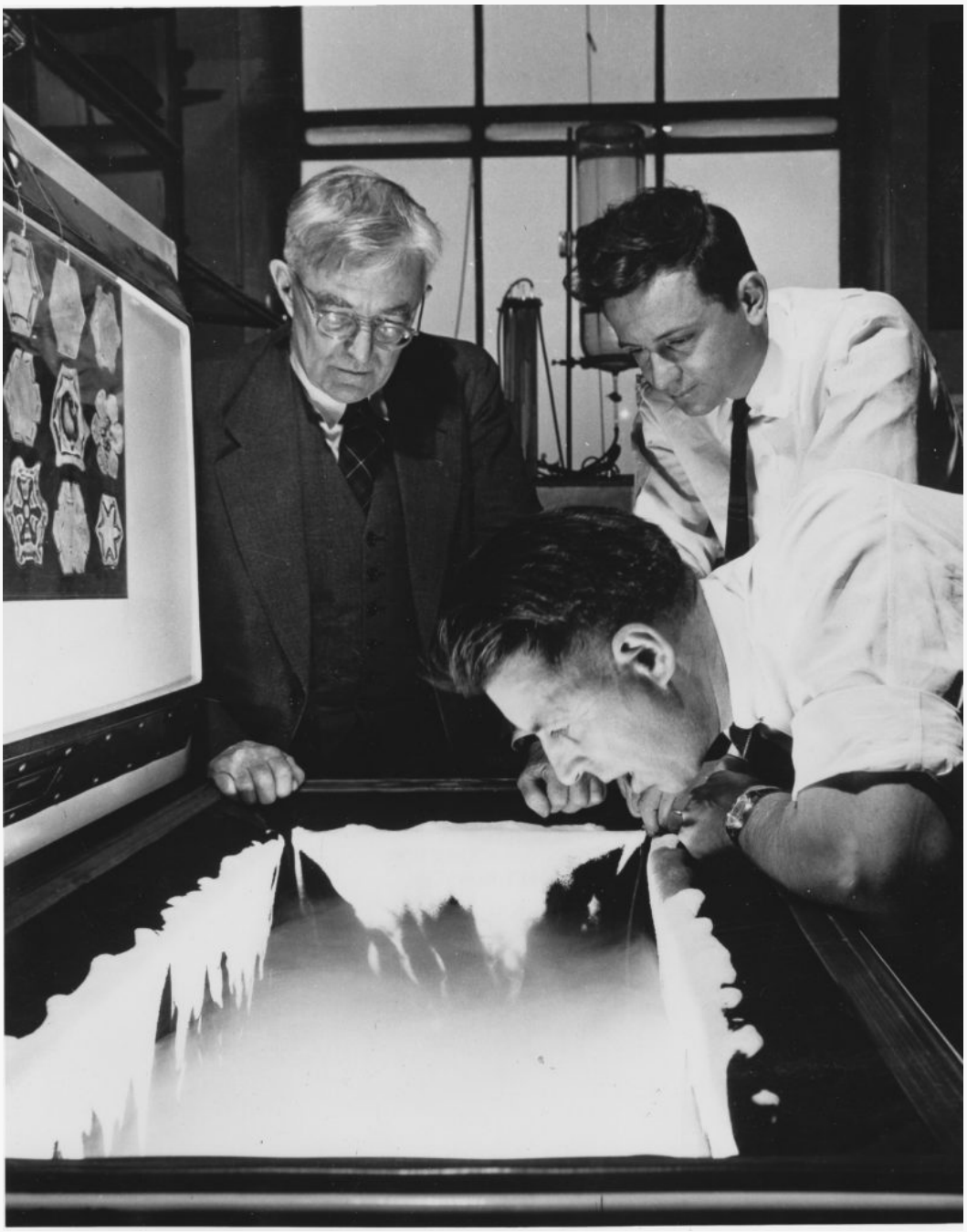
The Weather Men: How Kurt Vonnegut's Brother Tried To "Abolish The Evil Effects" Of Hurricanes With Science

By Tomas Kellner | Sep. 7th, 2017

Kurt Vonnegut's science-fiction novel "Cat's Cradle" revolves around a tricky compound called ice-nine that can turn water solid at room temperature. Vonnegut, who worked for GE in the 1950s as an in-house journalist, came up with many beautifully outlandish plots for his best-selling books. But ice research was hitting close to his beat as well as his home.

That's because at the time, another member of his family was employed by GE — his brother, the physicist Bernard Vonnegut. Bernard, together with Nobel

laureate Irving Langmuir and atmospheric scientist Vincent Schaefer, formed a crack research team looking for ways to control the weather and even break up hurricanes. In 1946, Schaefer made history when he flew into a cloud in a small plane and set off the world's first artificial snowfall with a bag of dry ice. He was known as the Snow Man ever since.



Top image: Bernard Vonnegut (left) and Vincent Schaefer (right) are seeding a snow cloud in Schaefer's ice box. Above: Nobel winner Irving Langmuir (standing with glasses) next to Bernard Vonnegut. Schaefer is leaning over the freezer. Kurt Vonnegut used Langmuir as a model for the scientist Felix Hoenikker in his book "Cat's Cradle." In the novel, Hoenikker invents a material called ice-nine that's stable at room temperature. Kurt Vonnegut got the idea for the fictional material from Langmuir when the two worked at GE. All images credit: Museum of Innovation and Science Schenectady

The research, which GE called "Project Cirrus," was serious business. It grew out of the company's study of thin ice layers that sometimes coated aircraft wings and crippled planes during World War II.

Schaefer was testing different materials in his lab by dropping them into a repurposed home freezer. Working with dry ice, he discovered that tiny grains of the substance, which is carbon dioxide frozen to minus 109.3 Fahrenheit (minus 78.5 Celsius), transformed the air inside the freezer, created many millions of ice crystals and started a miniature snowstorm.

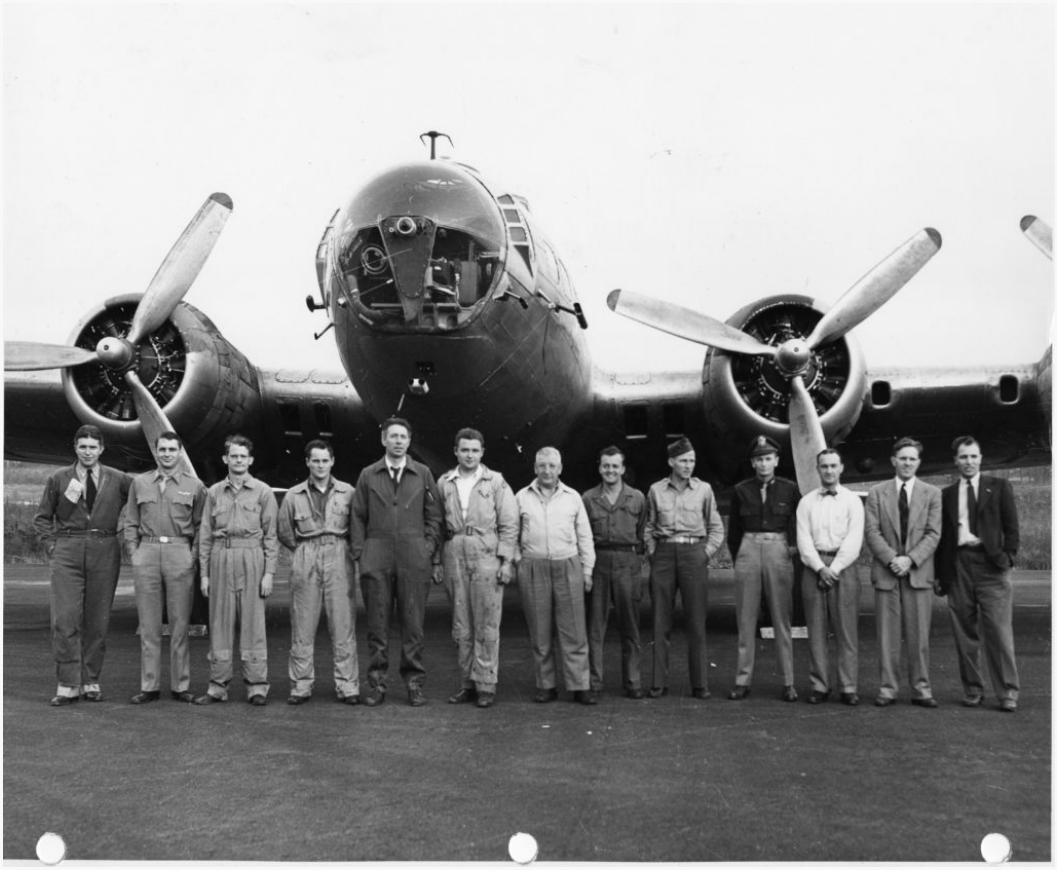
By fall 1946, Schaefer knew enough to take his research out of the lab. In November that year, he and GE test pilot Curtis Talbot climbed into a small Fairchild plane and tried to seed with dry ice a cloud floating above Schenectady (*see video*). "Curt flew into the cloud and I started the dispenser in operation," Schaefer wrote in his lab notebook. "I dropped about three pounds (of dry ice) and then swung around and headed south. About the time I looked toward the rear, I was thrilled to see long streamers of snow falling from the base of the cloud through which we had just passed."

The team kept working and Bernard Vonnegut improved on the method by using silver iodide, a substance whose crystals are similar to frozen water, to summon snow. The chemical compound was apparently so powerful at creating snow or rain that "all the air of the United States could be nucleated at one time with a few pounds of silver iodide," the researchers reported. (Kurt apparently passed on this book idea.)

But others noticed. The G-E Review wrote that "the results of Project Cirrus's five years of weather research will have a profound influence upon domestic and world economics ... Making it rain, modifying thunderstorms and hurricanes, and clearing ground fogs near airports are some of the vital possibilities."

Making ice and snow sometimes involved fire. Bernard Vonnegut's method, called "rain by fire," created tiny silver iodide particles by burning charcoal and silver. (See GE

press release at the bottom of the story.)

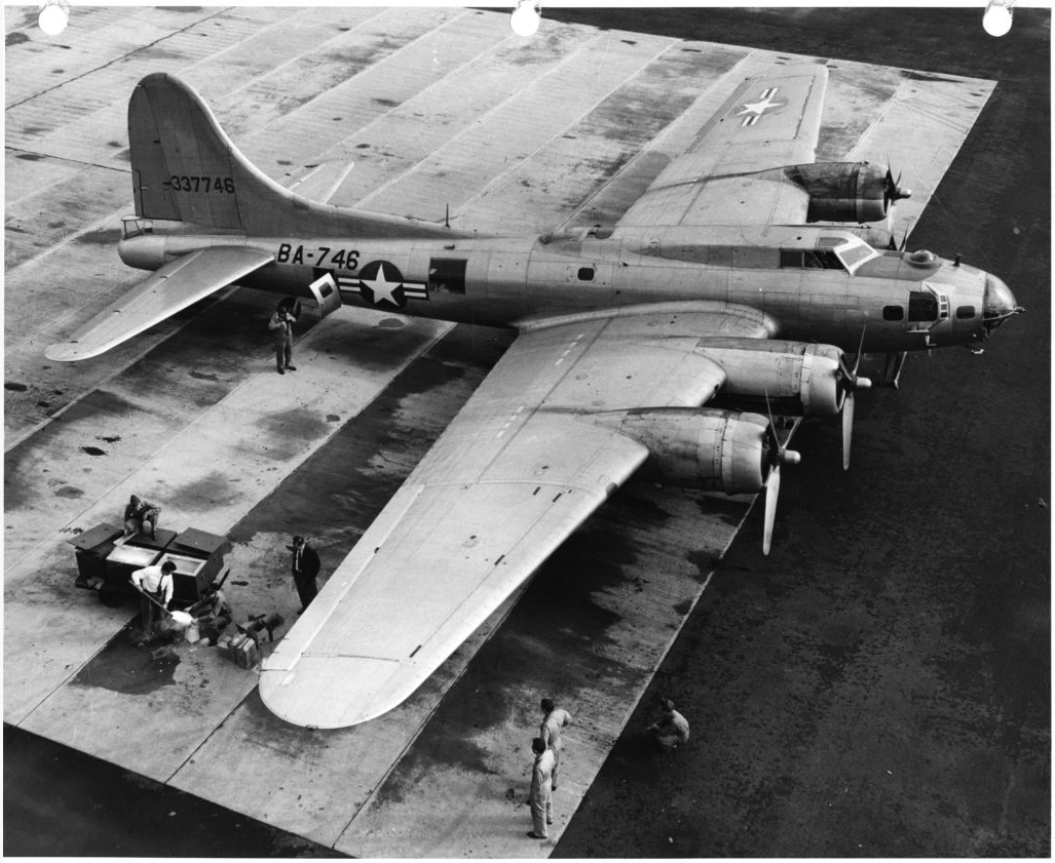


Schaefer, the tallest man in front of the plane, with the modified B-17 bomber.

Project Cirrus really took off in 1947, when as many six U.S. Navy and U.S. Air Force planes were seeding clouds in places as far apart as New Mexico and Hawaii. One of the aircraft was a modified B-17 bomber whose glass nose bristled with a battery of obscure instruments including the cloud meter, rain catcher, psychrometer for measuring humidity, and many others.

By then, the team had also figured out that many different substances could seed clouds, including common salt. Langmuir reported that observations in Puerto Rico and Hawaii "indicate[d] that it should be frequently possible to induce heavy rainfall by introducing salt into the trade wind at the rate of about one ton in the form of fine dust particles of about 25 microns in diameter."

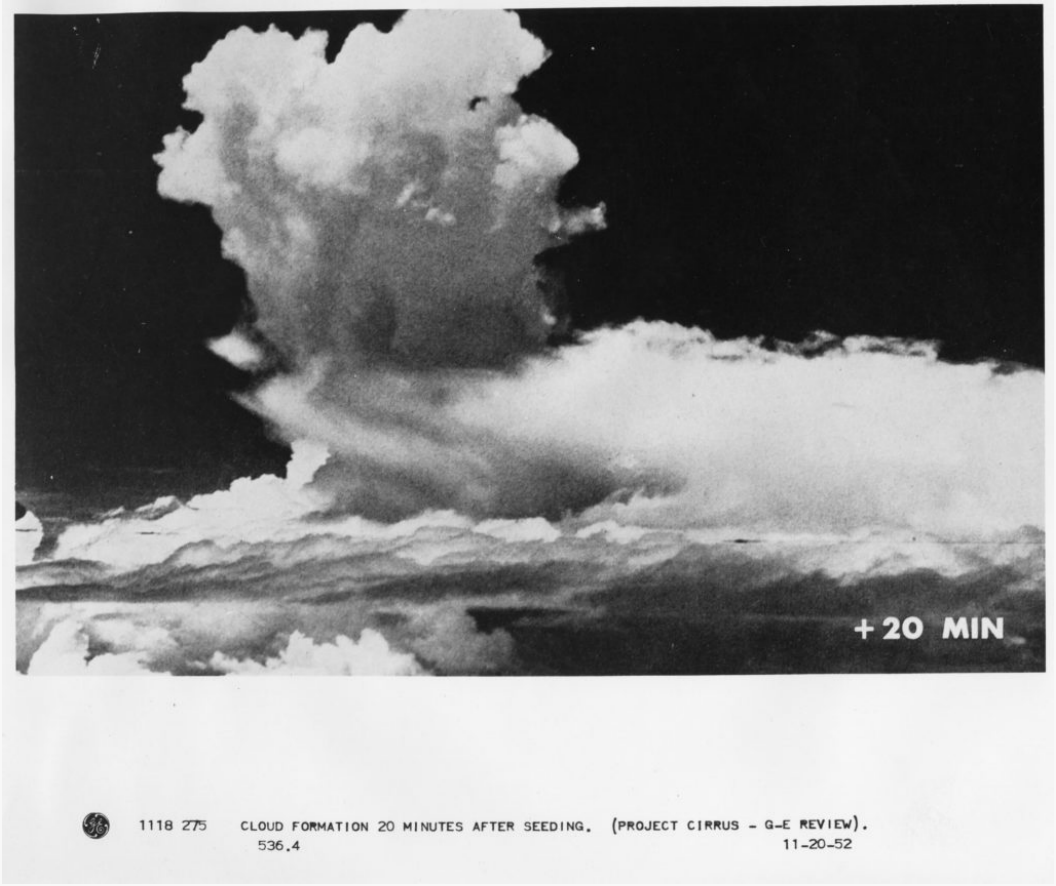
Perhaps the most daring part of the project took place during the 1947 hurricane season in the skies off the coast of Florida and Alabama. On Oct. 13, the team spotted a storm that "consisted of an eye of approximately 30 miles in diameter, surrounded by a thick wall of clouds extending from about 800 feet up into the cirrus overcast at 20,000 feet, and some 30-50 miles thick," according to a witness account.



Workers loading dry ice into the place to seed clouds.

The team loaded the modified B-17 seeding plane with dry ice and sent up another B-17 to record the operation. There was also a larger B-29 bomber as the control aircraft with Schaefer on board. Although they steered clear of the eye of the storm, they dropped 80 pounds of dry ice along a 110-mile track while circling the hurricane at 19,200 feet. “No attempt was made to penetrate through the wall of the storm into the eye or to seed in or near the squall line, owing to the failure of the group’s homing aids (radio, compass, and visual flares),” the observer reported. “It was thought that such an attempt, although desirable, would likely result in a separation of the aircraft, with subsequent abortion on the primary mission.”

Still, Schaefer, who was ensconced in the relative safety of the B-29, saw “many suitable clouds for seeding operations to occur in this type of hurricane. … Owing to the complex structure of this ‘old’ storm, it is believed that a ‘young’ hurricane would provide much more satisfactory data for estimating the effect of seeding operations.” Langmuir added: “The stakes are large … I think we should be able to abolish the evil effects of these hurricanes.”

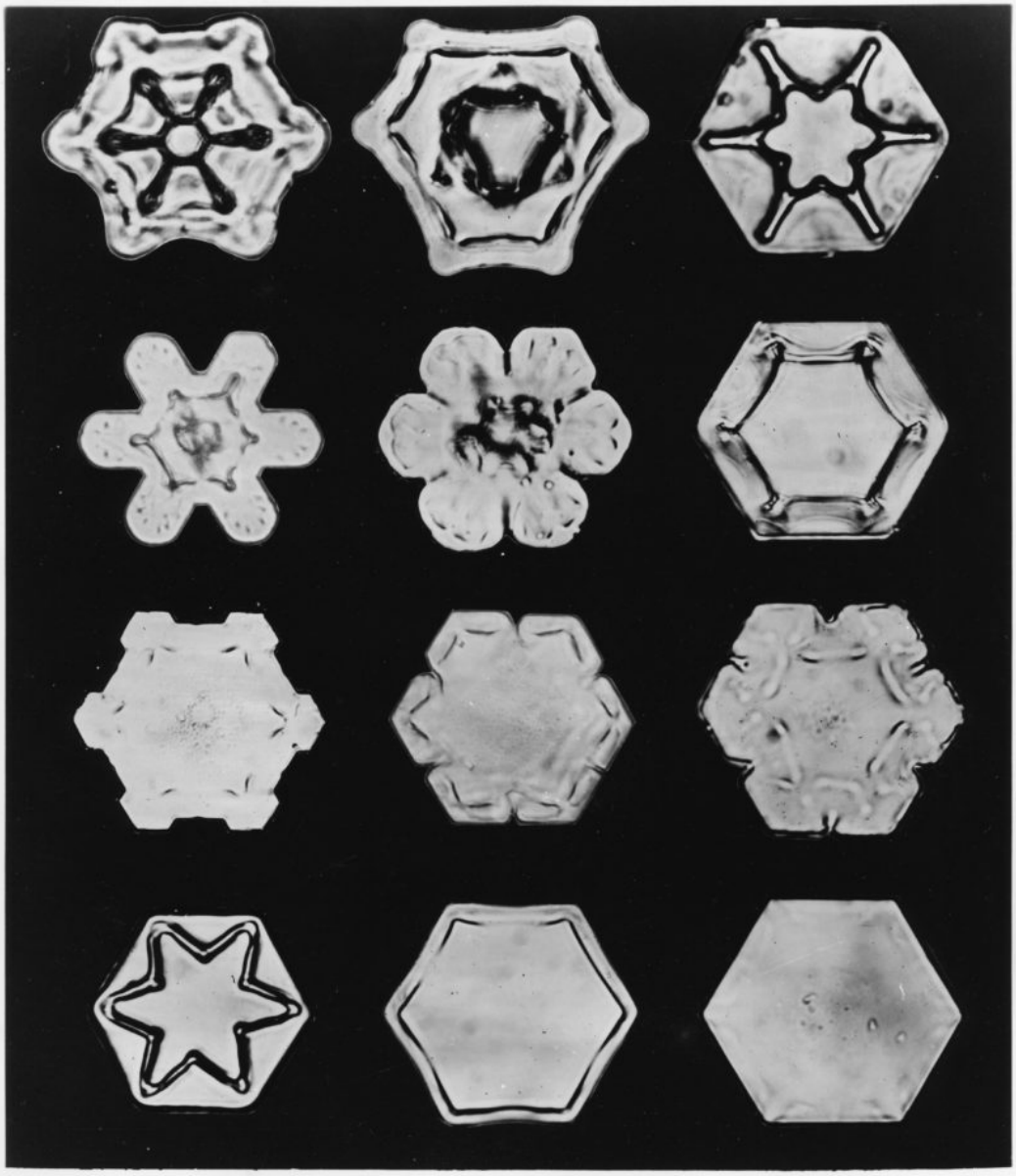


"The stakes are large ... I think we should be able to abolish the evil effects of these hurricanes," Langmuir said.

But despite the positive results, the size of the stakes and even Langmuir's appearance on the cover of Time magazine, Project Cirrus ran out of funding in 1952. And money was just one obstacle. The country also lacked (and still does) laws governing "artificial weather modification."

Still, as G-E Review pointed out, "so many other research projects had been stimulated that the continued progress in the search for new and basic knowledge of weather phenomena seems assured." (Although GE is no longer trying to subdue storms, company scientists are still studying icing with the world's most powerful supercomputers.)

After Project Cirrus ended, Schaefer and Bernard Vonnegut moved on to new positions outside GE and continued to study weather. But we thought there was no better time to dust off the legacy of the snow men's research than ahead of Christmas morning.



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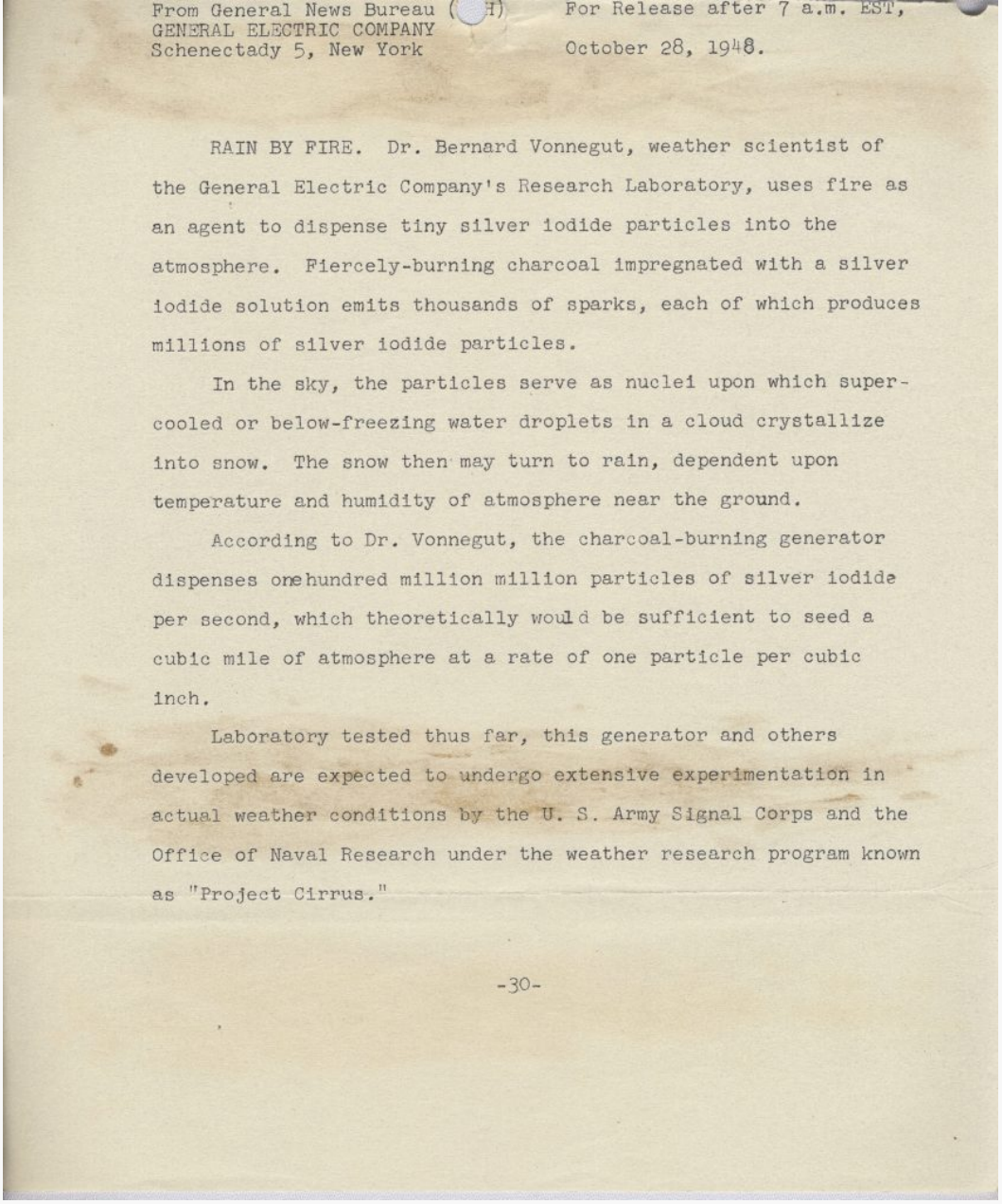
The scientists used this snow crystal recorder to monitor the shape, size and frequency of falling ic crystals.

Schaefer (left) and Bernard Vonnegut also used a pop gun to seed the cold box.



From General News Bureau (H)
GENERAL ELECTRIC COMPANY
Schenectady 5, New York

For Release after 7 a.m. EST,
October 28, 1948.

RAIN BY FIRE. Dr. Bernard Vonnegut, weather scientist of the General Electric Company's Research Laboratory, uses fire as an agent to dispense tiny silver iodide particles into the atmosphere. Fiercely-burning charcoal impregnated with a silver iodide solution emits thousands of sparks, each of which produces millions of silver iodide particles.

In the sky, the particles serve as nuclei upon which super-cooled or below-freezing water droplets in a cloud crystallize into snow. The snow then may turn to rain, dependent upon temperature and humidity of atmosphere near the ground.

According to Dr. Vonnegut, the charcoal-burning generator dispenses onehundred million million particles of silver iodide per second, which theoretically would be sufficient to seed a cubic mile of atmosphere at a rate of one particle per cubic inch.

Laboratory tested thus far, this generator and others developed are expected to undergo extensive experimentation in actual weather conditions by the U. S. Army Signal Corps and the Office of Naval Research under the weather research program known as "Project Cirrus."

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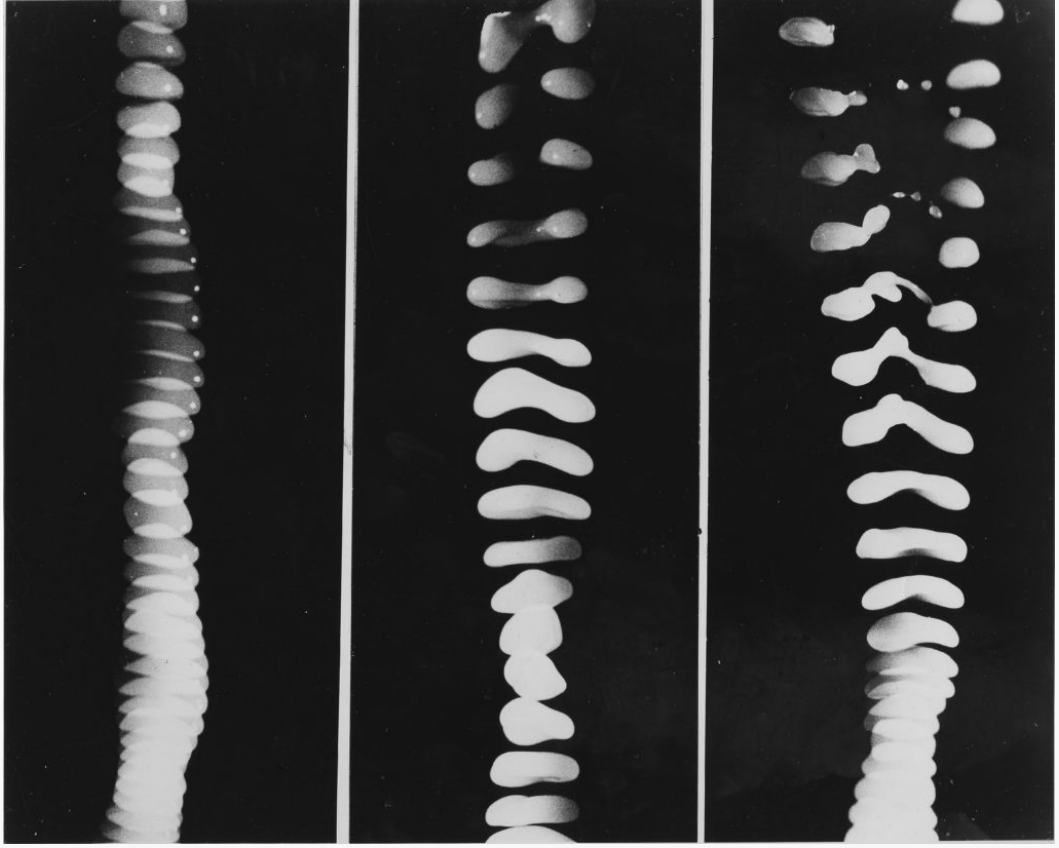
A GE press release announcing Bernard's breakthrough.



The team also studied and recorded the dynamics of falling raindrops.

Make it snow! An image of a seeded cloud.

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https://www.ge.com/reports/snow-men-cometh-kurt-vonnegut-ice-nine-white-christmas-demand/