

METEOROLOGY

Gulf Stream Warms

Variations in the North Atlantic sea surface temperatures, measured from the 1880's to the beginning of World War II, point to a long-term warming of the Gulf Stream.

THE GULF Stream along the United States coast warmed up some five degrees Fahrenheit in a 60-year period, Prof. J. Bjerknes of the University of California at Los Angeles reported.

He told the American Meteorological Society meeting in Boston, Mass., that this long-term warming seems to be related to an observed increasing strength of the high pressure area known as the Bermuda High. This is a semi-permanent center of action bringing warm and humid conditions to the eastern United States when it is well developed.

Dr. Bjerknes said the long-range Gulf Stream warming was found in preliminary investigations of the variations of North Atlantic sea surface temperatures from the 1880's to the beginning of World War II. The highest warming was found along the Gulf Stream from Cape Hatteras, N. C., to the southern edge of the Newfoundland Banks.

Warming of a lesser amount was found in most other parts of the Gulf Stream,

except for a small temperature decrease in a zone west of Ireland.

The increased strength of the Bermuda High, Dr. Bjerknes said, has speeded up the shifting of warm water and may also have led to a slight northward displacement of the Gulf Stream.

Although the Gulf Stream warming trend has lasted through the whole period, the changes of sea surface temperatures over the rest of the North Atlantic show a warming and then a cooling at intervals of a few years.

Dr. Henry Stommel of Woods Hole Oceanographic Institution, Woods Hole, Mass., reported that he had devised a theoretical model of ocean circulation showing how it changes in combination with weather conditions at the surface.

Even though the oceans as a whole are stable, mixing processes do occur, and Dr. Stommel suggested one new method to account for such mixing.

The ordinary salt, or sodium chloride, dissolved in ocean water diffuses through

the water much more slowly than heat. A particle moving up through the ocean will release its heat until it is at the same temperature as its surroundings. Theoretically the particle then has no buoyancy. However, Dr. Stommel's studies have indicated, the particle continues to move up because of its dissolved salt content. Such motions due to salt buoyancy on a large scale could account for ocean mixing, Dr. Stommel believes.

Clue To Past Climates

A CLUE to climates of the past is locked in the ice of glaciers, scientists at the Meteorological Society meeting learned.

Prof. Samuel Epstein of California Institute of Technology, Pasadena, Calif., reported that the ratio of normal oxygen-16 to oxygen-18 is a clue to past weather history. This ratio can also be used to trace the current cooling of air masses during storms and the transfer of water from equatorial regions to cold areas.

He said the two oxygen isotopes evaporate and condense at slightly different rates. The ratio between the two thus gives the history of the water both in its recent and far distant past.

Better Predictions Seen

METHODS of weather forecasting will leap ahead faster during the next 15 years than they have since the end of World War II. This was predicted by weathermen gathered for the 40th anniversary meeting.

Many meteorologists at the meeting voiced optimism concerning the new knowledge of how the atmosphere works that will result in more accurate and longer-range weather predictions. Radar, radio telescopes, manned and unmanned balloons, laboratory and mathematical models of atmospheric conditions, and earth-circling satellites will each add to the new knowledge, the experts suggested.

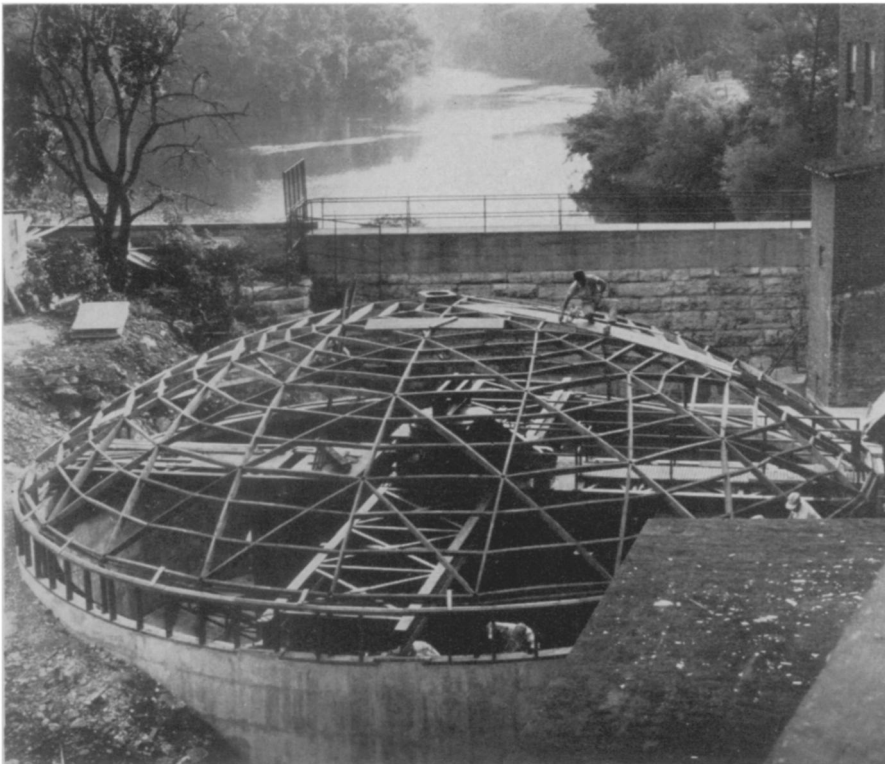
The meteorologists discussed how the "winds" change from surface-like motions to electronic fields acting in combination with the earth's magnetic field some 60 to 100 miles up.

Dr. H. H. Booker of Cornell University, Ithaca, N. Y., reported some motions of electromagnetic origin sometimes reach 37 miles per second at altitudes of 90 miles.

He said the evidence of movements in the ionosphere comes from observations of long-lasting visual meteor trails, noctilucent clouds, radar echoes from meteor trails, drift over the earth's surface of fading patterns associated with radio waves reflected from an ionospheric layer, and cosmic radio waves arriving from discrete extra-terrestrial sources.

Dr. J. S. Greenhow of the University of Manchester's Jodrell Bank Experimental Station, Cheshire, England, reported that observations using the 250-foot radio telescope had shown regular prevailing and tidal wind components in the high atmosphere. There are also large-scale irregular motions, he said.

Science News Letter, January 30, 1960



FILTER TANK—Each 24 hours chemicals in this filter can remove radioactive particles from 1,000,000 gallons of water drawn from the Black River. The water is used in the manufacture of special papers by Knowlton Brothers, Watertown, N. Y., for packaging photosensitive materials. Even the smallest amounts of radioactivity in the paper could result in defects in the films.