METEOROLOGY

World's Weather by Tiros

Scientists from 27 countries came to the U.S. for a 10-day meteorological workshop studying information from the Tiros weather satellites, Ann Ewing reports.

➤ THE THREE TIROS satellites have greatly helped in plotting the world's weather and spotting severe storms.

To learn how to use the photographs in forecasting, some 40 meteorologists representing the weather services of 27 nations were in Washington, D.C., for a 10-day International Meteorological Satellite Workshop from Nov. 13 through 22.

Tiros III, the meteorologists were told, has photographed 18 tropical storms in all stages of development. On Sept. 10, the "hurricane hunter" satellite made history by discovering Hurricane Esther while it was forming. Without the satellite photographs, this hurricane might have gone undetected for days.

Altogether, five hurricanes and one tropical storm were seen by Tiros in the Atlantic, and two hurricanes and a tropical storm were photographed in the eastern Pacific. Nine typhoons were followed in the central and western Pacific.

On 17 days since the launching of Tiros III, information revealed by satellite photographs has led to revision of weather charts prepared at the U.S. Weather Bureau's National Meteorological Center.

The international workshop was held so meteorologists from other countries can in the future make direct use of United States satellite information in their daily weather forecasting. The workshop was arranged by the National Aeronautics and Space Administration and the Weather Bureau. The countries represented were Argentina, Brazil, Canada, Republic of China, Denmark, El Salvador, Finland, France, Federal Republic of Germany, Honduras, Iran, Ireland, Israel, Italy, Netherlands, Netherlands Antilles, New Zealand, Nigeria, Norway, Pakistan, Portugal, Republic of South Africa, Sudan, Thailand, United Arab Republic, United Kingdom, and the West Indies Federation. Russia, Poland and Czechoslovakia were invited and accepted but the delegates did not show at the meeting, although Russian scientists have expressed an interest in satellites to improve weather forecasting.

The Tiros satellites will be replaced in about a year by the "more useful and more nearly operational Nimbus series," James E. Webb, NASA Administrator, told the weathermen. Nimbus satellites will be focused on the earth at all times from polar orbits.

Then every country desiring and prepared to do so can receive information directly from the satellites.

This means, Mr. Webb said, that all nations could, for the first time, obtain an immediate and comprehensive view of the total cloud cover pattern in its own and neighboring geographic area.

Dr. F. W. Reichelderfer, chief of the Weather Bureau, noted that atmospheric science is global by nature and has no national boundaries.

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STAINLESS STEEL BOOTS—Developed by the Naval Medical Field Research Laboratory at Camp Lejeune, N. C., the new boots have a six-inch stainless steel "sole" with a "blast deflection" contour wedge to scatter fragments of exploding land mines from the wearer. They are expected to be issued to foot soldiers in 1962.

TECHNOLOGY

Speech Machine Can Sing

➤ A SYNTHETIC speech machine that produces natural sounds and can sing a simple song or say a few sentences has been developed at the Massachusetts Institute of Technology, Cambridge, Mass.

How the machine operates was reported to the Acoustical Society of America meeting in Cincinnati by Drs. M. H. L. Hecker, A. S. House and K. N. Stevens of MIT's electronics research laboratory.

They used an electronic device to represent the human body's major speech parts. These include the vocal tract, which extends from the larynx (voice box) to the lips, and the nasal cavities, which are linked to the vocal tract and extend to the nostrils. The device electronically simulates the sound pathways of the vocal tract and the nasal cavities.

The electronic control circuits are given detailed instructions concerning what to do and when. These instructions are determined by analyzing natural speech sounds, studying X-ray motion picture films of persons speaking, and knowing speech acoustics and phonetics.

Experiments with speech synthesizers, the scientists reported, consist of electronically changing the ways in which the vocal tract and nasal cavities react and when, then noting the effect such changes produce on the synthetic sound.

Studies of the performance of an artificial speech machine "reveal important details concerning the production and perception of natural speech," the scientists found. Speech synthesizers will play an increasingly important role as communications between man and machine advance, they predicted.

Having added three nasal consonants to the vocabulary of their machine, it can produce essentially all speech sounds occurring in the English language.

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BIOLOGY

Second-Childhood Joke Justified by Growth

➤ MAN'S GROWTH rate increases again after he passes 70, thus providing some "slight justification" for the second-childhood joke.

The rate of shrinkage is greatest between 60 and 70 years of age, Dr. A. E. Needham of the zoology department, University Museum, Oxford, England, states in Nature, 192:579, 1961.

The shrinkage is slower in the very old, Dr. Needham reports, and the specific growth rate increases again in old age.

"There is direct evidence of this," he said, "in the rate of cell division in some tissues. Other properties also reverse their trend in later life."

Growth in the broadest sense, including maintenance and repair of body tissues, remains positive throughout life, the zoologist explained, although eventually it is unable to keep up with the destruction of tissue that occurs in aging.

Although man's growth increase stops around the age 30, Dr. Needham states, aging, or senescence, is not maximal at the age of 30. There is no discontinuity at that age, for anabolism, the process of assimilation of nutritive matter, continues to decline smoothly.

Dr. Needham started his research to test an old paradox that aging is faster at the beginning than at the end of life.

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