# ABSTRACTS OF PAPERS

# SOCIETY OF TOXICOLOGY

**INCORPORATED**

## ELEVENTH ANNUAL MEETING

WILLIAMSBURG, VIRGINIA

MARCH 5–9, 1972

Preprinted from TOXICOLOGY AND APPLIED PHARMACOLOGY



Printed in Great Britain

Tape 2 side B

120. *Long-Term Exposure of Primates and Guinea Pigs to Mixtures of Sulfur Dioxide and Fly Ash.* R. J. KANTZ, II, W. M. BUSEY, Y. ALARIE, C. E. ULRICH, and A. A. KRUMM, TRW/Hazleton Laboratories, Inc., Vienna, Virginia. (J. W. Clayton, Jr.)

Four groups of nine cynomolgus monkeys, both male and female, and four groups of fifty male and fifty female Hartley strain guinea pigs were exposed by inhalation to mixtures of sulfur dioxide ($SO_2$) and fly ash (FA). Contaminant concentrations for these exposures were 0.1, 1.0, and 5.0 ppm $SO_2$ and 0.5 mg/m$^3$ FA. The duration of exposure was 22 hr/day, 7 days/wk for 52 wk for the guinea pigs and 78 wk for the monkeys. Measurements of body weight, pulmonary diffusion, total airway resistance, and biochemical determinations were made during pre-exposure and periodically throughout the study for both species. In addition, the distribution of ventilation and arterial blood gas measurements were performed on the primates. At the termination of the exposure, all surviving animals were sacrificed and necropsied. Tissues from the respiratory system and the major organs were examined microscopically. Measurements of body weight, growth, survival, and pulmonary function revealed no deleterious effects from the exposures. Hematological and serum biochemical determinations were not affected by the exposures. Similarly, no adverse effects attributable to $SO_2$ or FA were inferred from the organ weights or organ/body weight ratios of the major organs. (Supported by the Air Pollution Research Program of the Electric Research Council.)

Tape 3 side A

121. *An Indirect Action of Ozone on the Pulmonary Macrophage.* DONALD E. GARDNER, Environmental Protection Agency, Research Triangle Park, North Carolina. (D. L. Coffin.)

Alveolar macrophages (AM) may be washed out of the lungs and maintained for short periods for study of their stability, viability, and phagocytic function. A model system was developed for such studies. It was found that when AM were separated from the acellular portion of the lavaged fluid and maintained at 37°C in physiological saline, they were very unstable. However, stability of AM was markedly improved when they were maintained in lavaged fluid from the lung. It was, therefore, hypothesized that a protective factor was present in the lung fluid. Using this model system, it was noted that the exposure of animals to ozone had an adverse effect on AM stability in vitro. A dose-response relationship was established over the range of concentrations of 0.1–10.0 ppm for 2.5 hr. A similar loss of cell stability was observed when normal AM were suspended in normal acellular lavaged fluid which had been previously exposed to 30 min of ozone in vitro. The data indicates that the deleterious effects of ozone on lung cells may be due to an indirect action mediated by the presence of a protective factor in lung fluid. Alveolar macrophages from ozone exposed animals could be partially protected if they were transferred to normal lavage fluid. The in vitro phagocytic capabilities of the normal AM in ozone-treated lavaged fluid were not adversely affected. It is believed that this is the first evidence for an indirect action of ozone on alveolar macrophages mediated by the presence of a protective factor in lung fluid.

Tape 3 side A

122. *Altered Central Nervous System Function Resulting from Ozone Exposure.* C. E. ULRICH and M. F. SOBECKI, TRW/Hazleton Laboratories Inc., Vienna, Virginia. (J. W. Clayton, Jr.)

A methodology was developed for evaluating central nervous system (CNS) effects applicable to inhalation toxicology studies. The basis of the method is the concept of overtaxing the CNS with closely spaced pairs of light flashes and evaluating the resulting evoked responses. Averaging techniques were used to extract the evoked responses from background electrical activity. Latencies of the evoked responses were the measured variable. The effect of ozone at 1.5 ppm for 4–6 hr on rats with chronically implanted electrodes was evaluated with this methodology. Electrodes were sterotaxically implanted in the red nucleus, mid-brain reticular formation, ventral–medial nucleus of the thalamus, posterior nucleus of the hypothalamus, and the visual cortex. The results indicate that $O_3$ produces an increase (18–26%) in the evoked response latencies and that the effect is similar for all areas of the brain investigated. Overtaxing the CNS was shown to increase the sensitivity of the method for detecting CNS changes during these exposures.