METEOROLOGY

Seeding May Reduce Rain

Spraying immature thunder clouds with silver iodide may decrease natural rainfall. Predicting thunderstorms from energy in atmosphere proposed.

➤ TRYING TO make it rain out of immature thunder clouds by seeding them with silver iodide may actually decrease the amount of rain which would have fallen naturally over an area. This is the opinion of Dr. E. J. Workman, president of the New Mexico Institute of Mining and Technology, presented at a session of the American Meteorological Society meeting in New York devoted to artificial rainmaking.

In fact, said Dr. Workman, if silver iodide crystals are efficient substitutes for natural water-droplet-forming nuclei in the air, it would appear reasonable to undertake a rain reduction program in some areas by extensive pollution of the atmosphere with these crystals.

Seeding immature clouds may dissipate some of the energy necessary within the general area for the creation of thunderstorms and thus actually reduce the amount of rain which otherwise would have fallen naturally.

This might have an effect on the weather over a very large area. Dr. Workman pointed to the theory held by Nobel Prize Winner Dr. Irving Langmuir that "rainmaking" with silver iodide in New Mexico had an effect on the weather over a large area of the United States.

Dr. Workman said that the local effect which he found of dissipating energy by seeding with silver iodide crystals might be responsible for the widespread effect rather than any local increase in rain over New Mexico.

Originally an enthusiast over the possibilities of increasing rainfall by cloud seeding, Dr. Workman admitted that "the enthusiasm with which we started about four years ago has not been sustained. Our simple field experiments designed to test elements of current rain-increasing practice have been inconclusive for the most part, and, moreover, our accumulated laboratory observations give us cause to doubt some of the basic assumptions inherent in the youthful rainmaking technology."

Dr. Langmuir, speaking at the same session, reported on a statistical study which, he said, showed that periodic seeding with silver iodide in New Mexico caused periodic effects in rainfall over a wide area of the United States.

He asserted that the agreement which he found between most of the rainfall and seeding phases "gives conclusive proof that the periodicity was actually caused by silver iodide seeding."

Dr. Langmuir disagreed with statistician Glenn Brier of the U. S. Weather Bureau. Mr. Brier stated that based on usual scientific standards "it appears that the hypothesis that silver iodide seeding affected the larger scale features of the weather or circulation has not been demonstrated."

Discussion of whether or not seeding with silver iodide crystals on a periodic basis actually causes large-scale changes in the weather has been going on for more than two years. Many meteorologists and physicists believe that the controversy will never be settled.

Forecasts for Jets

➤ WEATHER REPORTS will have to come from twice as high up and twice as fast when jet airliners go into commercial operation all over the world. Jet airliners will fly twice as high and twice as fast as the "old-fashioned" four-engined propeller planes now in use.

The need for more accurate reports of cloud and wind conditions up to 40,000 feet and for faster weather reporting to jet pilots was illustrated in test flights of the British jet airliner the Comet I. It will go into service on the London-Rome-Cairo run this spring.

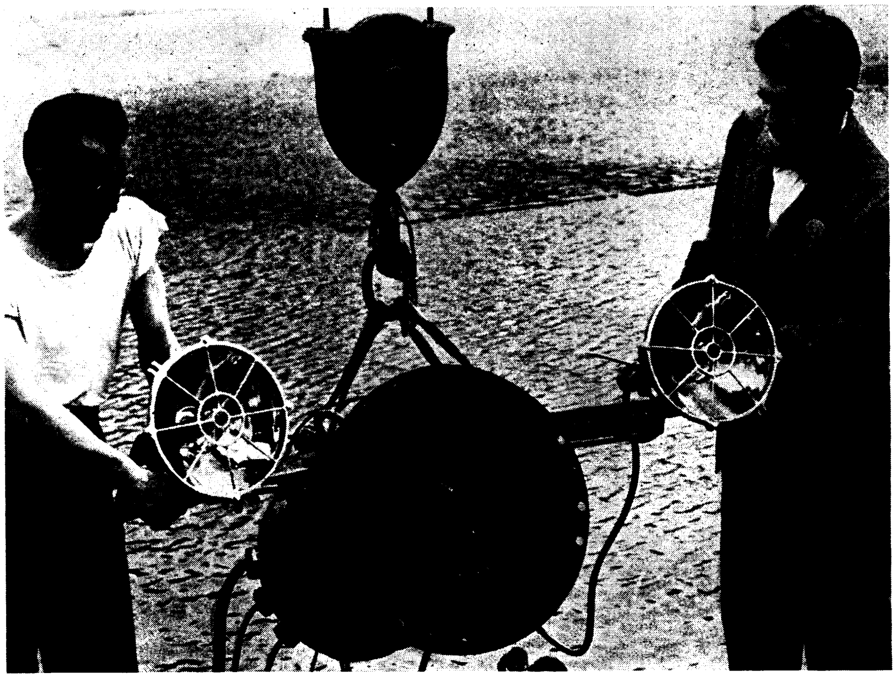
The meteorological problems involved were described by A. C. Campbell Orde, operations development director of the British Overseas Airways Corporation, operators of the Comet. He spoke at a joint meeting of the American Meteorological Society and the Institute of the Aeronautical Sciences.

Mr. Orde described a flight of the Comet from London to Singapore and return. The pilot was constantly receiving inadequate or inaccurate weather briefings as to what kind of cloud conditions and wind speeds and directions he would find at 40,000 feet along his route. The average cruising level of the Comet is 40,000 feet.

In addition the pilot needed, while in flight, quick and accurate information as to temperatures, visibility and wind speed and direction at the airport at which he planned to land. The same information was required for alternate landing fields. Several times on the flight some of this information was late in coming in.

Temperature of the field at take-off is extremely important to the Comet, Mr. Orde said. A difference of one degree Centigrade is equivalent to between 200 and 250 pounds in payload.

These problems did not prove to be unsolvable, the B. O. A. C. executive said. No fundamental changes are necessary—



UNDERWATER TV CAMERA—Engineers adjust the flood lights on one of the U. S. Navy's underwater television cameras before lowering it to the ocean's floor where it will serve as a "seeing eye" for divers. It is manipulated by remote control and records a picture that is transmitted to a television-like screen on the ship.

merely more speed and greater altitudes for meteorology.

He called for more intensive upper air research on a worldwide scale and a more global type of weather service, not compartmentalized along national lines.

Sun Affects Weather

➤ THE EFFECT of the changing sun's energy on the surface of the earth and its oceans may have a bearing on whether abnormal weather persists or suffers sharp changes from month to month.

This was the hypothesis put forth by Jerome Namias, chief of the U. S. Weather Bureau's extended forecast section, at the American Meteorological Society meeting. His assumption was made after a study of how and when weather conditions varying from normal persisted or failed to persist from month to month.

Mr. Namias was not considering normal seasonal changes or persistences in the weather. He was considering why, if December was colder than usual, for instance, it was more likely than not that January also would be colder than usual. Measurements showed that this persistence in a specific abnormal weather pattern existed for all months of the year except for April and May in the spring and October and November in the fall.

Great and often abrupt transitions of long-period weather regimes have happened between these two pairs of months, he discovered. The greatest likelihood that one month would be similar to the following month, weatherwise, was in July and August, his studies showed.

The weather we have during any one month is the result of a pattern of wind currents high up circling the northern hemisphere from west to east. Their speed, whether their path is more to the north or south and whether their path bends in deep or shallow waves, must be the result of powerful forces.

One of these forces, he hypothesized, may be the amount of solar energy which is allowed by cloud cover to hit the surface of both the oceans and the earth. In addition, how that energy is absorbed or reflected can help change the weather pattern, or help keep it along the same track.

The weather pattern, he said, may be in harmony with this solar energy, and thus the energy helps it to persist. Or it may be at variance with it, and thus we see the great changes which take place between April and May and between October and November. The evidence, he said, pointed to a general tendency toward persistence of weather patterns, except at those times, rather than toward abrupt changes.

Mr. Namias said that there was no conclusive evidence for the hypothesis put forward by some other meteorologists that sunspot activity had a bearing on this persistence.

Predicting Thunderstorms

➤ FIGURING OUT whether there is enough energy in the atmosphere to make a thunderstorm may be a good way to predict thunderstorms. This is the opinion of Roscoe R. Braham, Jr., of the University of Chicago, presented at the meeting of the American Meteorological Society.

The total energy for a thunderstorm, he said, can be figured if the latent heats of condensation in the rainfall, of the water which is evaporated in the downdraft and the water which remains as cloud after the thunderstorm is over, are all added together. This amount of energy must be available in the atmosphere before a storm is started. Furthermore this available energy must exist in addition to the energy nature uses in the uniform heating of the environment.

Mr. Braham figured out how much energy was necessary for the formation of the average thunderstorm. It follows, he said, that whenever that amount of energy is present in the atmosphere, a thunderstorm will develop. Thus they can be predicted.

Mr. Braham tested his theory through the use of radar echoes of water drops in the sky over a wide area before they began to fall. This, he said, was a good measurement of convection—the movement upward of a column of air. What he saw on the radar screen, correlated rather well with his measurements of energy, he said, although not enough data are yet available to be positive about it.

Science News Letter, February 9, 1952

Question Box

Photographs: Cover, U. S. Department of Agriculture; p. 83, U. S. Navy; p. 85, General Electric Company; p. 87, Western Union; p. 90, Mount Wilson and Palomar Observatories.

SCIENCE NEWS LETTER

VOL. 61 FEBRUARY 9, 1952 No. 6

The Weekly Summary of Current Science, published every Saturday by SCIENCE SERVICE, Inc. 1719 N St., N. W., Washington 6, D. C., NOrth 2255. Edited by WATSON DAVIS.

Subscription rates: 1 yr., $5.50; 2 yrs., $10.00; 3 yrs., $14.50; single copy, 15 cents, more than six months old, 25 cents. No charge for foreign postage.

Change of address: Three weeks notice is required. When ordering a change please state exactly how magazine is now addressed. Your new address should include postal zone number if you have one.

Printed in U. S. A. Entered as second class matter at the post office at Washington, D. C. under the act of March 3, 1879. Acceptance for mailing at the special rate of postage provided for by Sec. 34.40, P. L. and R., 1948 Edition, paragraph (d) (act of February 28, 1925; 39 U. S. Code 283), authorized February 28, 1950. Established in mimeographed form March 18, 1922. Title registered as trademark, U. S. and Canadian Patent Offices. Indexed in Readers' Guide to periodical Literature, Abridged Guide, and the Engineering Index.

Member Audit Bureau of Circulation. Advertising Representatives: Howland and Howland, Inc., 393 7th Ave., N.Y.C., PEnnsylvania 6-5566 and 360 N. Michigan Ave., Chicago. STAte 2-4822.