

METEOROLOGY

Long-Range Weather

Special unit in Weather Bureau will test long-range weather forecasts using electronic computer, following success constructing mathematical model that worked for three weeks.

► AN ELECTRONIC COMPUTER will be used to predict weather several days or weeks in advance, a step being taken by the Weather Bureau as part of its program to improve the accuracy of weather forecasting.

The Bureau has formed a special research unit to test out numerical prediction methods for periods longer than three days in the future.

Instructions to the electronic computer for the required calculations are being coded, and the unit is expected to be in full operation by late spring, SCIENCE SERVICE learned.

An electronic computer is in daily use forecasting weather, but its predictions are only for about 48 hours in advance. (See SNL, Dec. 3, 1955, p. 362.) Forecasts for longer periods have to be based on different mathematical models of the atmosphere.

Success in constructing the first such mathematical model, which gives weather patterns for up to three weeks in the future, was one reason for starting the new unit. Dr. Norman A. Phillips of the Institute for Advanced Study, Princeton, N. J., devised the successful model. (See SNL, April 23, 1955, p. 269.)

Certain changes, expected to improve its accuracy, are now being made in that model, according to Dr. Joseph Smagorinsky, chief of the Bureau's general circulation research section, who heads the experimental project.

Once the machine is instructed on how to perform its calculations, Dr. Smagorinsky expects to let the computer make forecasts for as far in the future as possible.

This, he hopes, will be at least 30 days, or through one period of what weathermen call the index cycle. That is, long enough for the general characteristics of air flow to repeat themselves at least once.

At one point in the index cycle, Dr. Smagorinsky explained, atmospheric flow is zonal, or relatively parallel to the equator. This pattern gradually breaks down until large troughs and ridges are formed and the atmosphere is comparatively turbulent.

The time required for these changes from smooth to turbulent flow and back again is not predictable. If the time required to complete an index cycle were known, long-range forecasting would be done routinely and accurately.

Dr. Smagorinsky said the unit's work was two-pronged:

1. To construct, with what was now known, a mathematical model of the atmosphere that would reflect its actual state

over a period of weeks as accurately as possible.

2. To make fundamental investigations of such fields as the effects of changes in solar output on weather, and how clouds form and dissipate, with the aim of being prepared to make more accurate numerical predictions at a later time.

The special unit, operated by the Weather Bureau, receives financial support from the Office of Naval Research and the Geophysics Research Directorate.

Its activities are guided by an advisory committee consisting of Dr. Harry Wexler, the Bureau's director of meteorological research, and Drs. John von Neumann and Jule Charney of the Institute for Advanced Study, Princeton, N. J., where studies on numerical weather forecasting were pioneered.

The unit will use the International Business Machines Corporation's electronic computer, the IBM 701, now being used for the daily predictions, to test out long-range numerical weather forecasts.

Science News Letter, February 18, 1956

• RADIO

Saturday, Feb. 25, 1956, 2:05-2:15 p.m. EST. "Adventures in Science" with Watson Davis, director of Science Service, over the CBS Radio Network. Check your local CBS station.

Youthful winners of the Fifteenth Annual Science Talent Search for the Westinghouse Science Scholarships, who have been selected from the nation's high schools as potential creative scientists of the future, will describe their projects. Other winners appeared on last week's program.

SURGERY

Tooth Deformities Go With Spinal Curvature

► TOOTH DEFORMITIES and spinal curvatures are likely to develop in the same patient, perhaps because of common growth or development factors, an orthopedic surgeon, Dr. Charles V. Heck, and a dental surgeon, Dr. Everett A. Grimmer, both of Chicago, reported to the American Academy of Orthopaedic Surgeons meeting in Chicago.

Of 46 persons with spinal curvature in a group of 140 examined, 30 had one or more dental deformities. By contrast, only three among 17 with curvatures due to polio or to a congenital factor had dental deformities.

The dental deformities included overbite, receding lower jaw, irregular contour of the dental arches and high angular palate.

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JET PLANE FOR CARRIER—This new British swept-wing jet, the Vickers Supermarine N.113, has been ordered in quantity by the Royal Navy for aircraft carrier operation. It has high-lift flaps incorporating "supercirculation," whereby air ducted from the engine compressor is blown over the upper surface of the flaps, cutting down on deck-landing approach speed. It is powered by two Rolls Royce Avon turbojet engines, and fitted with a "tooth" wing leading edge and an all-moving tail.