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? WHY THE WEATHER ?

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ORIGIN OF TROPICAL CYCLONES

Tropical cyclones form typically over the ocean in the belt of calms known as the "doldrums". The tropical cyclones of the North Atlantic, known as West Indian hurricanes, seem to originate mainly either in the western Caribbean or the region about the Cape Verde islands. What are the causes producing these violent storms?

To start a tropical cyclone there is required a considerable area, 100 miles or more across, where the pressure is fairly low, and the air warm and moist. Over such an area the air must have expanded generally without the relief of irregular convectional overturning characteristic of air over land surfaces. Beyond the calm area, opposing winds should occur. The region of the doldrums lying between the northeast and southwest trade winds can comply with all these conditions. The overflow of warm moist air aloft gradually raises the pressure around the edge of the low area and an inflow towards the center starts near the surface. Condensation near the center lowers the pressure there still further. The opposing trade winds aid by favoring the development of low pressure between them and by giving the inflow towards the center of the cyclone an initial twist. This rotary tendency is developed further by the deflective effect of the earth's rotation which turns the winds to the right and prevents the inflow's reaching the center. As deflection is essential for developing a strong cyclone, conditions are most favorable when the doldrums are farthest from the equator, for at the equator the winds are not deflected. Hence, we have West Indian hurricanes principally in the late summer and fall when the doldrums belt is farthest north, and starting equatorward. Furthermore, then the water is warmest and offers the greatest contrast to autumn cold winds off the land.

(Tomorrow: The Curved Path of a Hurricane)

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