

of low pressure which extends over the whole of Central Asia. Air passes northward from the region of high pressure as the southwest trade winds so far as the equator, where it gets caught up in the circulation around the low pressure over Asia. On account of the particular arrangement of sea and land, combined with deflection of wind currents due to the earth's rotation, this air travels for 4,000 miles over the sea before it reaches India, where it arrives in a very warm and exceedingly humid condition. This air, however, would probably sweep right across India to its goal in central Asia without producing much rainfall if it were not for the unique distribution of mountains around India. From the north of the Mokran coast, right around India, following the line of Afghanistan, the Himalayas, and the mountains of Burma, there extends an unbroken wall of mountains, nowhere lower than 5,000 feet, standing directly athwart the air currents. The mountains catch the air, which is being driven by a pressure distribution extending from the Southern Indian Ocean to the center of Asia, in a kind of trap, out of which there is no escape except by ascension. The damp, humid air, which begins to rain as soon as it rises 500 feet, is forced to rise between 10,000 feet and 20,000 feet, and, in consequence, large masses of water are precipitated over the greater part of the Indian area.

STORM WARNINGS IN INDIA.

The Meteorological Department of the Government of India has issued its report on the administration in 1919-20. Observations in connection with the upper air have been developed on behalf of the aviators who are from time to time crossing India. Storm warnings for stations in the Bay of Bengal and in the Arabian Sea are said to have been carried out successfully. It is, however, admitted that the warning of the storm which caused much damage to life and property in eastern Bengal on the night of September 24, 1919, was inadequate. Inland stations were not communicated with until early evening, and were then informed that a "slight to moderate storm" was expected. Special arrangements have been made to avoid the repetition of a similar mishap. The storm, which was tracked from September 22-25, developed rapidly as it approached, and crossed the Bengal coast as a cyclone about noon on September 24. It reached Dacca at about 2.30 a. m. on September 25, and finally broke up on that day in the Assam hills. At the center the deficiency of pressure was about $1\frac{1}{4}$ inches, and the calm area at least 15 miles in diameter. The total loss of life is estimated at 3,500. The value of property destroyed was probably greater than in any storm in Bengal for the last 200 years, but the destruction of human life was probably greater in the Bakarganj cyclone of 1876. An additional terror was caused by a vivid red glow appearing in the sky during the period of the lull. Details are given of the several storms which occurred during the year. Flood warnings are issued and the results are said to be very satisfactory. Rainfall data were received for publication from nearly 3,000 stations for the year.—*Nature* (London), April 28, 1921, pages 279, 280.

OCEAN SURFACE-CURRENTS INDICATED BY DRIFT-BOTTLES AND OTHER OBJECTS.¹

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During the summer of 1919 the Biological Board of Canada set out 330 drift bottles in the Bay of Fundy. Sixteen of these have been picked up on the shores of the Gulf of Maine. Each bottle contained a Canadian post-card on which was printed besides the address of the Biological station, the offer of a reward to the finder who wrote the time and place of finding, and posted the card. Two sizes of bottles were used—2-oz. and 8-oz.; to the latter a galvanized-iron drag was attached to hang at a depth of 3 fathoms, the object of the drag being to minimize the direct effect of the wind. Of the 55 bottles with drags, three were picked up on the Cape Cod peninsula, and three on the Maine coast. Of the 275 bottles without drags, eight were found on Cape Cod and two on the Maine coast. Seven of the bottles (of both sizes) which reached Cape Cod were found after an elapse of between 73 and 80 days. The direct distance between the Bay of Fundy and Cape Cod is 300 nautical miles. This gives an average daily drift of about 4 nautical miles.

The drift of these bottles indicates a surface movement of the water from the Bay of Fundy through the northwestern part of the Gulf of Maine, striking Cape Cod.

On August 29, 1919, drift bottles were set out off the coast of New Brunswick, one of them reaching the Azores on August 8, 1920. From the position in which this bottle was found it is believed that it approached the Azores from the north or northwest. Another bottle, dropped only a mile from the first one and at about the same time, was carried to the Cape Cod coast. It is presumed that the first bottle approached Cape Cod, but being a little farther east was eventually caught by the Gulf Stream and carried to the Azores as just related.

Still a third was put out at the same time about 6 miles northeast of that which went to the Azores. It was picked up on one of the northwestern islands of the Orkney group, on January 21, 1921.

According to the *Toronto Daily Star*, November 1, 1920, a sealed bottle cast into the ocean near Newfoundland in September, 1919, reached Nieuport, Belgium, in August, 1920.

A striking case of drift cited by Mr. Mavor was that of the derelict schooner, *Fannie E. Wolston*, which was adrift for two and a half years and was observed over 30 times. On December 15, 1891, she was seen in lat. 36° N. and long. 74° W. (northeast of Cape Hatteras), and four times afterward on her way across the Atlantic, until she reached lat. 35° N. and long. 39° W. on June 13, 1892, having covered in six months four-fifths of the course between the American coast and the Azores. After reaching the Azores she circled the Sargasso Sea and returned to the American coast by a southern route.

The following account (from the *Washington Times*, August 9, 1920) of the drift of one of the life belts of the ill-fated *Lusitania* furnishes an interesting case of the action of the ocean surface-currents:

PHILADELPHIA, August 7, 1920.—Scientists are greatly interested in the probable route followed by the *Lusitania* life belt recently picked up in the Delaware River off one of the city piers in the center

¹ Abstracted from *Science*, New York, Nov. 5, 1920, pp. 442-443, Feb. 25, 1921, pp. 187-188, and Apr. 23, 1921, p. 389; communications from James W. Mavor.