

GENERAL MOTORS RESEARCH CORPORATION

DAYTON, OHIO.

December 30, 1922.

Doctor H. S. Cumming, Surgeon General,
Bureau of Public Health Service,
Washington, D.C.

FILE B. L. 1

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Dear Sir: -

Your favor of December 20th addressed to Mr. P. S. duPont has been referred to the writer for answer.

The question of lead poisoning resulting from the use of lead compounds has been given very serious consideration by this Laboratory although no actual experimental data has been taken. The reason that no experimental data has been taken is due primarily to the fact that so far we have not been able to get the lead compounds to come out in the exhaust of the motor uniformly. Some of these materials remain in the motor cylinder and exhaust lines. However, the following figures have been compiled in an attempt to analyze just how serious the problem of lead poisoning from exhaust gas is going to be.

The most congested district in the world containing the greatest percentage of exhaust gas will be the vehicular tunnel under the Hudson River. In connection with the ventilation of this tunnel, Doctor Fieldner at the Bureau of Mines indicates that the percentage of carbon monoxide in the atmosphere resulting from the exhaust gas of internal combustion engines, must be kept below two one-hundredths of one percent in order that human beings may breathe this atmosphere for four hours per day and avoid the serious consequences of carbon monoxide poisoning.

Under these most extreme conditions the quantity of lead which will be present in the atmosphere as a lead compound, will be so minute that a human being will inhale only a total of one milligram of lead in four hours. This lead compound will be in the form of a finely divided dust comparable to cigar smoke. Consequently,



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a relatively small portion of this milligram will be retained by the human system. Doctor Yandell Henderson considers the absorption of one milligram of lead per day as dangerous. We feel absolutely confident that under the conditions that will exist in the vehicular tunnel, that people exposed to this atmosphere will only absorb a very small part of one milligram. The worst congested streets will certainly be much better than the vehicular tunnel; while the average street will probably be so free from lead that it will be impossible to detect it or its absorption.

We expect in the near future to place a small quantity of this lead compound on the market in some districts. There will not be enough lead used in the early stages of this development to present any health hazard whatsoever and during this period we propose to investigate the toxicity of these exhaust gases very thoroughly so as to determine just what the ultimate limit to the use of lead compounds actually is. We hope to secure your most hearty cooperation in carrying on this work.

Trusting this information will clarify the situation in your mind, I beg to remain

Very truly yours,

Thomas Midgley, Jr.
Chief Engineer,
Fuel Section.



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