METEOROLOGY

Hurricane Season Approaching

Electronic "brains" will be used for the first time this year to help predict and to track hurricane paths as the cyclonic storms near the United States.

By ANN EWING

➤ HURRICANES, BECAUSE of their great size and intensity, are the most destructive of all storms. This year, for the first time, a giant electronic "brain" will be used to help predict and to track hurricane paths as the tropical storms near the United States.

Last year's three great hurricanes—Carol, Edna and Hazel—killed 200 people and caused about $800,000,000 damage to property when they battered the east coast.

This year, with funds especially appropriated by Congress, the Weather Bureau is intensifying, modernizing and streamlining its hurricane warning services to reduce death and destruction.

A radar "eye" is being installed at Cape Hatteras to spot any tropical storm within 250 miles. All hurricanes that have ripped into New England have come within radar range of Cape Hatteras.

The season for these most dangerous storms is summer and early fall, with the Gulf coast storms coming sometimes as early as late June and the ones that roar up the coast most usual after July and before November.

During that period, swirling winds born in the hot humid areas of the tropics are likely to lash out over the western North Atlantic, the West Indies, and the south and east coasts of the United States.

Hurricane Hunters Move In

High temperatures and humidity team up with converging winds in the late summer and early fall to make these superstorms. They are officially termed hurricanes when their winds exceed 75 miles per hour.

The general atmospheric conditions in which hurricanes are spawned are known. Hurricane hunters under a joint Weather Bureau, Air Force and Navy program investigate suspicious areas. Ships and aircraft in the region are alerted at the first suspicion of a hurricane.

A hurricane is powered by droplets of water giving up their heat through condensation. The earth's rotation contributes to its initial spinning and continues to do so during the storm's lifetime.

Because of this rotation, hurricanes swirl in opposite directions in the two hemispheres, counter-clockwise in the Northern Hemisphere, clockwise in the Southern Hemisphere.

For several years, hurricane hunters have flown into the center of such a storm to learn about its course, to measure the force and directions of its winds. A more recent method is to "box" the eye, the relatively calm area at the storm's center, by flying into it from various points and out at others in order to get a picture of its structure.

Such reconnaissance flights have helped meteorologists perfect warning techniques that reduce damage and destruction considerably.

More accurate prediction of the storm's path would be possible if these flights covered more thoroughly areas farther from the eye, Dr. Herbert Riehl, meteorology professor at the University of Chicago, believes.

With William Haggard of the Weather Bureau, Dr. Riehl has worked out a five-minute method for predicting hurricane paths 24 hours in advance. First tested last year, the method will be widely used in 1955.

Dr. Gordon Dunn, chief Weather Bureau forecaster at hurricane-conscious Miami and a long-time expert on the tremendous storms, has announced plans for using the system there.

It is the first numerical process for predicting where a hurricane's swirling vortex is headed. Using it, the forecaster has only to subtract certain numbers on an especially plotted weather map, then consult a graph to get the hurricane's motion 24 hours ahead.

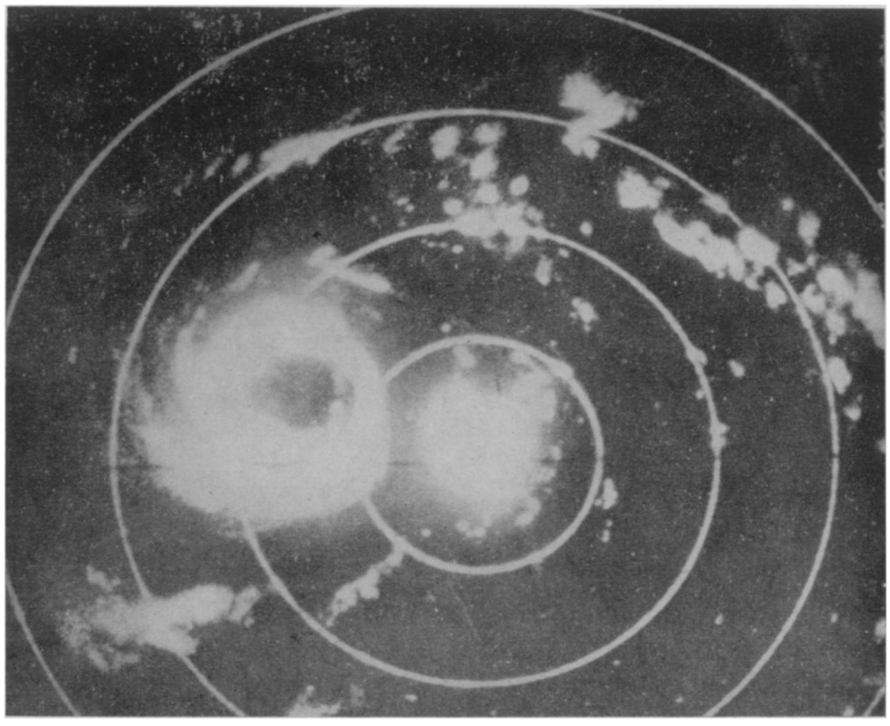
The numbers give atmospheric pressures near 18,000 feet at widely-spaced points up to 1,000 miles around the hurricane's eye. Only the area having an immediate effect upon the storm's motion is included in the forecast.

Have Many Routes

Hurricanes can take several kinds of paths, depending on the location of pressure areas in their vicinity. They tend to follow the southern and western border of the semi-permanent Atlantic high pressure area, usually centered near Bermuda.

A hurricane path is thus usually a parabola, paralleling the winds in the upper atmosphere.

The storms move like a small whirl or vortex in a stream, but the streams that carry or steer the hurricane are currents of air. One of these "steering currents" is the jet stream, a 200-mile-per-hour river of air



HURRICANE ON RADAR—How a hurricane appears on a radar scope is shown in this photograph taken as Navy reconnaissance pilots were tracking down a storm over tropical waters. Its cyclonic circulation and relatively calm "eye" are clearly portrayed in this 1953 vintage storm record.

found streaking 10,000 to 40,000 feet above the earth's surface.

In recent years, more air has been coming in from the south and from the ocean off the east coast, Jerome Namias, chief of the Weather Bureau's extended forecast section, said when asked if the east coast was likely to become a "hurricane alley."

This flow pattern "accounts for some of the milder winters we have been getting," he said, "but it is also associated with the increased vulnerability to hurricanes of the east coast north of Hatteras."

Tremendous Energies Expended

Tearing over the waters of the western Atlantic, hurricanes expend enough energy in a single day to run all the power plants in the world for several years. This tremendous energy has never been harnessed. Nor does man have much hope of ever taming the hurricane.

Concerning possible control of hurricanes, I. R. Tannehill, retired chief of the Weather Bureau's division of reporting and forecasting, said "exploding a large number of atom bombs to create a disturbance of the storm's dimensions would be more dangerous than the hurricane itself."

Dr. Robert H. Simpson, an aviation weather specialist at the Weather Bureau, estimates that a hurricane spends energy at the rate of 500 trillion horsepower, the equivalent of "several thousand atomic bombs per second."

Computers Aid Prediction

Electronic computers probably will not track the hurricane itself, because, tremendous as the energies involved are, the tropical storms are nevertheless relatively small-scale atmospheric disturbances. Particularly in their early stages, hurricanes are too small to be handled on the electronic computers under the present systems.

Predicting a hurricane's path with electronic computers would possibly work like this: First, the general overall circulation, assuming that the hurricane had no influence on large-scale air flow, would be forecast. Then the meteorologists would, by means of mathematical formulas representing the tropical disturbance, try to find where the hurricane was headed.

This process is like throwing a stick on a river, then watching how fast and where it floats and when and where it hits the bank.

A hurricane's energy thrown against coastal cities has caused great disasters, usually from the towering waves driven like a wall of water by the storm's winds.

The worst hurricane disaster in the United States claimed 6,000 lives at Galveston, Texas, in 1900. As recently as 1935, a hurricane wave drowned or killed more than 4,000 persons in the Florida Keys, and in 1938 probably caused the majority of the 600 or more deaths in the great "New England" hurricane.

In India in 1876, a hurricane produced an inundation in which more than 100,000 persons were killed.

In spite of the tremendous depths of an ocean, the waves generated by a hurricane start vibrations along its floor. These vibrations are known as microseisms and can be picked up by seismographs at distant places.

Although seismographs can detect hurricanes, using them to determine the storm's position and intensity is still the subject of research.

But many meteorologists foresee the day when radar and seismograph stations will make hurricane hunters obsolete for spotting and tracking the storms, although aerial reconnaissance would still be necessary for research on structure.

Named for Girls

Girls' names are used in naming hurricanes because they are "shorter, quicker and less confusing" than the older methods for exchanging detailed information between widely scattered points. They also reduce confusion when two or more tropical storms occur at the same time.

The need for a simple, easily understood and remembered identification for each hurricane is emphasized by the fact that one storm can prompt each day millions of telephone calls, thousands of additional news bulletins, and countless telegrams, messages, etc.

The list of girls' names selected for use this year in naming hurricanes in the Gulf of Mexico, Caribbean Sea and Atlantic Ocean is as follows: Alice, Brenda, Connie, Diane, Edith, Flora, Gladys, Hilda, Ione, Janet, Katie, Linda, Martha, Nelly, Orva, Peggy, Queena, Rosa, Stella, Trudy, Ursa, Verna, Wilma, Xenia, Yvonne and Zelda.

Alice is the only name repeated from the 1954 list. This is because 1955's hurricane Alice occurred on Jan. 2, before Weather Bureau experts had had time to draw up a new list. Another set of names for the rest of 1955's hurricanes was believed necessary because Carol, Edna and Hazel were identified with specific storms in 1954.

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TECHNOLOGY

Complete First Phase Of Supply DEW Line

See Front Cover

➤ THE FIRST phase of an Arctic airlift supplying the DEW, or distant early warning, line in Alaska is now completed.

U. S. Air Force C-124 Douglas Globemasters operated around the clock, frequently in hazardous conditions, flying supplies to the northern rim of the Alaskan Peninsula. Over 6,600 tons of tractors, buildings and other heavy equipment for the DEW line was airlifted during the operation.

One of the planes is shown on the cover of this week's SCIENCE NEWS LETTER approaching for a landing on a snow-covered landing strip, being guided by Ground Control Approach radar.

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