

THE EFFECT OF NATURAL GAS ON TREES AND OTHER VEGETATION¹

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When manufactured gas was used in homes and industry, a leak in the gas main could result in sudden death to nearby vegetation. The death of plants was acknowledged by all to be the result of toxic components such as cyanogen which formed hydrocyanic acid when mixed with water and carbon monoxide. It was simple to determine if manufactured gas was present in soil atmosphere by placing a potted tomato plant in a hole in the "suspect" area. If manufactured gas was present, another of its components — ethylene — resulted in severe epinasty of the tomato leaves within 24 hours.

With the swing to use of natural gas the question arose whether a gas leak in soil could injure plants. It was known that natural gas in itself was apparently non-toxic to plants. However, the death of trees and other vegetation in the vicinity of a gas leak in soil was still quite common.

Natural gas was known to be dryer than manufactured gas, and the gas companies were soon faced with an increased number of gas leaks as natural gas dried out the packing at the joints of underground pipes, and the leaks resulted.

Despite the dead vegetation in the vicinity of natural gas, there were those who claimed that non-toxic gas could not possibly be responsible for death of vegetation. However there were those who would refute this. A speaker at the 1958 annual meetings of the New Jersey Federation of Shade Tree Commissions was Mr. Milton W. Heath, Jr., of the Heath Survey Consultants, Wellesley, Massachusetts. The Heath Company operated a service of detecting gas leaks in soil, serving over 650 utility companies in 47 states. Two excerpts from the presentation by Mr. Heath are as follows:

"Let me state beforehand that our Company has been locating gas leaks by the effects of gas on vegetation for over 25 years, and the transition from manufactured gas to natural gas has not im-

paired the ability of our consultants to accomplish this whatsoever. In fact, the overall effects are more striking with natural gas in many instances than they were with manufactured gas, one reason being the increased pressures natural gas is distributed under, which results in greater volume loss."

"Some will contend that there is no effect on vegetation from natural gas but again, as I mentioned previously, our experience proves otherwise and, in fact, our business functions as a result of this fact that vegetation IS affected by this gas."

For a number of years some utility companies refused to accept claims against them for trees allegedly killed by gas leaks when natural gas was involved. However, one of these companies, even though originally claiming "no fault" did pay the City of New York for "Trees apparently killed by natural gas." (*New York World Telegram*, July 13, 1961; and *Daily News*, July 14, 1961.)

Tests conducted by Braverman, Ettinger and Jacobs, and reported in the technical section of *Gas Age*, April 26, 1962, described the results of their determination of air quality in soil where natural gas was associated with dead trees. They reported higher percentage of methane, up to 10% carbon dioxide, and less than 5% oxygen in soil near recently killed trees. By contrast, they observed a lack of methane, 3 to 4% carbon dioxide, and 20% oxygen in the root area of healthy trees. Their final comment was — "The results obtained in this set of experiments are fairly consistent. In the absence of any counter evidence it appears that trees are damaged and killed by methane and the concomitant lack of oxygen."

For years scientists, as well as the industrialists who recognized that vegetation would die in the vicinity of natural gas leaks, did not know the chain of events leading up to the plant death. It was conjectured that the natural gas under pressure replaced the oxygen in the soil which

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