviewed.

Jähne, Michael, *Die Bauskulptur des Spätmittelalters im Saarland (1260-1550). Untersuchungen zu Stil und Ikonographie.* Saarbrücken: Verlag die Mitte, 1998. ISBN 3-921236-79-7, EURO 33.

Janssen, Paul, *Jan Bijlert (1597/981671)* (Oculi, 7). Amsterdam and Philadelphia: John Benjamins, 1998. ISBN 1-55619-272-X, $197. To be reviewed.

Jedding, Hermann, *Johann Heinrich Roos. Werke einer Pfälzer Tiermalerfamilie in den Galerien Europas.* Mainz: Philipp von Zabern, 1998. ISBN 3-8053-2330-1, DM 168.

Kavaler, Ethan Matt, *Pieter Bruegel. Parables of Order and Enterprise* (Studies in Netherlandish Visual Culture). Cambridge and New York: Cambridge UP, 1999. ISBN 0-521-62267-0, $75. To be reviewed.

Kettering, Alison McNeil, *Gerard ter Borch en de Vrede van Munster.* Zwolle: Waanders, 1998. ISBN 90-400-9239-7 (Dutch), 90-400-9240-0 (English), Dfl 30. To be reviewed.

Kilian, Jennifer, *Karel Dujardin (16261678)* (Oculi, 8). Amsterdam and Philadelphia: John Benjamins, 1999. ISBN 1-55619-273-8.

Klinger, D. M. and Antje Höttler, *Holbein. Werkverzeichnis. Gemälde und Miniaturen. Die Malerbrüder Ambrosius und Hans d. J.* Nürnberg: DMK Verlag, 1999. ISBN 3-923642-34-2, EURO 101.

Korteweg, Anne S., *Boeken van Oranje-Nassau. De bibliotheek van de graven van Nassau en prinsen van Oranje in de vijfteinde en zestiende eeuw.* The Hague: Museum van het Boek/Museum Meermanno-Westreenianum/Koninklijke Bibliotheek, 1998. ISBN 90-6259137-X, EURO 15.

***Kunstgeschiedenis** in Nederland. Negen opstellen.* Ed. by Peter Hecht, Chris Stolwijk, Annemieke Hoogenboom. Baarn: De Prom, 1998. ISBN 90-5333-708-3, EURO 16. – Nine papers given at a symposium in Utrecht in 1997.

Kunze, Matthias, *Daniel Seiter (1647–1705). Die Zeichnungen.* Salzburg: Salzburger Barockmuseum, 1997. – Catalogue of an exhibition held at the Barockmuseum, August 5 – September 14, 1997. The catalogue, which is also a *Werkverzeichnis,* is based on the author's PhD dissertation (Tübingen) of 1994.

*Die **Landshuter** Stadtresidenz. Architektur und Ausstattung.* Ed. by Iris Lauterbach and Christoph Luitpold

Frommel (Veröffentlichungen des Zentralinstituts für Kunstgeschichte, XIV). Munich: Zentralinstitut für Kunstgeschichte, 1998. ISBN 3-9806071-1-9, DM 48. – Residence of Duke Ludwig X of Bavaria, which goes back to 1536.

Laureys, Marc, ed., *The World of Justus Lipsius: A Contribution towards His Intellectual Biography. Proceedings of a Colloquium Held under the Auspices of the Belgian Historical Institute in Rome (Rome, 22-24 May 1997).* Brussels: Belgian Historical Institute of Rome, 1998.

***Leven** te Leuven in de late Middeleeuwen.* Ed. by Lutgarde Bessemans. Leuven: Peeters, 1998. ISBN 90-429-0661-8, EURO 59. – Catalogue of an exhibition held at the Stedelijk Museum Vander Kelen-Mertens.

*Het **Leuvense** Stadhuis. Pronkjuweel van de Brabantse gotiek.* Ed. by Maurits Smeyers. Leuven: Peeters, 1998. ISBN 90-429-0660-X, EURO 37.

Liess, Reinhard, *Der Heisterbacher Altar. Ein Frühwerk Stefan Lochners.* Bramsche: Rasch, 1998. ISBN 3-932147-56-1, EURO 17.

Luber, Katherine Crawford, *Albrecht Dürer and the Venetian Renaissance.* Cambridge and New York: Cambridge UP, 1999. ISBN 0-521-56288-0, $60. To be reviewed.

Lütke Notarp, Gerlinde, *Von Heiterkeit, Zorn, Schwermut und Lethargie. Studien zur Ikonographie der vier Temperamente in der niederländischen Serien- und Genregraphik des 16. und 17. Jahrhunderts* (Niederlande-Studien, 19). Münster: Waxmann, 1998. ISBN 3-89325-656-3, EURO 40.

***Maria** Sibylla Merian. Neues Blumenbuch.* Facsimile of 1680 Nürnberg edition. Vol. 1: Facsimile; vol. 2: Commentary. ISBN 3-7913-2060-2, DM 198. Publication scheduled for June 1999.

***Maria** Sibylla Merian. Neues Blumenbuch.* Special edition. Munich: Prestel, 1999. ISBN 3-7913-2059-9, DM 40.

***Michael** Pacher und sein Kreis. Ein Tiroler Künstler der europäischen Spätgotik, 1498-1998.* Ed. by Artur Rosenauer. Bolzano: Arthesia, 1998. ISBN 88-7014-982-X, EURO 42.

Muller, Frank, *Heinrich Vogtherr l'Ancien: Un artiste entre Renaissance et Réforme* (Wolfenbütteler Forschungen, 72). Wiesbaden: Harrassowitz, 1997. DM 198.

***Naar** het lijk. Het Nederlandse doodsportret, 1500-heden.* Ed. by B. Sliggers. Zutphen: De Walburg Pers, 1998. ISBN 90-5730-042-7, EURO 22.

Nalis, Henk, *The Van Doetecum Family. Part IV: The Northern Netherlandish Years, 1583-1606* (The New Hollstein – Dutch and Flemish Etchings, Engravings and Woodcuts, 1450-1700). Rotterdam: Sound & Vision, 1998. ISBN 90-75607-28-8, EURO 282.

*Der **Niederrhein** und die Alten Niederlande.* Ed. by Barbara Rommé (Kunst und Kultur an der Wende zur Neuzeit. Schriften der Heresbach-Stiftung Kalkar, 9). Bielefeld: Eimer, 1998. ISBN 3-89534-262-9, EURO 32. – Proceedings of the conference which accompanied the exhibition: "Gegen den Strom – Meisterwerke niederrheinischer Skulptur in Zeiten der Reformation".

***Pittura** fiamminga in Liguria, secoli XIV-XVII.* Ed. by Piero Boccardo and Claudio Di Fabio. Cinisello Balsamo: Silvana, 1997. ISBN 88-815046-1, EURO 47.

*La **pittura** nei Paesi Bassi.* Ed. by Bert Meijer. 3 vols (La pittura in Europa). Milano: Electa, 1997. ISBN 88-435-4039-4, EURO 208.

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Organic Chemistry in Unconventional Solvents

The Molecular Basis of Biological Order

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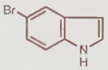
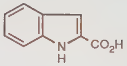
INDOLES

Since the first identification of an indole skeleton in indigo over a century ago, this nucleus has been found in various dyes, alkaloids, and plant growth hormones. It is also present in tryptophan and is a key element in various drugs such as indomethacin, the thiosemicarbazone of 1-methylisatin, and several CNS depressants. The fluorescent and phosphorescent properties of indoles have been valuable in their detection and identification, especially in biological systems.[1] Aldrich offers a number of indole derivatives, some of which are presented below. Please consult the Aldrich Catalog/Handbook for other indoles and related products.



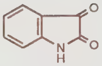
Synthesis of selective 5-hydroxytryptamine antagonists.[2]

B6,860-7 5-Bromoindole, 99% **5g $15.35; 25g $67.20**



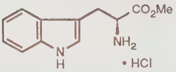
Synthesis of antitumor and antibacterial agents.[5]

I-510-9 Indole-2-carboxylic acid, 98% **5g $18.50; 10g $30.80 50g $108.00**



Chromatographic spray reagent for amino acids.[8]

11,461-8 Isatin, 98% **5g $10.15 100g $10.95; 500g $34.75**

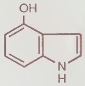


1

(-)-Indolactam-V[13] and vindorosine[14] synthesis.

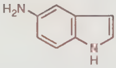
36,451-7 L-Tryptophan methyl ester hydrochloride, 98% (1) **5g $10.05 25g $39.05**

36,450-9 D-Tryptophan methyl ester hydrochloride, 98% **1g $7.20 5g $25.40**



Precursor for anticancer agents.[3]

21,987-8 4-Hydroxyindole, 99% **250mg $29.15; 1g $79.50**

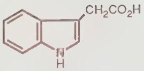


1

Used in combination with hydrazones as chromogenic systems for the detection of peroxidase.[6]

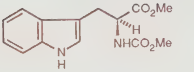
A5,965-4 5-Aminoindole, 97% (1) **1g $34.40; 5g $110.15**

30,720-3 5-Aminoindole hydrochloride, 98% **250mg $13.70; 1g $38.40**



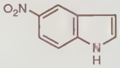
Agrochemical research.[9]

I-375-0 Indole-3-acetic acid, 98% **5g $8.30; 25g $22.30; 100g $84.35**



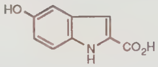
Oxyindole alkaloid synthesis.[15]

36,706-0 Nα-Methoxycarbonyl-L-tryptophan methyl ester, 98% **1g $16.50; 5g $55.00**



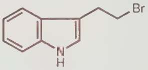
Peptidoleukotriene antagonist synthesis.[4]

N1,760-2 5-Nitroindole, 98% **1g $17.10; 5g $57.00; 25g $154.70**



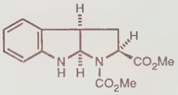
Preparation of benzodiazepines such as cholecystokinin and gastrin inhibitors.[7]

14,351-0 5-Hydroxy-2-indolecarboxylic acid, 98% **1g $40.60 5g $137.05**



Deserpidine,[10] *dl*-alloyohimbine,[11] and *dl*-deplancheine[12] synthesis.

37,652-3 3-(2-Bromoethyl)indole, 97% **1g $9.00; 5g $30.00**



Synthesis of natural products.[16]

37,236-6 Dimethyl L-(+)-3,3a,8,8a-tetrahydropyrrolo[2,3-*b*]indole-1,2(2*H*)-dicarboxylate 1g $17.00

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About Our Cover:

Readers of the *Aldrichimica Acta* have known for twenty-four years that our chemist collector prefers Dutch 17th century paintings, preferably of Biblical subjects by Rembrandt students. But occasionally he just cannot resist buying more modern paintings. So it was with this large family portrait (oil on canvas, 59 x 91 inches), which he first saw in the basement of a Paris dealer. The clothing suggests that it was painted about 1815, but where and by whom? Is the ring on the middle finger of the mother's left hand a clue to the country and denomination? The desk looks New England of the period, but there may have been desks just like this in Scandinavia. The family Bible is open at "Acts", in English.

The raw canvas was exported from England by the London firm of Jesse Middleton which supplied canvases to Rembrandt Peale and Gilbert Stuart, but probably also to European artists. The sylvestris pine of the heavy stretcher could have grown in North America or northern Europe. Prof. R. B. Hoadley and his students at the University of Massachusetts at Amherst have developed a method[1] to distinguish between them, which involves measurements of fusiform ray heights. Unfortunately, there is a range where one cannot distinguish between North American red pine and northern European Scots pine, and values obtained from this stretcher fall into that range.

What is most enchanting is the depiction of the personalities: the stern father (a minister?), the mother, concerned mainly with the welfare of the family, and each of the children, alike in some ways, yet so different. And don't overlook the dog and cat.

Our hope is that descendants of this family will recognize their ancestors and so point to where this was painted and perhaps even to the artist.

Some years ago, in *Aldrichimica Acta 11*, 3 (1978), we depicted a Dutch church, and several readers identified the church through its distinctive organ. Perhaps readers will be able to help us with this, also.

The quality of this painting makes it a fitting cover for the *Acta* with the truly exciting papers of Prof. Grieco and Dr. Williams.

---

1) "The Use of Fusiform Rays as a Basis for Distinguishing the Woods of *P. sylvestris* and *P. resinosa*," Zarifan, S.A. M.Sc. Thesis, University of Massachusetts at Amherst, Department of Forestry and Wildlife Management, May, 1987.

The Detective's Eye: Investigating the Old Masters

Twenty-four paintings that have been reproduced on our *Acta* covers and five that have been on our catalog covers were among some seventy works in an exhibit at the Milwaukee Art Museum (January 19 - March 19, 1989) for which Isabel and Alfred Bader were guest curators.

If you relish detective work and puzzles about Old Master paintings, you will find much to enjoy in this fully illustrated catalog, and you will learn something about our chemist collector's interest in art and connoisseurship as well.

Z18,350-4 **$12.20**

Lab Notes

I was surprised to find that one type of flask which has been made by German and Czech glassblowers for at least 50 years was not available in the U.S. Since this flask with the round bottom, the "Apollo" flask, is so useful to the organic chemist, I suggest that Aldrich might like to offer it.

It has properties similar to the Apollo space ship; when dropped on water it has two stable positions. In most cases it will stand on a bench in a stable position without a ring, and it can float on a liquid surface, even in a very unstable position, keeping the neck up. It will float in a stable position upside down in a liquid. This means that if a filled flask drops from the rotavap, most of the solution remains inside the flask. Simply close the neck with a stopper and remove it from the bath. A further advantage of the Apollo flask is that it has a larger inner volume than the round-bottom flask for the evaporation of foaming liquids, and the inner surface of the flask is easily reached with a spatula.

Dr. Pavel Drasar
Institute of Organic Chemistry
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Editor's Note: Aldrich now offers five volumes of Apollo flasks in both ₸14/20 and ₸14/23 joint sizes. These are listed below. For more information, contact our Technical Services Department at 800-231-8327.

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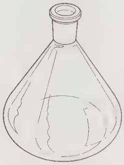
Low profile flasks for easy access with a spatula. Inner shape of the flask is best for the controlled evaporation of foaming solvents, such as toluene or xylene, on a rotovap.



	with ₸14/20 joint		with ₸14/23 joint	
Cap. (ml)	**Cat. No.**	**Each**	**Cat. No.**	**Each**
10	**Z22,131-7**	$10.70	**Z22,137-6**	$10.70
25	**Z22,132-5**	11.90	**Z22,138-4**	11.90
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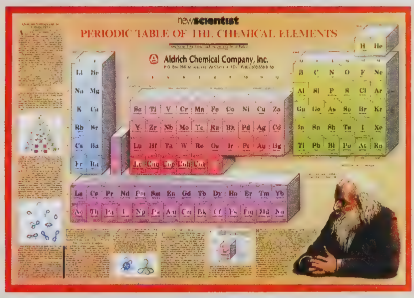
100	**Z22,134-1**	15.05	**Z22,140-6**	15.05
250	**Z22,136-8**	15.20	**Z22,141-4**	15.20



Do you have an innovative shortcut or unique laboratory hint you'd like to share with your fellow chemists? If so, please send it to Aldrich (attn: Lab Notes, Aldrichimica Acta). For submitting your idea, you will receive a complimentary, laminated periodic table poster. If we publish your *Lab Note*, you will also receive **The Detective's Eye: Investigating the Old Masters** (see previous page). We reserve the right to retain all entries for consideration for future publication.

"Please Bother Us."

by Alfred Bader.

Dr. Ian O'Neil of the University of Liverpool kindly suggested that we offer a reversed phase silica gel for column chromatography. Using chromatography methods, compounds such as organic stannanes,[1] amino-acids, nucleosides, carboxylic acids, and sulfonic acids may be readily separated.[2]

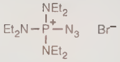
Naturally, we made this material.

(1) Farina, V. *J. Org. Chem.* **1991**, *56*, 4985. (2) O'Neil, I.A. *Synlett.* **1991**, 661.

37,763-5 Octadecyl-functionalized silica gel
25g $22.00 100g $61.00

It was no bother at all, just a pleasure to be able to help.

New Diazo Transfer Reagent



$\mathrm{Et_2N-\overset{NEt_2}{\underset{NEt_2}{P^{+}}}-N_3 \quad Br^-}$

This new reagent, suggested by Prof. Ralph Raphael of Cambridge University, bears a strongly basic phosphorimine nitrogen (allowing basic autocatalysis), generates a neutral leaving group (hexaethylphosphoramidic triamide, easily removed as its hydrobromide salt), and is reportedly exceptionally stable against shock, friction, and rapid heating.

McGuiness, M.; Shechter, H. *Tetrahedron Lett.* **1990**, *31*, 4987.

38,082-2 Azidotris(diethylamino)phosphonium bromide, 98%
1g $8.50; 5g $24.00

Organic Chemistry in Unconventional Solvents

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Indiana University
Bloomington, Indiana 47405

Introduction

The use of water as a solvent in organic chemistry has, for the most part, been nonexistent despite the fact that many biochemical processes occur in the presence of water at ambient temperature. Whereas Mother Nature discovered the secrets of water millions of years ago, the organic chemist has only recently come to appreciate the enormous potential water holds for those engaged in synthetic organic chemistry.

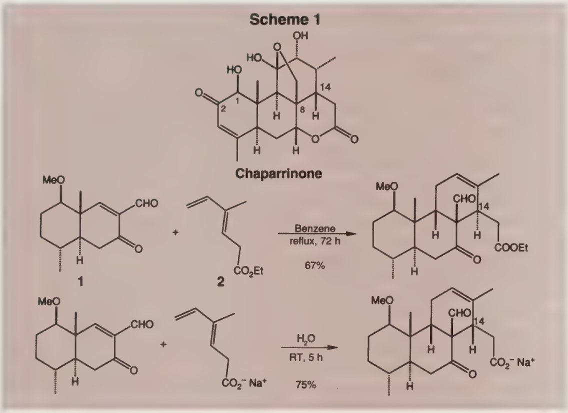
Our own realization that water can have a profound effect on the way one does organic chemistry goes back a few years to our early work on the quassinoids. In fact, it was over ten years ago that we embarked on a total synthesis of the highly oxygenated quassinoid, chaparrinone, employing a Diels-Alder approach (Scheme 1). The strategy that we adopted was a modification of the [4+2] cycloaddition chemistry we had developed in conjunction with the first successful synthesis of the parent quassinoid, quassin.[1]

There are, in principle, four possible Diels-Alder adducts that can arise from cycloaddition of **1** and **2**: two adducts from the β-face of the dienophile and two from the α-face, all via endo transition states. In reality, only two of the four possible adducts were anticipated since the presence of the angular methyl group in the dienophile precludes approach of the diene from the β-face. Proceeding along conventional lines, the diene and dienophile (Scheme 1) were dissolved in benzene and allowed to reflux over an extended period of time. One major product that possessed the incorrect configuration at C(14) was isolated.

The problem of reversing the selectivity in the Diels-Alder reaction proved to be a formidable challenge. However, after extensive experimentation, the desired reversal in selectivity could be achieved by conducting the Diels-Alder reaction in water and employing the sodium salt of 4-methyl (*E*)-3,5-hexadienoic acid as the diene.[2] Equally noteworthy was the fact that, in water, the rate of the reaction was dramatically accelerated. Best results were obtained when the reaction was conducted with a five-fold excess of diene carboxylate (2.0 *M* in water).

Several features of this reaction warrant comment. The reaction rate is dramatically slowed upon lowering the concentration of diene below 1.0 *M*. Furthermore, upon addition of organic solvents (e.g., dioxane, methanol, tetrahydrofuran) to help solubilize the dienophile, the reaction rate, once again, is dramatically slowed. The above observations strongly suggest that aggregation of the diene carboxylate plays a critical role in helping to solubilize the dienophile. However, the observed rate acceleration, along with the reversal in selectivity, is attributed

Scheme 1



Dr. Stephen Branca, Aldrich Chemical, presenting Dr. Paul A. Grieco wth the 1991 ACS Award for Creative Work in Synthetic Organic Chemistry.

to the hydrophobic effect (the entropy driven association of nonpolar species in water that minimizes their exposure to water). When several transition states are possible, the more compact transition state, occupying the smallest volume, should be favored. Examination of the transition state leading to the desired C(14) β-H adduct reveals a compact, ball-like structure, whereas the transition state leading to the undesired isomer is bulky and cumbersome.

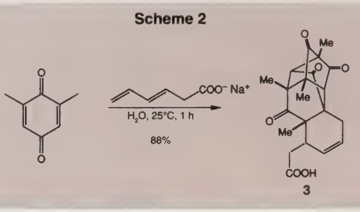
The enhanced reaction rate and reversal in selectivity observed above led us to investigate further the scope of water and other unconventional solvents for the Diels-Alder reaction. I would be remiss at this point if I did not mention the pioneering work of Breslow who was the first to report the hydrophobic acceleration of the Diels-Alder reaction between cyclopentadiene and methyl vinyl ketone in water.[3,4]

Diels-Alder Reactions in Aqueous Medium

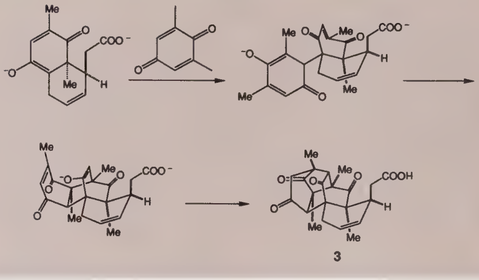
During the course of our study on the aqueous Diels-Alder reaction, we found that diene carboxylates react in water at ambient temperature with a wide range of dienophiles.[5] Much of this work has been published and will not be reviewed here; however, several applications of this methodology to natural products synthesis, as well as an application to a novel carbocyclic ring forming reaction, are deserving of mention. In the latter category, we were particularly intrigued to find that, during the examination of the reaction of diene carboxylates with a number of substituted benzoquinones, we obtained a novel pentacyclic compound.[6] Exposure of 2,6-dimethylbenzoquinone to 1.5 equiv of a 1.0 *M* solution of sodium (*E*)-3,5-hexadienoate in water containing a catalytic amount of sodium hydroxide gave rise to carboxylic acid **3** (Scheme 2). The anticipated Diels-Alder adduct is obtained in the absence of base. The formation of **3** arises via deprotonation of the Diels-Alder adduct followed by two sequential 1,4-Michael addition reactions (Scheme 3). Similar results were obtained with sodium (*E*)-4,6-heptadienoate. Other substituted benzoquinones (e.g., 2,5-dimethylbenzoquinone) behave similarly.

Two examples serve to illustrate the applicability of the aqueous Diels-Alder strategy to the synthesis of natural products. The synthesis of the bicyclic lactone **6**, which constitutes the basic AB ring system of the sesquiterpene lactone, vernolepin, was readily realized via a one pot procedure (Scheme 4).[7] Cycloaddition of sodium (*E*)-3,5-hexadienoate with the α-substituted acrolein **4** in water followed by direct reduction of the intermediate Diels-Alder adduct **5**, without workup, gave rise, upon acidification, to **6** in excellent yield.

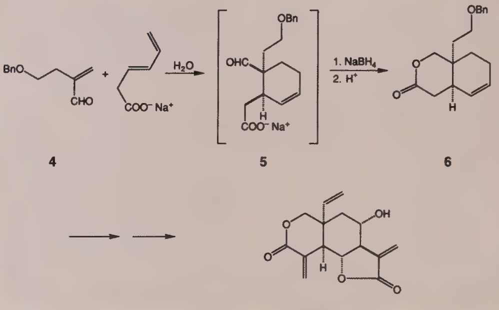
Scheme 2



Scheme 3



Scheme 4

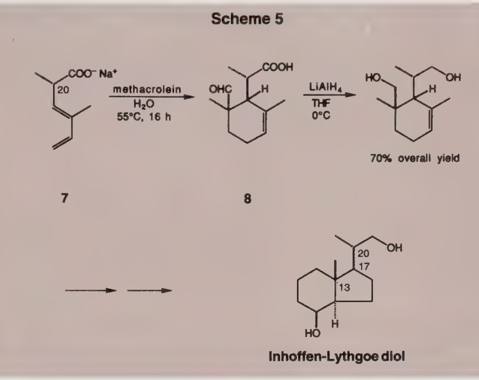


Vernolepin

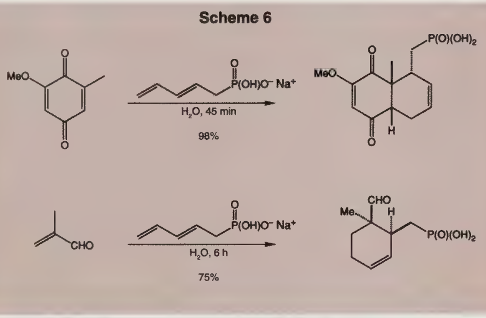
In connection with synthesizing the Inhoffen-Lythgoe diol (Scheme 5), a novel intermolecular Diels-Alder strategy in water was employed, wherein an intact C(20) stereocenter, as part of a diene unit, was used to elaborate directly the stereocenters of the latent C/D trans-fused hydrindane ring system at C(13) and C(17).[8] Remarkably, condensation of methacrolein with the sodium salt of chiral diene **7** proceeded in water, giving rise to carboxylic acid **8**. Approximately 15% of the other diastereoisomer could be isolated. In contrast to the high degree of diastereoselection observed above, the corresponding reaction employing the methyl ester of **7** gave no diastereoselectivity in the absence of water.

The aqueous Diels-Alder methodology can be extended to dienes bearing other water solubilizing groups. In this regard, we have examined the sodium salt of (*E*)-2,4-pentadienylphosphonic acid (Scheme 6)[9] and the dienyl ammonium chloride salts (Scheme 7)[10] derived from (*E*)-2,4-pentadienyl-

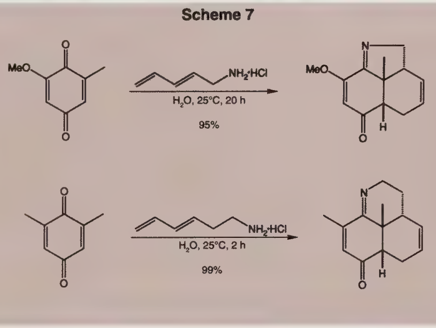
Scheme 5



Scheme 6



Scheme 7



amine and (*E*)-3,5-hexadienylamine. The Diels-Alder reactions were conducted along the lines delineated above, employing a five-fold excess of diene, generally 1.0 - 2.0 *M* in water. In all cases, the Diels-Alder adducts were derived from endo transition states with ortho regiochemistry. With respect to the dienyl ammonium salts, the Diels-Alder adducts underwent subsequent internal imine formation. Uncyclized free amino compounds could not be detected upon workup. The (*E*)-2,4-pentadienylphosphonic acid used in connection with the above study was prepared, in straightforward fashion, by an Arbuzov reaction between (*E*)-2,4-pentadienyl bromide and tris(trimethylsilyl) phosphite, followed by exposure of the resultant bis(trimethylsilyl) (*E*)-2,4-pentadienylphosphonate to methanol.

Water as a Solvent for the Claisen Rearrangement

In the midst of our study on aqueous Diels-Alder chemistry, we became intrigued by the possibility of promoting Claisen rearrangements in water. There was ample precedent in the literature to suggest that water should have an accelerating influence. In fact, a number of research groups had independently demonstrated that polar solvents accelerate Claisen rearrangements.[11]

In a preliminary, qualitative study, allyl vinyl ether **9** was shown to undergo [3,3]-sigmatropic rearrangement in water at 60°C, giving rise to aldehyde **10** (Scheme 8). Rearrangement of the corresponding ester **11** in water is equally facile and efficient at 60°C despite the fact that the reaction medium is heterogeneous. In contrast, the rearrangement of **11** proceeds very slowly in benzene (Scheme 8). A solvent polarity study on the rate of the rearrangement of allyl vinyl ether **9** has been conducted in solvent systems ranging from pure methanol to water at 60°C.[12] The first order rate constant for the rearrangement of **9** in water is $18 \times 10^{-5}s^{-1}$, compared to $0.79 \times 10^{-5}s^{-1}$ in pure methanol.

The accelerating influence of water as a solvent on the rate of the Claisen rearrangement has been demonstrated on a number of substrates, which clearly illustrates the enormous potential it holds for those engaged in the synthesis of natural and unnatural products.[13] Notable, among the many cases that have been examined, is the rearrangement of allyl vinyl ether **12** (Scheme 9), which proceeds at 80°C. During his total synthesis of aphidicolin, McMurry found that the Claisen rearrangement of **12**, wherein the 1,3-diol unit was protected, required temperatures in excess of 200°C and was plagued by the elimination of acetaldehyde.[14]

Equally remarkable is the effect of water on the rearrangement of allyl vinyl ether **13** (R = Na; Scheme 10), a key intermediate in a synthesis of the Inhoffen-Lythgoe diol. The rearrangement of **13** (R = Na), which presumably occurs via a boat transition state, proceeds at 95°C. The corresponding ester **13** (R = Me) led only to recovered starting material upon prolonged heating in decalin at 95°C.

In an attempt to probe further the potential of water as a solvent for the Claisen rearrangement, we set out to study the rearrangement of the [4.5.5.5]-fenestrene derivatives **14** and **16** (Scheme 11), which, as a direct consequence of the [3,3]-sigmatropic process, would impart significant torsional strain to the novel functionalized fenestrenes **15** and **17**. Note that fenestrene **17** possesses a trans ring fusion between the two five-membered rings common to the acetaldehyde unit.

Claisen rearrangement of allyl vinyl ether **14** proceeded at 90°C, affording aldehyde **15**. The structure of **15** was unambiguously established by single-crystal X-ray analysis of the corresponding carboxylic acid. The transformation of **16** into **17** was surprisingly facile. It is particularly interesting to note that all previous attempts to employ Claisen rearrangements within the carbon framework of a fenestrane system, as well as efforts to synthesize a fenestrane possessing a trans ring fusion, have been unsuccessful.

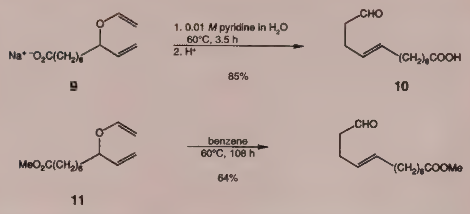
Lithium Perchlorate in Diethyl Ether — A Unique Medium for Accelerating the [1,3]-Sigmatropic Rearrangement of Allyl Vinyl Ethers

The rate accelerations recorded above have been attributed, in part, to stabilization of a polar transition state by water. We were particularly intrigued with the idea of using other, more polar media to lower further the barrier for the Claisen rearrangement. In view of the fact that lithium perchlorate solutions in diethyl ether have previously been employed to accelerate reactions with polarized transition states, we set out to examine the effect of lithium perchlorate-diethyl ether on the rate of the Claisen rearrangement. Over thirty years ago, Winstein[15] demonstrated that the ionization rate of *p*-methoxyneophyl *p*-toluenesulphonate in 0.1 *M* $LiClO_4$-Et_2O increased by a factor of 10^5. Similarly, Pocker[16] has observed that 5.0 *M* $LiClO_4$-Et_2O increases the rate of ionization of trityl chloride by 7.0 x 10^9.

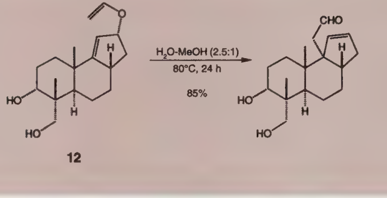
In order to probe the effect of lithium perchlorate in diethyl ether on a number of simple allyl vinyl ethers, a number of substrates (e.g., **18**; Scheme 12) were initially exposed to 0.1 *M* $LiClO_4$-Et_2O. After several hours at ambient temperature, no reaction was observed. However, exposure of **18** to 1.0 *M* $LiClO_4$-Et_2O over 24 h resulted in the disappearance of the starting allyl vinyl ether and the formation of one major product, which was not the product of the anticipated [3,3]-sigmatropic rearrangement, but instead the result of an exclusive [1,3]-sigmatropic rearrangement (Scheme 12). The rearrangement of **18** is best performed in 3.0 *M* $LiClO_4$-Et_2O. The intervention of the [1,3]-sigmatropic rearrangement during the course of a Claisen rearrangement is a rare event, witnessed previously in only a very few special cases where the normal [3,3]-process is either energetically or sterically unfavorable, or both.

The above procedure, utilizing 3.0 *M* $LiClO_4$-Et_2O to promote [1,3]-rearrangement

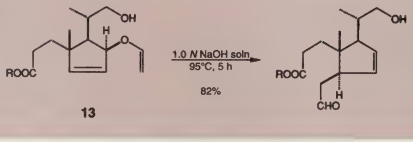
Scheme 8



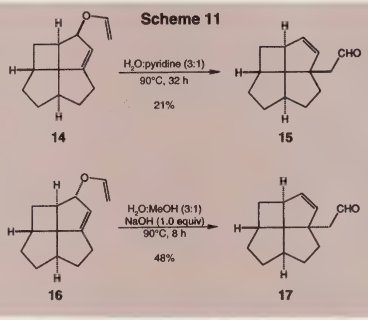
Scheme 9



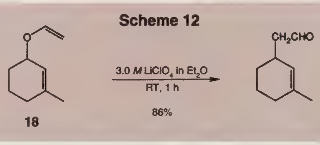
Scheme 10



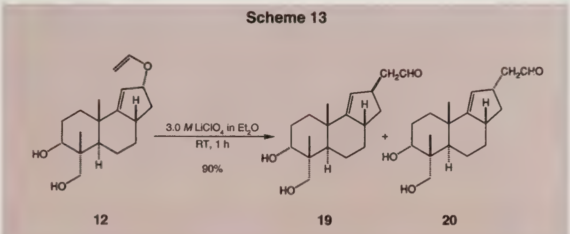
Scheme 11



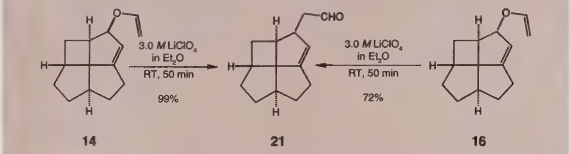
Scheme 12



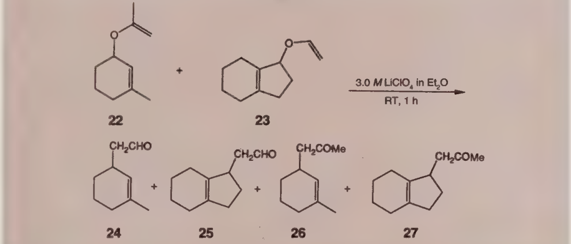
Scheme 13



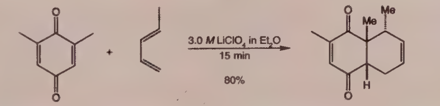
Scheme 14



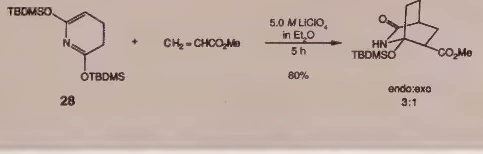
Scheme 15



Scheme 16



Scheme 17



of allyl vinyl ethers, is applicable to a variety of substrates.[17] For example, a 0.2 *M* solution of allyl vinyl ether **12** (Scheme 13) in 3.0 *M* $LiClO_4$-Et_2O underwent exclusive [1,3]-rearrangement within 1 h at ambient temperature, giving rise to **19** and **20** in a ratio of 5:1. Use of 5.0 *M* $LiClO_4$-Et_2O afforded **19** and **20** in the same ratio within a few minutes. Interestingly, exposure of the corresponding C(12) epimeric allyl vinyl ether to 3.0 *M* $LiClO_4$-Et_2O gave rise, within 1 h, to a 94% yield of **19** and **20** in a 5:1 ratio.

We were surprised to find that the fenestrene-derived allyl vinyl ethers **14** and **16**, employed above in conjunction with the aqueous Claisen rearrangement study, also underwent [1,3]-sigmatropic rearrangement, giving rise to the same aldehyde **21** (Scheme 14), suggesting, as did the data from the rearrangement of allyl vinyl ether **12**, that the observed [1,3]-rearrangement products may arise via dissociated ions, followed by recombination. In order to determine the extent of ionization of allyl vinyl ethers in 3.0 *M* $LiClO_4$-Et_2O, allyl vinyl ethers **22** and **23** (Scheme 15) were subjected to a crossover experiment. In a separate set of experiments, prior to the crossover study, it was established that both **22** and **23** (each 0.1 *M* in 3.0 *M* $LiClO_4$-Et_2O) undergo smooth transformation within one hour to their respective [1,3]-rearrangement products **26** and **25**, in excellent yields. Upon admixture of **22** and **23**, a mixture of aldehydes **24** and **25**, and ketones **26** and **27** was obtained in a ratio of 1.0:1.8:1.5:1.6, suggesting that dissociated ions are involved. We also established, via kinetics, that the reaction rate for the [1,3]-rearrangement of substrate **18** is dependent upon the concentration of lithium ion; however, additional factors may be operational.

Acceleration of Diels-Alder Reactions in 5.0 *M* Lithium Perchlorate-Diethyl Ether

Our longstanding interest in the Diels-Alder reaction led us to examine lithium perchlorate in diethyl ether as a medium for effecting [4+2]-cycloadditions, despite the general view that the rate of the Diels-Alder reaction is essentially independent of solvent polarity. This consensus is not surprising since, for years, the Diels-Alder reaction has been thought of as proceeding via a highly ordered, relatively nonpolar transition state. However, contrary to this widely held view, we have seen that a polar solvent, such as water, can have a profound effect on the rate of a Diels-Alder reaction. Unfortunately, there are limitations associated with water as a solvent: the vast majority of organic compounds are insoluble in water and water precludes the use of moisture-sensitive substrates.

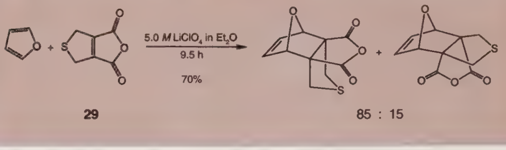
Our findings in this area clearly reveal that 5.0 *M* lithium perchlorate in diethyl ether is a powerful medium for facilitating [4+2]-cycloadditions.[18,19] A few representative examples serve to illustrate the effect. Whereas the reaction of *trans*-piperylene with 2,6-dimethylbenzoquinone in 5.0 *M* $LiClO_4$-Et_2O is complete within a few minutes (Scheme 16), the corresponding reaction in water is extremely sluggish. In the case of the sensitive diene **28**, reaction with methyl acrylate (Scheme 17) was complete in a few hours. In contrast, the reaction of **28** with methyl acrylate in benzene required 72 h at 60°C in order to go to completion.[20]

Diels-Alder adducts that hitherto were not accessible via conventional means can now be realized in 5.0 *M* lithium perchlorate in diethyl ether. For instance, furan is known to be a poor diene in the Diels-Alder reaction because of its aromaticity. In addition, the high temperatures required are not compatible with the furan cycloaddition products that cyclorevert at high temperatures. To circumvent the above difficulties, ultrahigh pressure has been employed to effect furan Diels-Alder chemistry. In his classic synthesis of cantharidin, Dauben found that reaction of furan with dienophile **29** required 15 kbar of pressure in order to realize reaction.[21] In striking contrast, the Diels-Alder reaction between furan and **29** proceeds smoothly in 5.0 *M* $LiClO_4$-Et_2O at ambient temperature and pressure (Scheme 18).

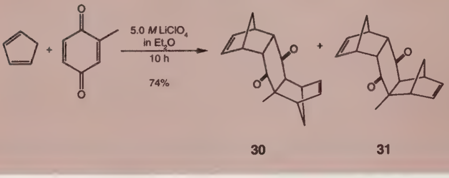
During the course of our study with dienophile **29**, we found that ethyl acetate and acetone can be employed in place of diethyl ether. For example, reaction of furan with **29** in 5.0 *M* lithium perchlorate in ethyl acetate proceeds at a reaction rate that is comparable to the rate in diethyl ether and gives rise to the Diels-Alder adducts shown in Scheme 18 in improved yield. Also effective was the use of 5.0 *M* lithium perchlorate in acetone. In contrast, the reaction rate was slowed considerably when tetrahydrofuran was employed.

Equally fascinating and informative was the observation detailed in Scheme 19, wherein methylbenzoquinone was exposed to excess cyclopentadiene in 5.0 *M* lithium perchlorate in diethyl ether. The formation of Diels-Alder adducts, such as **30** and **31**, normally requires ultrahigh pressure and is accompanied by copious amounts of dicyclopentadiene, a result that is not surprising since reaction rates for all Diels-Alder reactions should be increased under pressure due to the fact that all [4+2]-cycloaddition reactions proceed with a highly negative volume of activation. Interestingly, during the formation of **30** and **31** in 5.0 *M* lithium perchlorate-diethyl ether, the rate of dimerization of cyclopentadiene is not affected. A similar discovery was made recently by Forman and Dailey[22] who observed that the reaction rate for the Diels-

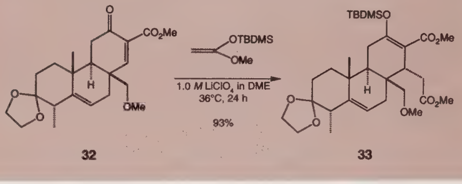
Scheme 18



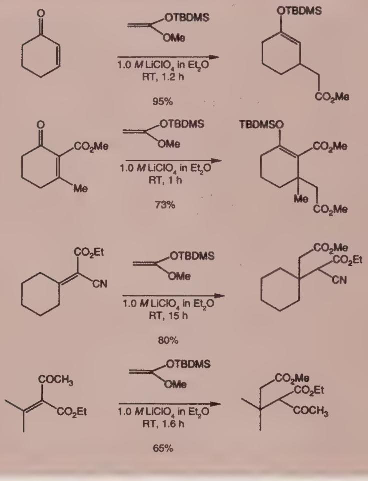
Scheme 19



Scheme 20



Scheme 21

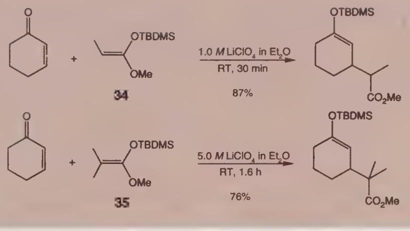


Alder reaction between styrene and 1,3-diphenylisobenzofuran is unaffected by lithium perchlorate in diethyl ether.[22] In this same report, Forman and Dailey present evidence indicating that the rate accelerations observed in lithium perchlorate-diethyl ether are consistent with lithium ion catalysis.

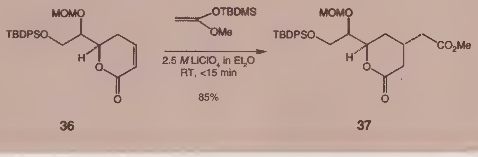
Lithium Perchlorate Catalyzed Conjugate Addition of Silyl Ketene Acetals to α,β-Unsaturated Carbonyl Compounds

Several years ago, in conjunction with an approach to bruceantin, we were unable to carry out the 1,4-conjugate addition of a silyl ketene acetal to activated enone **32** (Scheme 20) either thermally or under conventional Lewis acid catalysis (e.g., titanium tetrachloride or a 1:1 mixture of titanium tetrachloride and titanium tetraisopropoxide in methylene chloride). We have found that lithium ion catalysis will promote the conjugate addition of silyl ketene acetals to highly functionalized, hindered α,β-unsaturated carbonyl systems.[23] For example, treatment of a 0.1 *M* solution of activated enone **32** in 1.0 *M* lithium perchlorate in dimethoxyethane with 1-methoxy-1-(*t*-butyldimethylsiloxy)-ethylene gave rise, in excellent yield, to a single 1,4-addition product, **33,** possessing the C(14) α stereochemistry (Scheme 20). Use of 1.0 *M* lithium perchlorate in diethyl ether gave rise to considerable amounts of the 1,2-addition product. It is of interest to note that previously, in those instances where the thermal Michael reaction has failed due to steric congestion, or in cases where conventional Lewis acids are not compatible with existing functionality, ultrahigh pressure has been used to promote conjugate addition reactions.[24]

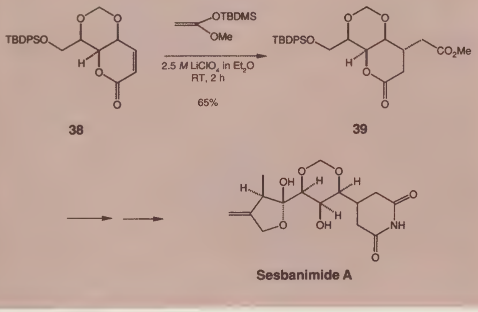
Scheme 22



Scheme 23



Scheme 24



Sesbanimide A

The lithium perchlorate catalyzed Michael reaction has been conducted on a number of substrates, including sterically demanding, β,β-disubstituted, unsaturated carbonyl compounds (Scheme 21). In the majority of cases examined, 1.0 *M* lithium perchlorate in diethyl ether appears to be the solvent of choice; however, more demanding situations may require increasing the concentration of lithium ion. Whereas silyl ketene acetal **34** undergoes smooth 1,4-addition to cyclohexenone in 1.0 *M* lithium perchlorate-diethyl ether at ambient temperature and pressure, the more demanding silyl ketene acetal **35** required the use of 5.0 *M* lithium perchlorate in diethyl ether (Scheme 22). No reaction was observed using 1.0 *M* lithium perchlorate in diethyl ether.

Lithium perchlorate has also been employed to catalyze the 1,4-addition of silyl ketene acetals to α,β-unsaturated δ-lactones. Reactions involving unsaturated lactones are best carried out in 2.5 *M* lithium perchlorate in diethyl ether. For example, treatment of a 0.1 *M* solution of δ-lactone **36** in 2.5 *M* lithium perchlorate in diethyl ether at ambient temperature and pressure with 1-methoxy-1-(*t*-butyldimethylsiloxy)ethylene afforded, within a few minutes, an excellent yield of lactone **37** (Scheme 23). Similarly, unsaturated lactone **38** was transformed into lactone **39**, a key intermediate in a recently completed synthesis of the cytotoxic natural product sesbanimide A (Scheme 24).[25]

Acknowledgements

It is a pleasure for me to express my sincere appreciation to the dedicated, hardworking, skillful efforts of my graduate students and postdoctoral associates whose names appear in the references cited. To them I will forever remain deeply indebted. I am grateful to the National Institutes of Health and the National Science Foundation for the generous support that made this research possible.

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18) Grieco, P.A.; Nunes, J.J.; Gaul, M.D. *ibid.* **1990**, *112*, 4595.
19) After the completion of our study, we became aware of a report in the literature [Braun, R.; Sauer, J. *Chem. Ber.* **1986**, *119*, 1269] that described the enhanced endo selectivity for the Diels-Alder reaction between cyclopentadiene and methyl acrylate in concentrated lithium perchlorate-diethyl ether solutions; however, no mention was made of increased reaction rates.
20) Rivera, M.; Lamy-Schalkens, H.; Sainte, F.; Mbiya, K.; Ghosez. L. *Tetrahedron Lett.* **1988**, *29*, 4573.
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About the Author

Paul A. Grieco was born in Framingham, Massachusetts, in 1944. He received his undergraduate education at Boston University and his graduate education at Columbia University where he obtained the Ph.D. degree under Professor Gilbert Stork. He was an NSF Postdoctoral Fellow with Professor E. J. Corey at Harvard University. In 1971 he joined the faculty at the University of Pittsburgh, rising to the rank of Full Professor in 1977. He moved to Indiana University in 1980 as Professor, and was named the Earl Blough Professor of Chemistry in 1985. He has served as Chairman of the Department of Chemistry at Indiana since July 1988.

The synthesis of terpenoids by Grieco in the 1970s led to the successful syntheses of a range of sesquiterpene lactones—syntheses that are pivotal to current developments in natural product synthesis. Key to many of these syntheses is the use of a bicyclo[2.2.1]heptane nucleus as a stereochemical control vehicle. In recognition of this work, he received, in 1981, the ACS Ernest Guenther Award in the Chemistry of Essential Oils & Related Products.

This strategic approach of using a bicycloheptane nucleus as a stereochemical control template was extended during the 1980s in Grieco's classic synthesis of compactin and also in the preparation of several members of the macrolide/polyether antibiotic group (methynolide, calcimycin, and tylonide, among others) where stereochemical data built into the bicycloheptane nucleus were transformed into the stereochemistry of acyclic molecules. More recently, he has led the way in the synthesis of complex quassinoids, accomplishing syntheses of quassin, chaparrinone, and klaineanone.

Professor Grieco has also been engaged in studying the behavior of organic reactions (e.g., Diels-Alder, Claisen) in aqueous media as well as in ambient temperature molten salts (5.0 *M* lithium perchlorate in diethyl ether). Professor Grieco has been the recipient of numerous honors. In addition to the ACS Ernest Guenther Award, he received the ACS Akron Section Award in 1982, a National Cancer Institute NIH Merit Award in 1988, an Arthur C. Cope Scholar Award in 1990, and the ACS Award for Creative Work in Synthetic Organic Chemistry, sponsored by Aldrich, in 1991.

Below are a few of the compounds mentioned in Dr. Grieco's article. Please consult the Catalog/Handbook for complete listings.

Reagents

2-Cyclohexen-1-one (97%, **C10,281-4**)
10mL $12.60; 25mL $19.00
100mL $51.05
Dicyclopentadiene (95%, **11,279-8**)
5mL $6.90; 100mL $7.10; 500mL $10.15
2L $12.20
2,6-Dimethylbenzoquinone (99%, **D14,970-5**) 1g $13.60
Furan (99+%, **18,592-2**) 5mL $5.80
100mL $6.10; 500mL $14.90
Lithium perchlorate (ACS, **20,528-1**)
5g $10.95; 100g $22.55; 500g $78.05
Methacrolein (95%, **13,303-5**) 5mL $8.85
100mL $43.15; 500mL $165.95
Methyl acrylate (99%, **M2730-1**)
5mL $8.85; 250mL $9.05; 1L $12.50
2L $18.60
Methyl-1,4-benzoquinone, (98%, **21,131-1**) 5g $10.95; 100g $35.00
trans-**Piperylene** (97%, **11,180-5**) 1g $24.80
5g $81.10

Solvents

Acetone (99+%, **17,997-3**) 1L $11.50
4L $26.20; 16L $72.30; 18L $79.90
Benzene (99+%, **15,630-2**) 500mL $14.70
1L $22.05; 4L $50.75
1,2-Dimethoxyethane (ethylene glycol dimethyl ether, 99+%, **E2740-8**)
5mL $10.00; 100mL $11.05
500mL $21.00; 1L $35.30 4L $88.50
1,4-Dioxane (99+%, **D20,186-3**)
25mL $10.95; 1L $15.10; 4L $41.40
18L $115.90
Ether (99+%, **29,608-2**) 100mL $12.50
800mL $15.75; 8L $110.25; 18L $182.30
Ethyl acetate (99.5+%, **32,030-7**) 1L $14.20
Methyl alcohol (99+%, **17,995-7**) 1L $7.60
4L $19.70; 18L $51.45
Tetrahydrofuran (99.5+%, **14,722-2**)
25mL $10.95; 500mL $11.40; 1L $18.80
4L $54.90

From the Aldrich Bookshelf

Handbook of Industrial Chemical Additives: An International Guide by Product Tradename, Function and Supplier
M. Ash and I. Ash, VCH Publishers, New York, NY, 1991, 859 pp.

This single-volume edition of the Encyclopedia of Industrial Chemical Additives contains an alphabetical listing of more than 18,000 entries, with cross reference indices for chemical composition, functional classification (enzyme, lubricant, UV absorber, etc.), and manufacturer's directory.
Z23,134-7 $175.00

Organic Reactions, Vol. 40
L. Paquette, Ed., John Wiley & Sons, New York, NY, 1991, 528 pp.

Z22,167-8 $90.00

Protective Groups in Organic Synthesis
2nd ed., T.W. Greene and P.G.M. Wuts, John Wiley & Sons, New York, NY, 1991, 500 pp.

Details the use of protective groups in synthetic organic chemistry. Covers properties and selection based on need of a protective group, and the development of new protective groups. Includes 206 new groups and 1,500 new references, representing literature from 1980 to 1989.
Z22,155-4 $59.95

Reductions by the Alumino- and Borohydrides in Organic Synthesis
J. Seyden-Penne, VCH Publishers, New York, NY, 1991, 193 pp.

This book concisely organizes pertinent information of numerous hydride reagents. To achieve a desired transformation, a simplified selection is presented that is based on stability and solubility data, reactivity (with special reference to problems of stereochemistry and compatibility), and hydride reduction to main functional groups of organic chemistry. Foreword by Prof. H.C. Brown.
Z23,133-9 $65.00

Solvents and Solvent Effects in Organic Synthesis
2nd ed., C. Reichardt, VCH Publishers, Weinheim, FRG, 1988, 534 pp.

Contains current knowledge of solvent effects in organic chemistry.
Z18,336-9 $126.50

Annual Reports in Organic Synthesis
Academic Press, Orlando, FL.
1990 472 pp **Z23,108-8** $44.95
1991 475 pp **Z23,109-6** $44.95

Safe Storage of Laboratory Chemicals
2nd ed., D.A. Pipitone, Ed., John Wiley & Sons, New York, NY, 1991, 297 pp.

Guide for identifying chemical storage hazards and implementing measures for storing specific classes of compounds, including OSHA requirements and EPA legislation.
Z22,126-0 $95.00

Gardner's Chemical Synonyms and Trade Names
9th ed., J. Pearce, Ed., Gower Technical Press, Hants, UK, 1987, 1081 pp.

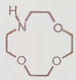
More than 47,000 entries, including 12,000 new entries, provided by chemical companies, principally in the fields of pharmaceuticals, agricultural chemicals, petrochemicals, plastics, polymers and synthetics.
Z22,163-5 $231.75

Handbook of Reactive Chemical Hazards
4th ed., L. Bretherick, Ed., Butterworths, London, UK, 1990, 2005 pp.

Discusses how chemicals react under impact, pressure, etc., documenting specific hazards and past accidents. Contains more than 4,600 entries for specific chemicals, with as many more secondary entries.
Z20,913-9 $195.00

Bretherick's Reactive Chemical Hazards Database on CD-ROM
This database version of Bretherick's Handbook of Reactive Chemical Hazards, 4th edition, is available for IBM PC and compatible computers. Information is presented like a printed page, with the advantages of fast access to chemical and classified subject indices, and cross reference indices to text, fire-related data, and structural diagrams. A comprehensive set of appendices, a technical glossary, on-line help, a pop-up notepad and a screen printing facility are available for added convenience.
Z22,175-9 $395.00

NEW Macrocycle Listings



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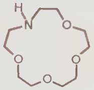

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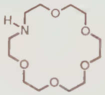

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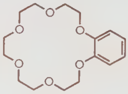

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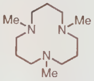


5

36,408-8	**1-Aza-12-crown-4,** 97% (1)	100mg $13.00 500mg $45.00
36,409-6	**1-Aza-15-crown-5,** 97% (2)	250mg $16.00; 1g $45.00
36,411-8	**1-Aza-18-crown-6,** 97% (3)	250mg $18.00; 1g $50.00
37,229-3	**Benzo-18-crown-6,** 99% (4)	1g $21.00; 5g $78.80
37,781-3	**1,5,9-Trimethyl-1,5,9-triazacyclododecane,** (TMTAD, 5)	25mg $11.50; 100mg $32.00

Aldrich offers a wide variety of oxa-, aza-, thia-, and oxaaza- crown ethers. These products have numerous applications in different areas of chemistry. Five of the latest additions to this product line along with some recent literature citations are presented here. Please consult our Catalog/Handbook and the 1991 New Products brochure for a complete list.

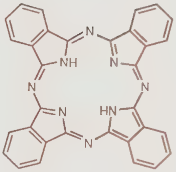
Yamamoto, T.; Hidaka, S.; Ishihara, T.; Iwadate, H. Ger. Patent 3 928 568 1990; *Chem. Abstr.* **1991**, *114*, 74418m. Kataky, R. et al. *J. Chem. Soc., Perkin Trans. 2* **1990**, 1425. Yaminskaya, K.B. et al. *Kolloidn Zh.* **1991**, *53*, 191; *Chem. Abstr.* **1991**, *115*, 36287f. Beer, P.D. et al. *J. Chem. Soc., Dalton Trans.* **1990**, 3289. Santos, M.A.; Drew, M.G.B. *J. Chem. Soc., Faraday Trans.* **1991**, *87*, 1321. Broos, J. et al. *Recl. Trav. Chim. Pays-Bas.* **1991**, *110*, 222; *Chem. Abstr.* **1991**, *115*, 29869u. Muratalieva, I.R. et al. *Izv. Akad. Nauk Kirg. SSSR, Khim.-Tekhnol. Nauki* **1989**, 20; *Chem. Abstr.* **1990**, *114*, 82329y. Kuchenmeister, M.E.; Dye, J.L. *J. Am. Chem. Soc.* **1989**, *111*, 935. Barret, A.G.M. et al. *J. Chem. Soc., Perkin Trans. 1* **1981**, 1501.

Phthalocyanines

Phthalocyanine (1) and its complexes (2) with various metals and nonmetals manifest high thermal stability, light fastness, and inertness to acids and alkalis. They have been used as pigments in printing inks, paints, coatings, and plastics. Newer applications include their use in lasers, lubricants, medicines, and photography; as photo- and semiconductors; and in xerography.

Aldrich offers a wide spectrum of phthalocyanine complexes with an extensive range of physical properties useful in various theoretical and practical applications.

Moser, F.H.; Thomas, A.L. *The Phthalocyanines,* Vol I and II, CRC Press, Boca Raton, FL, **1983**. Berezin, B.D. *Coordination Compounds of Porphyrins and Phthalocyanines,* J. Wiley & Sons, New York, NY, **1981**.



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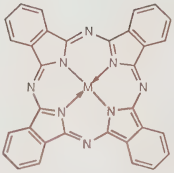


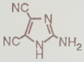
2

M = AlCl, Co, Cu, Pb, Ni, SiCl$_2$, VO, Zn

25,310-3	**29*H*, 31*H*-Phthalocyanine,** 98%	1g $12.60; 5g $29.85
36,253-0	**Aluminum phthalocyanine chloride**	1g $15.00 5g $50.00
30,769-6	**Cobalt phthalocyanine**	1g $8.30; 10g $35.85 50g $131.35
25,298-0	**Copper phthalocyanine**	25g $27.60; 100g $55.85
37,956-5	**Lead phthalocyanine**	1g $9.00; 10g $25.00
36,063-5	**Nickel phthalocyanine**	5g $15.00
28,776-8	**Silicon phthalocyanine dichloride**	1g $28.40 5g $94.00
34,812-0	**Vanadyl phthalocyanine**	250mg $16.25; 1g $45.60
34,116-9	**Zinc phthalocyanine**	5g $13.00; 25g $42.35

Building Blocks for Synthesis

Intermediates for Azo Dyes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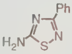

2

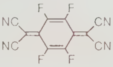
The dicyanoimidazole and the thiadiazole are components of azo dyes.[1,2] Both are used in preparations of photographic materials.[3,4]

(1) Jpn. Patent 59 147 052, 1984; *Chem. Abstr.* **1984**, *101*, 212665z. (2) Jpn. Patent 57 109 859, 1982; *Chem. Abstr.* **1983**, *98*, 36077t. (3) Bergthaller, P. et al. Ger. Patent 3 424 899, 1986; *Chem. Abstr.* **1986**, *105*, 70060e. (4) Tschopp, P. Eur. Patent 169 813, 1986; *Chem. Abstr.* **1986**, *104*, 216421b.

37,674-4 2-Amino-4,5-imidazoledicarbonitrile, 97% **(1)** 10g $12.50
50g $42.00

14,300-6 5-Amino-3-phenyl-1,2,4-thiadiazole (2) 1g $10.00; 5g $34.00

Important Electron Acceptor

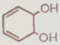


TCNQ-F$_4$ is a very strong electron acceptor which readily forms charge-transfer complexes with weak electron donors such as DBTTF (dibenzotetrathiafulvalene). It was recently employed in the layer-by-layer preparation and characterization of the TCNQF$_4$-TMTSF (tetramethyltetraselenafulvalene) charge-transfer complex.

Harada, Y. et al. *Surf. Sci.* **1991**, *242*, 95; *Chem. Abstr.* **1991**, *114*, 193154g.

37,677-9 2,3,5,6-Tetrafluoro-7,7,8,8-tetracyanoquinodimethane, 97%
5mg $14.50; 25mg $48.00

Important Diol

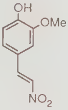


The recent syntheses of *l*-Conduritol F,[1] inositol phosphates,[2] and other cyclitols[3] have employed this benzene-derived diol.

(1) Ley, S.V.; Redgrave, A.J. *Synlett.* **1990**, 393. (2) Ley, S.V. *Pure Appl. Chem.* **1990**, *62*, 2031. (3) Ley, S.V. et al. *Tetrahedron*, **1990**, *46*, 4995.

36,506-8 *cis*-3,5-Cyclohexadiene-1,2-diol, 20 wt.% solution in ethyl acetate
1g $10.00; 5g $35.00

Synthetic Dopamine Precursor

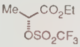


Reduction and demethylation of this β-nitrostyrene yields dopamine. It has also been utilized in the preparation of other phenethylamine analogs.

Vinogradova, V.I. et al. *Khim. Prir. Soedin* **1990**, 67; *Chem. Abstr.* **1990**, *113*, 114729b. Kohno, M.; Sasao, S.; Murahashi, S. *Bull. Chem. Soc. Jpn.* **1990**, *63*, 1252.

36,191-7 *trans*-2-Methoxy-4-(2-nitrovinyl)phenol, 98% 5g $7.50
25g $25.00

Useful Lactate

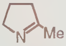


The trifluoromethanesulfonate of ethyl (*S*)-lactate is a useful alkylating agent for the introduction of the optically active α-methylethyl ester moiety. Unlike the chloride [from (*S*)-2-chloropropionate] displacement, the triflate displacement occurs stereospecifically.

Schmidt, R.R.; Kinzy, W. *Liebigs. Ann. Chem.* **1987**, 407. Piccolo, O. et al. *J. Org. Chem.* **1991**, *56*, 183. Petit, Y.; Sanner, C.; Larchevque, M. *Tetrahedron Lett.* **1990**, *31*, 2149.

37,463-6 Ethyl L-2-[(trifluoromethylsulfonyl)oxy]propionate, 98%
250mg $10.00; 1g $28.50

For Chiral Heterocycle Synthesis



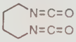
Hua and co-workers employed chiral sulfoxides synthesized from 2-methyl-1-pyrroline and (*S*)-(-)-menthyl *p*-toluenesulfinate for the preparation of a chiral indolizine skeleton such as the one found in (+)-castanospermine— a glycosidase inhibitor.

Hua, D.H.; Bharathi, S.N.; Robinson, P.D.; Tsujimoto, A. *J. Org. Chem.* **1990**, *55*, 2128.

38,105-5 2-Methyl-1-pyrroline
5mL $9.00; 25mL $34.00

27,875-0 (1*R*,2*S*,5*R*)-(-)-Menthyl (*S*)-*p*-toluenesulfinate, 99% 1g $7.80
10g $47.10

New Diisocyanate Listing

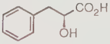


Used to prepare an active tetramethylenebisacylguanidine analog of a potent inhibitor of ADP-induced platelet aggregation.[1] Also utilized in the preparations of hydrophilic silicone rubbers for lens material.[2]

(1) Thomas, E.W. et al. *J. Med. Chem.* **1989**, *32*, 228. (2) Schaefer, H.; Kossmehl, G.; Neumann, W. Ger. Patent 3 517 612, 1987; *Chem. Abstr.* **1989**, *110*, 44975r.

37,113-0 1,4-Diisocyanatobutane, 97%
1g $8.50; 5g $28.00

Chiral Hydroxy Acid

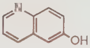


Useful chiral building block used to prepare statine[1] and peptide renin inhibitors.[2]

(1) Kano, S. et al. *J. Org. Chem.* **1988**, *53*, 3865. (2) Johnson, R.L. *J. Med. Chem.* **1980**, *23*, 666.

37,690-6 D-3-Phenyllactic acid, 98%
1g $18.00; 5g $60.00

Building Block for Pharmaceuticals

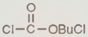


A useful starting material for the preparation of pyridoacridines,[1] aminoquinolines, ortho quinones,[2] and other quinoline derivatives[3] all of which are medicinally useful compounds.

(1) Mehta, P. et al. *Indian J. Chem. Sect. B* **1991**, *30B*, 213; *Chem. Abstr.* **1991**, *114*, 207078z. (2) Kitahara, Y. et al. *Chem. Pharm. Bull.* **1990**, *38*, 2841. (3) Nagarajan, K.; Shenoy, S.J. Ind. Patent 163 724, 1988; *Chem. Abstr.* **1990**, *112*, 118669j.

30,448-4 6-Hydroxyquinoline, 98%
5g $19.00; 25g $64.50

Building Block for Agrochemicals



$$\mathrm{Cl{-}\overset{\overset{\displaystyle O}{\|}}{C}{-}OBuCl}$$

Intermediate in the synthesis of aryl and heteroaryl carbonates with herbicidic and fungicidic properties.

Hashimoto, S.; Nakada, A.; Kano, S.; Takahashi, S. Ger. Patent 2 535 512, 1976; *Chem. Abstr.* **1976**, *85*, 33010m. Dolezal, J.; Konecny, V. Czech. Patent 141 957, 1971; *Chem. Abstr.* **1971**, *77*, 61561v.

37,817-8 4-Chlorobutyl chloroformate, 97% 5mL $13.50; 25mL $45.00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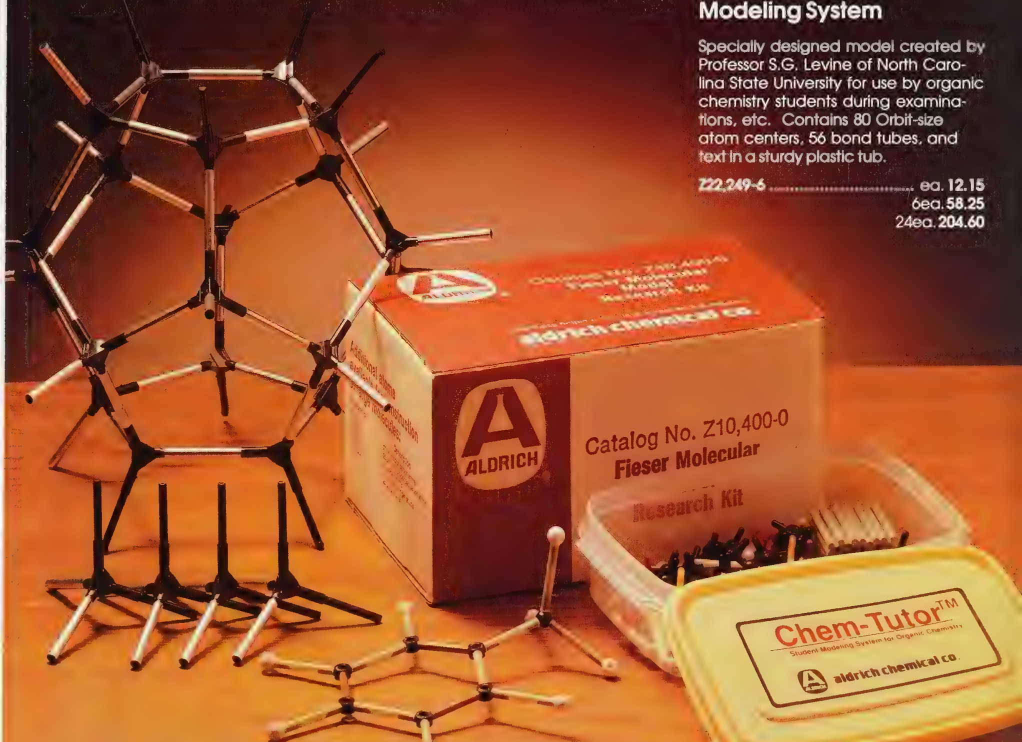

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(1) L.F. Fieser, *J. Chem. Ed.*, **40**, 62 (1963). (2) L.F. Fieser, *ibid.*, **40**, 457 (1963). (3) L.F. Fieser, *ibid.*, **42**, 408 (1965).
(4) L.F. Fieser, "Chemistry in Three Dimensions", 1963.

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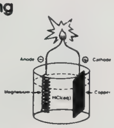
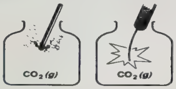


Shows the ability to generate chemically an electric current. A device is equipped with magnesium and copper electrodes, which are connected to a camera flash bulb. By immersing the electrodes in a hydrochloric acid solution, generation of a current and voltage activates the flash. Enough for eight demonstrations. Refills available.

38,059-8 .... **$44.80**



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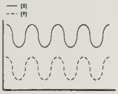

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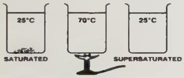
38,382-1 .... **13.45**



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38,063-6 .... **16.25**

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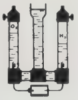

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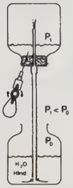

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38,162-4 (ammonia) **61.60**
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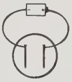

In this kit, different means of metallic iron oxidation are demonstrated by using an agar gel. They include oxidation of iron using an external power supply such as a battery, spontaneous oxidation of iron, and inhibition of spontaneous oxidation of iron with a magnesium strip. One demonstration per kit.

38,161-6 .... **16.80**

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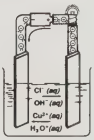

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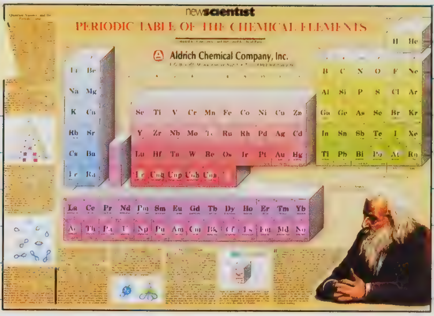

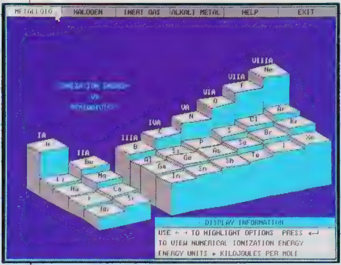

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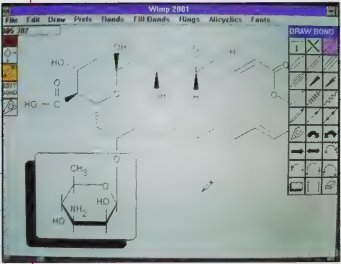

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The Molecular Basis of Biological Order

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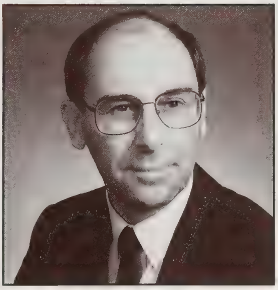


An essential feature of many biological interactions is reversibility. For example, the DNA double helix must form when a second complementary strand is built from a template strand, but sections of a double helix must come apart in order to expose a template strand during transcription. Additionally, small globular proteins unfold readily and reversibly, and their net stability (typically 20 to 80 kJ mol^{-1}) is shown, in this article, to correspond to about 1 to 5 amide-amide hydrogen bonds. When these polymeric molecules involve enormous numbers of hydrogen bonds, shown in this article to be much stronger than hitherto thought, how is such low net stability achieved? This article argues that a key element in determining this low net stability is the number of rotors that must be restricted in passing from a random coil to a highly ordered structure. Thus, reversibility in biology will frequently be associated with organized structures formed from flexible molecules. It is shown that the formation of the most common neutral-neutral hydrogen bonds in biologically important molecules [other than ROH...O(H)R] is favored entropically, due to the release of water molecules from the polar functionalities that form the hydrogen bonds. Natural selection has utilized functionalities that release an amount of water (favorable entropically) sufficient to restrict a few rotations (unfavorable entropically) as part of a strategy to yield functional molecules and complexes of small net stability.

Specifically, we have recently measured the intrinsic binding energy of the amide-amide hydrogen bond in aqueous solution as -20 ±7 kJ mol^{-1}. We conclude that this free energy of binding is largely entropy driven, and find its origin in the disordering of water molecules released from the amide CO and NH groups involved in hydrogen bond formation. The free energy of binding corresponds to a factor of at least 1000 in selectivity. A factor greater than the specificity of 2 to 20 hitherto accepted for individual uncharged hydrogen bonds. The free energy of binding of the amide-amide hydrogen bond, the most prevalent hydrogen bond in a folded protein, has repercussions for views of the free energy changes involved in protein folding. We show that the favorable entropy change associated with amide-amide hydrogen bond formation closely balances the unfavorable entropy change associated with the ordering of the peptide backbone. Thus, there is a relatively small overall entropy change upon protein folding. It is shown that similar factors are involved in RNA duplex formation, where the hydrogen bonds between base pairs are again concluded to be stronger than previously thought.

An equation for the estimation of association constants (either intramolecular or intermolecular) in aqueous or nonpolar media is presented. This equation may prove useful, in some cases, for estimating rough optimal binding constants for drugs to receptors, and possibly for substrates to enzymes.

Introduction

If the question, "What is the most important hydrogen bond in biology?" is posed, there might be some consensus for the answer, "the amide-amide bond" (Figure 1). For after all, it occurs on the order of 100 times even in the smallest of proteins. Surprisingly, there is still uncertainty with regard to the strength of this bond when formed in aqueous solution. And yet it is clear that the subject of molecular recognition might develop into a mature scientific discipline (i.e., one capable of making predictions) when this, and related interactions, have been at least approximately quantified.

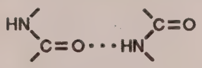


Figure 1. The amide-amide bond.

To make the necessary semi-quantitative determinations, either theory or experiment, or a combination of both, could be used. Computational approaches are having some success, but, in my own group, we have used an approach that uses some theory, but relies heavily on experiment. The theory used to analyze the experimental data is simple and approximate, and was established by others many years ago. It is outlined first, with the principles being illustrated by the binding of the antibiotic ristocetin A to the cell wall peptide analogue N-Ac-D-Ala-D-Ala to give the complex in Figure 2.

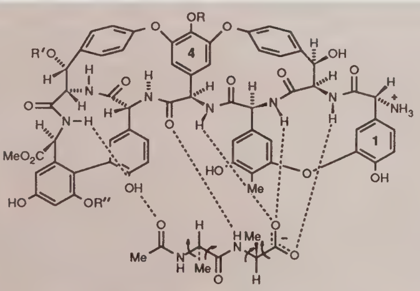


Figure 2. The complex resulting from the binding of the antibiotic ristocetin A to the cell wall peptide analogue N-Ac-D-Ala-D-Ala.

An Approximate Partition of the Free Energy of Binding: Equations for the Estimation of Binding Constants

We use four factors for the free energy of binding. The consideration of only four factors is justified only if the ligand and receptor show good van der Waals complementarity, and if the conformations of the bound components correspond closely to conformational energy minima in the separated states.[1,2] The first factor is the low probability of "catching" the ligand on the receptor in the absence of intermolecular forces. The second is the adverse free energy change (largely entropic) associated with the restriction of any internal rotations of either component upon complex formation. The third is the promotion of binding if hydrocarbon fragments can be removed from exposure to water upon complex formation, and the the fourth factor is the promotion of binding due to favorable interactions of polar functional groups in the complex. These four factors are now enumerated and elaborated.

(1) Any bimolecular binding process is entropically unfavorable due to the formation of a single molecule of complex, which occurs with loss of translational and rotational entropy. When allowance is also made for the small intrinsic exothermicity of such a process (due to the release of the kinetic energy associated with the loss of three degrees of rotational freedom and three degrees of translational freedom), the unfavorable free energy of association (ΔG_{t+r}, kJ mol^{-1}) as a function of the molecular weight of a ligand binding to a larger receptor is given in Figure 3.[1] As with all other free energy changes given in this account, it can be converted to an effect on $\log_{10}K$ by dividing by 5.7 (for room temperature binding). This scale is given on the right hand side of Figure 3. We find that within 4 kJ mol^{-1}, the same values apply for any molecular shape (rod, disc, or sphere) of a given molecular weight binding to any receptor of molecular mass 1,200 or greater.[1] Thus, for example, ΔG_{t+r} is adverse to binding by a factor of 10^{10} for a ligand of molecular weight 150, where the molecular weight includes bound solvent molecules, which can be regarded as translating and rotating with the ligand.

(2) Following Page and Jencks,[3] we note that binding is adversely affected by approximately 5 to 6 kJ mol^{-1} (ΔG_r) for each rotation restricted upon association. In the case of the complex in Figure 2, we approximate that no rotations of the antibiotic are stopped by the binding process (its peptide backbone is already relatively rigid due to the cross-linking of all the amino acid sidechains), whereas four rotations of N-Ac-D-Ala-D-Ala (see arrows in Figure 2) are restricted upon association. Thus, these rotational restrictions are adverse to binding by ca. 10^4. We note later that, for long chains with correspondingly larger moments of inertia of groups attached to the bond where rotation is to be restricted, the free energy cost of restricting a rotor may rise to 8 or 9 kJ mol^{-1}. Taking generalized values for the free energy cost of restricting rotations is, of course, an oversimplified approach, but is justified on the grounds that in many cases it works well. A more sophisticated approach would involve a knowledge of the free energy of rotation over 360° in the free state, and of the residual torsion in the bound state.

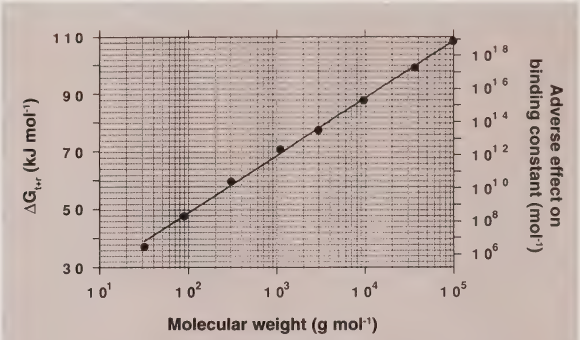


Figure 3. An estimate of the intrinsic adverse effect on binding constant due to a bimolecular association in aqueous solution when a molecule of given molecular weight binds to a receptor. For association in a nonpolar medium, add one power of 10 to the aqueous value, e.g., for a molecular weight of 1000, the adverse effect on bimolecular association from the graph is 10^{12} mol^{-1} (aqueous solution), and 10^{13} mol^{-1} (nonpolar medium).[1]

$$\Delta G = \Delta G_{t+r} + \Delta G_r + \Delta G_h + \Sigma\Delta G_p \qquad \text{(eq 1)}$$

$$\Delta G = \Delta G_{t+r} + \Delta G_r + \Delta G_h + \Sigma\Delta G_p + \Delta G_{conf} + \Delta G_{vdW} \qquad \text{(eq 2)}$$

$$-\Delta G = 10.5 + 11 + 3 \text{ kJ mol}^{-1} \qquad \text{(eq 3)}$$

(3) For every square angstrom (Å^2) of hydrocarbon fragments removed from exposure to water by the binding process, we assume the binding energy to be increased by 0.19 kJ mol^{-1}.[4,5] This value is based on thermodynamic measurements of the solubility of simple hydrocarbons in water, which indicate that this hydrophobic effect is essentially entropy driven at room temperature. Thus, if the area of hydrocarbon buried is xÅ^2, then the free energy change (ΔG_h) due to the hydrophobic effect is taken as 0.19x kJ mol^{-1}.

(4) The bringing together of the two binding entities is accounted for in factors 1 and 2. Thus, the free energy of binding that results from the interaction of any pair of functional groups (ΔG_p) is the same if the process occurs either intramolecularly or bimolecularly. Although such values, "intrinsic binding energies" when they occur with optimum geometry for binding,[6] have the potential to be fundamental and usefully constant numbers, it will remain for future experiment to establish or refute this potential. We will show that the binding energy of the amide-amide hydrogen bond is similar at two sites within an antibiotic complex, and assume that other values, which have been determined for the interactions of specified functional groups, will behave similarly.

In summary, the free energy (ΔG, kJ mol^{-1}) of a bimolecular association, following the above specifications, is approximated by equation 1, where $\Sigma\Delta G_p$ represents the free energies of binding for each set of interacting functional groups summed over all such sets of interactions.

For the more general case where ΔG_{conf} represents the total conformational strain energy produced upon binding, and ΔG_{vdW} represents the change in van der Waals energy between free and bound states (due, for example, to the existence of van der Waals repulsions or cavities in the complex), then equation 2 results.[1]

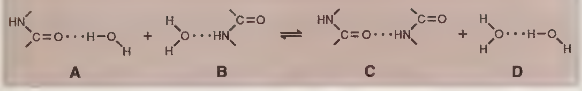
The Application of Equation 1: The Intrinsic Binding Energy of the Amide-Amide Bond

The thermodynamic parameters for the binding of the ligand N-Ac-Gly-D-Ala to ristocetin A and to the related antibiotic vancomycin, are available, as are those for the binding of N-Ac-D-Ala to the same antibiotics.[7] In passing from the former to the latter ligand, the leftmost amide-amide hydrogen bond in Figure 2 is deleted. The resultant reduction in the binding energy is 10.5 kJ mol^{-1} (mean value for the two antibiotics). But, as shown in equation 3, we must correct for the fact that the larger ligand is more difficult to catch (by 3 kJ mol^{-1},[1] factor 1), and for the fact that two more rotors are restricted in the binding of the larger ligand (10 to 12 kJ mol^{-1}, mean value of 11 kJ mol^{-1}, factor 2).

We conclude[1] that the intrinsic binding energy of this particular hydrogen bond is -24 ±7 kJ mol^{-1} (eq 3). An analysis[1] of the thermodynamics of formation of a second amide-amide hydrogen bond in Figure 2 to the carbonyl group of the amino acid associated with ring 4 gives ΔG_p = -18 ±7 kJ mol^{-1}. Taking the mean value of all the antibiotic data for this biologically crucial hydrogen bond gives ΔG_p = -20 ±7 kJ mol^{-1}, a selectivity in binding of ca. 10^2 to 10^4—much greater than has previously been appreciated, as will be discussed later. Moreover, the thermodynamic data[7] show that the difference in the binding energy of the two ligands is essentially completely entropy driven. The favorable free energy of binding of amide-amide hydrogen bond formation in water is almost all entropic in origin. What is the physical explanation for the experimental result?

The overall change occurring upon formation of the amide-amide hydrogen bond in aqueous solution is given in Scheme 1. Consider first the enthalpy change on passing from left to right in Scheme 1. The change involves making two hydrogen bonds and breaking two hydrogen bonds.[8] In terms of electrostatic binding energy (enthalpy), all of these hydrogen bonds may be of different or similar strengths. For example, it could plausibly be proposed that the order of exothermicities would be **C** > **A** ≃ **B** > **D**. But, even if this were so, it seems likely that the mean strength of **A** + **B** would be similar to the mean strength of **C** + **D**. Thus, the overall enthalpy change (ΔH) would be near zero, as found experimentally.

Scheme 1



What is the physical origin of the large favorable entropy of binding? In the equations for binding (equations 1 and 2), the losses, in rotational and translational entropy and in entropy due to the restriction of internal rotations, in making bond C have been factored out. Thus, a favorable entropy change on passing from left to right in Scheme 1 arises because water is much more ordered by the NH and CO groups of the two amide groups participating in hydrogen bond formation than is water by bulk water. It is the release of water from the participating amide functionalities that provides much of the favorable free energy change. This last conclusion provides support for the postulate that the exothermicities for the formation of the hydrogen bonds is **C** > **A** ≃ **B** > **D**. It is probably because the electrostatic interactions of the amide groups with water molecules are stronger than those of water with water that the amide groups order water more effectively than bulk solvent.

Is the Approach a Useful Approximation and of General Applicability?

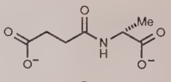
It should be noted that, in the above determination of the amide-amide hydrogen bond strength, the binding of one slightly truncated ligand (N-Ac-D-Ala) was compared with another (N-Ac-D-Gly-D-Ala). The term ΔG_{t+r} is very similar for these two ligands, and roughly independent of the broad assumptions made in determining this parameter (Figure 3). A test of the reliability of the ΔG_{t+r} parameter would, therefore, be to determine the same thermodynamic amide-amide hydrogen bond parameters by a method that uses the estimated absolute value of ΔG_{t+r}. This has been done[9] by considering the data of others for the dimerization of urea,[10] and of the cyclic lactams δ-valerolactam[11] and diketopiperazine[12] in aqueous solution. The values we obtain[9] per amide-amide hydrogen bond are ΔG_p = -27 kJ mol^{-1} for urea, ΔG_p = -27 kJ mol^{-1} for δ-valerolactam, and ΔG_p = -25 kJ mol^{-1} for diketopiperazine. If these values are broken down into ΔH and TΔS terms (at room temperature), then from the urea data ΔH = 0kJ mol^{-1} and TΔS = 27 kJ mol^{-1}, from the δ-valerolactam data ΔH = -8 kJ mol^{-1} and TΔS = 19 kJ mol^{-1}, and from the diketopiperazine data ΔH = -5 kJ mol^{-1} and TΔS = 20 kJ mol^{-1}. These values merit comment.

First, the ΔG_p values for the amide-amide hydrogen bonds formed to the antibiotics and in the dimers are in gross terms similar, and both are much larger than previously believed for these bonds in water. However, the values obtained for the dimers are, on average, about 6 kJ mol^{-1} more negative than for the antibiotics. This might partly reflect greater vibrational motion per hydrogen bond associated with the two hydrogen bonds of the dimers relative to the vibrational motion in the more extensive set of hydrogen bonds in the antibiotic complexes. The difference may also reflect inadequacies in the estimation of ΔG_{t+r},[9] or variations in CO to NH bond angle between the two cases. The finding of ΔG_p values for amide-amide hydrogen bond formation much larger than hitherto believed and self-consistent within one to two orders in magnitude in binding constant, by two different methods, argues well for their utility. But will ΔG_p values be usefully constant in the general case?

Intuitively, it might be anticipated that ΔG_p values for an interaction X...Y would change as Y makes progressively more interactions with X. For example, if X is the electron acceptor, then its affinity for electrons should be less after binding the electron donor Y than before, assuming Y to be a better electron donor than the displaced solvent molecule. Therefore, when the second Y binds to X, to give Y...X...Y, the ΔG_p value for the second interaction is anticipated to be less than for the first. There is experimental evidence that this is indeed the case, but the effects are not necessarily large, and can, in any case, be allowed for if the appropriate experimental data are available. Thus, when successive ammonia molecules (1 to 6 molecules) associate with Ni^{2+} in aqueous solution, the association constants are 468, 132, 41, 12, 4, and 0.8 M^{-1}.[13,14] That is, the mean decrease in the intrinsic binding constant of the (n+1)th ammonia over the nth ammonia is a factor of 3.6 M^{-1}, and the mean decrease of the intrinsic binding energy is only 3 kJ mol^{-1}. Specifically, we estimate that the first ammonia molecule binds with an intrinsic binding free energy of about -55 kJ mol^{-1}, the second one with an intrinsic binding energy of about -52 kJ mol^{-1}, the third with an intrinsic binding energy of -49 kJ mol^{-1}, and so on. In summary, ΔG_p values may decrease somewhat if one of the functionalities involved is already participating in other favorable interactions, but the effect may not be large.

Second, as for amide-amide hydrogen bond formation to the antibiotics (Figure 2, reminiscent of the formation of a ß-sheet), amide-amide hydrogen bond formation in the dimers described above is largely entropy driven. Once more, it is the release of water from the amide functionalities that largely provides the favorable free energy change (with an additional contribution due to residual motions associated with the amide-amide hydrogen bonds).

Having made a case that ΔG_{t+r} may be reasonably well estimated, and that ΔG_p values may not show large variations for specified functional group interactions, how useful is the generalization that ΔG_r=5 to 6 kJ mol^{-1}? Certainly, this value may tend to increase with an increase in the moments of inertia of the end groups whose rotational motion is restricted by the "freezing out" of the rotation. (It is later concluded that ΔG_r may be, on average, near 8 to 9 kJ mol^{-1} for freezing out N-C_α and C_α-CO rotors of a long peptide backbone, such as those found in a protein.) Additionally, it will tend to be decreased by an increased rotational barrier for this same rotation. If necessary, these variables can be accommodated in a subsequent, more sophisticated approach. But, in the meantime, we have tested the usefulness of the simple approximation, in one case, by comparing the binding constants of **3** and **4** to the antibiotic ristocetin A (Figure 4).[15]


3

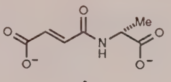

4

Figure 4. **3** binds with a binding constant of 12,000 M^{-1} (ΔG = -23 kJ mol^{-1}) and **4** binds with a binding constant of 120,000 M^{-1} (ΔG = -29kJ mol^{-1}).

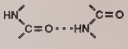
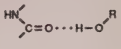
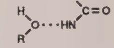
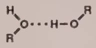
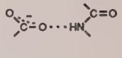
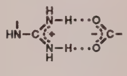
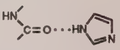
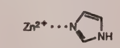
The former binds with a binding constant of 12,000 M^{-1} (ΔG = -23 kJ mol^{-1}), and the latter with a binding constant of 120,000 M^{-1} (ΔG = -29 kJ mol^{-1}). The presence of the double bond in the latter freezes out a rotation present in the former, leading, on the basis of the simple approach, to a predicted increase in the binding energy of 5 to 6 kJ mol^{-1}, in excellent agreement with the experimental value of 6 kJ mol^{-1}. A more sophisticated approach, allowing for a small difference in hydrophobic effect between the two ligands and also for the increased barriers to rotation about the bonds between the C=C double bond of **4** and its carbonyl groups (due to conjugation), predicted an increase in binding energy of 8 kJ mol^{-1}, still in good agreement with experiment.

The above considerations, with the justifications of the values of the parameters used, take care of all the principles involved in the approach. It appears that the approach may be of general utility, and some consequences for systems of wide interest are now presented.

Consequences for Drug/Receptor and Enzyme/Substrate Interactions

For the interaction of a drug at a complementary receptor, or for the interaction of a substrate with an enzyme, equation 1 can be used (given the appropriate values of ΔG_p) to estimate *roughly* the maximum possible binding constant.[16a] The utility of the equation depends upon the availability of ΔG_p values for a wide variety of functional group interactions that are commonly found in drug/receptor and enzyme/substrate interactions.[16b] Table 1 gives values that we have determined so far, although they may, of course, require adjustments as a consequence of subsequent experiments and numerical refinement of the approach. Clearly, an enormous number of important values remain to be determined, but some important principles can already be illustrated with this limited set of provisional values.

Table 1
ΔG_p Values (kJ mol^{-1}, in aqueous solution) for Some Common Functional Group Interactions of Biological Importance[a]

Interaction	ΔG_p	Interaction	ΔG_p
	-20		-12
	-12[b]		~0[b]
	-28		-51
	-24		-65

[a]Estimated errors in these values are ±30%.
[b]Inferred on the basis of theoretical arguments.[17]

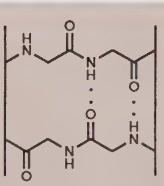


Figure 5. An isolated element of a β-sheet.

First, it is clear from a consideration of equation 1 (in conjunction with Figure 3, the cost of restricting rotors, the limited benefits of hydrophobic effects for association, and Table 1), that a small linear peptide can never bind strongly to another small linear peptide in aqueous solution through formation of an isolated element of ß-sheet (Figure 5). The formation of one amide-amide bond (-20 ±7 kJ mol^{-1}, taking the mean of the antibiotic-derived values as being more reliable than those for dimerization) per two residues (repeat unit of Figure 5) can, at best, counter the unfavorable free energy change of restricting four backbone rotations (probably 20 to 24 kJ mol^{-1}), but is not sufficient to also overcome the unfavorable loss of rotational and translational free energy for a bimolecular association (Figure 3). It is for this reason that the antibiotics of the vancomycin group must have cross-linked sidechains in order to work. Through this crosslinking (Figure 2), the rotation of the antibiotic backbone is restricted, and physiologically useful binding of a small unconstrained peptide becomes possible. (The ordering of the peptide backbone of small globular proteins is covered subsequently.) Second, as would be expected, intrinsic binding constants of polar groups to multiply-charged metal ions will be large (e.g., Table 1). Interactions to multiply-charged ions are important for productive binding of ligands otherwise capable of forming only weak or few hydrogen bonds (e.g., of ethanol to alcohol dehydrogenase, carbon dioxide to carbonic anhydrase, and oxygen to hemoglobin).

Why Do Different Types of Uncharged Hydrogen Bonds Vary Greatly in Free Energy of Formation?

It is evident from the data given in Table 1 that different types of uncharged hydrogen bonds vary greatly in their free energy of formation in aqueous solution—from the large value for the amide-amide hydrogen bond (ca. -20 kJ mol^{-1}),[1,9] to the very small value for the hydroxyl-hydroxyl hydrogen bond (-2 kJ mol^{-1}).[8] It is postulated that both ends of an amide dipole organize coordinated H_2O more than H_2O is organized in bulk water, and that release of H_2O from the amide functionalities, therefore, provides a major part of the favorable entropy change observed for amide-amide hydrogen bond formation. Let us now estimate the free energy of formation of the amide-hydroxyl bond (NHCO...HOR, Scheme 2) from a theoretical analysis.

If ROH...OH_2, where ROH is a phenol (as in tyrosine) or an alcohol (as in serine), and H_2O...H_2O hydrogen bonds are assumed to have similar electrostatic (ΔH) strengths, then the water molecules associated with ROH will be ordered to about the same extent as those in bulk water. There will be no significant net entropy change associated with the release of water from ROH. Thus, the intrinsic binding free energy of the NHCO...HOR interaction will be derived essentially from the entropically favorable release of the relatively highly ordered water molecules associated to the amide carbonyl group. If we make the reasonable postulate that each end of the amide dipole (NH or CO) organizes coordinated H_2O to about the same extent, then the favorable entropy of formation of NHCO...NHCO will be about twice that of NHCO...HOR, as is found experimentally (Table 1).[17]

These concepts are further strengthened by extending the arguments to the intrinsic binding free energy of the hydroxyl-hydroxyl interaction (Scheme 3). Since the hydroxyl group is assumed to organize coordinated water, through hydrogen bond formation, to about the same extent irrespective of whether the hydroxyl group is part of a phenol, alcohol, or water, the entropy change associated with this interaction is postulated to be near zero. The enthalpy change is also, of course, near zero (Scheme 3), and, hence, so is the intrinsic binding free energy (Table 1). Indeed, small values (e.g., -2 kJ mol^{-1}) for deletion of a hydroxyl-hydroxyl interaction are found experimentally.[8] Since these experimental values are based on protein engineering experiments, there are several possible reasons why they might be small and negative rather than zero from the analysis associated with Scheme 3. For example, in the mutation of L-tyrosine to phenylalanine, the analysis is more complicated than indicated in Scheme 3, for several possible reasons. Thus, the deletion of a hydroxyl group results in a cavity, a partially or totally collapsed cavity (with an associated cost in free energy of reorganization), or a cavity accommodated by a water molecule (but in a space that has evolved to be somewhat smaller than is required for a water molecule).[8]

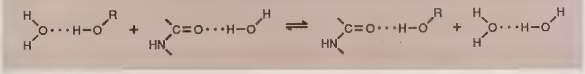
Consequences for Protein Folding

Creighton has recently reviewed[18] our understanding of the physical basis of the stability of the folded conformations of proteins, and noted that, "currently there appears to be an unprecedented degree of confusion in the literature." He notes contradictory statements by different authors, such as "stability is maintained only by...van der Waals and hydrogen bonding" and "hydrogen bonding opposes folding". In this section, it is proposed that the concepts developed and the parameters presented in earlier sections may clarify the situation.

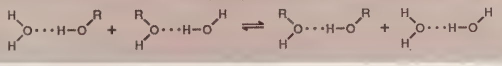
1. Organization of the Peptide Backbone

As noted in the introduction, by far the most common hydrogen bond in a protein is the amide-amide hydrogen bond—about 60 to 70 in a typical 100-residue protein.[19] It is clear that the physical basis of protein folding cannot be analyzed until an approximate free energy of this hydrogen bond is defined. We have now measured this value (-20 ±7 kJ mol^{-1}).[1] Physically, this value corresponds to the answer to the question, "What is the free energy change upon making the amide-amide hydrogen bond in aqueous solution, when the unfavorable free energy change associated with bringing the amide functionalities into the bonding geometry has been factored out?" Thus, it is a general parameter for this interaction, appropriate to both unimolecular (protein folding) and bimolecular (substrate/receptor) interactions.

Scheme 2



Scheme 3



There are two important points to note about this value. First, it is much larger than the values previously accepted for uncharged hydrogen bonds (in the range of 0 to -7.5 kJ mol^{-1}, giving a factor of 0 to 20 to selectivity),[8] and specifically much larger than the value accepted for the amide-amide hydrogen bond as involved in protein folding.[20-23] As we have already seen, the amide-amide hydrogen bond gives a factor of 10^2 to 10^4 to selectivity. Second, it is associated with a very small enthalpy change, being almost completely entropy driven. In summary, it is suggested that the amide-amide hydrogen bond is a major entropy driven, free energy change in promoting protein folding.

To illustrate the important consequences for the understanding of protein folding of the above conclusion, we apply the Gibbs equation, $\Delta G = \Delta H - T\Delta S$, where a negative ΔH indicates heat given out in a change, and a negative value of TΔS indicates an overall increase in order in a change occurring at a temperature, T (degrees K). In the globular proteins that have been studied calorimetrically, it is clear that at room temperature both ΔH and TΔS of folding are remarkably small (given the very large number of interactions involved).[24] A small TΔS for folding immediately poses the question, "How can this be so, since a folded protein clearly has a much more ordered peptide backbone than does the unfolded state from which it is formed?"

It is evident from the study of model peptides that many α-helices of moderate length (i.e., 15 to 50 residues) are formed with ΔG not far from zero in aqueous solution at physiological temperatures.[25] Additionally, ΔH per residue for helix formation is relatively small (-3.8 to -5.5 kJ mol^{-1} per residue).[25] It follows that TΔS for isolated helix formation (Figure 6) is similarly negative, but, most importantly, similarly small (compared to the favorable and large value of TΔS for amide-amide hydrogen bond formation). Since there is good evidence that the small ΔH value for helix formation is not critically dependent on the nature of the amino acid sidechains,[25] the small value of TΔS must be a property of the changes involving the peptide backbone. In making a long helix, these changes are: one amide-amide hydrogen bond is made per residue, and two rotors (N to C_α and C_α to C=O) per residue are restricted. There may also be a small effect due to further restriction of an already limited amide bond rotation. We have already concluded that the cost of restricting a rotor in a long chain will be greater than the 5 to 6 kJ mol^{-1} taken for a terminal amino acid. Since a consensus set of thermodynamic parameters for the amide-amide bond from our work[1,9] (weighting more those derived using the more reliable ΔG_r parameter than those derived using absolute values of ΔG_{t+r}) is $\Delta G = -20$ kJ mol^{-1}, $\Delta H = -2$ kJ mol^{-1}, and $T\Delta S = 18$ kJ mol^{-1}, then the value of ΔG to freeze out the backbone rotations of one amino acid residue must be ca. 20 kJ mol^{-1}. Since the experimental exothermicity of helix formation (-3.8 to -5.5 kJ mol^{-1} per residue) is close to the exothermicity of hydrogen bond formation and restriction of two rotations,[26] the ΔG value for stopping the rotations of one amino acid residue finds its origins essentially completely in TΔS (ca. -22 kJ mol^{-1}, Table 2). That is, it is largely an adverse entropy change due to the organization of the peptide backbone, as demanded by any physically plausible interpretation.

The value of ΔG of about 20 kJ mol^{-1} to restrict the rotations of one amino acid residue at room temperature is an entirely reasonable value—8 to 9 kJ mol^{-1} per N-C_α and C-C(O) rotor in a long chain, with perhaps an additional marginally unfavorable increment due to very limited restriction of sidechain α-ß rotation (alanine excepted). Amino acid sidechains are, of course, important in the "fine-tuning" of helix stability, but it is argued that the large and opposing effects are mainly properties of amide-amide bond formation and of the restriction of peptide backbone rotations.

Similar conclusions apply to ß-sheet formation. In the formation of an extended ß-sheet, the central parts of the sheet form one amide-amide hydrogen bond per residue (Figure 7). As in the case of helix formation, the peptide backbone of one amino acid in the protein has to be restricted for every amide-amide hydrogen bond that is made. Assuming that ß-sheet formation involves an intramolecular strain and hydrophobic effect of the backbone that is not much different to that for α-helix formation, then again the entropic advantage of amide-amide hydrogen bond formation will be about equal and opposite to the entropic disadvantage of organizing the peptide backbone of one amino acid residue. As in the case of α-helix formation, formation of an infinitely extended ß-sheet will occur with ΔG near to zero per residue (excluding "fine-tuning").

Since ΔG is near zero for formation of extended sheets and helices, both can be populated reversibly at room temperature. The "permanent" population of such structures (i.e., in folded proteins) would then be dependent on additional favorable free energies of "fine tuning". These "fine tuning" factors would include the nature of the amino acids sidechains, and the ability of two transiently stable amphiphilic helical or sheet structures to stabilize each other via hydrophobic inter-

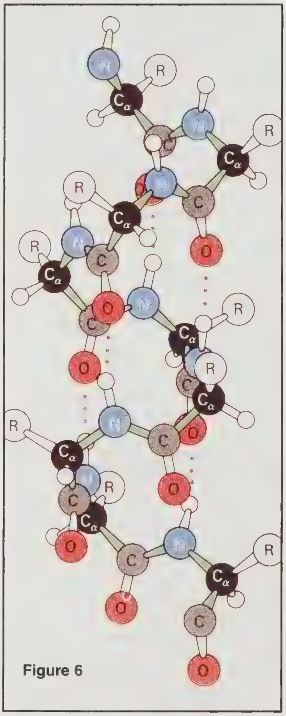


Figure 6

Table 2
Approximate Thermodynamic Parameters (kJ mol^{-1} per residue) for Peptide Backbone Organization in α-Helix Formation

	ΔG	ΔH	TΔS
Generalization from experiment	0	-4	-4
Amide-amide bond formation	-20	-2	18
Restriction of backbone rotors	20	-2	-22

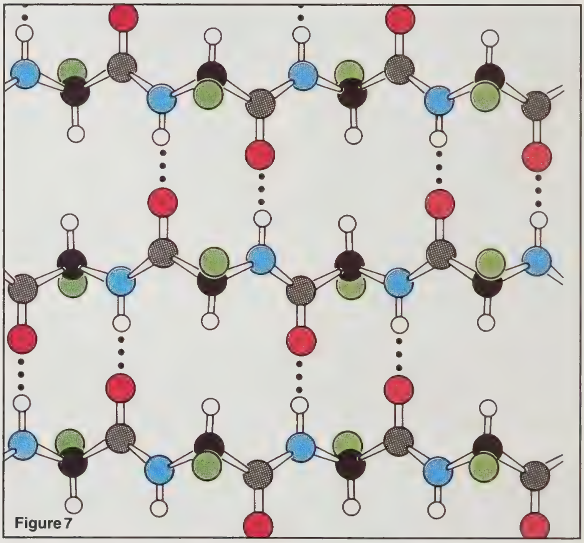


Figure 7

actions between the helices, sheets, or sheet and helix. The requirement of ΔG near zero for extended elements of sheet and helix, and evidenced by much prior experimental work, seems inescapable. If ΔG were large and negative for such structural elements, then almost any such element could be formed with a low probability of reversal, and hence mistakes would be common in folding pathways. If, on the other hand, ΔG were large and positive for such elements, then their populations would be insignificant, and protein folding would be too slow. The similar intrinsic stabilities of sheets and helices is evidenced not only by the fact that the difference in preferences of specific amino acids to occur in either unit is not large,[27] but also by the fact that pentapeptides of the same sequence can occur either in sheet or helix.[28] Additionally, O'Neil and DeGrado have shown[29] that the relative thermodynamic stabilities of each of the 20 commonly occurring amino acids in the α-helical versus random coil states varies by only 3.2 kJ mol^{-1} from the most favorable, alanine, to (excluding proline) the least favorable, glycine. Marginal helix and sheet stability in the absence of tertiary interactions is largely, but not exclusively, a property of the thermodynamic characteristics of the peptide backbone defined above.

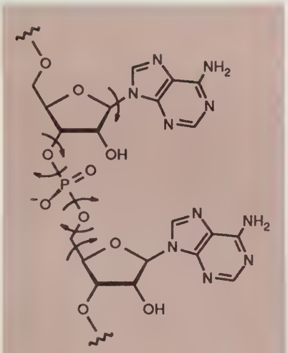


Figure 8. Illustration of the 6 rotors which must be restricted (arrows) for formation of an additional base stack.

2. A View of the Balance of Free Energies, Enthalpies, and Entropies Involved in Protein Folding

The large favorable free energy of amide-amide hydrogen bond formation means that the balance of free energy changes responsible for protein folding must be reconsidered. Since the hydrophobic core of a protein has packing close to that of a solid, and the unfolded state does not, there is net van der Waals stabilization of the folded state. From the structures of a number of relatively small, water soluble, globular proteins, the number of hydrogen bonds, magnitude of the hydrophobic effect, and van der Waals stabilization of an average protein of 100 residues (one lacking crosslinks and cofactors) can be estimated.[30] The data and associated conclusions are presented in Table 3.

By far the most reliable number in Table 3 is the total ΔG, but it is also reliably known that ΔH and TΔS of folding are both small.[24] Since amide-amide hydrogen bonds predominate over all others, hydrogen bond formation is enormously favorable entropically, and to an extent that the most probable value is about double that for the hydrophobic effect. Since the overall entropy of folding is small, it follows that the disordering associated with the release of water from polar and hydrocarbon groups closely balances the ordering of both the peptide backbone and the sidechains (restriction of internal rotations, Table 3).[30] Additionally, since ΔH of folding is also remarkably small (near -1 kJ mol^{-1} per residue), it follows that the significant release of heat due to efficient packing of the hydrocarbon core, small exothermicity of hydrogen bond formation, and restriction of internal rotations,[26] must be balanced by an opposing endothermic process. This presumably reflects strain in the folded structure, and indeed the crude strain value estimated in this way (Table 3) is consistent with the strain estimate cited by Creighton.[31]

In summary, the numbers given in Table 3 are crude, but what is important and new is the very large influence of water release from amides in aiding the restriction of bond rotations upon folding. The free energy change associated with the hydrophobic interaction is too small to organize the peptide backbone; amide-amide hydrogen bond formation is the major free energy change necessary to bring this about. Finally, it should be noted that the large binding energy (-51 kJ mol^{-1}) for the guanidinium-carboxylate interaction (Table 1) is not inconsistent with the weak binding energies (i.e., ΔG = 0 to -5 kJ mol^{-1}) found experimentally for salt bridges at the surface of proteins.[32,33] The cost of rotor restrictions in the sidechains of amino acids that can form such bridges (arginine or lysine with aspartic acid or glutamic acid) is comparable to, but opposite in sign to, the large intrinsic binding free energies associated with ion-pair interactions.[33,34] Additionally, the surface salt bridges found in proteins may not form the ideal geometry indicated in Table 1.

Table 3

Factorization of the Thermodynamics of Folding an "Average" Protein of 100 Residues (kJ mol^{-1}) at 298K

Factor	ΔG	ΔH	TΔS
Strain in folded state	750 ±500	750 ±500	
Hydrophobic effect	-900 ±300		-900 ±300
Van der Waals effects	-350 ±100	-350 ±100	
Hydrogen bond	-2000 ±700	-200 ±300	1800 ±700
Internal rotations	2500 ±800	-300 ±300	-2800 ±800
Total	**-50 ±30**	**-100 ±200**	**-100 ±200**

Consequences for the Formation of RNA and DNA Helices

The formation of RNA and DNA helical structures from random coil single strand structures can be analyzed at three levels:[35]

(1) in the increment of ΔG for extension of single strand helices by an additional base, which involves only the restriction of 6 rotors (Figure 8) to be balanced against the formation of an extra stack of one base or another (Figure 9A);

(2) in the increment of ΔG for each base pair added to a double helix; this involves the restriction of 12 rotors of the two sugar phosphate backbones (the restrictions shown in Figure 8 occuring twice), the formation of 2 base pair stacks, and the formation of 2 hydrogen bonds for A-T (or A-U) base pairs, or 3 hydrogen bonds for G-C base pairs (Figure 9B); and

(3) in the formation of double helical structures of short duplexes from random coil single strands. This process involves all the changes listed under (2), but also involves the loss of rotational and translational free energy when the bimolecular association of two strands to give a duplex occurs.

Thermodynamic parameters are available for all these changes.

1. Single and Double Helix Extension

The mean values of thermodynamic parameters for single strand helix formation (per added single stack, from 10 sets of published data, Figure 9A), and for double helix formation (per added double stack, from 6 sets of published data, Figure 9B) are summarized in Table 4.[36] A striking feature of the data presented in Table 4 is the close similarity of the parameters for formation of the two structures. The exothermicities must be associated mainly with base stacking, and are almost the same, despite the fact that only one stack is formed in single strand formation, and two stacks are formed in double strand formation. It must be concluded that, per stack formed, stacking is enthalpically more favorable in single strand structures than in double strand structures. This is, of course, physically reasonable since, in single strand formation, stacking has to be compatible only with rotor restriction; whereas, in double strand formation, stacking has to be simultaneously compatible with both rotor restriction and hydrogen bond formation (i.e., the geometrical restraints are much more demanding in the latter situation). The key point is that, despite this much smaller favorable exothermicity per base stack in the double strand case, the extension of a double strand by one base pair has a favorable free energy of a magnitude comparable to that for extension of a single strand by one base (Table 4). This is despite the fact that the formation of the double strand structure involves the restriction of 12 rotations, whereas the formation of the single strand structure involves the restriction of only 6 rotations.[35]

In other words, the entropy changes involved in the two very different types of structural extensions are essentially the same (Table 4). Therefore, the entropic cost of restricting the extra 6 rotations necessary for extension of the double strand structure must be comparable to the entropic benefit of a structural feature unique to double strand formation (i.e., to the entropic benefit of forming two hydrogen bonds, since the data in Table 4 refers to the formation of A-U and A-T base pairs).

The hydrophobic effect per added base pair to a duplex is similar to the hydrophobic effect per added base pair to a single strand[35] (at least in part due to the poorer base/base overlaps on average in double-stranded compared to single-stranded structures, see above), and is ca. 12 kJ mol^{-1}. Thus, from the entropy data for single strand formation in Table 4, if y is the value of TΔS for restricting 6 rotations at 300K:

$$-116 \times 300 \times 10^{-3} = y + 12$$
$$\text{i.e., } y = -47 \text{ kJ mol}^{-1}.$$

In light of the physically similar rotor restrictions occurring twice over in duplex formation, and using the entropy data for duplex formation from Table 4, then if z is the value of TΔS for formation of the two hydrogen bonds of the duplex:

$$-110 \times 300 \times 10^{-3} = z + 12 + (-47 \times 2) + (-5)$$
$$\text{i.e., } z = 54 \text{ kJ mol}^{-1}$$

where the last term on the right hand side of the equation (-5 kJ mol^{-1}) is a small factor to allow for the adverse TΔS for restriction of rotation of the adenine amino group upon hydrogen bond formation (Figure 10). Thus, the favorable TΔS per hydrogen bond is ca. 27 kJ mol^{-1}. Strikingly, the entropy change is large and favorable, as is that derived earlier in this article for the chemically similar amide-amide bond (ca. 18 kJ mol^{-1}, Table 2). The large favorable entropy term is again assumed to find its origin to an important extent in the release of water from the polar functional groups involved in hydrogen bond formation (Figure 10). On the basis of a hydrogen bond inventory,[8] hydrogen bond formation in RNA and DNA duplexes should be approximately isoenthalpic, since there are the same number of hydrogen bonds on both sides of the equilibrium (Figure 10). Thus, it is concluded that in duplex formation, the free energy of formation of a hydrogen bond is in the vicinity of -27 kJ mol^{-1}. As for the amide-amide hydrogen bond formed in the folding of proteins, the conclusion is that the hydrogen bonds formed between bases in the generation of nucleic acid double helices are stronger than hitherto thought. Turner et al.,[37] derived a strength of -2 to -8 kJ mol^{-1} (specificity of 2 to 20), whereas the *lower* limit obtained here, assuming an error limit of ±25%, corresponds to a selectivity of about 3,500.

2. Double Helix Formation

Given the thermodynamic parameters for extension of a preformed double helix by one base pair (Table 4), then formation of a short $(A.U)_n$ double helix from single strands of A_n and U_n will, in addition, be determined by the change in translational plus rotational free energy (ΔG_{t+r}) for the bimolecular association of two strands to give one of duplex. Indeed, the melting temperatures reported[38] for a number of short A.U duplexes can be reproduced by using thermodynamic parameters derived from Table 4 in conjunction with ΔG_{t+r} taken as 70-85% of the value read off from Figure 3.[35b] These results indicate how experimental data for associations can be used to reduce uncertainties in the approach.

Uncertainties in the Approach

The experimental parameters used in this article fall into two classes. First, those that are directly determined on the system of interest, e.g., binding constants. Second, those that are determined on model systems to

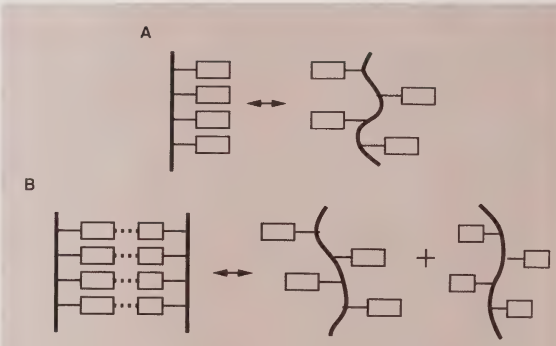


Figure 9. Schematic illustration of base stacking in the formation of a single strand helix (A) and a double strand helix (B).

Table 4
Thermodynamic Parameters for Single Strand and Double Strand Helix Formation[a]

Structure	ΔG (kJ mol^{-1})	ΔH (kJ mol^{-1})	ΔS (J mol^{-1} K^{-1})
Single	-2.2 ±2.7	-37 ±4	-116 ±17
Double	-5.3 ±3.9	-38 ±8	-110 ±16

[a]The data for double strand helix formation are all for the formation of A-U or A-T base pairs.

allow the separation of variables relevant to the system of interest, e.g., parameters for the hydrophobic effect (ΔG_h), for the change in rotational and translational free energy upon bimolecular association (ΔG_{t+r}) , and for the free energy change in restricting internal rotations (ΔG_r). It is in this second class of parameters that the main uncertainties lie. All that can be said about them is that values corresponding to the currently accepted numbers in the literature have been used. The values used for ΔG_{t+r} are consistent with the relative rates of many unimolecular versus, otherwise analogous, bimolecular reactions, and those used for ΔG_r are, for example, from experimental rotor restrictions occurring upon cyclization reactions (and, in one case, from a system of direct interest, see **3** versus **4**). Nevertheless, uncertainties in these parameters remain because the degree of residual motion in biologically important aggregates is, itself, uncertain. However, even though the approach will doubtless evolve and the parameters be refined, the fact remains that in evaluation of the strengths of some of the most important hydrogen bonds in biology, long established principles regarding entropy changes have been ignored, and the bonds appear to be stronger than conventional wisdom would have us believe.

Conclusion

Solution binding constants determine whether a particular ordered structure, perhaps important for biological function, will be highly populated. A difficult task in the crude estimation of solution binding constants is the estimation of strain and van der Waals repulsion energies. Although these can, in principle, be allowed for (equation 2), it seems simplest to first examine structures in which such strains and repulsions might be minimal. It is argued, in this article, that some of the interactions honed by natural selection may satisfy this criterion, and thereby allow, to a useful approximation, the application of equation 1. In these cases, rough optimal binding constants can potentially be estimated by reading off the low probability of "catching" one molecule upon another from Figure 3 (or a modified version of it, see, for example, the comment on nucleic acid double helix formation), allowing for the number of rotations restricted in the binding process, estimating the hydrophobic effect from the area of hydrocarbon buried (for associations occuring in aqueous solution), and allowing for the binding free energies associated with each interaction of polar functional groups (e.g., Table 1). If the approach proves to be of general utility, the measurement of a large number of intrinsic binding free energies[6,8] will be necessary in the future. The parameters suggested in this article may need subsequent refinement since they represent early work. However, the principles involved seem to be well based, and the initial conclusions physically plausible. In particular, hydrogen bonds formed in aqueous solution between uncharged groups are concluded to vary in strength. The hydrogen bonds in nucleic acid duplexes, and the main hydrogen bonds in proteins, amide-amide, are concluded to be stronger than hitherto believed.[39]

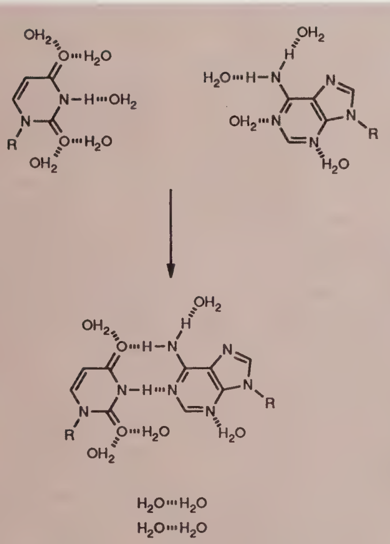


Figure 10. Illustration of the entropically favorable release of water associated with the formation of hydrogen bonds between base pairs.

Rotor restrictions that occur upon association are seen as a powerful factor opposing binding. This point may bear on the frequent occurrence of polycyclic secondary metabolites, in which 5- and 6-membered rings are common. Polycyclization, to form small rings, generates a large amount of order in a small molecule. The common presence of this order supports the concept that secondary metabolites (defined as products without a role in the internal economy of the producer) have evolved under the pressures of natural selection to bind to selected targets in organisms that compete with, or have competed with, the producer.[40] It is a further consequence of this idea that control of the extent of ring formation will allow subtle control of binding, and, hence, of physiological function.

Acknowledgements

I wish to thank all my colleagues named in references 1 and 35 for their efforts in making this work possible. In particular, special thanks are due to Andrew Doig for his insight in semi-quantitatively determining many aspects of the theoretical approach. SERC (UK), Smith Kline Beecham, and the Upjohn Company are thanked for financial support. Contributions from Eli Lilly, ICI, Roussel Uclaf, Pfizer, and Schering towards specific parts of the program are also gratefully acknowledged.

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5) This value is ca. 50% larger than that used in our previous work (ref 1). The value used previously is based directly on the experimentally determined solubilities of selected hydrocarbons in water. In such experiments, one side of the equilibrium involves separate hydrocarbon and water phases, each restricted to a specified volume of the container. In contrast, in the molecular recognition processes under study, all species have access to the total volume of the solution. Thus, the values obtained from the water solubility of hydrocarbons include a favorable entropy of mixing (Sharp, K.A.; Nicholls, I.A.; Fine, R.F.; Honig, B. *Science* **1991**, *252*, 106). When a correction has been made for this factor, the value of 0.19 kJ mol^{-1}/Å^2 is obtained.

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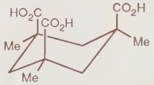
About the Author:

Dr. Dudley Williams is a Reader in Organic Chemistry at the University of Cambridge, and Deputy Director of the Cambridge Center for Molecular Recognition. Dr. Williams began his research in organic chemistry at the University of Leeds, where he obtained his Ph.D. in 1961. After three years as a postdoctoral fellow at Stanford University, he went to the University of Cambridge, where he has carried out work on mass spectrometry, NMR, natural products, and molecular recognition phenomena. For this work, he has received the Meldola Medal, the Corday Morgan Medal, the Tilden Medal, and the Alfred Bader Award in Organic Chemistry (1991) He was elected a Fellow of the Royal Society in 1983.

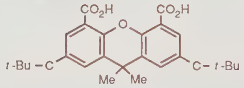
Compounds for Molecular Recognition Studies



Kemp's triacid, when reacted with various diamines, provided molecules of cleft-like shapes in different sizes. The hydrogen bonding related interactions and aryl stacking arrangements between these hosts and guests allow the design of models for recognition and replication.

Rebek, J., Jr. *Chemtracts—Organic Chemistry* **1989**, *2*, 337 and references cited therein.

34,228-9 **Kemp's triacid**, 99% 1g $30.65



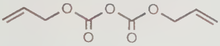
Rebek has designed new modular units based on a xanthene dicarboxylic acid that have allowed complexation of larger target molecules and have the added advantage of increasing the organic solubility of the new clefts and complexes.

Nowick, J.S.; Ballester, P.; Ebmeyer, F.; Rebek, J., Jr. *J. Am. Chem. Soc.* **1990**, *112*, 8902.

37,937-9 **2,7-Di-*tert*-butyl-9,9-dimethyl-4,5-xanthenedicarboxylic acid**, 98% 1g $19.00

Biochemical Applications

Amino Group Protection

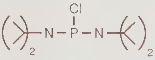


A convenient reagent for the introduction of the allyloxycarbonyl (alloc) protecting group in peptide and nucleotide synthesis.[1] It readily reacts with a variety of amino compounds and, except for the reaction with amino acids, does not require basic catalysts. The by-products (CO_2, allyl alcohol) are volatile and thus easily removed.

(1) Sennyey, G.; Barcelo, G.; Senet, I.-P. *Tetrahedron Lett.* **1987**, *28*, 5809.

36,723-0 Diallyl pyrocarbonate, 97% 1g $17.70; 5g $61.80

For Oligonucleotide Synthesis

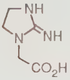


This crystalline, monofunctional phosphitylating agent is used in the preparation of phosphoramidites, H-phosphonates, and for nucleotide coupling.[1,2] It possesses many other applications in organometallic[3] and organic[4] chemistry.

(1) Marugg, J.E.; Burik, A.; Tromp, M.; van der Marel, G.A.; van Boom, J.H. *Tetrahedron Lett.* **1986**, *27*, 2271. Elie, C.J.J.; Dreef, C.E.; Verduyn, R.; van der Marel, G.A.; van Boom, J.H. *Tetrahedron* **1989,** *45*, 3477. (2) Wada, T.; Ishikawa, K.; Hata, T. *Tetrahedron Lett.* **1990**, *31*, 6363. (3) King, R.B.; Bhattacharya, N.K.; Holt, E.M. *J. Organomet. Chem.* **1990**, *394*, 305. (4) Moriarty, R.M.; Hiratake, J.; Liu, K. *J. Am. Chem. Soc.* **1990**, *112*, 8575.

34,134-7 Bis(diisopropylamino)chlorophosphine 1g $7.00; 5g $23.00

Cyclocreatine

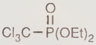


Cyclocreatine serves as a substrate for the determination of creatine kinase equilibrium constants[1] and of ADP level in transgenic mouse liver expressing creatine kinase.[2] This compound has potential as an antitumor candidate.[3]

(1) LoPresti, P.; Cohn, M. *Biochim. Biophys. Acta* **1989**, *998*, 317; *Chem. Abstr.* **1990**, *112*, 3440k. (2) Brosan, M.J.; Chen, L.; Van Dyke, T.A.; Koretsky, A. *J. Biol. Chem.* **1990**, *265*, 20849; *Chem. Abstr.* **1990**, *113*, 208795x. (3) Hark, R., University of Pennsylvania, personal communication, 1991.

37,762-7 2-Imino-1-imidazolidineacetic acid, 98% 1g $16.00; 5g $54.00

Phosphonoamino Acid Precursor



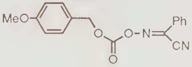
$Cl_3C-\overset{\overset{\displaystyle O}{\|}}{P}(OEt)_2$

One or more chlorine atoms of this useful phosphonate may be replaced by suitable nucleophiles. It has been employed in the preparation of phosphonoamino acids,[1] trimethylsilylmethyl phosphonates,[2] and alkoxymethyl phosphonates.[3]

(1) Halazy, S.; Danzin, C.; Eur. Patent 328 834, 1989; *Chem. Abstr.* **1990**, *112*, 77538v. (2) Teulade, M.P.; Savignac, P. *J. Organomet. Chem.* **1988**, *338*, 295. (3) Albrecht, S.; Herrmann, E. *Z. Anorg. Allg. Chem.* **1986**, *538*, 207.

37,452-0 Diethyl (trichloromethyl)phosphonate, 97% 5g $7.00 25g $23.80

MOZ-ON

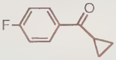


Reagent for the introduction of the Z(OMe) amino protecting group in peptide synthesis.[1] Comparable to BOC-ON (Cat. No. 19,337-2) in reactivity and ease of handling.[2]

(1) For a discussion of this and other amino acid protecting groups see Bodansky, M. *Principles of Peptide Synthesis*, Springer-Verlag: Berlin, 1984 (Cat. No. Z12,935-6). (2) Chen, S.T.; Wang, K.T. *Synthesis* **1989**, 36.

37,860-7 2-(4-Methoxybenzyloxycarbonyloxyimino)-2-phenylacetonitrile, 98% 5g $19.00; 25g $66.00

For Tomography Studies

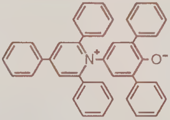


The N.C.A. (no-carrier-added) preparation of ^{18}F-labelled cyclopropyl phenyl ketone by nucleophilic substitution employed its nonradioactive form as the starting material. ^{18}F-substituted aromatic rings are common structural components of ^{18}F-labelled radiopharmaceuticals.

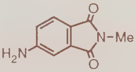
Shiu, C.-Y.; Watanabe, M.; Wolf, A.P.; Fowler, J.S.; Salvadori, P. *J. Labelled Compd. Radiophar.* **1984**, *21*, 533.

C11,900-8 Cyclopropyl 4-fluorophenyl ketone, 99% 5g $12.00; 25g $40.00

Determination of Water with Solvatochromic Dyes



1



2

As an alternative to Karl Fischer measurements, a procedure has been developed by Prof. H. Langhals using solvatochromic dyes to estimate water content of organic solvents. The wavelength of maximum absorption for Reichardt's dye [2,6-diphenyl-4-(2,4,6-triphenylpyridinio)phenolate] is very sensitive to changes in polarity of a solvent; hence, it is very sensitive to moisture content.

The moisture content of an otherwise pure organic solvent can easily be determined from the wavelength of maximum absorption of Reichardt's dye dissolved in a solvent sample. Measurements are taken on a UV-visible spectrophotometer, or estimation may be made visually by comparison with a standard color scale or a set of prepared standards. The calculation of the moisture content is carried out with a simple two-parameter equation. The parameters have been determined for 25 commonly used solvents. In certain cases, such as for acidic solvents, 4-amino-*N*-methylphthalimide, a fluorescent solvatochromic dye, should be substituted for the Reichardt's dye. The lower limit of detection is solvent-dependent and ranges from 1 to 10mg water in 100mL solvent.[1]

These two solvatochromic dyes are available from Aldrich.

Langhals, H. *GIT Fachs. Lab.* **1991**, *7*, 766 (German).
Langhals, H. *Anal. Lett.* **1991**, *23*, 12, 2243 (English).

27,244-2 Reichardt's Dye (1) 250mg $19.20; 1g $54.50

24,771-5 4-Amino-*N*-methylphthalimide, 97% **(2)** 1g $25.80

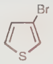
THIOPHENES

Thiophenes have long played an important role in medicinal chemistry. Currently, they are used as synthetic intermediates for a variety of drugs (e.g., antihistamines, local anesthetics, hypnotics, antispasmodics, and anticonvulsants). They have also been used as polymer building blocks, and as components for flavoring and sweetening agents.[1] A few of the many thiophenes listed by Aldrich are presented below. For additional thiophenes and related products, please see the Aldrich Catalog/Handbook or call our Technical Services Department to request a computer search at 800-231-8327. If we don't offer what you need, call us for a custom synthesis quote at 800-255-3756.

Polymer synthesis[2]

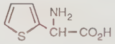
M8,440-2 3-Methylthiophene, 99+%
25g $19.20; 100g $53.90

Agrochemical research[3]



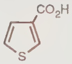
10,622-4 3-Bromothiophene, 97%
5g $13.30; 25g $40.60; 100g $139.55

High intensity sweeteners[4]



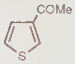
18,880-8 DL-α-Amino-2-thiopheneacetic acid, 98%
1g $22.35; 5g $78.45

Synthesis of medicinally important compounds[5]



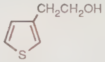
24,776-6 3-Thiophenecarboxylic acid, 99%
1g $11.50; 5g $37.75

Preparation of flavoring agents[6]



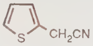
19,632-0 3-Acetylthiophene, 98%
1g $10.95; 10g $59.50

Photosensitive composition for lithographic plate production[7]



22,879-6 2-(3-Thienyl)ethanol, 99%
5g $30.75; 25g $101.10

Intermediate for ticlopidine[8] and antibacterial agents[9]

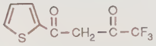


14,168-2 2-Thiopheneacetonitrile, 97%
10g $16.75; 50g $70.65

Conducting polymer synthesis[10]

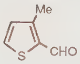
24,163-6 2,2'-Bithiophene, 97%
1g $11.00; 10g $61.40

Synergistic extraction of metal ions[11]



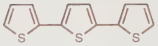
T2,700-6 Thenoyltrifluoroacetone, 99%
25g $25.90; 100g $62.70

Dopamine agonists synthesis[12]



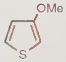
16,413-5 3-Methyl-2-thiophenecarboxaldehyde
25g $24.05; 100g $64.65

Nematocidal activity[13]



31,107-3 2,2':5',2"-Terthiophene, 99%
250mg $27.50; 1g $76.50

Synthesis of herbicides[14] and antihypertensive agents[15]



37,402-4 3-Methoxythiophene, 98%
5g $19.75; 25g $66.00

References:

(1) *The Chemistry of Heterocyclic Compounds—Thiophene and Derivatives*, Hartough, H.D. Ed., Interscience: New York, 1952. (2) Ochmanska, J.; Pickup, P.G. *J. Electroanal. Chem. Interfacial Electrochem.* **1991**, *297*, 211. (3) Kimura, F. et al. Jpn. Patent 62 155 271, 1987; *Chem. Abstr.* **1987**, *108*, 112477r. (4) Janusz, J.M.; Young, P.A.; Blum, R.B.; Riley, C.M. *J. Med. Chem.* **1990**, *33*, 1676. (5) Bollinger, P. et al. *Helv. Chim. Acta* **1990**, *73*, 1197. (6) Nishimura, O.; Masuda, H.; Mihara, S. *Koryo* **1990**, *165*, 91; *Chem. Abstr.* **1990**, *113*, 210350s. (7) Garreau, R. et al. Eur. Patent 375 005, 1990; *Chem. Abstr.* **1991**, *114*, 62943r. (8) Radisson, J. Eur. Patent 321 349, 1989; *Chem. Abstr.* **1990**, *112*, 35671c. (9) Idem ibid. Eur. Patent 274 324, 1988; *Chem. Abstr.* **1989**, *110*, 94983n. (10) Lopez-Navarrete, J.T.; Zerbi, G. *Chem. Phys. Lett.* **1990**, *175*, 125. (11) Wharf, R.M.; Choppin, G.R.; Pruett, D.J. *Solvent Extr. Ion Exch.* **1990**, *8*, 615. (12) Yamanaka, M. et al. Eur. Patent 381 235, 1990; *Chem. Abstr.* **1991**, *114*, 81573m. (13) Kyo, M. et al. *Plant Cell Rep.* **1990**, *9*, 393. (14) Ishizaki, M.; Osada, S.; Kato, S. Jpn. Patent 2 172 986, 1990; *Chem. Abstr.* **1990**, *113*, 211821h. (15) Press, J.B.; Sanfilippo, P.; McNally, J.J.; Falotico, R. Eur. Patent 360 621, 1990; *Chem. Abstr.* **1990**, *113*, 191320p.

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Analytical Tools for Polymer Scientists

Aldrich offers a wide variety of reagents and equipment for use by analytical scientists. Listed below are a few of those products that are useful for the analysis of polymers. If you don't find what you need here or in our Catalog/Handbook, please contact our Technical Services Department at 800-231-8327.

Hydroxyl Number Reagent

A mixture of pyridine, phthalic anhydride, and imidazole for the molecular weight determination of polyglycols by end-group functionalization. Subsequent titration with standard base yields molecular weight.

36,965-9 Hydroxyl number reagent 200mL $26.50
1L $88.40

Standard KOH Solutions

Convenient solutions for the determination of hydroxyl number and acid number for a variety of polymers. These solutions are prepared from A.C.S. reagent grade KOH and are standardized against NIST reference material.

31,933-3 Potassium hydroxide, 0.1*N* in methyl alcohol **500mL $7.60; 2L $13.00; 3L $41.00**
8L $47.30

31,934-1 Potassium hydroxide, 0.5*N* in methyl alcohol **500mL $8.55; 2L $14.70; 3L $45.90**
8L $53.20

31,938-4 Potassium hydroxide, 1.0*N* in methyl alcohol **500mL $8.65; 2L $15.10; 3L $46.90**
8L $54.70

Poly(styrene) Standards

Useful standards for the determination of molecular weight by gel permeation chromatography. Each comes complete with a data sheet giving lot specific molecular weight information.

32,783-2 Poly(styrene) Standard Kit $279.55
containing all 13 standards

Individual Poly(styrene) Standards:

Typical Molecular Weight	Cat. No.	Price/1g
800	**32,782-4**	**$23.65**
2500	**32,771-9**	**23.65**
4000	**32,772-7**	**23.65**
13,000	**37,951-4**	**23.65**
20,000	**32,774-3**	**23.65**
35,000	**32,775-1**	**23.65**
50,000	**33,034-5**	**23.65**
90,000	**32,777-8**	**23.65**
200,000	**32,778-6**	**23.65**
400,000	**32,779-4**	**23.65**
600,000	**33,035-3**	**23.65**
900,000	**32,780-8**	**23.65**
1,800,000	**32,781-6**	**23.65**

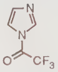
Reference Books

From polymer additives and infrared spectroscopy to glass transition temperature and molecular weight determination, Aldrich has many books to meet the needs of analytical polymer scientists.

Book	Cat. No.	Each
Polymer Handbook, 3rd ed.	**Z19,216-3**	**$165.00**
Polymers: Polymer Characterization and Analysis	**Z21,492-2**	**95.00**
Concise Encyclopedia of Polymer Science and Engineering	**Z20,902-3**	**150.00**
The Coblentz Society—Plasticizers and Other Additives, 2nd ed.	**Z21,502-3**	**100.00**
Applications of Polymer Spectroscopy	**Z11,130-9**	**94.40**
The Aldrich Library of FT-IR Spectra	**Z18,400-4**	**795.00**

New Reagents from Aldrich

For Acyl Transfer

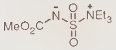


Mixed anhydrides generated in situ from this reagent and carboxylic acids serve as acylating agents in Friedel-Crafts reactions.[1] The facile trifluoroacetyl transfer allows the use of this reagent in the conversion of amides to nitriles.[2]

(1) Keumi, T.; Yamamoto, T.; Saga, H.; Kitajima, H. *Bull. Chem. Soc. Jpn.* **1981**, *54*, 1579. (2) Keumi, T.; Saga, H.; Kitajima, H. *ibid.* **1980**, *53*, 1638.

34,612-8 1-(Trifluoroacetyl)-imidazole, 98% 1g $7.40; 10g $37.40

Burgess Reagent

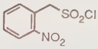


Useful reagent for the dehydration of secondary and tertiary alcohols to olefins[1] and the dehydration of primary amides to nitriles.[2]

(1) Burgess, E.M.; Penton, H.R., Jr.; Taylor, E.A. *J. Org. Chem.* **1973**, *38*, 26. O'Grodnick, J.S.; Ebersole, R.C.; Wittstruck, T.; Caspi, E. *ibid.* **1974**, *39*, 2124. Goldsmith, D.J.; Kezar, H.S., III. *Tetrahedron Lett.* **1980**, *21*, 3543. (2) Claremon, D.A.; Phillips, B.T. *ibid.* **1988**, *29*, 2155.

36,548-3 (Methoxycarbonylsulfamoyl)triethylammonium hydroxide, inner salt, 97% 250mg $12.50
1g $35.00

Photolabile Amine Protecting Group

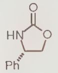


Professor Jean-Marie Lehn of the Université Louis Pasteur (Strasbourg, France) suggested that we offer this amino protecting group which is readily removed under mild conditions (i.e., by photolysis in methanol containing a trace of sulfuric acid) in sharp contrast to the drastic conditions (reductive, acidic, etc.) normally needed for sulfonamide cleavage. Professor Lehn and coworkers demonstrated its utility in azacrown ether chemistry.

Girodeau, J.-M.; Lehn, J.-M., unpublished work. Girodeau, J.-M. Thèse de Docteur- Ingénieur, Université Louis Pasteur, Strasbourg, France 1977.

37,582-9 2-Nitro-α-toluenesulfonyl chloride, 98% 1g $9.00; 5g $30.00

New Chiral Oxazolidinone

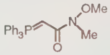


The asymmetric imine-ketene cycloaddition of the derived β-aminoketene provides a convenient approach to chiral 3-amino-β-lactams. The approach, first developed by Evans and Sjogren[1] was more recently employed in the synthesis of loracarbef—a synthetic β-lactam antibiotic.[2]

(1) Evans, D.A.; Sjogren, E.B. *Tetrahedron Lett.* **1985**, *26*, 3783. (2) Bodurow, C.C. et al. *ibid.* **1989**, *30*, 2321.

37,669-8 (*S*)-(+)-4-Phenyl-2-oxazolidinone, 98% 1g $29.00; 5g $97.00

New Weinreb-Nahm-Wittig Reagent

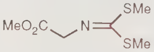


Evans and co-workers recently employed this reagent in the synthesis of cytovaricin.[1] Direct conversion of the intermediate aldehyde to the α,β-unsaturated methyl ketone resulted in the complete isomerization of an allylic-methyl stereocenter, whereas the use of Weinreb-Wittig modification[2] afforded the desired product without appreciable racemization. Aldrich also offers the corresponding HEW reagent (Cat. No. 36,243-3).

(1) Evans, D.A. et al. *J. Am. Chem. Soc.* **1990**, *112*, 7001. (2) Nahm, S.; Weinreb, S. M. *Tetrahedron Lett.* **1981**, *22*, 3815.

37,687-6 *N*-Methoxy-*N*-methyl-2-(triphenylphosphoranylidene)-acetamide, 98% 5g $22.50; 25g $75.00

Glycine Template



Trimethylaluminum mediated condensation of this glycine ester with Oppolzer's sultams (Cat. No. 29,835-2 and 30,580-4) provides chiral glycine templates for asymmetric synthesis of unnatural amino acids with high stereoselectivity.[1] Has also been employed in β-lactam synthesis.[2]

(1) Oppolzer, W.; Moretti, R.; Thomi, S. *Tetrahedron Lett.* **1989**, *30*, 6009. (2) Abramski, W.; Belzecki, C.; Chemielewski, M. *Bull. Pol. Acad. Sci., Chem.* **1985**, *33*, 451; *Chem. Abstr.* **1987**, *106*, 84433m.

37,732-5 *N*-[Bis(methylthio)methylene]glycine methyl ester, 97%
5g $18.00; 25g $60.00

Alcohol Protection

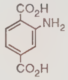
ICH_2OMe

Useful reagent for the protection of alcohols as methoxymethyl ethers as well as iodomethylation of aromatic systems.[1] Employed in a novel synthesis of sarkomycin.[2]

(1) Jung, M.E.; Mazurek, M.A.; Lim, R.M. *Synthesis* **1978**, 588 and references therein. (2) Otera, J.; Niibo, Y.; Nozaki, H. *J. Org. Chem.* **1989**, *54*, 5003.

38,022-9 Iodomethyl methyl ether,
97% 5g $15.50

Aromatic Building Block

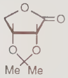


Recent applications of this amino acid include syntheses of azo dyes,[1] and acridonecarboxylic acids.[2]

(1) Kuthan, P.; Pavlikova, J.; Marhan, J. Czech. Patent 266 649, 1990; *Chem. Abstr.* **1991**, *115*, 10849r. (2) Rewcastle, G.W.; Denny, W.A. *Synth. Commun.* **1987**, *17*, 309.

38,107-1 2-Aminoterephthalic acid
25g $14.00; 100g $46.00

New Addition to the "Chiral Pool"

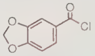


An excellent source of chirality for the synthesis of natural and unnatural products.

Heitz, M.-P.; Overman, L.E. *J. Org. Chem.* **1989**, *54*, 2591. Perri, S.T.; Dyke, H.J.; Moore, H.W. *ibid.* **1989**, *54*, 2032. Cohen, N. et al. *J. Am. Chem. Soc.* **1983**, *105*, 3661.

37,709-0 (-)-2,3-*O*-Isopropylidene-D-erythronolactone, 99% 1g $10.50
5g $35.00

Versatile Building Block



This important building block for pharmaceuticals[1] and agrochemicals[2] is now available from Aldrich.

(1) Adams, J., et al. Eur. Patent 301 672, 1989; *Chem. Abstr.* **1989**, *111*, 187606c. (2) Zurfluch, R. Eur. Patent 368 176, 1990; *Chem. Abstr.* **1990**, *113*, 152285m.

37,889-5 Piperonyloyl chloride, 99%
1g $10.50; 10g $60.00

Metal powders. . ,

which have long been the basis of a whole field of metallurgy, are now becoming increasingly useful to the synthetic chemist. Their use as reducing agents is widespread in both inorganic and organic chemistry. They are also becoming important starting materials in organic syntheses. Co-condensation of metal vapors with organic ligand vapors has led to the preparation of a variety of metal complexes.[1] Recently, the Rauchfuss group prepared several transition metal-sulfur compounds by *room temperature* reaction of metal powders, sulfur, and *N*-methylimidazole.[2] Below is a listing of our metal powders from the first row of the transition metals. Of course we offer metal powders from throughout the entire periodic table. Please consult the Aldrich Catalog/Handbook for those not listed here.

Ti	**36,699-4**	**Titanium**, -325 mesh, 99.98%	10g $25.00; 50g $85.00
	26,849-6	**Titanium**,-100 mesh, 99.9%	10g $9.75; 50g $28.40
V	**26,293-5**	**Vanadium**, -325 mesh, 99.5%	10g $30.95; 50g $118.35
Cr	**26,626-4**	**Chromium**, -100 mesh, 99.5%	50g $23.45; 250g $74.50
	26,629-9	**Chromium**, -325 mesh, 99+%	100g $15.55; 500g $57.55
	26,627-2	**Chromium**, -200 mesh, 99%	100g $14.40; 500g $50.55
Mn	**26,614-0**	**Manganese**, -50 mesh, 99.9%	100g $19.00; 500g $70.15
	26,613-2	**Manganese**, -325 mesh, 99+%	250g $17.45; 1Kg $47.00
	26,615-9	**Manganese**, -50 mesh, 99+%	500g $11.50; 2Kg $33.20
Fe	**25,563-7**	**Iron**, 99.99+%	10g $31.70; 50g $107.30
	26,795-3	**Iron**, ~10μ, 99.9+%	250g $24.80; 1Kg $66.80
	20,930-9	**Iron**, -325 mesh, 97%	500g $20.20; 2Kg $59.30
Co	**20,307-6**	**Cobalt**, 99.995%	5g $35.00; 25g $129.20
	26,663-9	**Cobalt**, <2μ, 99.8%	100g $29.35; 500g $107.20
Ni	**26,696-5**	**Nickel**, -100 mesh, 99.999%	10g $18.90; 50g $63.95
	20,390-4	**Nickel**, -100 mesh, 99.99%	100g $22.05; 500g $62.85
	26,828-3	**Nickel**, submicron, 99.8%	25g $31.25; 100g $98.35
	26,698-1	**Nickel**, ~3μ, 99.7%	100g $12.00; 500g $42.20
	26,697-3	**Nickel**, -100 mesh, 99%	100g $10.55; 500g $38.40
Cu	**20,312-2**	**Copper**, 99.999%	10g $61.50; 50g $231.85
	35,745-6	**Copper**, dendritic,~3μ, 99.7%	100g $10.95; 500g $38.40
	26,607-8	**Copper**, -150 mesh, 99.5%	100g $11.30; 500g $39.90
	26,608-6	**Copper**, -40 mesh, 99.5%	500g $19.50; 2Kg $59.20
	32,646-1	**Copper**, submicron, 99+%	10g $23.65; 50g $84.95
	20,778-0	**Copper**, -200 mesh, 99%	500g $18.60; 2Kg $54.90
	32,645-3	**Copper**, spheres, 5-10μ, 99%	50g $9.85; 1Kg $29.95
Zn	**32,493-0**	**Zinc**, -100 mesh, 99.998%	10g $41.00; 50g $146.05
	24,347-7	**Zinc**, -30 +100 mesh, 99% A.C.S. reagent	500g $28.20 2.5Kg $104.75; 3Kg $135.40
	26,634-5	**Zinc**, -15 +50 mesh, 99%, A.C.S. reagent	250g $12.50; 1Kg $36.65
	24,346-9	**Zinc**, 20 mesh, A.C.S. reagent	100g $11.40 500g $28.20; 3Kg $135.40
	20,998-8	**Zinc**, dust, -325 mesh	100g $15.45 1Kg $27.80; 5Kg $86.50

A particle size conversion table is located in the back of the Aldrich Catalog/Handbook.

References

1. For general discussions of metal vapor synthesis see: Blackborrow, J.R.; Young, D. *Metal Vapor Synthesis in Organometallic Chemistry;* Springer-Verlag, Berlin, 1979. Timms, P.L.; Turney, T.W. *Adv. Organometal. Chem.* **1977**, *15*, 53. Green, M.L.H. *J. Organometal. Chem.* **1980,** *200*, 119. Klabunde, K. *Acc. Chem. Res.* **1975**, *8*, 393.
2. Dev, S.; Ramli, E.; Rauchfuss, T.B.; Wilson, S.R. *Inorg. Chem.* **1991**, *30*, 2514 and references contained therein.

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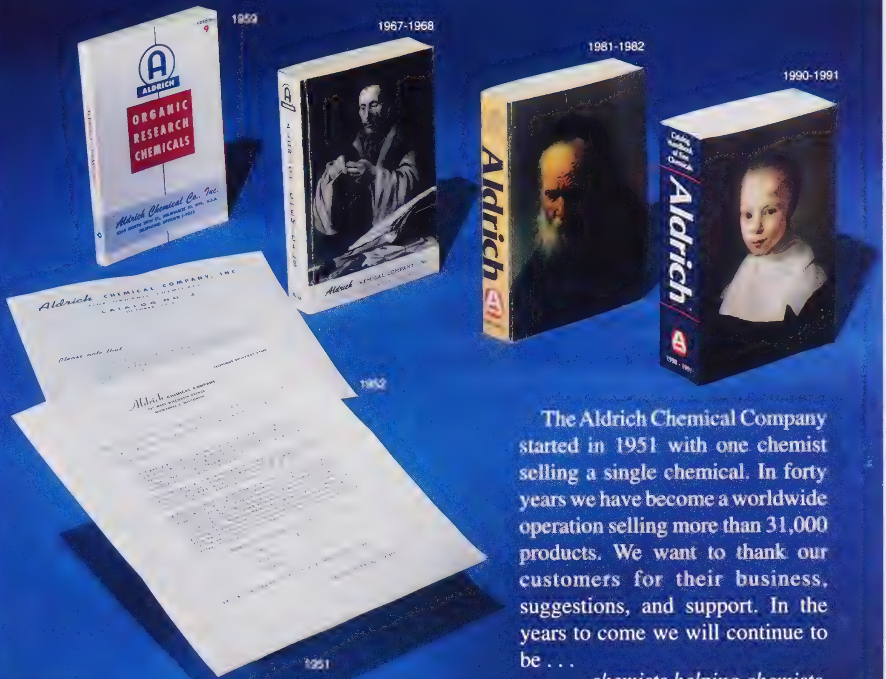

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October 19, 2005

Jacob Simon, Chief Curator
National Portrait Gallery
St. Martin's Place
London WC2H 0HE
ENGLAND

Dear Jacob,

Thank you so much for your kind letter of October 13th and particularly for taking the trouble of reading that rough draft for my next autobiography. That will not be published for quite a while so that we will have ample time to make the necessary corrections.

Isabel and I will be in England from the 11th of November to the 22nd of December and of course in London for the old master sales which I believe will be the week of December 5th. It would be great if we could get together then.

Thank you also for your help recently with that portrait by Herkomer which you suggested could be of Louis Breitmeyer. I have now had confirmation from his grandson that it is indeed a portrait of Breitmeyer.

May I ask you for your help with another English portrait, photograph enclosed. This is neither by a great artist nor in mint condition but I would love to know who the sitter is. If you do know, please let me know when we meet.

With all good wishes as always I remain

Yours sincerely,

Alfred Bader
AB/az
Enc.

Direct T 020 7312 2416 **F** 020 7306 0056
jsimon@npg.org.uk

National
Portrait
Gallery

Dr Alfred Bader
Alfred Bader Fine Arts
Astor Hotel – Suite 622
Milwaukee, WI 53202
USA

13 October 2005

Dear Alfred

Thank you very much for your letter of 6 September. You can take this response as granting permission to use the copyright text of 22 February 2005 entitled Help Us Secure a Great Portrait for the Nation.

Your letter encloses an extract from your next autobiography. On the portrait of the Duchess of Cleveland, you refer to meeting me at the Gallery: "After meeting Jacob Simon at the National Portrait Gallery...". It is not really clear from your text when this meeting took place. My remark applies to the circumstances of the sale in 2001 before it was ever publicly exhibited. I think this is an important point.

You then move on to the situation in 2004. The fact that the portrait had been exhibited in the Painted Ladies exhibition in 2001 and at auction in 2004 meant that our concerns about the lack of public scrutiny of the history of the portrait were significantly reduced. To state, however that the "publicity surrounding Christie's auction must have persuaded Jacob Simon not to worry further about the provenance" is completely incorrect. As a national institution we undertook additional provenance research, as we do with all acquisitions. In the process we uncovered new information which led to a flurry of activity. Had we not been able to satisfy ourselves, we would not have gone ahead with the sale and I had a draft letter to you awaiting this eventuality. So I do not agree with your text as it stands.

I would be delighted to welcome you and Isabel during your visit to England in November and December.

Yours sincerely

Jacob

Jacob Simon
Chief Curator

c Otto

Dear Mark,

Thank you so much for your e-mail of today and particularly to allow me to use your name in my essay.

Regarding the price we paid, I wrote "when he [Otto] told me later that he had offered $6 million I said that this seemed much too low and that he should go very much higher, subject of course to our examining the painting very carefully." And indeed we did go very much higher and the Aurora Trust accepted our offer plus 10%.

Otto has also suggested that I include the likely provenance before Ferdinand Bol, and I will do that.

And you are quite correct: this painting is not a sketch but just a beautiful, finished little painting. As Otto said, "This is the most precious and beautiful object I have EVER handled." I feel the same way.

There is really nothing in the three Sotheby's sales that I would like to acquire and so we have decided not to come to New York. Please give us a rain check, or even better visit us in Milwaukee.

With all good wishes I remain

Yours sincerely,
Alfred Bader

Mark Fisch wrote:

>
>
> ---
>
> Dear Alfred, I trust that you are well. Thank you for the e mail. I do have a few thoughts, that you are free to disregard but here goes. You refer to the Abraham as a sketch, but it is really a highly finished and signed, albeit small, old testament painting. The phrase sketch, to my thinking, indicates a quick and loosley painted outline of a picture, and the phrase also indicates something less important than a painting. Secondly, you give the impression that the price you paid was $6M plus 10%. If true then it is fine, but I was under the impression that you paid quite a bit more. Finally, I am fine with the use of my name. This is the sole exception that I have ever made, but feel honored to have my name linked with yours and RvR's. With the warmest of wishes, Mark
>
> -----Original Message-----
> From: Alfred Bader Fine Arts <baderfa@execpc.com>
> Date: Tue, 17 Jan 2006 13:12:57
> To:Mark Fisch <mfisch@ContinentalProperties.com>
> Subject: Abraham

Dear Mark,

As you perhaps know, I am working on a second autobiography which will probably be entitled More Adventures of a Chemist Collector.

I have already given you part of one chapter, about my best friend, Marvin Klitsner. In that chapter his son's speech will really be the centerpiece.

Attached is a rough draft dealing with Abraham and the Three Angels. Please let me know if this meets with your approval.

Best wishes,
Alfred

```
begin:vcard
fn:Dr. Alfred Bader
n:Bader;Dr. Alfred
org:Alfred Bader Fine Arts
adr:924 E. Juneau Avenue;;Astor Hotel - Suite 622;Milwaukee;WI;53202;USA
email;internet:baderfa@execpc.com
title:President
tel;work:414-277-0730
tel;fax:414-277-0709
url:http://www.alfredbader.com
version:2.1
end:vcard
```

From: "Otto Naumann" <otto@dutchpaintings.com>
Date: Tue, 10 Jan 2006 17:53:46 -0500
To: "'Alfred Bader Fine Arts'" <baderfa@execpc.com>

Here's your chapter back with my comments, in blue. See especially the last page.
Yours,
Otto

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The first painting I ever bought at auction was an oil on canvas (Fig. 1) depicting an old woman with a basket, shielding a candle with her hand, purchased for £28 at Sotheby's in London during my honeymoon, on July 23, 1952. This lot 153, was just called Jordaens, not J. Jordaens or Jacob Jordaens, indicating that Sotheby's did not think it to be by Jordaens. The seller, Lord Mackintosh of Halifax, wrote to me, "I bought this picture in London nearly thirty years ago and always thought it was by Wright of Derby, but of course you know he specialised in candle-light pictures. I sent it with another Wright of Derby to the Bi-centenary exhibition in his native town of Derby. The authorities there said it was a Jacob Jordaens and showed it as such in the Exhibition and it has always been accepted as such ever since."

But it wasn't by Wright of Derby or by Jacob Jordaens; nor was it by Rubens as Professor Erik Larsen alleged in an expertise written in 1956. It was an old copy after a painting on panel by Rubens which was on loan to the Museum of Fine Arts in Boston between 1948 and 1965. Still, I enjoyed looking at my painting, but eventually gave it to a school in Milwaukee which sent it to a local auction in November 1965 where it sold for $7,000. The school was happy and so was I. In 1952 I could have bought a better painting, an original, for £28, but we all make mistakes, and all is well that ends well.

When I went to London to view the old master sales at Sotheby's in December 2003, George Gordon showed me the Rubens original which he hoped would come up for sale in July. What a difference between this original and my copy. The original (fig. 2) includes a boy lighting a candle from that of the old woman and shows a clear pentiment of the old woman's left hand which had originally been painted higher. The work is on five pieces of wood, a clear indication that Rubens painted this not for sale but for his own enjoyment, and it is included, as no. 125, in the posthumous inventory of pictures found in his house in 1640.

Rubens produced this night piece around 1616 and etched the subject around 1621. The counterproof of the first state is inscribed in Rubens' own hand, in Latin, which translates to "Light can be taken a thousand times from another light without diminishing it."

Of course I told George Gordon how much I liked this original and about the old woman with a candle, the first painting I had ever bought at auction. In March 2004 George confirmed that the Rubens would be included in Sotheby's London sale on the evening of July 7, 2004 and would be exhibited before then in New York, where Otto Naumann was able to examine it carefully.

Sotheby's catalog described the painting, lot 30, in six carefully written pages with three photographs. Among the many copies, mine in Milwaukee in 1953 was included. I simply could not understand the estimate, £2-3 million. Two years earlier, on July 10, 2002, Rubens' <u>Massacre of the Innocents</u>, wonderfully well painted but a ghastly subject,

had sold for a hammer price of £45 million. I would much rather look at this wonderful night scene - one of Rubens' few night scenes - and like the Massacre painted entirely by Rubens, without workshop involvement - but for his own enjoyment. Otto thought that he could sell it profitably if we could buy it for £4 million, but I doubted that it would sell that inexpensively.

As at the sale of the Massacre of the Innocents in 2002, Henry Wyndham was the auctioneer. Once again the room was packed, not in anticipation of the Rubens this time, but of lot 8, a small painting described as the last Vermeer not in a museum. I did not like the painting and was rather surprised when Rob Noortman told me on the day of the sale that he wanted to buy it. He was indeed the underbidder to the purchaser, Stephen Wynn, who bid by phone. The hammer price was £16.2 million

Tension in the salesroom eased after this and bidding was rather slow. Ten of the first 29 paintings in the sale were bought back, but that wasn't going to happen to lot 30, the Rubens. There was only one other bidder, on the telephone, and Henry Wyndham knocked the painting down to me at £2.2 million, much to my happy surprise. ~~But I was not so fortunate with the lot that followed, a magnificent head of Jesus with the crown of thorns, by Lucas Cranach the Elder, estimated at £100,000-150,000. This is not a painting that either Otto or I could sell, but our friends, the Arnoldi-Livies in Munich, thought they might and I had agreed to bid to £200,000. But many others admired this wonderful head which soared to £600,000.~~

There was one other painting, the head of an old man by Jan Lievens, from the collection of the late D.G. van Beuningen in Rotterdam that I found very beautiful. It was estimated at £200,000-300,000, but there were many bidders, two of them particularly determined. It finally went to Johnny Van Haeften (bidding with Richard Green) for £1,650,000, a record price for a Jan Lievens. With commission the price was well over $3 million.

For years I have been writing (see pp.216-217 of my autobiography) and lecturing about Jan Lievens, called "Ein Maler im Schatten Rembrandts", a painter in the shadow of Rembrandt. Well, I believe the shadow is in our minds. Lievens was a great painter and not just while [?] close to [do you mean to say "...and not just a follower of..."?] Rembrandt in Leiden. Over the last forty years I have bought ten paintings by Lievens, most for just a few thousand dollars, and three of these ten I have given to Queen's. Some of them - one of Rembrandt's mother, for instance, and another of St. Paul, I like even better than the painting of the old man which brought a record price, and my favorite Lievens is a late work, painted in the 1660s, a portrait of Jacob Junius. I am so happy to see Lievens coming out of Rembrandt's shadow and I look forward to a "Lievens in America" exhibition which the Milwaukee Art Museum is considering with the National Gallery in Washington and the museum in Leiden.

Briefly I wondered whether I should keep that beautiful Rubens I had bought so inexpensively, but Otto was of course enthusiastic and was indeed able to sell it quickly to the Mauritshuis in The Hague. There it was described as a "Topstuk van Rubens", an exceptional painting by Rubens, which of course it is.

X

To P 3

Alfred,

Are you not intending to illustrate the Rubens we bought also? I think it would be nice for your readers to see both versions for comparison. You start out with Rubens, but you quickly move to Lievens as the main subject of this essay. Perhaps the two points should be taken separately? You might want to move the last paragraph up and finish your discussion of the Rubens, then go on to Lievens.

Yours,

Otto