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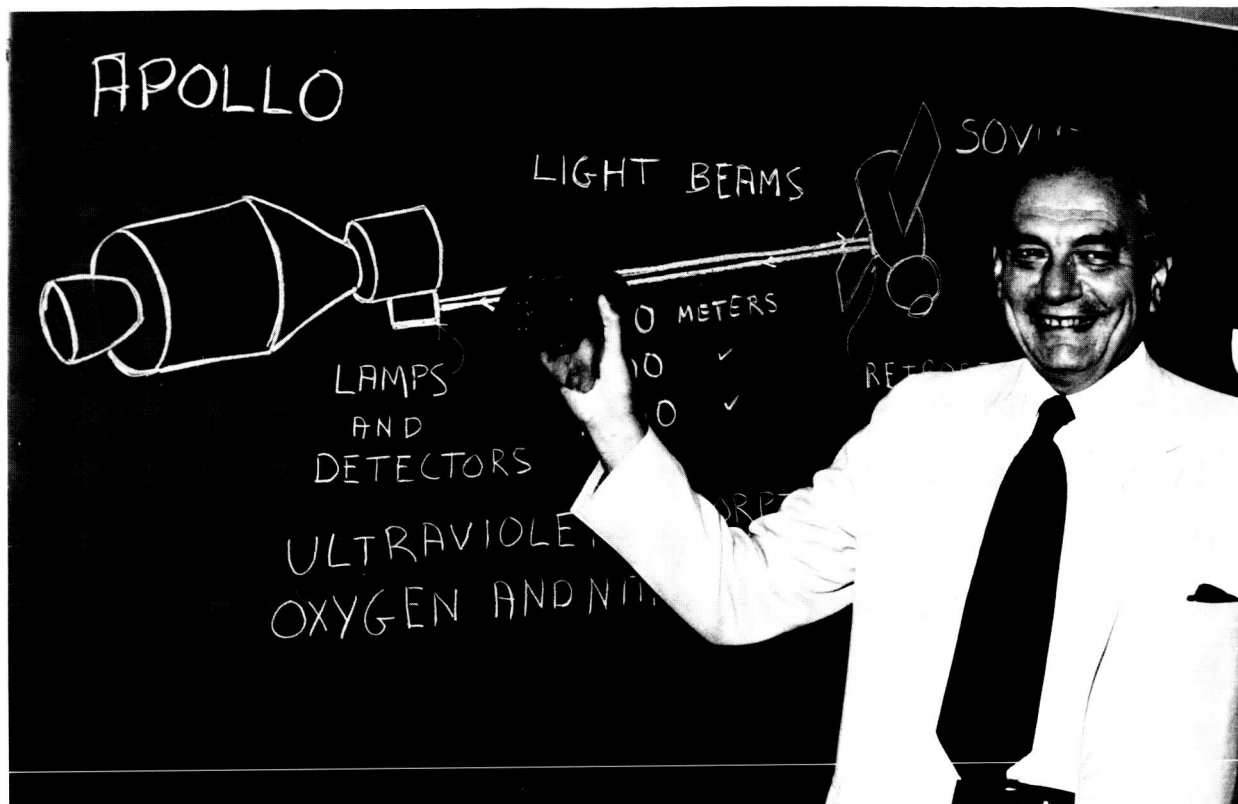
WORLD METEOROLOGICAL ORGANIZATION
GLOBAL OZONE RESEARCH AND MONITORING PROJECT
REPORT NO. 16

ATMOSPHERIC OZONE 1985

**ASSESSMENT OF OUR UNDERSTANDING OF THE PROCESSES
CONTROLLING ITS PRESENT DISTRIBUTION AND CHANGE**

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
FEDERAL AVIATION ADMINISTRATION
NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION
UNITED NATIONS ENVIRONMENT PROGRAM
WORLD METEOROLOGICAL ORGANIZATION
COMMISSION OF THE EUROPEAN COMMUNITIES
BUNDESMINISTERIUM FÜR FORSCHUNG UND TECHNOLOGIE

Dedicated to the memory of
FRED KAUFMAN



*“He was a scholar, and a ripe and good one;
Exceeding wise, fair-spoken, and persuading.”
From Henry VIII (Griffith in Act IV, Sc. ii,
lines 58–59)*

This report is dedicated to the memory of Fred Kaufman. It is the last and most ambitious of many studies to which he made major contributions for advisory committees of the National Academy of Sciences, National Aeronautics and Space Administration, Air Force Office of Scientific Research, National Science Foundation, National Research Council, and other institutions. Fred's service was so often sought, out of respect for his leadership in research and his judgment, vision, and luminous integrity. That he so often accepted these arduous tasks and devoted such effort to them exemplified his commitment to vital scientific development.

Frederick Kaufman stood among us as an intellectual and ethical leader for more than three decades. He established a taste for superb quality and originality in atmospheric chemistry through his field of gas phase radical kinetics. Born in Vienna, Austria in 1919, his early avocation was music; standing room only on Saturdays at the back of the upper balcony of the Opera House and practicing the piano under parental tutelage, he was to become a concert pianist. Fred acquired a vast knowledge of the musical literature and would gladly whistle any of the Mahler symphonies and many other pieces from memory; often quietly during boring scientific presentations.

Forced to leave Austria with his family in the late '30s, Fred's professional music career ended with an accident which seriously injured his hands and brought him from the family's temporary haven in Panama to Johns Hopkins School of Medicine as a patient. In 1941, his family emigrated to the United States and Fred returned to Hopkins as a student, moving from a beginning undergraduate to a Ph.D. in chemistry in just six years. The year was 1948. While his thesis dealt with organic solution kinetics, he turned to far more fundamental studies following his Ph.D. At the Ballistic Research Labs, then a leading research center in combustion chemistry and gas phase kinetics, Fred began his studies of gas phase free radicals. A Rockefeller Award took him to Cambridge, England where he simultaneously acquired control of free radical sources, an essential step in modern gas phase chemical kinetics, and brought discharge flow techniques into the forefront of atom-radical kinetics. It was from this point forward that Fred's immense power as an intellect, raconteur, and educator emerged in the fields of chemical kinetics and atmospheric physical chemistry.

Those privileged to work with Fred relished the opportunity. His zest and ardor in pursuit of science and his integrity and dedication were made all the more compelling by his intense interest in his colleagues. Fred was a natural teacher and leader. He drove toward intellectual excitement and provoked active involvement. He brought also boyish enthusiasm, eagerness, and exuberant humor, which somehow meshed naturally with great resources of charm, poise, and dignity. In the course of a typical encounter at a working dinner, a conversation with Fred would be likely to include a trenchant assessment of recent work in chemical kinetics as well as current political crises, a new art exhibit or concert, and the inside story of a favorite sports team.

Fred became the chemical conscience of the Space Research Coordination Center at the University of Pittsburgh in 1964 which was the foremost group of chemical physicists and aeronomers of that day. For the next twenty years, Fred and his research group concentrated on energy transfer processes, radical-molecule kinetics, excited state chemistry and spectroscopy and ion-molecule reactions.

The explosive development of the field of atmospheric chemistry following the realization that homogeneous gas phase chemical catalysis could distort the global distribution of ozone in the stratosphere revealed a new dimension in Fred Kaufman. In addition to innovation, strict standards of intellectual quality and scientific taste, he became the moral heart of an entire scientific community which was buffeted by new pressures from industry, government and the media. He steered our ship with wisdom, compassion and warmth.

James G. Anderson and Dudley R. Herschbach

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