

## METEOROLOGY

# Warning Saves Lives

► UP-TO-DATE changes in the United States hurricane warning network are credited with saving many lives in Hurricane Carla's savage attack on the Texas coast.

The modern day exodus inland of an estimated 300,000 coastal residents, which prompted some observers to call it the greatest flight of humanity in U.S. history, was brought about by the warnings received from a new radar network and a newly installed automatic sea-going weather station. Both became full-fledged members of the warning network just last month.

Radar units at Galveston and Lake Charles, Texas, pinpointed the onrushing hurricane when it was more than 260 miles off the coast. The radar's searching beam kept close tabs on the hurricane, tracking it all the way in to the coast.

Nomad I, an automatic weather station bobbing out in the Gulf of Mexico, also provided an advance warning of the hurricane. The robot "buoy" kept broadcasting data even when the storm churned huge waves as it swept by.

Hurricane Debbie following on the heels of Carla was spotted veering northeastward away from the continent by Tiros III weather satellite. The hurricane has missed the continent altogether.

The newly-completed radar network scans the U.S. coastline from Texas to Maine. The radar stations can track storms about 200 miles off the coast.

The old tried and true method of hunter airplanes is still best for tracking storms far out at sea, the Weather Bureau reported. These planes sometimes fly into swirling storm centers to collect weather data.

Hurricanes Betsy, Carla and Debbie were the product of the same weather conditions that hung around the Gulf Coast-Caribbean Sea area for a sustained period of time. A shifting high pressure area, strong trade winds and warm ocean air masses triggered off the three hurricanes in quick succession. Turbulent weather associated with Hurricane Carla spawned many destructive tornadoes.

September is the peak month for hurricanes. After receiving the warm sun rays all summer, the ocean reaches its highest temperature during this month. The warming of the air masses above the water provides energy to feed the hurricanes.

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## Like 10,000,000 A-Bombs

► A TYPICAL hurricane unleashes energy equal to 10,000,000 atomic bombs during its lifetime.

Slashing rains with winds that may reach over 150 miles an hour are created by energy generated within a whirling hurricane. Every second a hurricane releases at least ten times as much energy as the original Hiroshima-type bomb.

Trying to control such huge outbreaks of nature's energies is still beyond scientists'

present capabilities. U.S. Weather Bureau scientists are now searching for a weak spot in the hurricane's system when it is first forming to try to control it.

One such experiment will be carried out this month when airplanes will fly straight into a storm and drop silver iodide crystals in an effort to affect the storm.

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## Carla's Winds "Extreme"

► HURRICANE CARLA, with wind velocities hitting 173 miles an hour, ranks as one of the eight worst storms reported on the Texas coast since 1875, the U.S. Weather Bureau reported.

Before Carla, only seven of the tropical storms recorded in the area, starting in 1875 and continuing through 1949, were classed as "extreme," meaning that wind velocities exceeded 136 miles an hour and central barometric pressure was less than 28

## BIOLOGY

# Outer Cell Coating Seen

► PICTURES TAKEN with the electron microscope give evidence that every living cell has an outer coating of complex sugar compounds.

One evidence of this coating was previously recognized in certain organs and tissues as a "basement membrane," but the light microscope did not show such a layer surrounding all living cells.

Dr. H. Stanley Bennett, dean of the division of biological sciences, University of Chicago, reported the evidence for all living cells at the First National Congress of Anatomy in Mexico City. He named the outer layer of complex sugar compounds, or polymers, "glycocalyx," which translated from the Greek literally means "sweet husk."

Each living cell is surrounded by two coats, Dr. Bennett said. The inner of these coats is the plasma membrane. The glycocalyx, which is on the outside, can be seen surrounding cells from an amphibian, a mold, a bacterium and a number of cells of mammalian tissues.

The outer coating is rich in polysaccharides—complex sugar compounds formed by combinations of many smaller sugar molecules. The chemical nature of each polysaccharide determines its properties, which play an important part in the cell activities.

In bread mold the electron microscope reveals both the inner plasma membrane and the outer glycocalyx.

In mammalian egg cells, the glycocalyx is so conspicuous that it can readily be identified with a light microscope.

A very thinly spread layer of polysaccharides around red blood cells has been seen

inches. Records of Texas coastline tropical storms, dating back to 1766 and sketchy in the earlier years, show a total of 95, of which 62 have hit hurricane velocities of 74 miles an hour or more.

Wind velocities in hurricanes have been measured for sustained periods of five minutes at more than 150 miles an hour, while shorter gusts "in the most violent storms" have been clocked as high as 250 mph. Land-based anemometers for measuring wind velocity are usually damaged or blown away when winds attain extreme hurricane force, but accurate measurements are possible from instruments on nearby ships or airplanes.

The strongest winds on record, however, were not measured during a hurricane, but during an "extra-tropical storm," or winter blizzard, on Mt. Washington in New Hampshire, in the early 1930's. Winds blew at 188 miles an hour for sustained periods and in brief gusts at 229 miles an hour. An "upslope" effect in a mountainous area can cause such extremes during winter storms, the Bureau said.

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with the electron microscope, the scientist said. The chemical nature of this layer determines the blood types A, B, AB and O.

In heart muscle cells, the electron microscope shows the glycocalyx running parallel to the extensive plasma membrane, Dr. Bennett pointed out. Here, too, evidence has been found that this layer is composed of sugar polymers. Dr. Bennett said still other examples of the glycocalyx are known and he expects the discovery of more.

"We are beginning to comprehend its physiological importance," he said. "In some cases, this coating has an important role in selective uptake of substance by cells."

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## GENERAL SCIENCE

## Large Nations Have More Chance of Science Talent

► BECAUSE SCIENTIFIC and other high abilities seem to be possessed by people equally often in all nations, large nations will have advantages in science talent over small ones, provided the social systems do not frustrate ability, Prof. C. F. Carter, political economist of the University of Manchester, told the British Association for the Advancement of Science in Norwich, England.

Although large organizations may by their complexity make leadership and creative work difficult at times, nevertheless Prof. Carter observed that a scientist's ability to make new discoveries may be increased and certainly not reduced if his product has a large market instead of a small one.

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