

METEOROLOGY

"Brains" Forecast Weather

"Numerical forecasting" method being tried out at Institute for Advanced Study. Predictions made by speedy electronic computers.

► A REVOLUTIONARY method of predicting the weather is being tried out at the Institute for Advanced Study in Princeton, N. J., SCIENCE SERVICE learned through U. S. Weather Bureau sources.

The method is now made practicable through the development of giant electronic "brains" which can compute all the millions of multiplications and divisions necessary to it. It is called "numerical forecasting."

In numerical forecasting, the electronic computer is given a great many pieces of information describing the flow pattern of the current weather situation. Through the use of mathematical formulas, the machine then comes up with a prediction of what the weather will be one hour from now.

The process then starts all over again, on the basis of this prediction. It is repeated, until, by one-hour jumps, the machine comes up with a series of figures describing what the weather will be like 24 hours from now.

Numerical forecasters—so far there are only a few—see two advantages over present methods of forecasting the weather. First, a human forecaster can only use general, overall information about the weather on which to base his prediction. He could not possibly assimilate the great mass of detailed information about current weather conditions which is fed into the electronic brain.

Second, the human forecaster cannot use the step by step, hour by hour method. He jumps all at once into the future, 24 to 36 hours from now. However, it is evident that it is much easier to predict the weather one hour from now than a day from now. Numerical forecasters believe that, through the use of the step by step method, more accurate forecasts will result.

Until now, it has taken even the electronic brains a full 24 hours to work out the forecast for 24 hours from now. Thus the scientists were only keeping pace with the weather.

However, a machine with a much larger capacity and a higher speed is being built at the Institute for Advanced Study and it is hoped to be able to work out the prediction, involving millions of separate multiplications and divisions, in one-half to one hour.

At present, numerical forecasters are working on the problem of forecasting winds and pressures at about 20,000 feet over the entire United States. This is a good weather indicator, but in the future they hope to predict other information.

The pioneers in this work are Dr. John von Neumann, director of the electronic

computer project of the Institute, Dr. Jules G. Charney, also of the Institute, and Dr. R. Fjortoft, on leave from the Meteorological Institute in Oslo, Norway.

Science News Letter, March 22, 1952

BOTANY

Spring Comes North, Heralded by Red Maples

► EXPERTS CAN predict quite accurately how far and how fast spring travels north by looking at certain trees, usually the red or silver maple or the hackberry.

With due allowance for altitude, nearness to large bodies of water and location in city or countryside, spring travels north at approximately 100 miles per week from early March through May.

Red maple is the most often used milestick because it is one of the few trees that grows all the way from Miami to Quebec and because it is one of the first to put forth its spring flowers. Sometimes, in fact,

its flowers are out in a premature warm spell, then die and drop in a following cold spell.

Usually the red maple leafs in February or early March in Florida, in early April in Virginia and Maryland and in early May in southern New York and northern Ohio. A difference of two weeks' growth can often be noted within a distance of 15 miles. Most often this is a direct effect of altitude.

Along the seashore, trees and shrubs will leaf earlier than inland, while those in the city will be somewhat ahead of the nearby countryside. Flowering of trees in the city is aided by reflected heat from buildings, streets and sidewalks, while near large bodies of water, the heat of the water helps to speed the growth process.

Science News Letter, March 22, 1952

BIOLOGY

Brazilian Frog Quacks Like Duck, Also Swarms

► A FROG that "quacks" like a duck has now been added to the zoological collection at the Smithsonian Institution. The new species, *Hyla similis*, is found particularly in the outskirts of Rio de Janeiro, Brazil, though its exact range is not known.

Dr. Doris M. Cochran, associate curator of reptiles and amphibians, reports that this frog has a habit of swarming and that on one occasion, hundreds were found in a single tree.

Science News Letter, March 22, 1952



DEVIL'S HOLE—This Nevada desert pool, 40 feet long, 15 feet wide and with a surface 30 feet below the surrounding desert, has been the home of a unique species since the end of the Ice Age. Now a unit of the Death Valley National Monument, the pool contains pupfish, or *Cyprinodon diabolis*. These tiny fish, of which only 50 to 150 are known, have the smallest range of any species of vertebrate animals.