of the disc at the moment is recorded. In this way any change in width could be measured.

While these observations can only be made by persons who have had some training in work of this nature, valuable data may be secured by any who are fortunate enough to live within the eclipse belt. I desire to secure, if possible, a complete record of the appearance of the bands over the entire country, together with statements regarding the direction of the wind, condition of the air, etc. The bands can be best observed by spreading a sheet or other large white cloth on the ground. As soon as the moving shadows appear, which will probably be about a minute before totality, lay a lath on the sheet parallel to the shadows, with as great accuracy as possible. Then try to estimate the width of the bands and the velocity with which they are moving, also the direction in which they are going, that is whether from east to west or west to east. The width of the bands can be best determined, I imagine (I have never seen them), by estimating the width of a group, say five or six, or as wide a bunch as the eye can grasp and follow, with certainty as to the number of dark bands in it. A scale for reference, preferably a white board with feet and half-feet marked with strong black lines, will be of assistance. It should be laid perpendicular to the shadows, that is at right angles to the lath. The speed can be estimated by trying to keep up with the moving shadows, and may be recorded as slow walk, fast walk, slow run, etc. Those who are accustomed to counting quarter seconds, can probably make a fair estimate of the speed by noting the time of transit of a band across the sheet. The shadows will disappear at the moment of totality, but will reappear again as soon as the sun's edge emerges from behind the moon. A second lath should be laid on the sheet, parallel to the bands unless their direction is the same, and the same observations repeated, noting whether the direction of motion is reversed. After the eclipse is over, determine the direction of the two laths as accurately as possible with the compass, and measure the angle between them. Note the direction of the wind before and after the eclipse, and record the general atmospheric conditions.

Tabulate the data as follows:

BEFORE TOTALITY.

1.—Direction of the bands.
2.—Width of bands. (Give all data, that is number of dark bands in given width of the system.)
3.—Estimated speed. State how estimated.
4.—Direction of motion. Whether from east to west, or west to east.
5.—General appearance. Whether sharp or lazy, whether contrast between light and shadow is considerable. If possible estimate relative intensity of illumination in dark and light areas.
6.—Direction of wind. Temperature and general atmospheric conditions.

AFTER TOTALITY.

Repetition of the above.
Actual angle between the laths.
General remarks and location of point of observation.
Reports should be sent to Prof. R. W. Wood, Physical Laboratory of the University of Wisconsin, Madison, Wis.

STATIONS OF THE MEXICAN TELEGRAPH COMPANY.

In the March number of the Texas Climate and Crop Bulletin, Mr. I. M. Cline, Local Forecast Official and Section Director, publishes the monthly summaries for the three regular stations of the Mexican Telegraph Company, viz, Coatzacoalcos, Tampico, and Vera Cruz. The apparatus at these stations has been carefully established by Dr. Cline. The stations are maintained entirely at the expense of the telegraph company, and as they are quite independent of the official Mexican system conducted by the superintendent of the state telegraphs, it is proper that the records should be published by the Weather Bureau. Observations are daily sent by cable from these three stations to Galveston, and therefore, appear in the regular daily bulletins and charts published at Washington and elsewhere. These accurate observations, so far south on the Gulf coast, combined with those at Merida, give us a very comprehensive view of atmospheric conditions over the Gulf of Mexico when northers or hurricanes prevail, and the Weather Bureau is greatly indebted to the Mexican Telegraph Company for its hearty cooperation in this matter.

INFLUENCE OF THE WIND AND OF RYTHMIC GUSTS ON THE LEVEL OF LAKE ERIE.

In the MONTHLY WEATHER REVIEW for April, 1898, page 164, the Editor has calculated the outflow of the Great Lakes into the St. Lawrence River, and has shown the need of further data relative to the rainfall and evaporation. Similar calculations, as revised in the light of the most recent data, have lately been published by the United States Board of Engineers on Deep Waterways in its preliminary report on the regulation of the level of Lake Erie (House Doc. No. 200, Fifty-sixth Congress, first session). In the course of this report it is shown that a serious source of irregularity affecting the navigation of the lakes is the great variation of level at the outlet and inlet of each lake due to the influence of the wind. On this point the report says:

From the head of Lake Erie to the islands (about 30 miles) the depth of water is only about 35 feet, and through the channels between the islands the depth is from 25 to 35 feet.

Heavy westerly winds force the water through these passages into the main body of the lake, causing a lowering of the water level at the head of the lake and a corresponding rise at Buffalo, N. Y. The amount of this change of level depends upon the stage of the lake, the velocity and direction of the wind, and the duration of the storm, and in extreme cases, with wind velocity of 60 to 80 miles lasting for several hours, the change of level reaches 6 to 7 feet at each end of the lake.

The change of level at Cleveland, Ohio, is generally less than one foot, showing that the wind effect is mostly at the two ends of the lake, and is due to the depth of water being so small that return currents are not generated sufficiently to equalize the effect of wind on the surface, until considerable difference in level is produced. The deeper the water the less will be the head necessary to produce any given volume of flow in return current, and it is probable that the elevation to which the water will be raised by wind of any given velocity and duration will be approximately the same, whether the lake be at extreme low or medium high stage when the storm occurs. Storms of sufficient force to change the water level 3 feet or more at the head of the lake are very infrequent, and can only be provided for by making the depth of channels at the head and foot of the lake that amount deeper than through other portions of the waterway system.

The length of time which these changes would be in excess of 1 foot is so small that, with the level of the lake regulated above mean stage, the detention from this cause would not seriously delay commerce.

In this connection the student should consider the influence upon the water level of changes in atmospheric pressure. If the barometer should be higher at one end of the lake than at the other by one-tenth of an inch, and should continue so for a sufficient length of time, it would cause a difference in level of over one inch of water. Barometric differences of several tenths frequently occur. An interesting article upon this subject, by Prof. A. J. Henry, will be found in the MONTHLY WEATHER REVIEW for July, 1899, page 305.

An important cause for the occurrence of differences of level at the two ends of a lake consists, not so much in the temporary differences of barometric pressure or in the temporary influences of gusts of wind, as in the regularity with which these temporary pressures and gusts act upon the water. There is always a natural period which is called the free oscillation of a water surface. By experiment in a basin or tub, we may easily find what depth of water allows of a rythmic oscillation from side to side throughout the whole mass of water. For this depth the water rises on one side of the tub while it is falling on the other side. If we depress the water on one side by blowing upon it, or by pushing it, or by tipping the basin, and do this systematically while the water is itself falling on that side, but do not do it when the water is rising, we quickly observe that we have so timed our artificial impulses as to force the waves to grow larger and larger. This is also the principle elaborated by Dr. R. A. Harris in connection with the local tides of the ocean, and, indeed, of the Great Lakes also. The influences that come from the sun