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Introduction

It is difficult to find two scientific careers, conducted largely on opposite sides of an ocean, to be as closely connected as those of John Todd and Ray March. Although they started their careers as undergraduate chemists more or less at the same time and place (i.e. at the University of Leeds in the 1950s), March went to Canada for graduate studies and has remained (mostly) in North America ever since, whereas Todd has pursued his research in England. It is clear from the literature that the two led different and distinct research groups. However, their close friendship and their common interest in the quadrupole ion trap resulted in a long and very fruitful scientific relationship that has spanned their entire careers. This is also clear from the literature. However, I can also attest to it personally. On a visit to John Todd's laboratory in 1991, I walked into a laboratory to find Ray March drafting a paper. "Oh, yes. Ray is here. Did I not mention that?", was John's comment upon seeing my pleased surprise. One afternoon Ray and his wife took me on a tour of Canterbury and displayed familiarity with the city normally restricted to full-time residents. They had clearly spent considerable time there.

I think it is fair to say that the line that traces the invention of the three-dimensional quadrupole to the current widespread use of ion traps in chemical and biological research went through Todd and March. In the 1970s, in particular, Ray and John led the two most prominent efforts in chemical research using the quadrupole ion trap. Their work was certainly my first introduction to the topic. It is also my understanding that a presentation at an American Society for Mass Spectrometry meeting by Ray March inspired George Stafford to start thinking about ideas that could transform the ion trap into a commercially successful mass spectrometer. Stafford and his co-workers at Finnigan, with John Todd as a key consultant, then developed a number of innovations that attracted the interest of the mass spectrometry community as a whole. The commercial success of the effort is now well known.

Roughly eight years ago, Gary Glish and I co-edited a special issue of this journal dedicated to quadrupole ion traps. That issue provided a good picture of the mass spectrometry work (mostly in chemistry) that was taking place in the late 1980s. With the retirement of John Todd and Ray March from their teaching posts at the University of Kent and Trent University, respectively, it made sense to revisit mass spectrometry research with quadrupole ion traps in the late 1990s, both to honor John and Ray and to summarize progress in the field. However, an honor issue is both retrospective and prospective. Therefore, this issue begins with a commentary by Professor R. Graham Cooks, himself a major contributor to the development of the quadrupole ion trap as a tool for chemical research, on the contributions of Ray and John. This is followed by an article by another three-dimensional quadrupole pioneer, Dr. Ralph Weurker, who graciously agreed to write an article describing his work with "micrometeor" storage in the 1960s. This article is then followed by an article written together by the honorees that reviews quadrupole ion trap research before the introduction of commercial systems. The remainder of the issue relates current research and, once again, reflects a wide range of research activities. The articles are roughly organized into studies that are primarily directed towards instrumentation and ion physics, studies aimed at ion/molecule reaction chemistry, articles involving collision-induced dissociation, and

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important applications of quadrupole ion traps in chemical analysis.

I am personally grateful to the individual contributors for agreeing to publish their work in this issue and to the many reviewers who provided important feedback both to me and to the authors. I also take this opportunity to publicly thank John Todd and Ray March for their many contributions to mass spectrometry and to my research. Speaking only for myself, but I suspect that my experience is shared by many of us who entered into research using quadrupole ion traps in the 1980s, much of what I know about quadrupole ion traps I learned from discussions with and the writings of John Todd and Ray March.

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