animals only survived; is the tale that could be prolonged indefinitely.

During the two and a half months of this remorseless climate the mercury has been but once or twice above the freezing point, and for days many degrees below zero all day. One of the most serious features of this condition of affairs is the water famine with which most of the farmers have to contend. The rainfall had been below the average when the winter set in, and since then none has fallen, and the water supply of most of the farmers is exhausted, causing great inconvenience and in many cases much suffering.

February is usually the worst winter month in this latitude, and if this is the case this year untold privations will have to be endured before the end is in sight.

A WEST INDIAN STORM.

By Mr. JOHN S. QUIN.

Mr. John S. Quin, Editor of the Avis, Christiansted, St. Croix, sends the following relative to a disturbance of moderate intensity, No. VIII on Chart II of the MONTHLY WEATHER REVIEW for October, 1903. On that chart the track is given from Cuba to New Foundland. With regard to its previous history, Mr. Quin says:

There was a normal condition of the atmosphere up to Tuesday morning, October 20, for cirrus clouds were seen coming from about northwest. But by noon on Wednesday, October 21, an important change had taken place, for through the spaces among the lower and middle clouds, which were then accumulating in heavy masses, a layer of high clouds (cirro-stratus) could be seen moving slowly up from about south. This motion of the high clouds made it highly probable that a cyclone center had been formed, or was forming, toward the south. And the evidence of the high clouds was strengthened by that of the lowest clouds, which were moving rather fast from east-southeast, and thus, when taken with the other signs, indicated a cyclone center to south-southwest; which was probably its actual position at that time. The subsequent course of the weather harmonized with these conclusions, for by noon on Thursday the wind had gone round to south, and it was coming from the same quarter on Friday morning, with much cirro-stratus coming from the west. By noon on the same day the wind had gone round to south-southwest, and in the afternoon was even a little farther round toward southwest. As darkness approached, however, it was very interesting to notice how a layer of middle clouds (alto-stratus), which was coming slowly from southwest by west, gradually became still slower till hardly any motion could be seen in it. The night settled down in a calm, and the early morning (Saturday) showed the lower clouds moving from south-southeast. Hence, we concluded that the cyclone had left us and that the wind was falling back to its normal direction. It continued to fall back, till, on Sunday morning, it was blowing very gently from east, or, to speak more accurately, the clouds were moving from the east while the wind (surface wind) had gone round so far as to blow from east-northeast. The evidence of the barometer readings had in the meantime kept pace with the evidence of the wind changes, as will be seen from the table below.

Now comes the very interesting question: Did this depression originate in the Caribbean or did it come from the Atlantic? Considering the apparent absence of evidence from the island reports, we were at first inclined to the former opinion, but after arranging the evidence so as to take a bird's eye view of it, we are obliged to come to the conclusion that the depression passed in from the Atlantic, but in so mild a form as at first to have escaped notice. We are inclined to believe, also, that the movement increased in force as it went on, and that it made a special advance in strength on Wednesday. To this point, however, we will return later. We would now ask the attention of the reader who has followed us thus far to the table below, where we give the barometer readings and wind directions for the three islands, Santa Cruz, Antigua, and Barbados. Of these three islands, Barbados is farthest to windward and Santa Cruz farthest to leeward, while Antigua lies between. A cyclone center following the usual direction would have to travel nearly 300 miles in passing from its nearest point in regard to Barbados, to its nearest point in regard to Antigua, and would then have to travel a little over 200 miles more before making its nearest point to Santa Cruz. Now, if we examine the figures given in the table, we shall see that the lowest morning reading for each place (*the figures in italics*) show a progressive movement from east to west. For Barbados it was on *Monday*, for Antigua on *Tuesday*, for Santa Cruz on *Wednesday*. The table seems then to prove that the *barometrical depression* was not formed in the Caribbean, but over the Atlantic, and that it moved from the latter into the former.

But is there any evidence of a cyclonic movement? If we use the word cyclone as meaning hurricane, certainly it is obvious that there was nothing of the sort; but if we use it in its proper sense, as meaning a rotary movement of the air, then there is some evidence for it. At Barbados we notice that the wind on Saturday morning (17th) was east-northeast, but by Monday morning, when the barometer had reached its lowest point, it was east-southeast, and the following morning it was from southeast. This was a true cyclonic behavior of the atmosphere, and we can now see that the depression passed on the south side of Barbados. The force, however, must have been extremely weak, for we see no more of its effects among the islands to windward till we come to the south wind in Antigua on Thursday and Friday. That wind was doubtless a portion of the cyclonic movement, the center being then far away to the west. In Santa Cruz the cyclonic movement was well marked during the latter part of the center's passage, say Wednesday to Friday, when it was passing south of us, and afterwards was moving off to the northwest.

The reader is now referred to the table, which shows the wind directions as well as the morning readings of the barometer. Where two directions are given for one day, the upper is from the morning report and the lower from the afternoon report.

Morning readings.

Date.	Santa Cruz, 8 o'clock.		Antigua, 9 o'clock.		Barbados, 10 o'clock.	
	Pressure.	Wind direction.	Pressure.	Wind direction.	Pressure.	Wind direction.
Saturday, October 17	30.04	ese.	30.04	e., ne.	30.13	ene., e.
Sunday, October 18	30.04	e. by n.	.....	.....	.....	.....
Monday, October 19	29.98	e.	29.94	e.	*30.05*	ese., s.
Tuesday, October 20	29.96	e.	*29.92*	e.	30.06	se., ese.
Wednesday, October 21	*29.94*	ese.	29.94	e.	30.08	se.
Thursday, October 22	29.97	ese., s.	29.97	s., se.	30.12	ese., s.
Friday, October 23	30.00	s., ssw.	30.02	s., e.	30.17	se.
Saturday October 24	30.03	sse.	30.03	e.	30.16	se., e.

Lastly, we return to the question: Did the force of the movement increase on Wednesday, the 21st? It was probably gathering strength all the time of its passage, and the fact that the outward flow of the higher air from the center was not detected here till Wednesday may be explained, at least in part, by the fact that its center had not till then arrived at its nearest approach to us. On the other hand, there is the curious fact that on Wednesday morning the barometer here fell from 29.94 at 8 a. m. to 29.87 at noon, an unusual fall, since under ordinary circumstances the reading at noon is about the same as at 8 a. m. A still more interesting fact is that at Antigua and Barbados the afternoon readings on Wednesday showed two-hundredths and seven-hundredths, respectively, below the afternoon readings of the previous day, notwithstanding the fact that at both islands the barometer had started to rise. To make this matter as clear as possible, we give a table of the afternoon readings of the barometer at Antigua and Barbados.

Afternoon readings (4 o'clock).

Date.	Antigua.	Barbados.
Friday, October 16	29.98	30.04
Saturday, October 17	*	30.04
Monday, October 19	29.83	29.93
Tuesday, October 20	29.85	29.97
Wednesday, October 21	*29.83*	*29.92*
Thursday, October 22	29.89	30.05
Friday, October 23	29.98	30.10
Saturday, October 24	*	30.09

*Not given.

Perhaps, after all, it would be a mistake to attach much importance to this small fall; still it is well worth notice.

If, then, we wish to make a picture for ourselves of the weather conditions in this part of the world last week, we must first think of a wide area of sea out in the Atlantic, but near to our islands, over which the air was rather lighter than over the surrounding parts. This wide area gradually advances on us during the first days of the week and fills up the eastern part of the Caribbean Sea. By Wednesday we get evidence that a cyclonic center has been formed, and we see from the motions of the wind that this center subsequently advances toward the northwest. On Wednesday it is nearest to us, but by Saturday morning it has withdrawn itself, and the usual fine weather returns. Whether this center, which has thus passed us and traveled onward, has been very stormy or not, can not yet be told, perhaps never will be, for unless its force has grown so much as to assume a destructive character no one will notice it. For us in St. Croix the movement has been one of immense value, bringing us, in the form of heavy and long expected rains, just what was wanted to insure for us in regard to our staple industry a fairly good position in the coming year.

CLIMATOLOGICAL TABLES FOR MERZIFOUN, TURKEY.

By Prof. J. J. MANISSADJIAN, dated Anatolia College, Merzifoun, February 26, 1904.

In continuation of tables published in the MONTHLY WEATHER REVIEW for January, 1903, p. 25, I take pleasure in presenting the following summary of monthly and annual values observed by myself at the observatory of Anatolia College, Merzifoun, latitude 40° 51′ north; longitude 35° 31′ east, altitude 751 meters, or 2646 feet.

Meteorological records at Anatolia College, Merzifoun, Asia Minor.

1903.	Air pressure (in millimeters).					Air temperature (in degrees centigrade).									
	Average.	Maximum.	Date.	Minimum.	Date.	7 a. m.	1:45 p. m.	9 p. m.	Average.*	Average maxima.	Average minima.	Average daily range.	Absolute maximum.	Date.	Absolute minimum.	Date.
January	694.97	699.3	25	687.7	15	— 3.6	6.5	2.8	— 2.38	1.47	— 3.93	5.40	8.5	14	—13.5	26
February	695.5	703.5	26	686.2	16	— 5.95	2.89	0.96	— 1.14	3.9	— 3.4	7.3	10	24	—10.5	20
March	693	699.2	28	685	7	1.70	8.41	3.66	4.3	9.47	0.32	9.15	19.5	31	— 3.5	17
April	688.5	694.7	4	684.7	7	10.25	16.4	10.45	11.8	18.18	6.25	11.93	24	19	1.5	4
May	690.9	695.8	15	686.5	25	14.93	18.9	13.1	15	20.9	9.34	11.56	30	14	5.5	19
June	688.7	692.9	4	682.4	23	18.25	21.4	15.5	17.6	23.5	12.1	11.4	28	28	9.5	7
July	690.1	694	15	685.3	22	19.3	22.8	17.3	19.1	24.30	13.42	10.88	30	9	9	6
August	690.3	695	6	682.8	18	17.6	22.5	16.8	18.4	23.5	13.5	10	30.5	18	9.5	20
September	693.8	698.1	5	688.5	11	13.1	18.4	12.8	14.3	19.2	8.9	10.3	28	16	2.5	28
October	692.5	697.2	15	685	11	8.92	15.9	11.5	11.9	16.6	6.9	9.7	23	8	1	23
November	693.9	699.7	2	684.4	23	2.9	8.15	4.8	5.2	8.6	2.2	6.4	14	22	— 4.5	27
December	693.4	700.3	22	685.5	9	2	6	3.1	3.5	6.5	1.3	5.2	11.5	11	— 3	5
Annual	693.8	697.5	.....	685.5	.....	8.28	14.02	9.4	10.3	14.68	5.57	9.11	30.5	.....	—13.5	.....

1903.	Cloudiness, 0-10.						Precipitation.					Wind, number of observations with—								
	7 a. m.	1:45 p. m.	9 p. m.	Average.	Clear days (less than 2).	Cloudy days (more than 8).	Total.	Maximum.	Date.	Days with 1 mm.	Days with more than 2 mm.	N.	NE.	E.	SE.	S.	SW.	W.	NW.	Calm.
January	6.8	6.7	5.4	6.3	8	15	20.2	5	18	2	5	1	40	8	1	3	3	3	5	29
February	4.8	5.2	4.1	4.9	8	7	7.9	2.2	23	4	1	3	35	4	0	2	7	4	6	23
March	4.7	5.4	3.8	4.6	11	8	35.2	13	12	5	3	2	40	3	5	0	8	0	1	34
April	4.1	5.4	4.3	4.6	8	4	20.7	8.7	26	4	5	3	21	2	8	2	13	4	2	35
May	4	6.2	5.3	5.2	5	9	87.1	19.8	6	4	8	4	29	1	1	0	9	0	4	45
June	4.3	5.5	4.6	4.8	6	5	95.1	24.4	14	6	10	3	31	3	2	0	14	0	1	36
July	3.9	3.8	1.9	3.2	14	3	25.2	6	6	1	5	22	32	4	0	0	2	1	0	32
August	4.4	3.8	2.6	3.6	12	3	73.3	25.6	6	1	5	23	21	1	0	0	1	1	0	46
September	3.6	2.1	2.8	2.8	15	1	10.7	10.7	11	0	1	13	29	0	0	1	0	0	1	46
October	3.4	3.6	3	3.3	17	3	33.7	20	31	1	3	15	4	0	0	0	2	0	0	72
November	6.6	6.7	5.4	6.2	4	11	38.8	14.8	14	1	5	13	2	0	0	0	0	0	0	75
December	8.1	9.2	7.5	8.2	1	20	25.1	7	31	3	4	2	0	0	1	0	0	0	1	89
Annual	4.9	5.3	4.2	4.8	109	89	482.0	.....	.....	32	54	104	284	26	18	8	59	13	21	562

NOTE.—The decimals are printed as in the original manuscript. Unfortunately, the total number of rainy days is not given. *1/3 (7 a. m. + 1.45 p. m. + 9 p. m.).

REMARKS ON BIGELOW'S STUDIES ON THE CIRCULATION OF THE ATMOSPHERE.

By Prof. A. WOEIKOF, dated St. Petersburg, Russia, March 1, 1904.

The best means to detect an influence of a change of solar radiation on the temperature of the atmosphere would be the difference of pressure between tropical heights and the lowlands at their base, as has been shown by Hann. The pressure differences would depend not only on the temperature of the whole air stratum between the pairs of stations, but also on the quantity of vapor, for as the Tropics have a great percentage of water surface a larger evaporation would result from a greater quantity of solar heat, and the effect on the temperature of the lower stratum would be marked in some cases by increased cloud and rain. Unfortunately there are few mountain or even plateau stations of the Tropics with long records. India and Ceylon would alone be available, but in that region there are stations covering the years 1873–1900 which Professor Bigelow uses. For a shorter period nearer to our time the stations in Peru and Hawaii would be available. As the tropical high stations are few and their importance is great, it would be worth while to make all the calculations necessary to give a true mean; the reduction of different hours of observation is facilitated by the very great steadiness of the daily variations of pressure in the Tropics, so that the reduction factor from hourly observations in the lowlands could be used, taking into account the diminution of pressure with altitude. I hope these remarks will not be taken as a disparagement of the excellent work of Professor Bigelow, but simply as a suggestion for a future extension.

THE VERTICAL COMPONENT OF THE WIND.

By Rev. MARC DECHEVRENS, S. J., Director of the Observatory of St. Louis, island of Jersey, England, dated March 1, 1904.

In the MONTHLY WEATHER REVIEW for November, 1903, page 536, there is an interesting note in which the Editor speaks of the vertical component of the movements of the atmosphere. It concludes with the following remarks:

It is very desirable that we should have both demonstrations and measurements of the rate of ascent and descent of currents of air. * * * Any contribution to the subject of the vertical component of atmospheric motions will be welcome to the meteorologist.

Previously, in the Editor's "Treatise on meteorological apparatus and methods," in 1887, he described an inclinometer of my invention, intended to measure the angle of the wind with the horizon, but said nothing of the anemometer with which, in 1887, I replaced this very defective vane. This anemometer fulfils the wish which he expressed to see an anemometer of rotation substituted for the vane.

I put it in operation at the Observatory of Zi-Ka-Wei, China, in 1896 and 1897. After my return to Europe I installed it in 1894 at Jersey, under conditions according well with those which the Editor demanded, in 1887, to ensure observations of real utility:

> Only in a level country or at sea, with a vane (or better an anemometer of rotation) established upon a very high tower, can we feel assured that the results of vertical measurements will be of meteorological importance, and that general currents, vertical or inclined, are really the subject of observation.

Jersey is a rather small, level island at the mouth of the English Channel, and the steel tower, of which I send a photograph, fig. 1, intended for the exposure of the anemometers, was erected on a hill of 55 meters, near the shore; it is, itself, 50 meters high, and the anemometer rises above it 6 meters, so that the total elevation of the anemometer is 111 meters.

Besides the picture of the tower I send also one of the Dechevrens universal anemometer, fig. 2. I had conceived the idea of it in China, and succeeded in having it constructed by the firm of Richard, at Paris. It analyzes the movement of the air in the same manner that a complete magnetograph analyzes the magnetic condition of the earth; it measures at the same time the direction of the wind and the two components, horizontal and vertical, of its velocity. In order to get the horizontal component I have substituted, for the hemispherical cups of Robinson, straight semicylinders, which you will easily distinguish in the