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International symposia on free radicals

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A brief history is given of the 25 International Symposia on Free Radicals. Reasons are suggested for the success and longevity of this series.

1999 marks the Silver Jubilee of the Free Radical Symposia, and may be considered an appropriate time to review the reasons for their success and longevity. It has been my good fortune to have attended nineteen of the twenty-five conferences on free radicals, including the early ones. Memory is of course selective and personal bias unavoidable: the views expressed are my own.

Outstanding in my mind has been the strong and well-developed *esprit de corps* among the participants. Many attendees are attracted by the variety of topics discussed and also by the general informality of the proceedings. It can even be said that the symposia have influenced the careers of some of the attendees.

It is to my mind important that the question of the definition of a free radical has been carefully avoided. Most of the papers have been concerned with the chemistry and physics of paramagnetic species and short lived intermediates but exciting new developments in chemical physics are also discussed from time to time.

The series is overseen by an International Committee which decides on locations and offers suggestions for topics and speakers. Each conference, however, is run by a local committee which is also responsible for funding. In this way fresh and varied approaches ensure the vitality of the series.

The first meeting of the series was organized by Paul Giguère and held under the auspices of the Chemical Institute of Canada at Quebec City, 10-11 September 1956. The first paper was given by Gerhard Herzberg on 'Absorption Spectrum of Free CH_3 and CD_3 Radicals'. It was followed by vigorous discussion, which has since been a characteristic of the Free Radical meetings.

The second meeting was held in Washington, DC at the National Bureau of Standards, 18-20 September 1957 and was organized by Herbert Broida and Arnold Bass. Their designation of the meeting as the Second International Symposium on Free Radicals has led to the meeting at Quebec City being considered as the first of the series.

In the early years the success of the Free Radical Symposia was closely linked to the Free Radical programme which was set up at the National Bureau of Standards (NBS) from 1956 to 1959. Broida and Bass were responsible for the programme, to which many scientists from universities, industry and overseas laboratories were invited to participate. The emphasis was directed towards understanding the properties of free radicals. As the Director of the NBS stated 'We have no concern or no responsibility in our programme of trying to develop things useful or determining whether useful things can arise from this field'. However, it is possible that the US

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Table 1. List of Free Radical Conferences.

Location	Date	Chairmen
1 Quebec City, Canada	Sep. 1956	P. A. Giguère
2 Washington, DC, USA	Sep. 1957	H. P. Broida, A. M. Bass
3 Sheffield, UK	Sep. 1958	G. Porter
4 Washington, DC, USA	Sep. 1959	H. P. Broida, A. M. Bass
5 Uppsala, Sweden	July 1961	S. Claesson
6 Cambridge, UK	July 1963	B. A. Thrush
7 Padua, Italy	Sep. 1965	G. Semerano
8 Novosibirsk, USSR	July 1967	V. N. Kondratiev
9 Banff, Canada	Aug. 1969	H. Gunning, D. A. Ramsay
10 Lyon, France	Sep. 1971	M. Peyron
11 Königsee, Germany	Sep. 1973	W. Groth
12 Laguna Beach, California, USA	Jan. 1976	E. K. C. Lee, F. S. Rowland
13 Lyndhurst, Hants, UK	Sep. 1977	A. Carrington
14 Sanda, Hyogo-ken, Japan	Sep. 1979	Y. Morino, I. Tanaka
15 Ingonish, NS, Canada	June 1981	W. E. Jones
16 Lauzelles-Ottignies, Belgium	Sep. 1983	R. Colin
17 Granby, Colorado, USA	Aug. 1985	K. M. Evenson, R. F. Curl, H. E. Radford
18 Oxford, UK	Sep. 1987	J. M. Brown
19 Dalian, China	Postponed	
20 Susono, Shizuoka, Japan	Sep. 1990	E. Hirota
21 Williamstown, Mass, USA	Aug. 1991	S. D. Colson
22 Doorworth, Netherlands	Sep. 1993	H. ter Meulen
23 Victoria, BC, Canada	Aug. 1995	A. J. Merer
24 Tällberg, Sweden	Aug. 1997	M. Larsson
25 Flagstaff, Arizona, USA	Aug. 1999	T. A. Miller

Defense Department which initiated the programme had hoped that new rocket fuels would emerge from the studies.

Much excellent fundamental research was initiated at the NBS. The Free Radical Symposia provided a forum for its discussion and an impetus towards further work which often followed when symposia participants returned to their home laboratories.

The third meeting was held at the University of Sheffield, 4–5 September 1958 under the chairmanship of George Porter. This meeting was a Faraday Society Discussion devoted to Free Radical Stabilisation. It was followed a year later by the fourth meeting, held once more at the National Bureau of Standards, 31 August–2 September 1959, which served as a grand finale for the Free Radical programme at the Bureau.

Since then meetings have been held at intervals of approximately two years at various locations around the globe. A list of meetings, locations and Chairmen is given in table 1. The meetings usually attract about 100 participants and are held in a reasonably quiet or secluded location for 4–5 days. Topics include the spectra of free radicals in their ground and excited states, theoretical studies, production and observation techniques, the importance of free radicals in chemistry and biology and in particular in combustion, atmospheric studies and astrophysical sources.

The interdisciplinary character of the meetings is attractive to many who find specialized meetings too restrictive. One attendee who complained that the Free

Radical meetings were 'neither fish nor fowl' went home and afterwards wrote a definitive paper on an unsolved problem which had surfaced in the Free Radical programme at the Bureau of Standards. Another claimed that he had originated a new technique for studying free radicals while relaxing in the mountain air at the Free Radical meeting at Banff.

Meetings nowadays tend to be overloaded with contributions so that poster sessions are necessary. One characteristic of the Free Radical meetings is that authors of posters are allowed two minutes, rigorously enforced, before the session to highlight the important aspects of their contributions.

Certainly a measure of our success has been due to the skill of the committees in their choice of locales, excursions and banquets for the enjoyment of participants. Highlights which come to the mind of the author are: the banquet and dance at the Royal Palace at Uppsala (1961); the luncheon on the Island of Torcello in the lagoon of Venice (1965); the Russian banquet at Novosibirsk with 32 toasts (1967); a fishing excursion for 50 participants on a Lake in the Canadian Rockies when the only bites were from mosquitoes (1969); the banquet at a chateau near Lyon (1971); the string quartet at Königsee (1973); a pony trek through the New Forest (1977); the typhoon during a visit to Himeji-jo (1979); the lobster banquet in Nova Scotia heralded by bagpipes (1981); the banquet in Brussels with entertainment provided by the 'Gilles' folklore dancers (1983); the cabaret produced by the wife of one of the participants at Williamstown (1991).

In recent years the Broida prize has been introduced to recognize outstanding contributions by young scientists under the age of 40. Two awards have been given so far to Marsha Lester (University of Pennsylvania, USA) and Peter Bernath (University of Waterloo, Canada).

The International Committee was established in 1961. All Chairmen of Conferences are ex-officio members of the International Committee. The present Committee has four Nobel Laureates among its members. At each meeting a member from a country not represented on the International Committee is invited to attend. Proceedings are informal. The following have been Chairmen of the International Committee: H. P. Broida (1961–1973), D. A. Ramsay (1973–1981), S. Leach (1981–1990), A. Carrington (1990–1997), and J. M. Brown (1997–).