A. M. TROZZOLO: AN APPRECIATION

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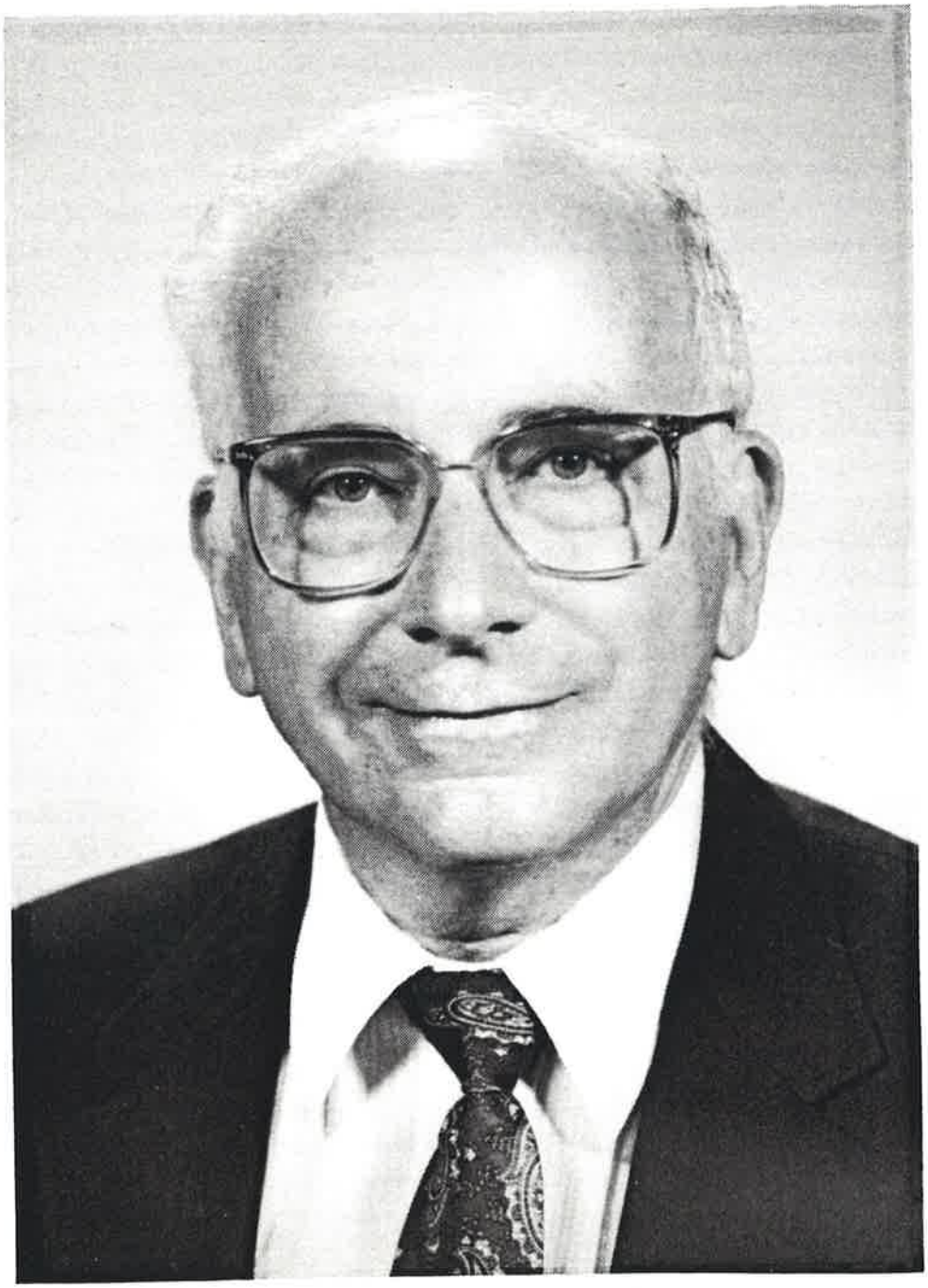

Anthony M. Trozzolo is now Huisking Professor Emeritus in the Department of Chemistry at the University of Notre Dame. It is difficult to imagine Tony in an emeritus role given his varied professional activities over many years. But at this time of change a brief reminiscence may be appropriate. Our most significant interactions were during his sixteen years at Bell Laboratories, from 1959 to 1975, and these remarks will focus on that period. We collaborated, often with others, in a number of studies of carbenes with results which were rewarding for all concerned.

I first met Tony in 1958, shortly after joining Bell, on a recruiting trip to the University of Chicago. Several far-sighted managers at the Labs, particularly Field Winslow, Bill Slichter and Dave McCall, wanted to expand the effort in organic chemistry, a subject near the limit of Bell's range of technical interests. In contrast, physical chemistry and solid state physics were central to many of their research operations and well staffed..

Tony was a prime recruit. His doctoral thesis with Bill Urry dealt with diazo compounds and carbene chemistry. The research was fine preparation for his studies at Bell Laboratories some years later. Even in graduate school his wide-ranging interests in both organic and physical chemistry led him to tap a variety of sources and produce unique combinations. That style has continued throughout his career.

The beginning of my collaborations with Tony demonstrate how, at a given time, certain ideas are ready to sprout. In 1955-56 I attempted to observe the postulated ground triplet state of benzyne in solution by magnetic resonance. In retrospect, it was an unusually ill-conceived effort. By the late '50's, after the work of Skell on diphenylmethylene and Hutchison on the EPR of metastable triplet states, the possibility of observing the ground triplet state in a single crystal was considered at Bell and elsewhere. Independently, Tony was coming to similar conclusions.

The first experiment at the Labs was carried out in 1961 by Tony and Robert W. Murray who were now collaborating on carbene chemistry. They heated a sample of powdered diphenyldiazomethane inside the EPR cavity looking for magnetic signals. Somewhat above 100 °C a loud explosion destroyed the glass portions of the apparatus and contaminated the cavity with magnetic impurities. That contamination was the ultimate sin for Bill Yager, the EPR specialist with whom they were working. They were banned from his laboratory. Bill was now strongly prejudiced against further organic efforts on reactive intermediates. Their precursors were likely to be detrimental to his equipment.

Within a year Bill Yager and I had learned how to detect triplet states in randomly oriented systems. With Tony and Bob another try was made to look at diphenylmethylene, now produced by photolysis at low temperatures of the parent diazo compound diluted in a rigid matrix. Success was immediate as the wide-ranging spectrum characteristic of the methylene was seen without difficulty. Thus began five years of extraordinarily fruitful collaborations in which many aspects of methylenes and nitrenes, these last with Gerry Smolinsky, were investigated by EPR and electronic spectroscopies.

Some of the more noteworthy contributions of that period arose from Tony and Bob Murray's investigations of the chemistry of dicarbenes, including the EPR detection of para-dicarbenes and dinitrenes in their ground triplet states in 1963. At the end of the first paper was the report of the first ground state quintet spectra arising from meta-dicarbenes and meta-dinitrenes. It was four years before these observations were analyzed and the details published. This coupling of methylene triplets continues to be pursued today in several laboratories as examples of "organic ferromagnets". In 1964 geometrical isomerism in carbenes was observed. Another landmark was Tony's discovery of triplet-triplet emission as

the luminescence of diphenylmethylene. In this period and later he was also making major contributions in singlet oxygen chemistry, oxirene photolysis, charge transfer complexes, laser dyes and photobiology.

In addition to the specific contributions mentioned above and many others, Tony was an essential contributor to the fertile environment in chemistry at Bell Laboratories in those extraordinary days of the '60's and '70's. In that period, before the break-up of the Bell System, the Labs was unsurpassed as an institution for scientific research. Free of duties other than research, funding available almost instantaneously for a worthy activity and with colleagues who are often ready to listen, comment, or even collaborate for shorter or longer periods, science was done with efficiency and enjoyment. The participants contributed to as well as drew from this environment. Within that group Tony occupied a unique position. His ability to interact in many areas, his easy style coupled to an intense dedication, and his many scientific gifts stimulated new things to happen around him as well as with him. Tony thrived in this atmosphere as well as making it possible for others to flourish.

Tony's departure from Bell Laboratories was a critical loss; he could never be replaced. The Lab's depth of talent was such that fine work continued to be done in many areas. But Tony's unique contributions, both formal and informal, were now elsewhere.

Tony was and remains a prominent citizen of the scientific community, being particularly alert to the opportunities for organic photochemistry. He was founder and first chairman of the Gordon Research Conference on Organic Photochemistry in 1964. He has served on numerous national and international committees, workshops, etc. and continues to do so.

In his many contributions to photochemistry at Bell Laboratories, Notre Dame and the chemical community at large, Tony Trozzolo has left an enviable record. We hope his new status will allow him the time to expand his research activities and increase, still further, his impact on us all.