Rain Makers: I—The Technique

Weather Control Research Centers In Tucson

In one of man's earliest attempts at forcing rain from the skies, he angrily fired cannon balls at likely looking clouds. But since a brilliant discovery in 1946, his attempt has been more scientific and is in progress on an impressive scale. Here, in the first of three articles, is the story of how he's going about it.

By FRANK CAREY
AP Science Reporter

WASHINGTON—(AP)—A scientist breathed into a home-type freezer eight years ago and started a miniature snowstorm that has grown into a blizzard swirling around this question:

"Can man control the weather?"

Tests of rain and snow making have been hailed as milestones of a new era in man's relation to nature. The faithful think it may be possible to break drouths and hold back floods, sidetrack hurricanes, prevent tornadoes and hailstorms, and dissipate fog at airports.

SOME EVEN envision man using the weather as a weapon of war—bogging down the enemy's troops in mud, parching his food crops in burning sun, perhaps manufacturing storms to be infected with germs or radioactive dust.

Skeptics—including scientists of the U. S. weather bureau—maintain that evidence is far from conclusive that weather control has any chance of being achieved on a practical scale.

There is no clear proof, these skeptics say, that when rain increased it was due to artificial techniques—it might have rained anyway.

A COMMITTEE appointed by congress to evaluate the tests has not yet reported, but the Associated Press has surveyed representative rain-making operators, clients and scientists.

Their conclusions might read like this if you put them in form of a forecast:

"Prospects unsettled over the nation. High enthusiasm followed by skepticism in some sections."

RAIN-MAKING projects were inspired, by what happened one day in 1946 in the laboratory of Dr. Vincent Schaefer, then of the General Electric Co. of Schenectady, N. Y.

Schaefer had been trying to duplicate in the laboratory one of nature's "supercooled" clouds —clouds which contain water in liquid state even though the temperature is below freezing. The water doesn't freeze because it is perfectly pure. He wanted to find out how this "supercooled" water is suddenly changed, in nature, into a snowstorm.

He produced clouds by blowing his breath into a freezer. But he couldn't produce snow even though he added to his clouds a variety of materials—soap powder, sugar, talcum powder and volcanic dust.

THEN ONE DAY he was having trouble keeping the freezer at low temperature. He dropped some chunks of dry ice into the box.

A miniature snowstorm developed before his eyes.

The first touched off a host of experiments involving the "seeding" of clouds with dry ice from airplanes in an effort to make them yield snow or rain.

Schaefer and other investigators, both civilian and military, claim they produced precipitation by this means—or at least that precipitation quickly followed seeding.

LATER IT WAS found that silver iodide, dispersed from plumes or generated as a kind of "smoke" from devices on the ground, could serve the same purpose. Crystals of silver iodide closely resemble those of dry ice.

The theory is that these substances provide "nuclei" for millions of tiny ice crystals in the clouds. As the natural crystals attach themselves to the nuclei, the formation grows and eventually falls to the ground as snow or rain, depending upon the temperature beneath the cloud.

In general, seeding works only on "supercooled clouds." Fortunately for the rain makers, a lot of these are floating around, even in summer. But they are found only above altitudes of about 12,000 feet.

SILVER IODIDE is supposed to have some advantage over dry ice because it can be dispersed in a sort of a "smoke" over relatively large areas. Also, it can be dispersed from generators on the ground. Dry ice must always be dropped from airplanes.

Silver iodide costs more per pound than dry ice, but a little goes a long way.

Rain makers using one or the other of the materials usually charge farmers three cents an acre for "seeding" clouds over range land, 20 cents an acre for wheat land.

IF AN AREA suffers from too much rain, cloud seeders believe "overseeding" may be the answer. They say that with overseeding it may also be possible to sidetrack hurricanes, break up small thunder clouds before they can brew tornadoes and clear fogs from airports.

The theory of overseeding is that if enough artificial nuclei are fed into a cloud, all the water in it will be used up in making very small ice crystals, none of which will ever get big enough to fall as snow or rain.

Even the most enthusiastic proponents of cloud seeding grant that much more has to be learned about the inner secrets of clouds before weather control can reach maximum theoretical effectiveness.

VARIOUS SCIENTISTS are making intensive studies of these secrets. One of the most unique studies will be carried on by the recently established Institute of Atmospheric Physics (IAP) at Tucson, jointly operated by the University of Arizona and the University of Chicago. The Sloan foundation of New York gave $160,000 for the establishment of the institute.

Among other ventures of the institute, a radar set will be placed on one of the mountain peaks surrounding Tucson and aimed at rain clouds in the hope of obtaining "echoes" from tiny droplets when they grow big enough to cause rain. Special cameras will be used to photograph the echoes if they show on the radar screen.

Automatic cameras will be mounted on other peaks to photograph continually the visible parts of clouds. Air force planes and crews are expected to be made available for flights through clouds to take temperatures, study the size of droplets and measure other factors with special instruments.

MODERN MAN is not the first to try to control the weather. However, he is better equipped than early prospectors in the field.

History records one of the earliest attempts was by the simple—and perhaps defiant—device of firing cannon balls into the skies.

And in the early 1870's the U. S. department of agriculture experimented with "dynamite kites and explosive balloons" near Midland, Tex. A "Gen. Dyrenforth" was credited in the records of the time with breaking a long drought.

EARLY METHODS may have been crude, but they sometimes resulted in rich pay-offs for the rain makers.

A chap by the name of Frank Melbourne popped up in Cheyenne, Wyo., on Aug. 27, 1891, claiming he had produced rain 12 times during an Australian drought.

Cheyenne, parched as a Wells Fargo horse after a long run, agreed to pay Melbourne $150 if he could produce rain by midnight Sept. 1.

Here's record of how Melbourne went about his work, but by midafternoon on Sept. 1 it was pouring.

Tomorrow: Report from clients.

—Citizen Photo

DROUTH AREAS WATCH TUCSON STUDIES
Dr. James E. McDonald shows a piece of radar equipment being installed at the University of Arizona for the Institute of Atmospheric Physics. IAP cloud studies may yield a vital key in a thirsty world's search for rain-making methods.

Radar Study Begins At UA

With installation of radar equipment on the roof of the engineering building at the University of Arizona and addition of two new staff members, the Institute of Atmospheric Physics was making rapid expansion strides today.

The two new staff members added to the personnel are Robert Des Jardins and Lee L. Sims.

Sims, a World War II flight pilot, has been engaged in the micro-meteorology project, a study of atmosphere lying within two or three feet of the earth's surface and involving the study of heat transfer, radiation, evaporation and other related atmospheric problems.

Des Jardins was formerly a teaching assistant at Florida State college, Tallahassee. He formerly worked as a meteorologist for Northwest Airlines at Anchorage, Alaska.

Other members of the staff include Dr. James E. McDonald, associate director; Irving E. Ames, electronic technician; Dr. A. Richard Cassander, associate director; Dr. Roscoe R. Graham, director who is also associated with the cloud physics project of the University of Chicago.

The research is aimed at determining how much the future development of dry regions throughout the world can be enhanced by efforts to stimulate rainfall.

The radar equipment will detect precipitation as it forms in distant clouds by use of extremely short radio wavelengths of three centimeters. These waves are reflected by rain drops and produce a radar echo which will show up on a viewing screen set up in the attic of the engineering building.

Through this technique the scientists will be able to look through the clouds and follow the life history of rain drops as they are formed from tiny cloud droplets until they fall to earth as rain.

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