Outline of an investigation into the possible injurious effect of organic lead compounds as additions to gasoline.

The proposed introduction of lead tetra ethyl as an admixture to gasoline should unquestionably be considered from the point of view of its possible injurious nature to the public health.

There is every reason to believe that organic lead compounds of this type as such are highly toxic when introduced into the human body. The first health hazard would therefore probably appear in the manufacture of tetra ethyl lead on a large scale. The toxicological action of this substance should therefore be investigated on animals, with particular reference to the amount of poison required to produce acute and chronic lead poisoning and the channels of absorption of the poison into the animal body.

The second health hazard involved in the use of this chemical would probably occur through the absorption of lead by persons handling gasoline containing lead tetra ethyl. Experiments should therefore be carried out to determine the volatility of lead tetra ethyl as contained in a finished gasoline mixture under various conditions of temperature, and the toxic effect of such vapors upon animals. The poisonous effect of such mixtures should also be established with regard to the absorption of lead when the mixture in liquid form is applied to the skin.

The third health hazard may consist in the possibility of poisoning due to the admixture of lead oxide to the motor exhaust gases. It is quite possible that gasoline containing lead tetra ethyl might produce exhaust gases containing a large amount of finely divided lead oxide, which would contaminate the air of garages and automobile repair shops to such an extent that persons breathing this air over a considerable period of time might take in sufficient lead so as to cause chronic lead poisoning. Similar possibilities of lead poisoning might exist in vehicular tunnels such as the New York tunnel. It is also possible that in congested large cities under favorable wind conditions enough lead oxide might accumulate as a fine dust in the air so as to produce conditions which might be dangerous to persons exposed to this air. Toxicological experiments should therefore be performed to determine the toxic effect of exhaust gases developed by motors burning gasoline containing lead tetra ethyl, these experiments to be performed on various species of animals under conditions similar to those obtaining in the actual use of this fuel. This would require methods for the accurate estimation of lead in air, and methods for the estimation of lead in the excreta of animals exposed to lead contaminated air.

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