

METEOROLOGY

Forecasting by Computer

The weather satellite and computer programs pioneered by Dr. Reichelderfer at the Weather Bureau will lead to better understanding of weather behavior—By Ann Ewing

► **FUTURE WEATHER** satellites and improved methods of using computers to forecast weather are keys to the continued expansion of the Weather Bureau under its new head, Dr. Robert M. White, president of Travelers Research Center, Inc., Hartford, Conn.

These two new instruments to make weather predictions more reliable are the most recent in a long list of "firsts" achieved under the direction of the retiring chief, Dr. Francis W. Reichelderfer, who has headed the Bureau for 25 years.

Dr. White, a graduate of Harvard University and Massachusetts Institute of Technology, is an authority on the circulation of atmosphere and statistical weather prediction. He is 40 years old and a native of Boston.

During Dr. Reichelderfer's first year in office, he completed the Weather Bureau's switchover to air mass analysis as a basis for weather predictions, the method still in use today. During his last year, he inaugurated a new research laboratory using one of the world's fastest and most powerful computers, called STRETCH, to test mathematical models of the earth's atmosphere. The aim is a better understanding of how and why the world's weather behaves as it does.

The computer program is expected to lead to improved long-range weather forecasts and to help bring closer to reality the control of weather. One possibility in weather control, so-called rainmaking, was one of the many tough battles through which Dr. Reichelderfer successfully led his Bureau, weathering charges that the Bureau's attitude toward rainmaking claims as unproved was "old-fashioned and fuddy-duddy."

Use of weather satellites to give photographs of the earth's cloud cover has already given weathermen valuable information on otherwise unknown storms, including hurricanes, and has shown changes in large-scale weather patterns.

The usefulness of weather satellites is now being greatly increased for meteorologists in other countries through installation of a relatively inexpensive instrument that will allow them to obtain directly from the satellites pictures of cloud cover over their areas. Dr. Reichelderfer has long championed in-

ternational cooperation on weather, stating that there are "no national boundaries" for weather.

In addition to the improved general predictions made by the Weather Bureau under Dr. Reichelderfer's guidance, many special warnings and forecasts are prepared. These include:

1. Possibilities of floods for major rivers.
2. Information on all weather conditions that affect shipping.
3. Hurricanes and other tropical disturbances.
4. Severe local storms, such as tornadoes or hailstorms.
5. Agricultural information affecting crops or livestock, particularly the chance of frost occurrence.
6. Drought or dryness information to help prevent crop losses and forest fires.
7. Weather by telephone dial in principal cities across the country.
8. Aviation weather, including recordings.

Before being appointed head of the Weather Bureau by President Franklin D. Roosevelt in 1938, Dr. Reichelderfer served 20 years in the U.S. Navy as a meteorological officer. He is affectionately known as "The Chief" to Weather Bureau scientists.

Dr. Reichelderfer was born in Harlan, Ind., on Aug. 6, 1895. He is married and has one son.

• Science News Letter, 84:87 Aug. 10, 1963

SEISMOLOGY

Quakes Take Annual Toll

► **EARTHQUAKES**, such as the one in Skoplje, Yugoslavia, that killed an estimated 2,000 in July, will continue to claim thousands of lives annually.

The result of tremendous strains in the underground structure of the earth, earthquakes occur suddenly and often violently, destroying lives and property. Every day minor quakes occur somewhere in the world—an estimated one million annually. However, 95% are too faint or too far from population centers to be detected without very sensitive seismographs.

Earthquakes have been detected everywhere except in Antarctica. They cannot be accurately predicted or prevented. They occur more frequently in some areas than others, particularly in a ring around the Pacific Ocean and in a belt across Asia and Southern Europe. Tremors occur more often in the summer than in the winter, but follow no regular pattern.

The force of an earthquake is measured in two ways—in terms of its magnitude and intensity. The magnitude, which is independent of location or depth, is measured on the Richter scale, which ranges from one up to nine.

The Skoplje quake was of magnitude six. Intensity, however, is a measure of the violence of the earthquake at a given location. It is measured on the Mercalli Scale, which ranges from one (barely perceptible) to 12 (total destruction).

The Skoplje disaster was of intensity nine-plus, indicating that since the quake was not extremely powerful, it must have been

located near the surface and very close to Skoplje in order to have been of such high intensity. An earthquake of intensity nine-plus will do considerable damage even to well-built structures and will break underground pipes.

Tragedy though it was, the Skoplje quake was not one of the major earthquakes of all time, or even of this century. The worst earthquake disaster of recorded history occurred in Shensi, China, in 1556, when 830,000 people lost their lives.

The worst earthquake in the United States occurred on April 18, 1906 in San Francisco. It claimed 452 lives.

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AVIATION

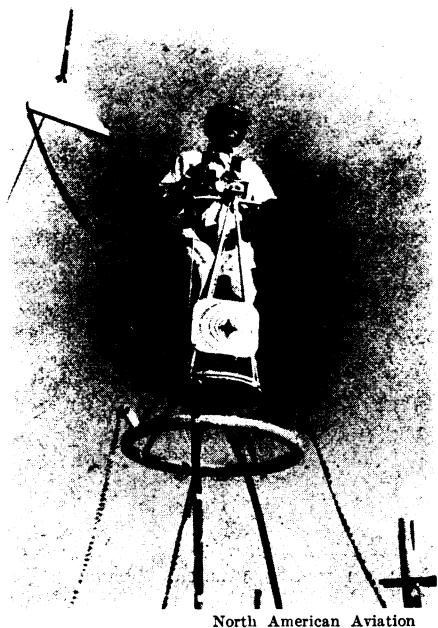
Robot Landing System For Aircraft of Future

► **A ROBOT** guidance system, capable of landing an airplane in any kind of weather, is being developed for use in the 1970's.

It will be an outgrowth of today's systems, consisting of two ground-based scanning radio beams to provide the aircraft with lateral and vertical guidance, and a sending-receiving communications system.

The system will provide guidance continuously from the time the aircraft first "connects up," five to eight miles from the airport. It is being developed for the Federal Aviation Agency by Airborne Instruments Laboratory of Deer Park, N. Y.

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North American Aviation

SPACE SCOOTER—A human "pogo stick" for use in outer space and on the rough surface of the moon has been tested successfully by North American Aviation in Downey, Calif. The pilot stands on a three-foot circular platform on the 40-pound scooter.