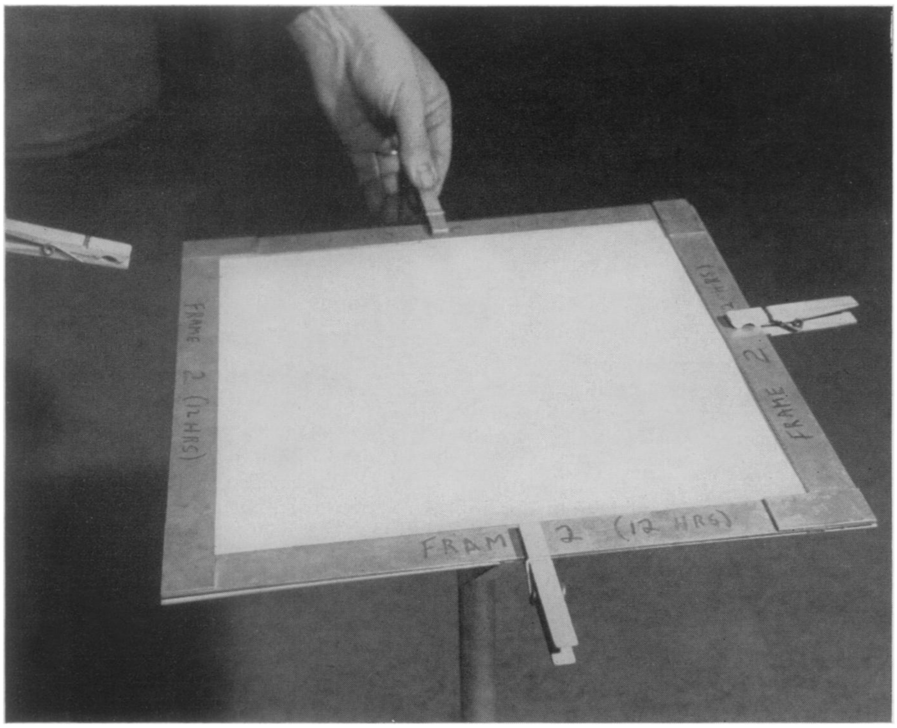


*ATOMIC DUST COLLECTOR—Gummed paper, one-foot square, placed on a three-foot high stand, collects dust in the air in one of the two sampling methods used at fixed stations monitoring for atomic debris. The sheets are changed every 24 hours.*

PHYSICS

# Atomic Explosion Evidence

**Radiations from debris of the fission process can be picked up by detection instruments all over the world. Progress toward useful power from atom highlighted in AEC report.**

### See Front Cover

*Former President Truman was quoted on Jan. 26 as saying that he was still "not convinced" that Russia has a workable atomic bomb. Congressional, atomic and civil defense officials immediately contradicted this statement, recalling the announcements of three Russian blasts made from the White House during Truman's administration. Following is an explanation of how an atomic explosion can be detected.*

➤ EVIDENCE FOR an explosion of atomic bomb material in Russia would be read on instruments such as Geiger counters and scintillation counters all over the world.

Judgment as to whether such an explosion came from an intentional bomb explosion or from the accidental blow-up of an atomic pile would have to be made by comparison.

The evidence might appear as a general increase in radiation, which might be shown by fogging of photographic plates in normally protective wrappings. On monitoring instruments, a sudden increase in the amount of "background" radiation detected would show that something had happened.

Differences as to time and intensity of such readings on the Pacific and Atlantic coasts, and in other parts of the country, would point to the place and time that the atomic explosion had occurred.

A more direct way of learning about such an explosion was actually discovered on Feb. 7, 1951, when radioactive snow fell in Ann Arbor, Mich., and other places in the United States following the test explosion of an atomic bomb by the Atomic Energy Commission in Nevada. This snow, and the fine dust carried aloft by other atomic bomb explosions, when collected and analyzed, was found to be carrying samples of fission products.

Such material can be carried in the upper atmosphere to great distances. When it finally settles to earth, it can tell directly what kinds of materials were involved in the original explosion.

The explosion of an atomic bomb sets free in the air the fission products of the uranium 235 or the plutonium 239 which were the materials that exploded, together with fragments of whatever materials made up the casing of the bomb. These materials, even divided into the smallest particles, would give off radioactive rays which can be recognized by the rate at which their activity dies away.

Similar radioactive dust from the explosion of an atomic reactor might be expected to contain many more kinds of material than that from a bomb. Such a calamity has never, so far as the public knows, taken place on earth.

It is known, however, that an atomic pile is built up of graphite with boron and cadmium in the controls, beryllium in the neutron reflector, and concrete and lead for shielding. All these should modify the record of fission products.

The radiation monitoring system set up by the Atomic Energy Commission to keep a continuous check on radioactive dust in the atmosphere is described in the Commission's 13th semiannual report. A network of observing stations extends across the U. S., with a total of 121 fixed stations operated in connection with the U. S. Weather Bureau, and two mobile monitoring teams which cover varying locations in a zone from 200 to 500 miles from the test site near Las Vegas, Nev.

The amount of radioactivity found at the stations is recorded continuously, and this is related to the type of burst, the radioactive cloud formed by the experimental atomic explosions, and the weather conditions.

Shown on the cover of this week's SCIENCE NEWS LETTER are some dust samples being processed. The technician at left folds the samples and places them in crucibles for ashing in the furnace. At right, a technician grinds the ashes and places them in numbered planchets for measuring.

As a side result, valuable information is furnished to industries sensitive to increases in normal background radiation, and to meteorologists on movements of large masses of air at varying altitudes.

### Progress Toward Useful Power

Work on harnessing the atom for use ful power is progressing at a fast-moving pace, the AEC also reported.

Outlined in its 13th semiannual report was the present state of development of nuclear reactors. These include both research and testing reactors as well as power plants to propel airplanes, submarines and large surface vessels.

Work has started on the development of "a nuclear power plant suitable for the propulsion of large naval surface vessels such as aircraft carriers," the report said.

Use of the atom for industrial power, subject of reports of four industrial teams during the latter half of 1952, raises "unique policy" problems that require decision. These include, the AEC states, "ownership of the plants, licensing and use of fissionable materials, secrecy, patent rights, public safety, and liability in case of disaster."