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Tetrahedron

The Tetrahedron publications: a 50-year history by Harry Wasserman

The first issue of *Tetrahedron* was published by Pergamon Press in April 1957, with Sir Robert Robinson and R. B. Woodward as the publication's two founders. In the foreword to the first issue, Sir Robert stated:

With the publication of this first part of Volume 1, a significant and unique enterprise has been launched... The ideal which activates this initiative is based upon our conviction that science is a worldwide discipline and we hope to do a real service to international collaboration in organic chemistry.

The inaugural issue published twenty articles, representing nine different countries. Contributors included D. Ginsburg, C. Djerassi, Sir Robert Robinson, S. Sugasawa, M. J. T. Robinson, O. A. Reutov, R. H. Martin, and G. Fodor, and the editorial advisory board included many of the world's leading chemists.

Robert Maxwell recognized the importance of the science journal as a key component of progress and communication in the dissemination of scientific knowledge. He realized that the vast majority of such journals were published by scientific societies, leaving a minor role to the private publishing establishment. Through personal involvement in the operation of Pergamon Press, he sought to provide scientists with freedom from the rigid practices of the societies, and the independence to publish material based on anonymous peer review.

Sir Robert Robinson and R. B. Woodward were appointed co-Chairmen of the Editorial Board of *Tetrahedron*, and at one of the first meetings of the editors and advisors held in Prague in 1960, they discussed the aims of *Tetrahedron*. What about the disparity in the quality of the research results submitted by authors in underdeveloped countries where facilities and financial support do not provide opportunities available to the research workers at major, well-financed institutions? The two Chairmen strongly agreed that the journal should encourage work at the newly emerging sites, with the goal of publishing the best work from these laboratories.

In the early days, the regional editors included W. E. Doering, covering North and South Americas, R. Martin in the UK, and later, Guy Ourisson (France and Belgium). The original executive editor was Professor Henry Stephen, based in Oxford, UK. After his death, his widow,

Dr. Theodora Stephen, took over his job with great dedication and boundless energy. For many years she earned the appreciation of the editors, authors and co-workers on the Pergamon staff.

When Doering decided to give up the American editorship in 1960 because of other commitments, I was invited to take over the role. I recall greatly benefiting from the efficient organization and smooth operation inherited from the Doering office.

In March 1959, the first 'sister journal' to *Tetrahedron* was launched. The opportunity for rapid publication of results in *Tetrahedron Letters* through camera-ready copy provided a medium for dissemination of new scientific information that met the needs of the post-war communication of research results. In particular, the field of synthetic organic chemistry prospered with these new publication opportunities. The availability of computer-assisted rendition of structural formulas through camera-ready copy made it possible to reduce significantly the time from receipt of manuscripts to publication. Total synthesis, exciting new approaches to total synthesis, and availability of new synthetic methodology were areas that thrived in a system where new developments within the broad area of organic chemistry could be quickly shared worldwide.

Other chemistry publications were also added to the *Tetrahedron* group. In 1990, based on the strong recommendation of Derek Barton, Steven Davies' journal focusing on phenomena involving asymmetry was launched as part of the Tetrahedron family under the title *Tetrahedron: Asymmetry*.

On the other hand, a proposal that a new 'review' journal should be developed to cover research in organic chemistry was strongly opposed by R. B. Woodward, who was mindful of the opposition of the scientific community to the proliferation of new journals, thereby adding financial burdens to the libraries. Eventually, Woodward agreed to the establishment of review articles, only if they could be incorporated into the main *Tetrahedron* journal. Such is the interest in these reviews, or 'Tetrahedron Reports', that they are among the most downloaded and cited articles published in the journal.

An interesting development along the lines of new journals was stimulated by an event involving the rejection of an

article submitted to *Tetrahedron Letters* on the grounds that it was based mainly on developments in medicinal chemistry rather than on novel organic chemistry. Discussion of this matter by the Board of Editors led to the realization that there would be a great deal of interest in a publication similar to *Tetrahedron Letters*, which would be of special appeal to investigators in the closely related areas of biological and medicinal chemistry. The journal, *Bioorganic and Medicinal Chemistry Letters* (BMCL) was thus established with Dale Boger as editor. The first issue appearing in 1991 followed the *Tetrahedron Letters* format for rapid publication in the area of chemical biology. The companion publication dealing with full papers, *Bioorganic and Medicinal Chemistry* (BMC), was soon added to the *Tetrahedron* family with editorial direction by Chi-Huey Wong. The first issue of BMC appeared in July 1993.

Other creative changes in the make-up of the journals included the addition of a section at the beginning of each issue, summarizing the contents of the papers in the form of graphical abstracts. These abstracts differ from those instituted earlier by *Angewandte Chemie* in that they are designed by the authors as a condition of submission rather than by the publisher, a situation which makes for speedier processing. Such has been the success of this development that today, every organic chemistry journal and many in related fields follow the *Tetrahedron* example, and publish this type of graphical abstract.

The regular publication of *Symposia-in-Print* in the journal has been a particularly effective method for focusing attention on timely topics in the field of organic chemistry. This method of highlighting up-to-date results in emerging or important research areas has been met with a great deal of enthusiasm. In practice, an investigator working successfully in a given research area is invited to act as a Guest Editor for the purpose of identifying colleagues who would make up the roster of contributors to a special issue. Typically, the editor (or co-editors) contacts about 12–15 investigators, inviting them to contribute to a collection of papers in the chosen area. Potential authors are normally given about six months to submit full papers, complete with experimental sections. Many contributors may have already published a preliminary paper on the work, and they frequently welcome the opportunity to follow up in this way with a full account. All papers are subject to peer review to maintain the high standards of the journal. Indeed, many of the *Symposia-in-Print* receive above average citations, such is the timely quality of the papers they present. Since the initiation of the program in 1981, there have been 129 Symposia published including the special symposia organized at the award of the *Tetrahedron* Prizes.

When it became clear that Sir Robert was not coping fully with the increasing number of incoming manuscripts submitted to the journal, Sir Derek Barton volunteered to replace Sir Robert as a referee, but only on the condition that his name would not appear in any special way in the published material.[†] So for many years as a ‘silent’

reviewer, he refereed all *Tetrahedron Letters* manuscripts that arrived in London. He chose to remain anonymous in order to avoid any possible disapproval from members of the Chemical Society of London, who might have been unhappy with his Pergamon Press association.

In his contribution to the congratulatory book written in honor of Robert Maxwell’s 65th birthday, Barton wrote:[†]

I was not invited to be a member of the first editorial board (of Tetrahedron) because Sir Robert thought that I was a member of the opposition. I was of course loyal to the Chemical Society and I was present when the project for Tetrahedron was discussed. My own point of view was that there was room for another journal provided that it was international.

After Woodward died in 1979, Sir Derek Barton became the Chairman of the Board of Editors and retained that position until his death in 2000.

Shortly after Woodward’s death, the Executive Board of Editors suggested to Robert Maxwell that a prestigious prize to honor the memory of the two founding co-Chairmen should be established. Robert Maxwell fully supported this idea, and so, in 1980, ‘The Tetrahedron Prize for Creativity in Organic Chemistry’ was formed. The objective of the prize is to recognize a scientist who has demonstrated outstanding creativity in organic chemistry through original contributions that have moved the field in a new and significant direction. Nominations are openly invited, with members of the Executive Board of Editors of Tetrahedron Publications forming the voting committee. The prize was initially awarded every second year, but is now awarded annually. The 23 recipients of the Tetrahedron Prize are listed below.

1981	Albert Eschenmoser
1983	Elias J. Corey
1985	Gilbert Stork
1987	Arthur J. Birch
1989	Michael J. S. Dewar
1991	William S. Johnson
1993	Ryoji Noyori; K. Barry Sharpless
1995	Alan R. Battersby; A. Ian Scott
1996	Samuel Danishefsky
1997	Stuart L. Schreiber
1998	David A. Evans; Teruaki Mukaiyama
1999	Henri B. Kagan
2000	Peter B. Dervan
2001	Yoshito Kishi
2002	Kyriacos C. Nicolaou
2003	Robert H. Grubbs; Dieter Seebach
2004	Koji Nakanishi
2005	Bernd Giese
2006	Hisashi Yamamoto.

The Tetrahedron Prize has truly established itself as a prestigious award, and to complement this, the Executive Board of Editors decided at the 2004 Editor’s meeting in New York to initiate two annual ‘Young Investigator Awards’. The awards are aligned to the main areas of research covered by the journals, namely organic synthesis, and bioorganic and medicinal chemistry. To date these awards have

[†] From ‘Robert Maxwell and Pergamon Press’, Pergamon Press, 1988, D. Barton, pp 429, 473.

attracted an outstanding calibre of nominees, with the following six winners identified to date.

- 2005 David MacMillan (organic synthesis)
Laura Keissling (bioorganic/medicinal chemistry)
- 2006 Erick Carreira (organic synthesis)
Jon Ellman (bioorganic/medicinal chemistry)
- 2007 John Hartwig (organic synthesis)
Wilfred van der Donk (bioorganic/medicinal chemistry)

As the scope of *Tetrahedron* journals increased and regional editorial offices were established on a broader international basis, difficulties arose with respect to the language to be used in writing the papers. At one point, it was decided that English would be the medium for all articles. This presented a barrier to some contributors for whom English was not the native language.

A special problem arose when papers accepted by the editorial office in Japan were being rejected prior to publication, presumably on the basis of the scientific quality. In this connection, Professor Kyosuke Tsuda, the Japanese regional editor for *Tetrahedron*, was informed by the London staff that all accepted contributions from Japan would in future have to be re-refereed by the London regional office. Tsuda was outraged by the decision to single out the Japanese papers for double refereeing, and an impasse developed whereby Japanese contributors refused to submit papers to the *Tetrahedron* publications. On further analysis of this matter by members of the Board, it soon became apparent that the scientific work from Japan did, in fact, easily meet the scientific standards. The problem with the papers lay, for the most part, in grammatical errors and the authors' unfamiliarity with English expressions and idioms. Complicating this situation was Tsuda's reaction to what he considered to be an insult, and his refusal to discuss the matter with Maxwell or any of his staff. Tsuda made it clear that he would only engage in discussions in which the communication would take place in a foreign language with which he felt comfortable, namely, German.

Fortunately, one of Tsuda's former students, Nobuo Ikekawa, agreed to act as an intermediary in all ensuing contacts. It thus became possible to arrange discussions between Tsuda and a German-speaking organic chemist who recently received Ph.D. as a member of R. B. Woodward's research group. Elga Wasserman, whose native language is German, was in Japan at that time at a meeting in Sendai and she volunteered to meet with Professor Tsuda in Tokyo. Through Ikekawa, Tsuda expressed his willingness to set up such a meeting.

The ensuing discussions were amicable and fruitful, and led to a completely satisfactory solution to this problem. Maxwell quickly arranged for the necessary funds to be made available to Professor Tsuda for use in the examination of Japanese manuscripts by an English-speaking organic chemist. This individual was given the task of reviewing the papers with specific attention to English usage. It soon became abundantly clear that the Japanese work provided vitality, diversity, and strength to the *Tetrahedron* publications. Once again, the journals could embrace the

original charter of providing 'service to international collaboration in organic chemistry.'

In 1992, the idea of publishing a series of *Perspectives* covering the field of organic chemistry was approved as a medium for highlighting special features of the discipline not developed in the ordinary publications. These papers could provide a common thread of interest to investigators as summarized below:

The object of Perspectives is to stimulate an increased awareness of the unity of organic chemistry by highlighting those aspects of the field which will have appeal to all of its practitioners. These include an appreciation of the role of individuals and circumstances in the history of the subject, the dynamic of the current activity, and the prospects for the future. Toward this goal, we shall, when necessary, recognize the role of intellectual and sometimes even personal discord in the development of the field. Whether solicited or volunteered, these manuscripts will be published from time to time, after being subjected to the usual peer review.

Between 1992 and 1999, seven *Perspectives* were published. The first, *Discoveries Missed, Discoveries Made: Creativity, Influence and Fame*, by Jerome Berson, deals with some of the historical background related to the discovery of the diene synthesis and the orbital symmetry rules. This article received an enthusiastic response and set a standard for the series. There followed *Ciguatera and its Offshoots—Chance Encounters en route to a Molecular Structure*, providing a 35-year history of ciguatera research at the University of Hawaii by Paul J. Scheuer. The account illustrates how the availability of new physical methods and separation techniques made a tremendous difference in our ability to elucidate complex structures of natural products while offering new challenges in the discovery of reactions and new theoretical concepts.

A third *Perspective*, *The Discovery of Natural Pathways to Vitamin B₁₂*, by A. Ian Scott, relates a 25-year odyssey along the pathway of Vitamin B₁₂ biosynthesis, outlining a prognosis for the future of natural products biosynthesis. The fourth in the series, *Coincidences, Decarboxylation and Electrostatic Effects* by Frank Westheimer outlining the dramatic effect of coincidences sometimes observed in research, was followed by *Perspective No. 5, The Chemistry of Research Collaboration* by Nelson Leonard, a fascinating review of his work on many varied problems, during 50 years involving collaboration with colleagues.

The *Perspective* by Gabor Fodor (No. 6), *The Power of Observation* described the important role that careful laboratory observation often plays in solving problems in organic chemistry. *Perspective No. 7* was based on a panel discussion held at a 1981 New York ACS meeting on *Woodward the Teacher as Remembered by His Students*. The participants were H. H. Wasserman, J. A. Berson, J. B. Hendrickson, D. S. Kemp, and E. Wenkert.

Despite a strong start in the program, there has been very little activity in the *Perspectives* during the years since 1999. The Board of Editors recently decided to reactivate

the series, so perhaps this 50-year anniversary provides an opportunity to refresh interest in the series that has had such an auspicious beginning.

As the 20th century drew to a close, the *Tetrahedron* journals pioneered many new electronic-based developments, many of which have since been adopted by other journals and are now commonplace in the publishing world. For example, *Tetrahedron* led the field with the development of TetSubmit, an online submission tool for authors. Today, almost every scientific journal has adopted an online submission protocol, following this lead.

Similarly, journal content was first made available online through the innovative ‘Tetrahedron Information System’, or TIS. This service preceded the launch of ScienceDirect, which today is one of the world’s most advanced web delivery systems for scientific, technical, and medical information.

It is clear that the *Tetrahedron* family of journals continues to provide a medium for the publication of research results in organic chemistry from laboratories all over the world. Through innovations, new programs pioneered, and the commitment of an enthusiastic group of editors, many of its journals have become models for other publications in the field. Pergamon/Elsevier owes a debt of gratitude to the regional editors listed below, who have served with great dedication during these opening 50 years.

Regional editors—through the years

D. Barton
J. Baldwin
D. Boger
K. Burgess
D. Curran
S. Davies
W. Doering
B. Ganem
L. Ghosez
T. Goto
Y. Hashimoto
T. Hayashi
B. Imperiali
S. Ito
A. Katritzky
N. K. Kochetkov
G.-Q. Lin
R. H. Martin

S. F. Martin
A. McKillop
W. B. Motherwell
S. Neidle
A. N. Nesmeyanov
A. Nickon
T. Nozoe
D. Ollis
G. Ourisson
G. H. Posner
M. Shibasaki
T. Shioiri
H. Staab
W. Steglich
R. J. K. Taylor
E. J. Thomas
K. Tomioka
K. Tsuda
H. Waldmann
H. H. Wasserman
F. Weygand
R. M. Williams
W. T. Wipke
C.-H. Wong
J. Wood
S. Zard

On behalf of the regional editors I would like to take this occasion for expressing appreciation to the administrative and secretarial staffs of Elsevier for their invaluable support. During the Pergamon days, Betty Maxwell hosted many meetings of the Editorial Board at Headington Hill Hall, Oxford with style and grace, while in those early years, Gilbert Richards, Peter Shepherd, and Eileen Morrell made outstanding contributions to the vitality of the enterprise. Mary Lou Oates served with great dedication for nearly 25 years in the New Haven American Regional Office. Since that time, there have been many other individuals, too numerous to mention, who have played indispensable roles in the life of the journals.

Harry Wasserman
*Department of Chemistry,
Yale University,
225 Prospect Street,
New Haven, CT 06520, USA*
E-mail address: harry.wasserman@yale.edu

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