PLAINTIFF'S EXHIBIT

CAP-1568

ENVIRONMENT - March 1971 (See pages 29-33)

By Virginia Brodine

A Special Burden

THE POSSIBILITY that many deaths, particularly among nonwhites and in low socioeconomic groups, occur as a result of urban air pollution was brought to light by Dr. Bertram Carnow at the American Medical Association's (AMA) air pollution medical research conference in early October 1970. Other reports at the conference buttressed the belief that air pollution causes death and illness, and helped explain the biological mechanisms by which health is affected.

Dr. Carnow's Chicago Air Pollution Group has carried out a series of studies attempting to identify those individuals in the population most sensitive to air pollution, and the levels of pollutants at which their health is adversely affected. Most recent—and still continuing—is a study of the effect of changing air pollution levels on mortality. Early results of this mortality study led Dr. Carnow to propose a theory which suggests how air pollution may be contributing to urban deaths almost constantly.

This theory of air pollution's effect on life span and fatality rates also rests on the previous work of Dr. Carnow and his colleagues, which he summarized at the conference. The theory can be better understood after a glance at this work.

There were two studies of the changes in severity of symptoms among people with respiratory disease as levels of sulfur dioxide changed. It was not suggested that sulfur dioxide was the only pollutant responsible for the effects noted, but measurements of this pollutant were used as an indicator of air pollution in general. (See "Breathing Sulfur Dioxide," *Environment*, November 1968.)

One study by Dr. Carnow's air pollution group involved 51 people with chronic bronchitis, average age 57, for three months, October to December 1967. The investigators found a definite increase in acute illness as sulfur dioxide levels rose from 0.09 part per million to 0.10-0.19, and then to 0.20 and more. This increase intensified each of the following symptoms: coughing, difficulty in breathing (dyspnea), and purulent sputum (a condition associated with diseases of the air passages). Another study included 561 elderly people and also showed a relationship between days of acute illness and sulfur dioxide levels, with the more seriously ill being most sensitive to a rise in pollution levels. Since this study was initiated, 63 of the people have died, 73 percent of the deaths resulting from cardiorespiratory causes.

These studies showed that elderly persons with respiratory disease are a "high risk" group relative to air pollution. What about age alone as an indicator of high risk? Forty-nine people, aged 74 to 96, all residents of a home for the aged, were examined five days a week for a month. Examinations included tests of lung function. On the same days, sulfur dioxide and particulate concentrations were measured at the home (which was not air conditioned) from the roof. During the month of the study (August 6 to September 5, 1969), sulfur dioxide levels were considerably lower than in the 1967 study, but on the highest pollution day, they were double what they were on the day in 1967 when pollution levels were lowest (.0455 part per million as against .02). Particulate levels on the high pollution day during the month were more than three times what they were on the low pollution day (309 as against 72 micrograms per cubic meter of air). Yet the old people showed no change in lung function and no symptoms of respiratory illness with increases in air pollution.

Although this was a small number of people, it was noteworthy that at such advanced ages no one susceptible to increased air pollution was found. Dr. Carnow suggested that this group could be described as "hardy survivors" and that one reason for their normal lung function and resistance to air pollution was their smoking history. Only 16 percent of this group were smokers; none were heavy smokers; and an additional 26 percent had once smoked. In contrast, more than 40 percent of the people with chronic bronchitis who were the subjects of the earlier studies were smokers, and an additional 30 percent had once smoked.

A study of deaths from respiratory disease in Chicago in 1964 and 1965 by Dr. Mark Lepper showed that respiratory disease takes a higher toll among the poor than among the rich. It also showed

CAPCO KIN 0001242