



**GASOLINE ENGINE EXHAUST**—A jet impactor in Los Angeles collected this sample of what is being thrown into the air every day in the United States from the exhausts of millions of cars.

## CHEMISTRY

## Study Smog Causes

► **DIRTY AIR** or smog is not due to any one kind of pollution of the atmosphere we breathe. Many kinds of wastes of automotive transportation, industry and heating are poured out into the air. These substances, by the ton, react with each other to form compounds that science has not yet identified.

This was made known at the Second National Air Pollution Symposium in Los Angeles.

Stanford Research Institute scientists found in their studies that smog has uncommonly strong oxidizing powers. Rubber in smog areas cracks in a relatively short time. The air contaminants are gases, solids and liquids. One of the large volume sources of contaminated air consists of more than 125,000 tons of exhaust from automobiles, trucks and buses in the Los Angeles area alone.

Samples of polluted air can be collected for analysis by a jet impactor. This device collects the very fine, or aerosol, particles by impinging a high velocity air stream on a surface in such a way that the air stream is required to turn in a very small radius of curvature. In this way, small particles in the air stream do not have their momentum changed enough in a short distance to avoid striking the deflecting surface.

Dr. Sylvan Rubin of Stanford Research Institute reported his results using the jet impactor, part of a research program on

the nature of smog, in the *JOURNAL OF ATMOSPHERIC AND TERRESTRIAL PHYSICS*.

The amount of liquid picked up on the impactor's glass slide varied greatly but was always related to the haziness of the atmosphere, Dr. Rubin found.

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## METEOROLOGY

## Abundant Showers for Most of Nation to June 15

► **"ABUNDANT SHOWERS"** are in prospect until the middle of June over most of the nation, particularly in the northeast quarter.

But west of the Continental Divide and along the Gulf Coast people can expect less than the usual amounts of rainfall up to mid-June. This was the long-range weather forecast of the Weather Bureau's Extended Forecast Section.

Where less than normal rainfall is expected, the weather will be hotter than usual until mid-June. The temperature will also be higher in the rest of the south in addition to the Gulf Coast States. The northern and central plains and areas eastward through the North Atlantic states will be cooler than usual, while the rest of the nation can expect about normal temperatures.

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## ENGINEERING

## Tests Show Road Damage by Trucks

See Front Cover

► **EVIDENCE** THAT heavily loaded trucks break up highways has been found in tests conducted near La Plata, Md., for the highway departments of 11 states and the District of Columbia.

Designed to reveal the effects of four different kinds of axle loads on concrete pavement, the road research project was started in 1949 by the Interregional Council on Highway Transportation.

The group ran seven trucks over 1.1 miles of the Maryland highway a total of 238,000 times. The first published findings showed:

Trucks loaded to 22,400 pounds caused 6.4 times more cracking than those hauling 18,000 pounds. On the trucks with two sets of rear wheels and axles, 44,800-pound loads caused 12.3 times as much cracking as 32,000-pound loads. The figures were based on "all types" of subgrade under the test road.

The project was under the direction of the Highway Research Board of the National Research Council. Truck manufacturers and oil companies cooperated in the road tests.

Shown on the cover of this week's *SCIENCE NEWS LETTER* is the effect of one of the speeding trucks on the test pavement.

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## PHYSICS

## "Swimming Pool" Shields Low-Power Nuclear Reactor

► **"A "SWIMMING POOL"** is being used in Oak Ridge, Tenn., to cut down deadly radiations from a low-power nuclear reactor set up to aid development of better reactor shields.

Results of research with the reactor are expected to speed development of atomic-powered planes.

The reactor, an assembly of movable nuclear fuel elements placed on end in an aluminum grid, can be moved about within the pool. It is suspended by an aluminum framework from what is called the reactor bridge, which rests on wheels fitted to rails along either side of the pool.

An instrument bridge also spans the pool and operates on the rails. Using a carriage that slides up and down on the framework attached to this bridge, operators can place test instruments at any point in the pool.

The reactor uses fuel elements designed for the materials testing reactor, a large unit recently put into operation in Idaho. Its development was announced jointly by Union Carbide and Carbon Corporation and the Oak Ridge Operations Office of the U. S. Atomic Energy Commission, Oak Ridge, Tenn.

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