

METEOROLOGY

Hurricane's Zig-Zags Probed

This year marks start of most ambitious program ever launched to probe formation, structure and paths of hurricanes. The giant tropical storms have recently shifted westward.

By ANN EWING

► HURRICANES, the giant tropical storms that recently have shifted paths westward to roar up the East Coast and cost hundreds of lives and billions of dollars, will be subjected this year to the most extensive weather program ever launched.

Radar, especially instrumented airplanes and giant electronic "brains" will be used to probe the formation, structure and paths of the swirling storms, the season for which officially opened June 1.

One aim of the very detailed examination is to learn more about the hurricane's zig-zag motions than is now known, in order to be able to predict the paths more accurately.

Hurricane tracks are not smooth. The storm's center, or "eye," wiggles and wobbles and sometimes loops back on itself to make a circle. Although these short-period motions smooth out some when the entire path is considered, where and when the zigs and zags occur determines what areas of the coast will be hit.

For instance, a slight motion eastward near Cape Hatteras might cause the storm to slam into eastern Long Island and part of New England. If the zig were a zag at that point, however, the hurricane would smash into Delaware, Maryland, New Jersey and western Long Island.

Headquarters in Florida

The Weather Bureau's Hurricane Research Project with headquarters at West Palm Beach, Fla., under the direction of one of the Bureau's top experts, Robert Simpson, is the nerve center for the all-out assault on hurricanes.

Tropical hurricanes boiling up out of their breeding grounds in the southern part of the North Atlantic are steered by two great rivers of air.

In temperate latitudes, northward from Cape Hatteras, the controlling air streams usually blow in a general west-to-east direction, while in lower latitudes, from Florida southward, they blow in a general east-to-west direction. The former winds are called the "prevailing westerlies" and the latter winds are usually called "trade winds."

When first formed, the tropical storms are normally embedded in the trade winds and, therefore, move westward. On approaching the North American continent, however, the hurricane is sucked up into the meandering stream of the prevailing westerlies.

During 1954 and 1955, the prevailing westerly wind belt was displaced several hundred miles northward, as was the trade wind belt. This northward shift allowed hurricanes to stay embedded in the easterly current much longer than usual before the influence of the westerly current swept the storms to sea.

At high levels, above the region where cold polar air headed southward and warm tropical air headed northward meet, is found the jet stream, a 200-mile-per-hour current of air.

As a result of the northward shift in the prevailing easterlies and westerlies, the summer and fall jet stream has recently had an "unusual configuration," Dr. Harry Wexler, director of meteorological research for the Weather Bureau, said.

"The problem of predicting the jet stream is of tremendous dimensions," he pointed out. "We have to have data not only from

all over the Americas, but from most of the Northern Hemisphere as well."

Because the jet stream circles the earth, the electronic computer has turned out to be the best tool for predicting the stream's meanderings, needed to forecast the paths of hurricanes moving up the coast.

The computer is being used to improve forecasts of the hurricane's smooth path. Radar, airplanes and a very dense network of observing stations are being set up to help find out about the hurricane's wobbles, or short-period variations.

Radar-Equipped Aircraft

Three research aircraft, two Air Force B-50's and one B-47, will fly into the storms at three different levels, ranging from 1,000 to 40,000 feet. Equipped with the latest meteorological instruments, accurate navigation devices and radar, the planes will get an overall picture of the storm's structure — temperature, pressure, wind, humidity, whether the clouds are snow or water droplets, etc.

This information will be taken down on automatic punch card machines and re-



HURRICANE'S EYE—Looking into the relatively calm center of Hurricane Connie, this photograph shows a 1,000-foot bank of swirling clouds running from the upper right edge to the lower left edge, with the thin broken clouds marking the tropical storm's eye in the lower right half. The Atlantic Ocean can be seen through these thin clouds, 15,000 feet below. The small hole in the upper center is believed to be a false "eye." The photograph was taken off the North Carolina coast by a Navy Banshee F2H photo-plane on Aug. 9, 1955.

orders, so the data can be immediately available for forecasting the storm's movement as well as for later, through research.

Radiosonde stations used for guided missiles tested off the Florida coast are part of the enlarged network to help keep track of hurricanes. Great Britain, France, the Netherlands and Colombia have joined their radiosonde stations in cooperation.

Tremendous Energies Generated

Another aim of the intensive project is to learn more about a hurricane's energy budget. A typical hurricane takes in about 20 million tons of air every minute at the bottom, usually below a few thousand feet. This air rises swiftly and is thrown out at the top, around 30,000 or 40,000 feet.

In this way, the atmosphere acts as an enormous wringer, squeezing moisture out of the air.

The moisture condenses and produces heat energy at a rate equivalent to about 600 atom bombs a minute, Weather Bureau experts calculate.

A typical hurricane lasts about 10 days, liberating heat, by condensation of water, equivalent to something like 10 million atom bombs, enough energy to supply all electrical needs for the United States for the next 600 years.

Trying to control such a storm is far beyond our capabilities, Weather Bureau officials believe. There is hope, however, that probing for and finding a storm's weak spots, particularly in its early stages, might prove possible.

Modifying a hurricane before it is full-fledged will be investigated this year. Only one out of every ten likely disturbances actually develops into a storm. The idea is to try to dissipate these relatively small whirlpools of air, since their total energy content is much less than that of a fully developed storm.

A research vessel from Woods Hole

BIOCHEMISTRY

Anti-Tumor Chemical Acts Differently on Cell

► A CHEMICAL with potential cancer-checking ability is reported by Drs. A. Haddow and W. C. J. Ross of the Institute of Cancer Research, Royal Cancer Hospital, London.

The chemical is an alkyl sulfonate. Its action on cells, however, is different from that of other alkylating agents, such as sulfur and nitrogen mustards. Studies by Dr. O. G. Fahmy and Mrs. M. J. Fahmy of the same institute show that in fruit flies it is practically ineffective on the mature sperm but very active on the early germ cells.

Most striking feature of this chemical, they found, is the very high frequency of visible mutations it induces.

The studies of this chemical, which is 2-chloroethyl methane sulfonate, are reported in *Nature* (May 26).

Science News Letter, June 9, 1956

Oceanographic Institution, the Crawford, will spend the five months from June to October in the southern Atlantic. Scientists aboard will make detailed measurements aimed at finding a weak link that might be used to stop hurricanes.

In the United States, scientists will study the problem of storm surges, which are the real killers. Storm surges are not just huge waves, but a general rise in water levels, resulting in the inundation of coastal regions.

Hurricane waves a hundred feet high have also been reported, but few persons survive the passage of such mountainous crests so no one knows for sure how high they tower or whether they occur as single waves or in series.

Girls' names will again be given to this year's hurricanes, in alphabetical order from the following list: Anna, Betsy, Carla, Dora, Ethel, Flossy, Greta, Hattie, Inez, Judith, Kitty, Laura, Molly, Nona, Odette, Paula, Quenby, Rhoda, Sadie, Terese, Ursel, Vesta, Winny, Xina, Yola, and Zenda.

Tropical storms are classified as depressions until winds exceed 38 miles per hour, as storms when winds are up to 72 miles per hour, and as hurricanes when winds are more than 73 miles per hour.

Science News Letter, June 9, 1956

MEDICINE

Find New Virus in Fifth Disease Outbreak

► DISCOVERY OF A NEW VIRUS in patients during a school epidemic of Fifth Disease was announced by Drs. P. Brachman, G. Rake, G. Werner, A. Ketler and J. Scully of the University of Pennsylvania School of Medicine, Philadelphia, at a New York Academy of Sciences conference on Viruses in Search of Disease.

Whether the new virus is still in search of its disease or whether it is the cause of Fifth Disease is not yet known.

Fifth Disease is one of those mysterious ailments that attack children and for which no cause is known. In Fifth Disease, there is a rose-colored pimply rash, which feels hot and itches, and sometimes fever. It chiefly attacks children between the ages of four and 12.

In the Philadelphia grade school outbreak, two teachers and one parent got the disease, as well as 64 children in the school of 376. Third graders were hardest hit.

Fifth Disease is also known as *Erythema infectiosum*, which means an infectious rash.

Science News Letter, June 9, 1956

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