

1941-1949. Department of Physiological Hygiene, University of Toronto, Canada: Research Assistant (1941-1943); Research Fellow (1943-1947); Senior Research Fellow (1946-1947); Lecturer in Industrial Hygiene (1947-1949). Synthetic organic chemistry; metabolic studies of foreign organic compounds; experimental therapeutics in heavy metal poisoning; toxicology of organic compounds, heavy metals and airborne toxicants.

Professional Memberships.—

Air Pollution Control Association (company representative);
 American Association for the Advancement of Science;
 American Public Health Association;
 American Industrial Hygiene Association;
 Canadian Federation of Biological Societies;
 The Canadian Physiological Society;
 The Pharmacological Society of Canada (charter member);
 Society of Toxicology (charter member);
 Consultant, Threshold Limits Committee, American Conference of Governmental Industrial Hygienists;
 Member, Z-37 Committee of American Standards Association;
 Certification from the American Board of Industrial Hygiene in the Toxicological Aspects of Industrial Hygiene;
 Member, Editorial Board, Toxicology and Applied Pharmacology.

**STATEMENT OF DR. HAROLD N. MacFARLAND, HAZLETON
 LABORATORIES, INC.**

Dr. MacFARLAND. Mr. Chairman and gentlemen, I thank you for the opportunity to present testimony to this committee.

My primary purpose today is to describe to you two large experimental investigations having to do with the biological effects of air pollutants which are presently being conducted at Hazleton Laboratories, Inc. Hazleton Laboratories is an independent life sciences research firm which performs contract research for Government and industry. Its laboratories are located just a few miles from here, near Falls Church in northern Virginia.

In the last 2 days the need for additional knowledge in order to determine meaningful criteria and to set objective standards for air pollutants has been emphasized more than once. Specialists in this field have been aware for many years of the deficiencies that exist in our knowledge, but it has been only comparatively recently that adequate funding has become available to undertake the rather extensive investigations that are required.

What are the deficiencies and what needs to be done? Examination of existing experimental studies on the biological effects of air pollutants reveals a pattern which is readily understandable. The first investigators—toxicologists, physiologists, and scientists from cognate specialties—examined some of the simple gaseous pollutants, such as sulfur dioxide, in short-term or acute studies. In order to increase the chances of seeing biological responses, they worked with very high concentrations of these agents. And since one tends to do the simple and inexpensive thing first, these early trials were performed with small laboratory rodents as the test species. The measures of response in these animals were also simple and obvious—gross pathological damage and death. Although it was appreciated that human populations are scarcely ever exposed to just a single pollutant, investigators nonetheless usually only looked at single pollutants and almost no work was done with mixtures of pollutants.