warm fall. Carrying comparisons back to 1898 shows that predictions of rainfall and temperature in New England can sometimes be made from the preceding temperature of Honolulu. But it is interesting to observe that when this 60-day rule does not apply, the temperature at Honolulu is followed sixty days later by a similar temperature in New England 14 times out of 18 in the four years or 78 per cent. Excluding four months of comparisons, affected by uncertain normals, 31 out of 44 or 70 per cent of months of observed temperature at Honolulu were followed two months later by similar changes in New England.

TABLE 1.—*Departures from monthly normals in Honolulu.*

Year and month.	Rainfall departures.		Temperature departures.	
	Honolulu.	New England.	Honolulu.	New England.
1898.	*Inches.*	*Inches.*	° *F.*	° *F.*
May	.....	+ 0.49	.....	— 0.9
June	+ 1.34	— 0.20	— 1.5	— 0.7
July	.....	+ 0.52	.....	+ 1.2
August	.....	+ 1.62	.....	+ 2.7
September	.....	— 0.36	— 0.1	+ 2.6
October	.....	+ 2.78	— 0.3	+ 2.6
November	— 4.20	+ 1.82	+ 1.1	0.0
December	.....	— 1.08	— 1.0	— 1.3
1899.				
January	— 2.05	— 0.29	+ 0.4	+ 0.6
February	— 1.00	+ 0.30	+ 1.6	— 2.0
March	+ 0.78	+ 2.91	+ 0.5	— 1.1
April	— 1.94	— 1.33	— 0.1	+ 1.0
May	— 0.50	— 2.01	0.0	+ 0.4
June	— 0.40	0.00	— 0.8	+ 1.5
July	— 1.60	0.00	— 0.3	0.0
August	— 0.50	— 2.26	— 0.3	+ 0.3
September	— 1.35	+ 1.40	— 0.2	— 1.4
October	+ 1.56	— 1.67	— 0.6	+ 3.1
November	— 4.85	— 1.76	— 0.3	0.0
December	— 2.91	— 1.41	+ 0.6	+ 2.7
1900.				
January	— 2.46	+ 0.71	+ 0.4	+ 2.1
February	— 4.86	+ 3.69	— 0.1	+ 0.2
March	— 1.60	+ 1.65	+ 1.2	— 3.2
April	+ 2.24	— 1.19	0.0	— 1.2
May	— 1.40	+ 0.24	+ 0.7	— 2.2
June	— 0.72	— 0.14	+ 1.7	+ 0.8
July	+ 0.79	— 1.64	+ 1.3	+ 1.7
August	.....	— 1.42	+ 1.3	+ 2.0
September	— 0.50	— 1.30	+ 0.9	+ 2.3
October	+ 4.42	0.00	+ 0.6	+ 5.8
November	+ 5.78	+ 1.57	+ 0.3	+ 2.9
December	— 3.00	— 1.24	+ 0.1	— 1.7
1901.				
January	— 0.10	— 1.64	+ 1.2	0.0
February	+ 2.00	— 2.48	— 1.7	— 5.1
March	+ 0.82	+ 1.91	+ 1.0	+ 0.5
April	+ 0.30	+ 3.85	+ 0.2	— 1.0
May	+ 0.23	+ 2.03	+ 0.6	— 0.7
June	— 0.10	— 0.91	+ 1.5	+ 0.9
July	— 0.27	— 0.43	+ 0.5	+ 2.6
August	— 1.09	+ 1.66	+ 1.1	+ 1.7
September	— 1.19	— 0.97	— 0.3	+ 1.3
October	+ 1.68	— 0.64	— 0.5	+ 1.7
November	+ 1.68	— 1.72	— 0.5	— 4.4
December	+ 6.06	+ 4.08	+ 0.1	— 0.8
1902.				
January	— 2.80	— 1.48	+ 0.7	— 0.6
February	— 4.45	+ 0.33	— 0.9	+ 0.7
March	+ 7.96	+ 2.35	0.0	+ 7.8
April	.....	+ 0.66	— 1.0	+ 2.0
May	— 1.34	— 1.17	— 0.8	— 1.2
June	— 0.33	— 1.42	— 0.2	— 3.6
July	+ 1.07	— 0.77	+ 0.5	— 2.5
August	— 0.24	— 0.62	+ 0.8	— 2.3
September	+ 0.29	+ 2.15	— 0.1	+ 1.3
October	— 0.17	+ 1.35	— 0.6	+ 1.3
November	+ 4.65	— 0.93	— 0.5	+ 4.8
December	.....	.....	.....	.....

It would seem, therefore, that there is a certain interval between Hawaii and New England by which monthly climatological predictions may be approximated to a considerable degree of accuracy.

NOTE.—The above table is as given by Mr. Elmer without being revised by the Editor. If the rainfall had been expressed as percentages of the normal annual amounts and the temperatures had been expressed as percentages of the normal annual fall at the respective stations, the comparison would have been even more interesting. Any improvement or change in the adopted monthly normals will change the positive and negative signs, and also the above rule as given by Mr. Elmer. His conclusions, therefore, may not be confirmed by further investigation, but some definite geographic corelation of value may result.—ED.

SOME HIGH WIND RECORDS ON THE PACIFIC COAST.

By Prof. ALEXANDER G. MCADIE and Mr. W. W. THOMAS, Observer, United States Weather Bureau, dated May 27, 1902.

At the beginning of the year 1902 a new Weather Bureau station at Point Reyes Light was completed. The station is located in latitude 38° 12′ north, longitude 122° 51′ west of Greenwich. The station at this point was originally in rooms of the United States Light-House Building, upper southwest corner, and the records go back to October 9, 1888. The first observation in the present office was on January 17, 1902. The elevation of the new building is 490 feet above sea level. The height of the anemometer cups above the ground is 30 feet. On February 23, 24, and 25, 1902, a severe southeast disturbance prevailed along the coast of California. This was the first pronounced disturbance to which the new station had been subjected. The following extracts from the Daily Journal at Point Reyes Light by the Observer, Mr. W. W. Thomas, tell the story of the weather conditions at that time:

February 23, 1902.—A southeast storm began during the night with light rain and a 70-mile wind; the storm continued throughout the day showing no abatement at nightfall. A maximum of 80 miles from the southeast was recorded at 1:30 p. m., and this velocity was reached frequently during the afternoon. Order to hoist southeast storm warnings received 12 noon. Line down since 12 noon. No communication east.

February 25, 1902.—The day opened with light rain and a terrific southeast storm in progress; wind increased rapidly to 90 miles an hour at 10:15 a. m. and continued at that velocity until after 12 noon, very frequently reaching velocities of 98 to 100 miles an hour. A maximum of 98 miles during five consecutive minutes occurred 11:15 a. m., at which time an extreme velocity of 103 miles was recorded—a mile in 35 seconds. The wind began to veer to the west and to lose its force soon after noon; clearing conditions began and at 2 p. m. the weather was practically clear, with a fresh southwest wind. About 3 p. m. the clouds began to increase rapidly and during the evening threatening weather prevailed with brisk southwest wind.

Distant lightning was observed in the northwest between 11 and 12 p. m., and later information showed that distant thunder and lightning occurred in the northwest frequently throughout the night.

Since the passage of this storm the weather has reached a normal condition.

During all this terrific wind the anemometer worked magnificently and none of the instruments were damaged in the least.

On March 1 another severe southeast disturbance prevailed off this section of the Pacific coast. At San Francisco the wind changed from southeast at 9 p. m., seventy-fifth meridian time, blowing from the south for about 28 minutes and then from the southwest, reaching a maximum velocity a little after 10 p. m. of 60 miles and an extreme velocity at 10:12 p. m. of 75 miles. At Point Reyes Light the maximum velocity occurred at 9:45 p. m., when 10 miles were recorded in a trifle over five minutes. The observer states in a letter "that for a half hour prior to this time he checked off the 10-mile spaces as they occurred, timing the miles with his watch. One mile was completed in slightly less than thirty seconds; and for five minutes, including the time of the extreme velocity, the miles averaged a small fraction less than thirty-three and one-half seconds." This is at the rate of 107 miles per hour. The following brief report of the storm was written by the observer, Mr. W. W. Thomas:

The day opened with cloudy, threatening weather and light wind varying in direction from southeast to northeast. Light rain began at 7:45 a. m., local time; wind continued light to fresh, northeast to southeast until noon, when it began blowing steadily from the southeast and to increase in force to about 45 miles an hour. At 3:30 p. m. it increased suddenly to a little more than 70 miles an hour. Light rain ended at 5:35 p. m. and at 5:55 p. m. a rainbow was observed. About 5:30 p. m. the wind began to veer to the westward and to increase rapidly in force. At 6:45 p. m. a maximum of 108 miles was recorded from southwest. Wind continued to veer to west and northwest, still continuing at about 100 miles an hour until 9 p. m., local time.

Our flagstaff (wooden) blew down at 6:45 p. m. and the receiver of the rain gage blew away and has not been found.

FIG. 1.—Weather Bureau building at Point Reyes Light and the old flag staff, blown down March 1, 1902, after standing for several years.

The flagstaff blown down is shown in the accompanying photograph (fig. 1) made by Professor McAdie on December 28, 1901, just before the building was ready for occupancy. It should be stated that this flagstaff had stood for several years, being used for signaling purposes, and was, so far as one could judge, well braced and generally in good condition.

From May 15 to 20, 1902, the daily weather maps show the existence of a marked depression over the Mexican boundary and the valley of the Colorado. On Saturday, May 17, the southern depression, merging into an extensive trough overlying the entire Rocky Mountain region, was followed on the Pacific coast by an area of high pressure. While the readings were neither very low nor yet very high, there appears to have been an extensive air motion, an unusually large number of stations reporting maximum velocities. On the California coast steady and extremely high northwest winds prevailed for a period of not less than seventy-two hours. At Point Reyes Light for forty-eight hours ending midnight, May 18, the average velocity of the wind was 72 miles; for the twenty-four hours ending midnight, May 18, the average velocity was 78 miles; for twelve hours ending midnight, May 18, the average velocity was 84 miles; for six hours ending midnight, May 18, the average velocity was 88 miles. The greatest number of miles recorded in any one hour was 102, from 8 to 9 p. m., seventy-fifth meridian time, May 18. The maximum velocity for the storm was 110 miles, at 8:50 p. m. of the 18th, and the extreme velocity 120 miles, at 8:38 p. m.

This record is so remarkable for its length, the high velocities involved, and the general character of the air motion that a photographic copy has been made, accompanied by a partial enlargement, 3.3 times the original, of the portion between 8 and 9 p. m., when the extreme velocity was recorded. Four thousand seven hundred and one miles of wind are legibly recorded, and the record is complete, except from 9:19 to 9:36 p. m., during which time the observer put a new set of cups on the anemometer to replace a set that had become loosened from the axis and carried away at 9:19 p. m., May 18, the actual number of miles for the hour preceding being 91.

It also appears that between 8 and 9 p. m. on May 19 we have an actual record of 102 miles per hour. According to the tables furnished on page 16 of Circular D of the Instrument Division, the corrected velocity corresponding to this observed velocity would be about 77 miles.

It is not known to the writer how this record compares with those made at other points. He has found, however, a record in the MONTHLY WEATHER REVIEW for January, 1886, page 15, which, referring to the storm at San Francisco on January 22 giving a maximum velocity of 42 miles, states that the storm was said to have given the heaviest wind in twenty-five years. At Cape Mendocino, Cal., the writer finds, by reference to the forecast charts at San Francisco, a record of 108 miles, from the southeast, on January 22, 1886, at 7 a. m. There was also recorded a maximum velocity of 144 miles, from the southeast, at Cape Mendocino on January 20, 1886. The original wind sheet, if it be in existence, is at Washington, D. C., and it might be interesting to compare that record with the present one. In a table of the average velocity at Weather Bureau stations and the highest velocities for a 5-minute period, the Chief of the Weather Bureau gives 104 miles at Fort Canby, Wash.; at Hatteras, N. C., 105 miles; at Galveston, Tex., 100 miles; at Kittyhawk, N. C., 100 miles. The highest velocity recorded at San Francisco is 60 miles, and at Eureka, Cal., 50 miles.

The following note relative to high winds at Mount Washington, N. H., is taken from the MONTHLY WEATHER REVIEW, February, 1886:

> The 8-hour movement of the wind from 3 to 11 p. m. of the 26th was 925 miles, being at the rate of 115.6 miles per hour, and largely in excess of any previous 8-hour movement ever recorded at this station. The total movement of the wind for twenty-four hours ending 3 p. m. of the 27th was 2673 miles, being 533 miles in excess of any previous 24-hour movement. During the night of the 26–27th the terrific hurricane caused the building to rock and tremble; huge masses of frostwork were dashed against the station building with reports as loud as the discharge of a cannon.

The wind records at Pikes Peak have been published, but the volume is not accessible to the writer.

In connection with this high northwest wind of May 16–19, it only remains to be said that at San Francisco during the same period there were recorded 1311 miles, distributed during each twenty-four hours as follows: 415, 411, and 485. From 6 a. m. of the 18th to 6 a. m. of the 19th 531 miles were recorded.

At Point Lobos (see fig. 2), the extreme northwestern end of the peninsula on which San Francisco is situated and about five miles west of the Mills Building, the following velocities were recorded: May 16–17, 586 miles; 17–18th, 890 miles; 18–19th, 938 miles, or for the entire seventy-two hours, 2414 miles, which is about 33 per cent of the air movement at Point Reyes. Between 9 and 10 p. m., May 18, 53 miles were recorded; maximum 5-minute record, 72 miles, at 7 p. m., May 18. On Mount Tamalpais, Cal., for the three days under consideration the velocities were 1096, 1123, and 1002 miles, respectively, or in all 3121 miles, being 44 per cent of the Point Reyes movement. The maximum velocities were: May 16, 86 miles; May 17, 75 miles; May 18, 69 miles, and May 19, 69 miles.

FIG. 2.—United States Weather Bureau station and storm-warning tower, Point Lobos, Cal.

With reference to the actual velocities experienced by vessels, it is interesting to note that the steamer *George W. Elder*, leaving San Francisco on the morning of Sunday, May 18, found it impossible to pass Point Reyes Light and had to put into Drakes Bay for fourteen hours. In the same place the *Elder* found the big Kosmos liner *Serapis*, a collier, and a fleet of schooners; none of them had been able to get around the point.

Of even greater interest is the experience of the British ship *Westgate*, which arrived at San Francisco May 27, after being driven 1000 miles out of her course. On May 17, when within 50 miles of port, the strong northwest wind drove her nearly 1000 miles to the southward. It required ten days to make port. The following is a statement by Captain Neville:

FIG. 3.—Approach to Weather Bureau station at Point Reyes Light. Camera pointing south of east and tilted up at a small angle.

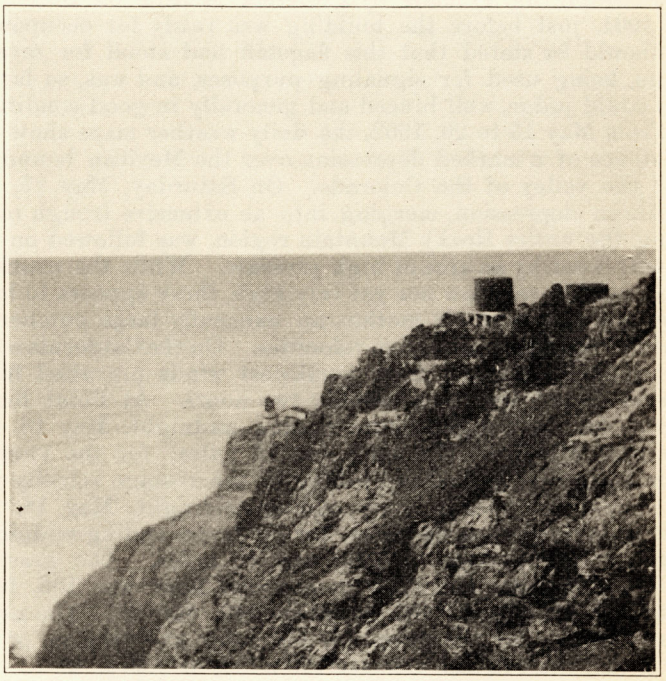

FIG. 4.—Water tank on bluff at Point Reyes carrying the anemometer at the time of the high wind of May 18, 1902. Point Reyes Light is shown to the left of the water tank and below it, on the bluff next beyond.

We left Newcastle, Australia, for San Francisco ninety-two days ago with 2084 tons of coal. It was one of the most uneventful voyages I ever made until we were within 750 miles of San Francisco. We encountered nothing but light winds and calms all the way, but nevertheless we made fair time. When about 750 miles from port the weather began to get dirty. Still I thought we could make our distance and run in through the Gate before the storm broke. I was mistaken. When within striking distance of our destination the storm came down and we had to 'bout

ship and run for the open sea. In all the years I have been to sea, I never saw a gale to equal the one of May 17 and 18. Mountainous seas broke aboard and the ship labored so heavily that at times I thought she would roll the masts out of her. The lower topsail and foresail went out of the boltropes like a kite escaping from its anchor, and for a time the ship ran under bare poles. After two hours hard work we got a goose-winged lower topsail set, and under it the *Westgate* rode out the storm. From that day to this we have had nothing but light winds, calms, and fogs. * * * We sustained no damage during the norther, except having whatever was movable on deck washed overboard.

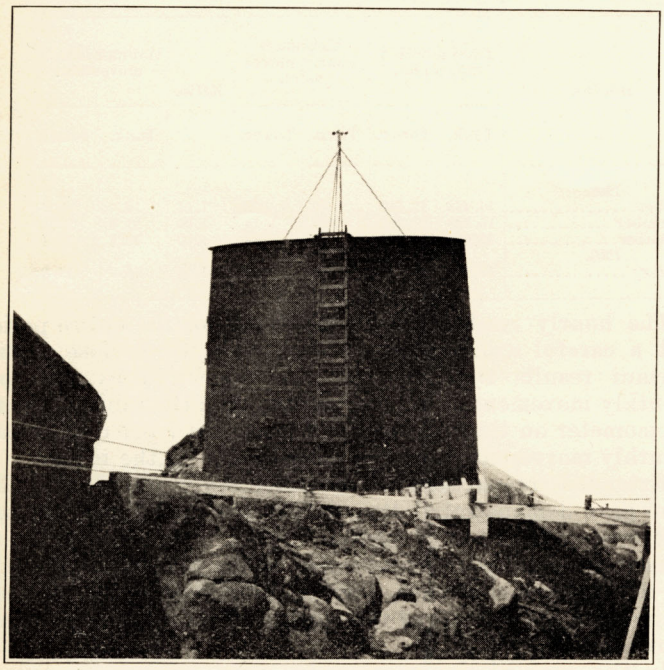

FIG. 5.—Water tank and anemometer at Point Reyes Light, as seen looking west-southwest. Dimensions: Base of tank, 4 feet above ground; height of tank, 16 feet; diameter of tank at the top, 19 feet, 3 inches; diameter of tank at the bottom, 20 feet, 6 inches; height of anemometer support, 10 feet, 4 inches; height of cups above ground, 30 feet; height of cups above sea level, 490 feet, approximately. The anemometer support is placed near the western edge of the top of the tank.

FIG. 6.—Storm warning tower and new point of exposure for the anemometer. Height of anemometer cups on the tower, 53 feet above the ground and about 593 feet above sea level.

On May 27, in connection with the paper above printed, Professor McAdie submitted a photographic reproduction of the anemometer record for May 16–19, showing 4701 recorded miles in the three days, 17th, 18th, and 19th; he added an enlargement of a portion of the record, showing 102 miles recorded during the hour 8–9 p. m., of May 18, with a maximum velocity at the rate of 110 miles during the five minutes 8:47–8:52 p. m.

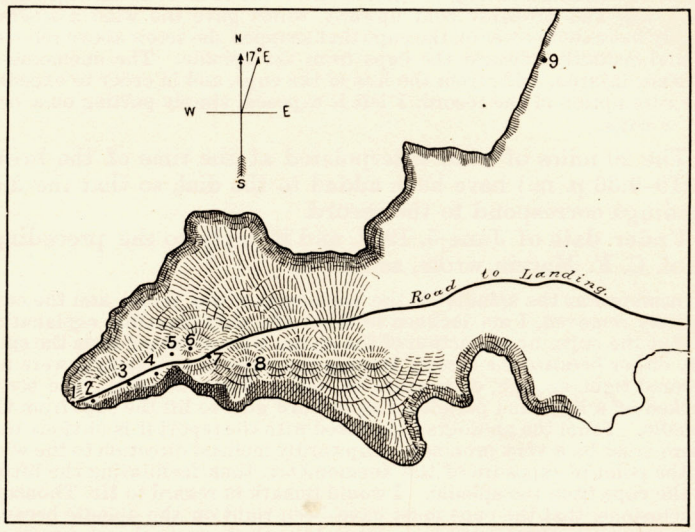

FIG. 7.—Plan of Point Reyes Peninsula, according to a survey made in 1880 by United States Engineer Corps. 1. Fog signal station; elevation 100 feet. 2. Light-house tower; elevation 250 feet. 3. Steps and chute leading to the light-house and signal stations. 4. Tank; elevation 460 feet. Anemometer on the tank; elevation 490 feet. 5. Weather Bureau building; elevation 490 feet. 6. Location of the new storm-warning tower; the ground at the tower is 540 feet; the peak is 550 feet high; the anemometer on the tower is about 593 feet above sea level. 7. Residences of the keepers. 8. Highest point of the ridge; elevation 597 feet. 9. Life-saving station.

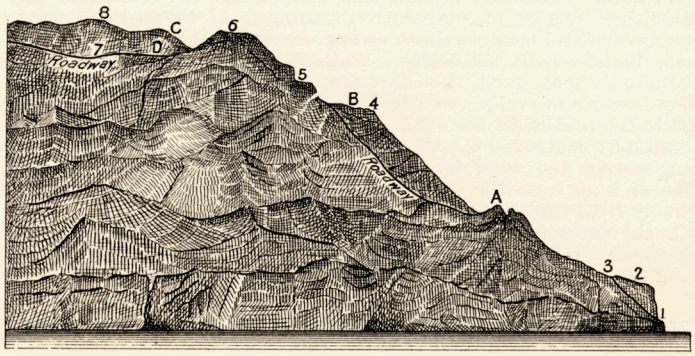

FIG. 8.—Contour of Point Reyes, as seen from the northwest. 1. Fog signal; elevation 100 feet. 2. Light-house tower; elevation 250 feet. 3. Steps and chute leading to the light-house and signal stations. 4. Water tank; elevation 460 feet. 5. Weather Bureau building; elevation 490 feet. 6. Storm-warning tower; elevation of ground 540 feet. 7. Dwelling of light-house keeper. 8. Highest point of the ridge; elevation 597 feet. A. Point from which photograph C, or fig. 3, was taken. B. Point from which photograph A, or fig. 5, was taken. C. Point from which photograph B, or fig. 6, was taken. D. Former exposure of the anemometer.

[The Editor regrets that these photographs as submitted can not be reproduced by the half tone process; on the other hand, any copy made by hand would lose the advantage of being a facsimile reproduction. The records are remarkably clear and uniform, so that there can be no doubt as to the accuracy of the rate of movement.]

Under date of May 27 the Observer in Charge, Mr. W. W. Thomas, writes as follows:

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