

While we can not claim the existence of monsoons, there is, nevertheless, a marked monsoonal tendency over a large section of the country. The general swing of the winds from northerly in winter to southerly in summer is very well marked in Texas. The cyclonic interruptions and weaker pressure controls, however, prevent any such strong or definitely marked effect as exists in India.

It is difficult to obtain accurate charts of wind velocities because the lack of uniformity of the data. In general, the highest average wind velocities are to be found along the Atlantic coast and over the Great Lakes. Hence the well-known stormy conditions off Cape Hatteras and the popular appellation of Chicago as the windy city—a term equally applicable to many Lake cities.

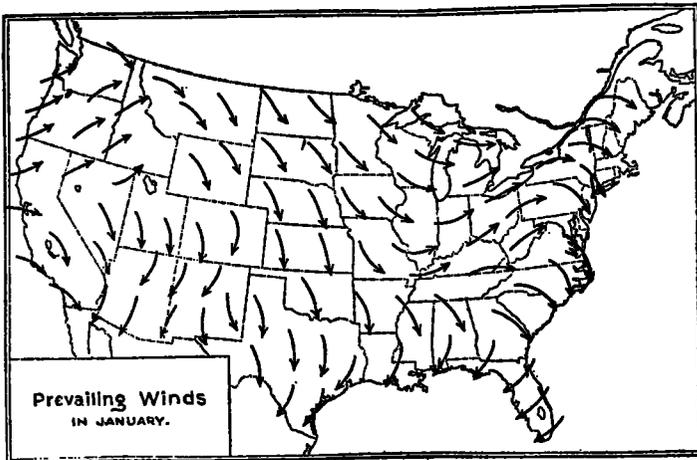


FIG. 1.—Prevailing winds in January.

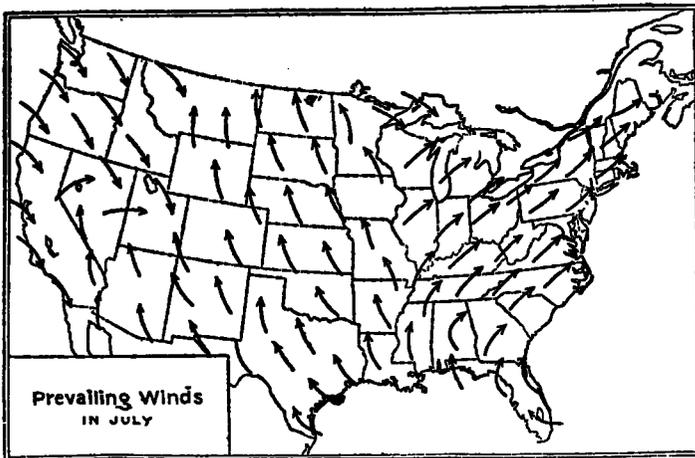


FIG. 2.—Prevailing winds in July.

Among the mountains, forests, and sheltered valleys, wind velocities are less. The Great Plains are almost ocean-like in their level monotony, and, as a result, higher winds are to be found there.

This is a fact of great economic importance for these winds are well adapted to driving windmills. Irrigation, stock raising, and domestic water supply in the Middle West are largely dependent upon underground currents of water. This necessitates pumping, and the wind conditions—relatively high velocity and steady—are so well adapted to this work as to make the raising of water economical and reliable. The Plateau region and the Pacific coast are irregular and variable in their wind

velocities, so that it is difficult to estimate their economic possibilities, although, without doubt, there are many places where wind power could be used to great advantage.

Of course, the highest wind speeds are those of the tornado, which invariably destroy any recording apparatus, but which, it is estimated, attain as high as 300 miles per hour. Second to tornadoes in destructiveness come the sudden squalls which accompany thunder-showers. West Indian hurricanes are responsible for the maximum wind velocities recorded on the Atlantic and Gulf coasts, while severe winter storms bring highest winds in the northern coast and Great Lakes regions. Maximum wind velocities are of importance because of their relation to shipping, uprooting of timber, and damaging of crops.

March is a proverbially windy month. This is true because it is a transition month, i. e., a time when the weather controls are passing from the winter to the summer, and there is a combined effect of the active winter controls and the rapidly increasing solar control. There is less seasonal variation over the Great Plains than in other parts of the country. This fact makes the winds in those regions conspicuous and important as a reliable source of power.—*C. L. M.*

#### THE WINDS OF BOSTON AND VICINITY.

By ALEXANDER McADIE.

[Abstract from *Annals of the Astronomical Observatory of Harvard College*, vol. 73, part 3, 1918, pp. 211-231, and vol. 83, part 1, 1917, pp. 28-46. Plates]

The climate of a locality depends primarily upon the circulation of the lower atmosphere. In spite of the considerable impression which the chilly easterly winds make on people, they are the least frequent and west winds the most frequent. Owing to the difference in the exposure of anemometers in Boston and at the Blue Hill Observatory, the average wind velocity at Blue Hill is about 60 per cent greater than in the city. The average mid-winter wind velocity is 8.2 meters per second, and the average midsummer velocity is 5.5 meters per second. The diurnal maximum velocity occurs in the afternoon and the minimum in the forenoon, the latter amounting to about 80 per cent of the former.

The highest wind velocity ever recorded at Blue Hill was 32 meters per second from the southeast on January 2, 1893, and the same velocity on February 10, 1909, this time from the south. The extreme velocity for a single minute has frequently exceeded 35 meters per second. The winds of summer are weaker than those of winter regardless of their direction. The weakest winter winds are from the east, with a mean velocity of less than 7 meters per second, and the weakest summer winds are the east-southeast and east, with velocities averaging 4 meters per second.

In general, months of excessive rainfall are months in which the northeast wind has a maximum duration. The average rainfall along the New England coast is about 1000 mm., while inland about 100 miles this value shrinks to about 800 mm. Consequently, the Atlantic seaboard is generally said to have a moist climate. This is, of course, relatively true; nevertheless, the climate is essentially dry, because the prevailing winds blow from the land. "If it were possible to reverse the surface circulation and substitute for the west wind, the east wind, the total rainfall would be 50 per cent greater and the number of rainy days would exceed 250 instead of the present number 106, or approximately 9 per month."

The excessive rainfall of the north Pacific slope is a good illustration of the effect of the prevailing winds blowing off of a water surface. Naturally, then, the excessively dry periods at Boston are characterized by the west wind.

The sea breeze must be considered one of the minor factors in the climate of New England. This is a very shallow wind and frequently does not exceed 250 meters in depth as shown by pilot-balloon ascensions. It is easily distinguished from the "sea turn" by its more rapid decrease in temperature and also by the fact that it is more gusty. The "sea turn" is of cyclonic origin and is of much greater depth. The temperature drop which occurs with a thunderstorm is well known, but it is not nearly so marked a drop as occurs with the incoming of the sea breeze.

From observations with kites, sounding balloons, pilot balloons, and clouds it appears that about 90 per cent of the time the wind speed increases up to the base of the stratosphere. Occasionally the speed does decrease with altitude, but this generally occurs when there is a strong surface wind, from the north and northwest, after the passage of a storm out the St. Lawrence Valley.

The discussion of the winds at Boston is concluded with a discussion of the theories of circulation and of cyclonic origin and structure.—*C. L. M.*

PAMPHLET ON MARINE WORK.

The Weather Bureau has recently published a pamphlet (W. B. No. 678, "The Marine Meteorological Service of the United States") descriptive of its marine work, the object being to direct attention to this particular branch of the bureau's activities and the existing need for more weather and water-temperature observations from ocean-going ships. Chapters are devoted to the following subjects: History of American Marine Meteorology, the Present Commercial Value of Marine Meteorological Work, Some Specific Needs for More Marine Observa-

tions, Marine Observations in Daily and Seasonal Weather Forecasts, Observations and Instruments.

During the war comparatively few ships' observations were collected and the marine work suffered accordingly. The termination of hostilities, however, permitted of steps being taken to build up the observational part of the work and the revival of the American merchant marine has directed attention to, and quickened interest in, the whole subject of ocean meteorology.

Copies of the pamphlet will be sent to any address on request.

REVIVAL IN MARINE WORK.

A compilation which has just been made shows that since March last, some 357 ships have indicated a willingness to furnish reports to the Bureau. Some of these ships rendered reports prior to the war. Below is given by nationalities, the present number of observing ships and the recent additions thereto.

Nationality.	Present number of reporting vessels.	Number secured since March, 1919.
American.....	588	194
British.....	526	87
Japanese.....	133	17
Dutch.....	127	12
French.....	63	10
Italian.....	55	16
Danish.....	43	.....
Norwegian.....	40	5
Spanish.....	25	2
Belgian.....	19	6
Swedish.....	11	2
Russian.....	8	.....
Honduran.....	4	.....
Chinese.....	4	3
Brazilian.....	2	1
Portuguese.....	2	1
Chilian.....	1	1
Argentinian.....	1	.....
Interallied.....	1	1
Total.....	1,653	357

*F. G. Tingley.*

BIBLIOGRAPHY.

RECENT ADDITIONS TO THE WEATHER BUREAU LIBRARY.

C. FITZHUUGH TALMAN, Professor in Charge of Library.

The following have been selected from among the titles of books recently received as representing those most likely to be useful to Weather Bureau officials in their meteorological work and studies:

**Agius, Thomas.**

The investigation of the air. A lecture delivered in the Aula Magna of the Malta university on the 19th of May, 1919. Malta, 1919. 29 p. 25 cm.

**Bigourdan, G[uillaume]**

La température moyenne des diverses parties de la France. charts. tables. 15½ cm. (Excerpted from Annuaire pour l'an 1912, publié par le Bureau des longitudes, Paris. p. A1-A47.)

**Clayton, H[enry] H[elm]**

Commerce and the weather. Buenos Aires. 1918. 14 p. 18 cm.

**Davison, Charles.**

The sound-waves and other air-waves of the East London explosion of January 19, 1917. Edinburgh. 1918. cover-title. 3 maps. 25½ cm. (Reprint from the Proceedings of the Royal Society of Edinburgh. Session 1917-1918. Vol. 38, part 2, no. 12, p. [115]-129.)

**Dorno, C[arl Wilhelm Max]**

Beobachtungen der Dämmerung und von Ringerscheinungen um die Sonne 1911 bis 1917. Berlin. 1917. 2 p. l., 94 p. tables (part. fold.) 34 cm. (Veröffentlichungen des K. Preussischen meteorologischen Instituts. Nr. 295. Abhandlungen Bd. 5. Nr. 5.)

**Domo, C[arl Wilhelm Max]**—Continued.

Himmelselligkeit, Himmelspolarisation und Sonnenintensität in Davos 1911 bis 1918. Braunschweig. 1919. cover-title. charts. tables. 29½ cm. (Sonderabdruck aus "Meteorologische Zeitschrift," 36 Band, Heft 5/6 und 7/8, p. [109]-124; [181]-192.)

Die Physik der Sonnenstrahlung. charts. tables. 26½ cm. (Sonderabdruck aus Handbuch der Balneologie, medizinischen Klimatologie und Balneographie, Leipzig, Band 1. p. [504]-533.)

**Dover, John.**

Totland Bay, Isle of Wight. Report of meteorological observations for the year 1918, with extremes & averages for preceding years. 19th year of issue. Newport, Isle of Wight. [1919] 24 p. incl. tables. 25 cm.

**Freybe, O[tto]**

Methodik des wetterkundlichen Unterrichts. 6 Vorträge mit Anhang. Berlin. [pref. 1914] 2 pl., 135 p. front. (fold. chart) illus. charts. (part. fold.) 24 cm.

**Horton, Robert E[lmer]**

Some broader aspects of rain intensities in relation to storm sewer design. 12 p. 16 charts. 3 tables. 29½ cm. (Reprinted from Municipal and county engineering, June-July, 1919.)

**International meteorological committee.**

Minutes of a meeting of members held at the Meteorological office, London, on July 3rd to 9th, 1919, by invitation of the director of the Meteorological office, president of the Committee. London. 1919. 42 p. 24½ cm. M. O. 237.