

globe renders it highly probable that nowhere over the ocean does the mean daily fluctuation of the temperature of the surface amount to 1° F. Hence the atmosphere over the ocean may be regarded as resting on or blowing over a surface the temperature of which is practically uniform at all hours of the day. This small variation is a prime factor in meteorology, particularly in those discussions which relate to atmospheric pressure and winds.

“The temperature of the air over the sea on the same 126 days has been examined, and the amplitude of the daily variation is seen to be $3^{\circ}21$, or nearly four times greater than that of the sea over which it lies. During this time the Challenger was near land on 76 days, and on these days the diurnal variation was $4^{\circ}38$, thus showing a larger range in the temperature of the air when near land than when out in the open sea. This larger variation in the daily temperature of the air than in that of the sea over which it lies is a point of no small significance in atmospheric physics from the important bearings of the subject on the relations of the atmosphere and its aqueous vapour to solar and terrestrial radiation.

“With respect to the diurnal variation in the elastic force of the aqueous vapour of the air, the observations made in the North Atlantic, at a distance from land, from March to July 1873, give a mean elastic force of 0.659 inch, falling to the minimum 0.639 inch at 4 A.M., and attaining the maximum 0.679 inch at 2 P.M. Thus the phases of the elastic force of vapour occur at the hours of the maximum and minimum temperatures of the sea and the air. On approaching land, however, the curve of the elastic force no longer follows the corresponding phases of the temperature of the sea and the air. The disturbance caused by proximity to land in the distribution through the day of the aqueous vapour in the lower stratum of the atmosphere is very striking. Under the influence of the land breeze, the time of the minimum humidity is delayed from 4 to 6 A.M.; and under the influence of the sea breeze and its effects, the amount of the aqueous vapour shows a secondary minimum from noon to 2 P.M. The latter minimum occurs at the hours when the surface of the land is most highly heated, when the ascending current of heated air rising from it is therefore strongest, and the resulting breeze from the sea towards the land also strongest. This diminution in the amount of the aqueous vapour observed on board the Challenger near land, points clearly to an intermixture with the body of air forming the sea breeze of descending thin air-filaments or currents to supply the place of the masses of air removed by the ascending currents which rise from the heated surface of the land.

“From the same observations it is seen that the daily maximum of the relative humidity occurs from midnight to 4 A.M., or when the temperature of the air is at the minimum, and the minimum humidity at 2 P.M., when the temperature is at the maximum, the curve of relative humidity being thus inverse to that of the temperature. This is substantially the curve of humidity for all climates and seasons.