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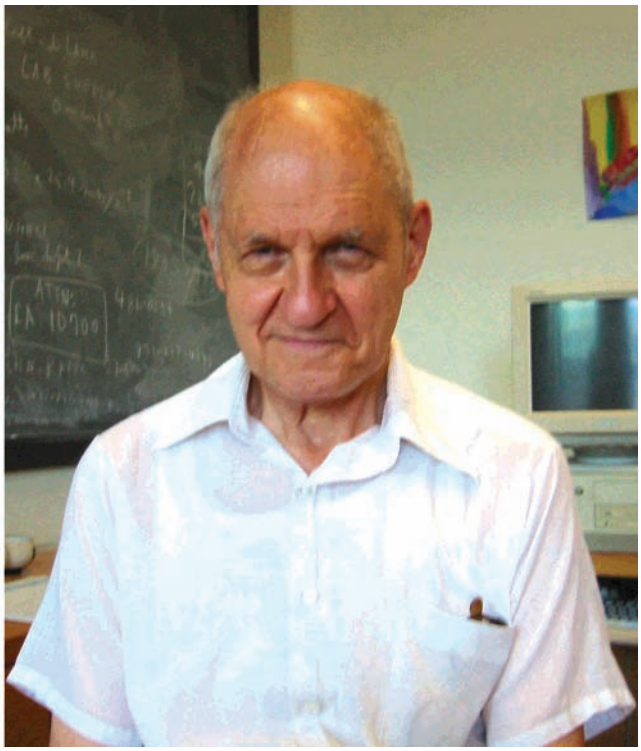

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Richard Bersohn Memorial Issue

A Personal Note on a Scientist and a Friend

I first met Richard Bersohn as a graduate student when he came to Jerusalem in 1969 to give a seminar at the Hebrew University's Physical Chemistry Department. We later discovered that the real reason for his visit was to escort his mother on a visit to Israel. During this visit Raphy Levine found out that Richard was in town and convinced him to give us a research seminar.

In his seminar, Richard showed us a little glass ball which he carried around with him, in which the angular distribution of the photofragmentation reaction $Cd-(CH_3)_2 \xrightarrow{h\nu} Cd + 2CH_3$ was mapped out in the form of Cd deposits on the glass walls. This was an example of the now famous "photofragmentation mapping" experiment, an experiment that is almost synonymous with Bersohn—simple and elegant. It is the only case I can recall of an entire experiment being carried about in the pocket of the scientist who performed it. In the photofragmentation mapping experiment, Bersohn, Jonah, and Chandra showed convincingly that molecular fragments resulting from photodissociation processes retain memory of the polarization direction of the light field that created them. Bersohn and colleagues were also able to show, by enlarging on the theory of Dick Zare for diatomic molecules, how the lifetimes of dissociating molecules could be inferred from the observed angular distributions.

Soon after Bersohn's photofragmentation mapping experiments, Kent Wilson was able to measure such angular distributions in molecular beams, ushering in a new age in photodissociation research. Contrary to bimolecular collisions, photo-

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dissociation allowed one to probe the dynamics as viewed by very few and small angular momentum ("partial waves") values. It was therefore possible even in the mid seventies and early eighties to develop the theory and perform realistic calculations and compare the results with experiments—a feat that was impossible at the time for bimolecular reactions to which a huge number of "partial waves" contribute.

Richard read an *Isr. J. Chem.* paper of mine written in 1973 on the theory of photodissociation and encouraged me warmly to continue with this line of research. In addition, we started discussing the topic of the general theory of the angular distribution of photofragments resulting from the photodissociation of polyatomic molecules. These discussions eventually resulted in a paper on the topic written with an ex-student of Richard's at Columbia University, Gabriel Balint-Kurti, in 1981.

Our discussions in the early seventies were the beginning of a friendship that lasted until his death in 2003. Richard used to visit the Weizmann Institute (where for a while he was an adjunct professor) almost every summer for more than 20 years. During these visits we would work on a wide variety of problems. It was a great joy, as I know of very few other people who could so well integrate theory with experiment.

The elegance achieved with modest means, which marked his earlier photofragmentation mapping experiments, was the hallmark of his later work too. A typical example was his work with Johnston, Katz, and Tsukiyama on the energy dependence of the $2H + D_2 \rightarrow 4DH + D$ reaction in which the same laser was used to measure the concentration of both D and H, thereby canceling many experimental unknowns and allowing for an easy determination of the absolute cross-section.

This volume is a testimonial to the enormous scope of Richard's scientific interests and his generosity in sharing scientific ideas. Richard's understanding in the various branches of science was nothing short of amazing. If you wanted to get to the gist, and get a good explanation of any phenomenon, he was the person to go to. As he himself wrote in his beautiful scientific autobiography, published in the *Annual Reviews of Physical Chemistry*, vol. 54, he was interested in almost every topic of Physical Chemistry, from optical pumping and photodissociation dynamics to Walden inversion in S_N2 type organic reactions and electron transfer in Cu-containing proteins.

It was therefore not surprising that when Neil Shafer-Ray first initiated this volume and invited people to contribute to it, the response was overwhelming. One distinguished colleague was in fact mortally offended, luckily only temporarily so, when his name was accidentally omitted from the list of people asked to contribute.

Typically, Richard himself was not, however, very enthusiastic about the project: he felt that he had already said what he wanted to say in his *Ann. Rev. Phys. Chem.* article, so when Neil and Bruce Berne presented him with the plan he was not very encouraging. What convinced him, I suppose, was that I told him it was already a *fait accompli* at that stage and there was no turning back the clock. Being the practical man that he was, that turned out to be the winning argument.

Unfortunately, Richard did not live long enough to see this volume in press, and what was intended to mark Richard's retirement from active science turned out to be his memorial volume.

He is, and will be for a long time, sorely missed. In the words of Dick Zare: "When I think of Rich Bersohn I think of someone who was quite self-effacing, who cared passionately about the pursuit of science, who loved discussing science with people, who was very straight and candid about his opinions of his own work and that of others, who really built up the physical chemistry group at Columbia, and who had a tremendous sense of humor. I also think of someone who succeeded in keeping his love of science and his personal life and family life in superb balance. He was universally admired, or so I believe, and those who knew him well valued greatly this man for his insight and his friendship."

As the Jewish saying goes, may his memory be blessed.

Moshe Shapiro
Guest Editor