

# LEADED GASOLINE REPORT DAMNING, EXPERIMENTS BY EXPERT REVEAL

Details of the Columbia Tests  
Show Death and Paralysis  
Invariably Result From  
Doses Given Animals;  
Even Rats Stricken

MERE HANDLING OF FUEL  
DILUTION IS POISONOUS

Article in The World Verified  
That University Workers  
Became Victims

From The World's Bureau  
Special Despatch to The World  
WASHINGTON, May 22.—Details of Columbia University experiments, which led authorities there to conclude that tetraethyl-lead gasoline is a menace to any one handling it, became known to-night, although the text of the report of Dr. Frederick B. Flinn, who conducted the experiments, still is a secret so far as complete publication is concerned.

Officials at the Public Health Service let it be known that the reason for this secrecy is that the report is so damning to lead gasoline that Dr. Flinn is going ahead with additional experiments intended to check every conclusion he has reached. For that reason he does not wish to make public any of his statistical data yet. It is denied by all concerned that any pressure is being exerted by any one to keep the report a permanent secret.

## High Spots Cited

The World, however, is able to present the text of Dr. Flinn's introduction to his report, presented Wednesday to the conference of scientists called by Surgeon General Cumming. The high spots are:

That with a few minor exceptions, only the lead diluted gasoline was used in the tests—the solution that goes to the public and not the raw tetraethyl lead itself.

That animals given treatment of small quantities of the fuel—10 cubic centimetres, or same amount that would remain on a garage man's hands if he used the gasoline to wipe off grease—died in many cases became paralyzed in others, and invariably were found through analysis to have absorbed lead. This amounts to poisoning.

That of two dozen rats so treated, all died, although rats are not usually susceptible to lead. That there is no doubt that the mere handling of the diluted fuel would cause lead absorption.

## World Story Proved

In this connection Dr. Flinn again in effect verified the article printed in The World some time ago that he and his assistant, Miss Agnes Starkson, had accumulated lead during the experiments, though working under the most careful conditions. Dr. Flinn described their symptoms as some of those usually found in lead poisoning.

Dr. Horatio Williams, head of the Department of Physiology at Columbia University at that time, denied The World article as "utterly false." His contention was that accumulation of lead was not necessarily lead poisoning, though it is conceded that lead poisoning is simply the stage where the accumulation has become great enough to bring serious results.

"There is one interesting factor,"

1,000 parts of ordinary gasoline) shows that it can be absorbed under ordinary conditions around garages."

Dr. Flinn explained first that the utmost care was taken with guinea pigs, rabbits, rats, goats, pigeons and monkeys used in experiments so as to make sure they were exposed only to the same conditions any ordinary garage man might meet if he handled the doped fuel.

After telling of some of the preliminary arrangements for the experiments the text of Dr. Flinn's introductory to the report continued.

"We dosed our rabbits with 3 cc of the diluted gasoline daily over various periods. Animals, rabbits, died, but we were unable to find out whether they died of lead poisoning or not until toward the very end of some of our lung exposures. Some animals were exposed from 189 to 190 days.

"Those exposed for the longer period have shown definite signs of lead poisoning. We have had one rabbit absolutely paralyzed in the hind quarters—could not move at all. That animal, on being analyzed, showed stippings very plainly. We analyzed that rabbit and found it contained about 4.9 milligrams of lead.

"We then turned to goats for the simple reason they are more hardy and not so susceptible to respiratory diseases as rabbits. We treated these goats on the neck and on the other parts of the body with two centigrams of the diluted ethyl gasoline. We had four of those goats abraded.

"We analyzed the fetus of those goats and found lead. We have one goat now that we are still treating which is very weak in its hind quarters. Another goat shows a tendency of weakness in its left hind leg.

## Fuels Compared

"In order to see whether there was a tendency between the dilute gasoline and the straight gasoline we took two of our goats and ordered distribution of the lead in the animal itself.

"We have taken two goats and put one cubic centimetre of the straight tetraethyl lead in the neck of those goats. We have dosed these animals for over sixty days at various times and the animals became hunched up and refused to eat, &c., and we feared they were going to die, so we stopped the dosage and let them rest for a few days. The animals recovered in a few days. That is the same thing that you see around industrial plants when a man is taken away from industrial exposure.

"About two weeks ago one of these goats became suddenly paralyzed in its hindquarters, cried all day long and passed out. We examined this goat and found lead in the organs, 3 1/2 MM. in the brain, the total brain weighing about 25 grams; we found lead in the bones and we found about .8 of 100 grams in the muscles, showing that lead was pretty well distributed throughout the whole animal.

"As to the other goat, we have stopped the lead for the time being to see if it will recover, and it has shown signs of coming out of the lead intoxication in two weeks.

## Garage Conditions

"Passing on to the gas chamber, we were uncertain exactly how to approach that question. We tried various evaporation tests of various materials, powders &c. We threw gasoline around like you would have it around a garage, where it would not be absorbed through wooden floors, and we found that the rate of evaporation varied according to the temperature, the air movement and as to how the gasoline spreads itself over the surface.

"However, we did find that we could evaporate about 400 cc. on the average, inside of about four hours, of gasoline. We used that as a criterion and exposed animals four hours in the gas chamber. The gas chamber contains approximately 120 cubic feet of air, and the air is charged about six times an hour. As far as we could determine, both by analyzing the air and by analyzing the fumes afterward, this would contain about .03 of lead per cubic foot.

"We evaporated our gasoline by pas-

we put them in. They showed no signs of any bad effect from gasoline.

"We decided to use that as a criterion, so we then exposed these animals to the vapor of gasoline in this air chamber, containing approximately, as far as we can determine, about 300 milligrams of lead per cubic foot. Strange to say, and rather to our surprise, we found the rats rather susceptible to lead poisoning.

"I do not quite understand it. We exposed only two dozen rats and each one died. We exposed them anywhere from fifty-six hours to over two hundred and twenty hours, and each time we analyzed we found lead in them.

"Our experience leads us to believe that if a man is exposed to the same exposure that the animals had, he cannot help absorb lead. Whether the symptoms become marked enough for the average scientific man to recognize the symptoms is a question.

"For fear that we might have made a mistake somewhere in our lead chamber, and so forth, just a couple of weeks ago we took an iron pan, about thirty inches in diameter, and with a false bottom made of one-half inch mesh on the bottom, and in that iron pan we put a litre and a half of gasoline, and on the top of the false bottom we placed white rats, leaving the animals exposed to just the natural evaporation of the gasoline.

## Evaporation Tested

"The litre and a half evaporated practically all inside of twenty-four hours and the animals were exposed twenty-four hours, except for two hours we took them out in order to give them a chance to get water and food, and it also gives us a chance to wash out the bottom of the pan so no dust from the evaporated material, or any concentrated lead, shall cause an addition to the gasoline.

"The rats did not die. We killed the two on purpose to determine the lead contents of the rats after seven days' exposure. At the end of seven days we found that the rats contained on the average four milligrams of lead, the rats weighing on the average fifteen grams, showing that lead can be accumulated by the ordinary, natural evaporation of gasoline."

## Autopsy Indicates Death Due From Lead Poisoning

Chemical examinations of parts of the viscera of Anatose Levanus, said to have been a laborer at the Bayonne docks of the Standard Oil Company, indicated yesterday that he had died from lead poisoning, according to Dr. Alexander O. Gettler, city toxicologist at Bellevue Hospital. Other parts of the viscera are still under examination.

"We don't know whether he absorbed this lead through tetraethyl or not," Dr. Charles Norris, Chief Medical Examiner, reported last night. "Thus far we have found no evidence of volatile lead, prevalent in cases of tetraethyl poisoning, and therefore we can't say whether the lead found in this man's kidney and spleen was derived through working with tetraethyl."

Levanus, who was thirty-eight and lived at No. 67 Cherry Street, was taken to Reconstruction Hospital at No. 395 Central Park West, April 22 last, and complained of straining of the back. Examination revealed no such strain, and moroseness and inability to make himself understood elicited little information for the hospital authorities. May 5 he became insane and was removed to the psychopathic ward at Bellevue, where he died May 14. Since that time Dr. Gettler has been conducting a chemical examination of his viscera.

"Dr. Gettler is not sure how much lead is present," Dr. Norris said last night. "Absorption of lead is an occupational disease. Great quantities indicate that the men have been subjected to constant absorption. The bones absorb more than any other part of the body, and so far Dr. Gettler has not examined them."

Dr. Norris said that detection of tetraethyl lead itself is only shown in the autopsy in cases where the sub-