

in the environment. It is present in the air, in the soil, in drinking water, in animal and vegetable life, and hence, in foods and beverages. Atmospheric lead originates from the combustion of wood, coal and vegetable matter, as well as from gasoline. Some of it even comes from meteorites entering the earth's atmosphere.

From the standpoint of public health, the principal considerations of lead as a possible health hazard concern (a) the amounts of lead to which the public is exposed, (b) the normal metabolism of lead inside the human body, and (c) whether there is any progressive accumulation of lead in the body over a period of many years.

Measurements of lead in the atmosphere have been undertaken for many years, and they show that atmospheric lead levels from all sources are low. The most recent survey, undertaken in Los Angeles, Philadelphia and Cincinnati, and published by the U. S. Public Health Service confirmed the earlier research results.

Similarly, many studies have been made of the lead inhaled and swallowed by the average person. The overriding evidence is that the average person daily eliminates from his body substantially the

same amount of lead taken in. Blood and urine analyses, showing that lead concentration in the human body is well within safe limits, corroborate these findings. Thus, the basic criterion is whether there is any progressive accumulation of lead in the human body over a period of years.

Comprehensive studies show that there has been no significant accumulation of lead in the body of the average American over the past 20 years as measured by blood level concentration.

Ethyl's Research Programs

Ethyl Corporation has sponsored much of the medical research work carried out at the University of Cincinnati. And it has supported many additional studies by other organizations, including one by the Midwest Research Institute which showed that antiknock compounds do not contribute in any way to the formation of photochemical smog.

Besides this externally conducted work, Ethyl's own research staff has for many years been conducting investigations of the whole field of fuels and engines as it relates to the broad problem of air quality. This latter work, which involves both chemical and engineering approaches, not only has the objective

of insuring that antiknock compounds at no time pose a hazard to public health, but is part of the broad effort being undertaken by the oil and automotive industries to solve the problem of photochemical smog.

In Ethyl's program, the primary aim is to develop basic information on potential modifications of automobile engines which will reduce emissions of unburned hydrocarbons and carbon monoxide.

Recently, as a result of this work, Ethyl's research laboratories reported to the Society of Automotive Engineers on new automobile induction systems which can markedly reduce these exhaust emissions.

Ethyl's new systems, which reduced emissions in experimental vehicles by about two-thirds, not only meet present California requirements for reduced exhaust emissions but also the more stringent standards scheduled there for 1970.

Much additional research and development work still needs to be done before these engineering concepts can be applied to mass-produced automobiles. Nevertheless, the work in the Ethyl laboratories, as well as in other organizations, demonstrates that the gasoline engine is capable of being developed to a point where it is no longer a significant contributor to the formation of photochemical smog.

As Ethyl's work illustrates, new knowledge about fuels and engines and about the mechanism of air pollution is constantly being uncovered. A broad research effort into the many ramifications of air quality is being undertaken by scientists in government agencies, in private industry, and in colleges and universities—and much of this work is being done on a cooperative basis. Substantial progress has already been made by the automotive industry in reducing the contributions of automobiles to air pollution. Long range, the gasoline engine will be further modified so that its contributions to atmospheric pollution will not be significant.

