In reply to your inquiry regarding the loss of the anemometer cups, I have the honor to say that I delayed further report upon this matter with the hope that in the meantime I could find the cups and from their condition report definitely as to how they gave way; however, the cups can not be found and the defect that resulted in their loss must therefore remain a theory. The miles of wind were recorded with such rapidity and regularity up to the very moment of the loss of the cups as to show that the screw that holds the cups to the spindle was constantly tight, which dispels the theory that this screw had worked loose, thereby allowing the cups to be lifted off; therefore, my only remaining theory is that under the terrific and long-continued strain one or more of the cross arms gave way and probably bent upward, which gave the wind a sudden, highly increased power on the cups that snapped the screw above referred to and instantly released the cups from the spindle. The anemometer was not injured, aside from the loss of the cups, and in order to expedite the resumption of the record, I left it exposed, simply putting on a new set of cups.

The 20 miles of wind interpolated at the time of the break (9:19–9:36 p. m.) have been added to the dial, so that the dial readings correspond to the record.

Under date of June 5, 1902, and in reply to the preceding, Prof. C. F. Marvin wrote, as follows:

Inasmuch as the spindle of the anemometer was intact and the cups entirely removed, I am inclined to think the only plausible explanation is that the cups, by the action of the storm, were detached from the spindle, either because the screws binding the cups to the spindle were not secured tight enough, or because of action from the storm the screw backed off a little and permitted an upward gust to lift the cups from the spindle. From the photograph inclosed with the report it is obvious that there must be a very pronounced upwardly inclined direction to the wind at the point of exposure of the anemometer, thus facilitating the lifting of the cups from the spindle. I would remark in regard to Mr. Thomas's conclusions, that the cups must have been tight on the spindle because the movement of the wind is registered regularly up to the very moment of the loss of the cups, that this is not necessarily the only one to be drawn. The spindle of the anemometer turns with such extreme freedom in its bearings that the very much greater friction between the cups and the spindle, even when the clamping screw is not tightened, is generally sufficient to keep the cups in continuous rotation, and it seems probable that the cups might have been working loose on the spindle for some time before the moment they were actually carried away.

Under date of June 27, 1902, Professor McAdie says:

It is doubtful if these high winds experienced at Point Reyes Light and at other points along the coast are really forced draughts. We have been in the habit of considering that this was so, but the truth can only be established by a set of comparative readings. If we may rely upon the reports of vessel masters these strong winds prevail at sea level and at some distance from the shore. While the topography is such as to accentuate air movement, the effect can not be justly described as a funnel effect because the velocities attained when the wind veers from the southeast to the northwest are equally high and this should not be the case if topography controlled the velocity. At San Francisco, with our so-called southeasters, the wind has been known to reach a velocity of over 50 miles an hour from the southeast and within a few moments an equal velocity from the northwest.

On the dates under consideration (May 16–19) it will be remembered that there was an unusually high velocity reported at nearly all points along the coast, and also at a number of interior points.

NOTE ON THE ANEMOMETER EXPOSURE AT POINT REYES LIGHT, CAL.

By C. F. MARVIN, Professor of Meteorology, dated February, 1903.

Prior to the erection of the Weather Bureau building to accommodate the station at Point Reyes Light the anemometer was exposed on a water tank located on the side of the bluff. A view of this location is shown in fig. 5. The excessive wind movement recorded at this locality, as set forth in Professor McAdie's paper, preceding, led us to question whether this was not due, at least partially, to a faulty exposure and to a strong draft of wind around the point of the bluff. In order to secure information on this point, extensive comparisons of wind movement have been conducted by installing a duplicate anemometer exposed on an attachment to the storm-warning tower erected very nearly on the summit of the bluff, as indicated in figs. 3 and 6. The anemometer cups were about 53 feet above the ground at the base of the tower—that is, about 593 feet above sea level. The anemometer on the tank had an elevation of about 490 feet above sea level. The relative location of these anemometers is more clearly indicated in figs. 7 and 8, which give the approximate plan and contour of the bluff.

The two anemometers were in all respects alike and recorded automatically side by side on a special two-magnet register. Comparative readings extended from noon, September 19, 1902, to noon, February 1, 1903. The following table gives the total monthly movements for the two anemometers:

Months.	Total monthly movement.		Maximum hourly movement.		Ratio.	Average hourly movement.		Relative monthly movement. Tank ÷ tower.
	Tank.	Tower.	Tank.	Tower.		Tank.	Tower.	
1902.								
October	14,466	13,519	62	59	1.05	19.4	18.2	1.07
November	15.393	14,792	77	74	1.05	21.4	20.5	1.05
December	12,385	12,225	58	53	1.09	16.6	16.4	1.01
1903.								
January	12,112	11,764	74	67	1.10	16.3	15.3	1.03

The hourly readings were tabulated for the entire period, but a careful examination of these fails to disclose any important results that are not also presented by the total monthly movements. It is apparent, from the tables, that the anemometer on the tank recorded from 1 to 7 per cent greater monthly movements than the anemometer on the tower.

Extended comparisons of anemometers at the Weather Bureau have demonstrated that differences in the indications of instruments that are of similar design and construction are caused principally by inaccuracies in the lengths of the arms of the anemometer cups, that is, by differences in the mean distance of the centers of the cups from the center of the axis of revolution.

In the case of the anemometer cups used in the present comparisons at Point Reyes Light, careful measurements show that the arms of the tank anemometer are 0.015 of an inch shorter than those of the tower anemometer. This is a difference of only 0.22 per cent, that is, we should expect the tank anemometer to show one-fifth of 1 per cent more wind movement than the tower anemometer.

The actual difference found from comparisons of the records at these two stations amounts to from 5 to 10 per cent for the maximum winds and from 4 to 6 per cent for the monthly movements, and must be attributed to some peculiarity of the exposure on the tank and to the variation in the direction of the wind.

From the foregoing it may be assumed that the extraordinary wind velocities recorded during the storms reported by Professor McAdie were fairly well indicated by means of the anemometer on the tank. In this connection, however, it is necessary to remark that accurate studies of the Weather Bureau type of Robinson's anemometer have never been extended to velocities above 50 miles per hour, at which speed the velocity indicated by the instrument is 9.2 miles or 18 per cent too high, so it is very probable that the wind movement producing an indicated velocity of from 100 to 120 miles per hour on the Weather Bureau anemometer was actually much less than 100 miles per hour. It is very greatly to be desired that researches should be undertaken to evaluate the indications of our anemometers at the very highest velocities ever indicated.

COMPOSITE AND OTHER ARRANGEMENTS OF WEATHER TYPES.

By H. W. RICHARDSON, Local Forecast Official, Duluth, Minn., dated March 17, 1903.

During recent years considerable attention has been devoted to the classification and indexing of weather maps and types as an aid to the forecasting, the most prominent contributors