this difference, I knew a thunderstorm was prevailing beyond my night horizon and he did not. It is well known that the night horizon of an observer is much less than it is in day time, and this I think accounts for the lightning from a cloudless sky as well as for rain from a cloudless sky, both phenomena being reported, as a rule, as having been observed at night. Mr. Weed reports the mountains southeast of his location, and the appearance of clouds about the north end of the mountain and the lightning left of the star and back of the mountains; this places the mountains in the southeast, the lightning east-southeast, and the clouds east and east-northeast; the wind was from the northeast, hence the clouds were evidently driven east of the mountain summits southward, causing the clouds to be beyond the night horizon of Mr. Weed and further, hid by the mountain peaks, so that the clouds should be about where the lightning came from; the lightning flashed upward and could be plainly seen while the clouds were below the horizon or behind the peaks. The description which Mr. Weed gives of the wind indicates also the possibility of a slight disturbance, possibly a local thunderstorm of mild intensity. It is well known that local storms, especially thunder squalls or storms, occur even when the weather map shows no signs of it.

MONTHLY STATEMENT OF AVERAGE WEATHER CONDITIONS FOR OCTOBER.

By Prof. E. B. GARRIOTT.

The following statements published on October 1, are based on average weather conditions for October as determined by long series of observations. As the weather of any given October does not conform strictly to the average conditions, the statements can not be considered as forecasts:

In October the storms of the middle latitudes of the north Atlantic Ocean become more frequent and severe and the winds are more pronounced in force and hold more steadily from westerly quarters.

The season of West Indian hurricanes terminates frequently with storms of maximum seasonal severity, and the severer storms are usually experienced in Cuba and the Bahamas. In Porto Rico and the Lesser Antilles storms are less frequent than in August and September. In the Philippine Islands and along the southeastern coasts of Asia typhoons occur less frequently than during September and the late summer months.

In October the wet season begins on the Pacific coast of the United States and rain becomes more general over the middle and northern Plateau regions. In the Rocky Mountain districts and Arizona October rains are light as compared with those of the summer months. Over the country generally from the Rocky Mountains to the Mississippi River there is a diminution of rainfall from June to December. East of the Mississippi the total precipitation averages less than for the summer months, but is more evenly distributed in the form of general rains.

Damaging frost is likely to occur in the United States in October as far south as the interior of the Gulf and South Atlantic States.

OBSERVATIONS AT HONOLULU.

Through the kind cooperation of Mr. Curtis J. Lyons, Meteorologist to the Government Survey, the monthly report of meteorological conditions at Honolulu is now made partly in accordance with the new form, No. 1040, and the arrangement of the columns, therefore, differs from those previously published.

Meteorological observations at Honolulu, October, 1900.

The station is at 21° 18′ N., 157° 50′ W.

Hawaiian standard time is 10h 30m slow of Greenwich time. Honolulu local mean time is 10h 31m slow of Greenwich.

Pressure is corrected for temperature and reduced to sea level, and the gravity correction, —0.06, has been applied.

The average direction and force of the wind and the average cloudiness for the whole day are given unless they have varied more than usual, in which case the extremes are given. The scale of wind force is 0 to 12, or Beaufort scale. Two directions of wind, or values of wind force or amounts of cloudiness, connected by a dash, indicate change from one to the other.

The rainfall for twenty-four hours is measured at 9 a. m. local or 7:31 p. m., Greenwich time, on the respective dates.

The rain gage, 8 inches in diameter, is 1 foot above ground. Thermometer, 9 feet above ground. Ground is 43 feet, and the barometer 50 feet above sea level.

Date.	Pressure at sea level.	Temperature.		During twenty-four hours preceding 1 p.m., Greenwich time, or 2:29 a.m., Honolulu time.									Total rainfall at 9 a.m., local time.
				Temperature.		Means.		Wind.		Average cloudiness.	Sea-level pressures.		
		Dry bulb.	Wet bulb.	Maximum.	Minimum.	Dew-point.	Relative humidity.	Prevailing direction.	Force.		Maximum.	Minimum.	
	*	†	†			‡	‡		§				
1	29.92	70	68	85	69	67.5	75	ssw-w.	1-0	3-0	29.96	29.86	0.00
2	29.95	76	71.5	87	70	68.5	75	sw-nne.	1-2	3	30.01	29.89	0.26
3	29.95	76	68.5	83	75	66.5	70	ne.	1-4	5	30.02	29.93	0.01
4	29.95	75	68	83	75	65.5	65	ne.	3	6	30.02	29.94	0.18
5	29.97	75	68	83	70	65.0	65	nne.	4	4	30.03	29.95	0.08
6	29.92	72	67.5	82	72	64.5	66	ne.	3-0	5-8	30.01	29.93	0.09
7	29.85	71	67.5	83	70	66.0	71	ne.	2	5	29.94	29.86	0.07
8	29.84	68	66.5	84	70	66.0	72	ne.	1-0	1	29.91	29.81	0.00
9	29.86	72	69	83	68	66.7	74	sw.	1-0	2-9	29.92	29.83	0.01
10	29.90	70	68.5	84	71	67.5	73	sw-ne.	1-2	2-10	29.94	29.87	0.20
11	29.91	75	71.5	83	70	69.5	80	s.	1	3-8	29.97	29.89	0.00
12	29.90	77	71.5	87	83	70.3	73	se-ne.	0-2	7-3	29.98	29.88	0.00
13	29.86	72	69	85	76	69.3	70	ne.	1-3	4	29.93	29.86	0.00
14	29.81	70	67	85	71	68.0	74	nne.	3	3-7	29.90	29.81	0.06
15	29.85	66	63.5	84	69	63.7	65	nne.	1	1-0	29.88	29.78	0.00
16	29.89	76	70	84	65	63.5	67	w-nne.	2-0	1-2	29.94	29.84	0.00
17	29.94	77	72	84	76	69.0	77	nne.	2-0	4-10	30.02	29.92	2.68
18	30.04	77	71.5	82	68	70.3	78	ne.	3	10-6	30.06	29.96	0.13
19	30.07	76	69.5	83	75	68.5	71	ne.	3	10-8	30.11	30.03	0.07
20	30 01	76	69	82	74	65.7	66	ne.	4-2	5-3	30.11	30.01	0.00
21	29.98	73	69	83	76	67.0	68	ne.	3	4	30.04	29.95	0.54
22	29.97	75	70	79	71	67.0	75	ne.	2-5	10-6	30.03	29.96	0.81
23	29.99	77	69	80	70	68.3	73	ne.	3	7	30.04	29.96	0.17
24	29.99	76	69	80	74	66.7	70	ne.	4	7-10	30.06	29.97	0.36
25	29.99	76	70	80	71	67.3	74	ne.	3-5	8-3	30.04	29.97	0.26
26	29.96	76	69	81	72	67.0	71	ne.	3-5	4	30.03	29.94	0.17
27	29.96	75	69	79	72	66.3	69	ne.	3-5	6	30.03	29.95	0.15
28	30.00	74	69	80	73	66.0	69	ne.	4-5	7	30.06	29.98	0.09
29	30.00	75	69	80	74	66.7	72	ne.	3-5	7	30.07	30.00	0.15
30	29.96	76	68.5	81	71	65.7	67	ne.	5-6	4-2	30.06	29.95	0.11
31	29.94	75	69.5	81	72	65.7	69	ne.	5	4	30.02	29.94	0.23
Sums	......	......	......	......	......	......	......	......	......	......	......	......	....
Means	29.953	74.0	69.0	82.4	71.8	66 9	71.0	....	2.7	5.2	.....	.....	6.88
Departure	—.006	......	......	......	......	+0.7	0.0	....	.....	+0.9	......	......	+4.42

Mean temperature for October, 1900 (6 + 2 + 9) ÷ 3 = 76.9; normal is 76.3. Mean pressure for October (9 + 3) ÷ 2 is 29.960; normal is 29.966.

* This pressure is as recorded at 1 p. m., Greenwich time. † These temperatures are observed at 6 a. m., local, or 4:31 p. m., Greenwich time. ‡ These values are the means of (6+9+2+9) ÷ 4. § Beaufort scale.

RECENT PAPERS BEARING ON METEOROLOGY.

W. F. R. PHILLIPS, in charge of Library, etc.

The subjoined list of titles has been selected from the contents of the periodicals and serials recently received in the library of the Weather Bureau. The titles selected are of papers or other communications bearing on meteorology or cognate branches of science. This is not a complete index of the meteorological contents of all the journals from which it has been compiled; it shows only the articles that appear to the compiler likely to be of particular interest in connection with the work of the Weather Bureau:

Nature. London. Vol. 62.
MacDowall A. B. Sunspots and Frost. P. 599.

Ciel et Terre. Bruxelles. 21*me année.*
Arctowski, H. Sur les conditions météorologiques des régions antarctiques. P. 379.
Polis, P., et Sieberg, A. L'Observatoire météorologique d'Aix-la-Chapelle. P. 384.
Teisserenc de Bort, L. Sur la mode de formation des types d'isobares. P. 389.

Das Wetter. Berlin. 17 Jahrg.
Kasner, C. Meteorologische Beobachtungen auf einer Reise nach Bulgarien. P. 217.
Bruckner, E. Ueber den Einfluss der Schneedecke auf das Klima der Alpen. (Schluss.) P. 222.
Sieberg, A. Sonnenringe und Nebensonnen. P. 235.
National Geographic Magazine. Washington. Vol. 11.
Algue, J. Manila Observatory. P. 427.
Newell, F. H. Limited Water Supply of the Arid Region. P. 438.
Proceedings of the Royal Society. London. Vol. 68.
Rambaut, A. A. Underground Temperature at Oxford in Year 1899 as determined by Five Platinum Resistance Thermometers. P. 218.
Memorias y Revista de la Sociedad Cientifica "Antonio Alzate." Mexico. Tomo 14.
Moreno y Anda, M. Contribution à l'étude Climatologique de la Vallée de Mexico. Pression Atmosphérique. P. 353.
Philosophical Magazine. London. Vol. 50.
Henderson, W. C. Experiments to determine whether a Liquid when Electrified loses any portion of its Charge by Evaporation. P. 489.
Archives des Sciences Physiques et Naturelles. Genève. 4me période. Tome 10.
Gautier, R. Résumé météorologique de l'année 1899 pour Genève et le Grand Saint-Bernard. P. 345.
Quarterly Journal of the Royal Meteorological Society. London. Vol. 26.
Hepworth, M. W. C. Remarks on the Weather Conditions of the Steamship Track between Fiji and Hawaii. P. 235.
Dines, W. H. Ether Sunshine Recorder. P. 243.
Meteorologische Zeitschrift. Band 17. Wien. 1900.
Exner, K. Windrichtung und Scintillation. P. 433.
Satke, L. Wolkengeschwindigkeit und -Richtung nach dreijährigen Beobachtungen in Tarnopol. P. 437.
Stentzel, A. Leuchtende und selbstleuchtende Nachtwolken. P. 448.
Meyer, L. Die Gewittervertheilung in Württemberg (mit Karte). P. 458.
Sapper, K. Meteorologische Beobachtungen in der Republik Guatemala im Jahre 1899. P. 459.
Meyer, L. Temperatur-Beobachtungen in verschiedenen Höhen des Münsterthurmes in Ulm. P. 463.
Billwiller, R. Starke Regenfälle und Hochwasser in der Südschweiz vom 21 bis 28 August 1900. P. 463.
Brillouin, M. Ursprung, Variationen und Perturbationen der atmosphärischen Elektricität. P. 465.
Chauveau, A. B. Ueber die tägliche Schwankung der Luftelektricität. P. 467.
Bork, H. Das Brockengespenst im Tieflande. P. 468.
Zoth, O. Ueber den Einfluss der Blickrichtung auf die scheinbare Grösse der Gestirne und scheinbare Form des Himmelsgewölbes. P. 468.
Knudsen, M. Der Einfluss der ostisländischen Polarstromes auf das Klima der Faröer. P. 470.
Sieberg, A. Sonnenring, beobachtet am Meteorologischen Observatorium zu Aachen I. Jahre 1900. P. 473.
Rotschuh, E. Das Nebensonnen-Phänomen von Aachen. P. 474.
Joubin, G. Polariskopische Beobachtungen während der totalen Sonnenfinsterniss. P. 475.
Elster, J. Ueber den Verlauf des elektrischen Potentialgefälles während der totalen Sonnenfinsterniss am 28 Mai 1900 zu Algier. P. 475.
Wolfer, A. Provisorische Sonnenflecken-Relativzahlen für das III. Quartal 1900. P. 476.

PROPERTY LOSS BY LIGHTNING IN THE UNITED STATES, 1899.

By ALFRED J. HENRY, Professor of Meteorology.

In 1898 systematic efforts were made by the United States Weather Bureau to ascertain the frequency of damaging or destructive lightning strokes throughout the United States. The results of the first year's work were published in Weather Bureau Bulletin No. 26, Lightning and Electricity of the Air, and also separately as Weather Bureau No. 199, Property Loss by Lightning, 1898. The collection of statistics bearing upon the loss of and damage to property was continued during 1899. As heretofore, dependence has been placed upon the reports furnished by agents and adjusters of farmers' mutual insurance companies, supplemented by press clippings obtained through one of the large newspaper-clipping agencies.

Farmers' mutual insurance companies operate mainly in the States of Illinois, Iowa, Minnesota, Wisconsin, Michigan, Nebraska, Missouri, Indiana, and Ohio. It may be assumed that for these States the returns that have been received are substantially correct as far as they go; it is not to be expected, however, that in a purely voluntary service, such as was freely given by the farmers' mutual companies, returns would be made for each loss sustained or that agents and adjusters would uniformly cooperate with the Weather Bureau. While the cooperation was much more complete in some States than in others, it does not necessarily follow that the statistics for one State are less complete than those for another, except in matters of detail. In general, newspaper clippings were relied upon to supply any lack of data that might be caused by failure of the mutual insurance companies to report their losses. At this point the question might naturally be asked, what proportion of damaging lightning strokes is reported to the newspapers? A categorical answer can not be given; probably three-fourths, possibly more. As a general proposition it may be assumed that substantially all of the larger losses, whether they occur in city or country, are sooner or later reported to the press. In the more thickly populated States the county newspaper generally contains a faithful chronicle of destruction by lightning throughout the county. It is only in the sparsely settled States and Territories that accounts of destructive flashes will fail of publication. There are, of course, many cases of lightning stroke in all communities accounts of which never appear in the public prints, mainly because the damage done is of little or no consequence.

The total number of reports received of buildings struck and damaged or destroyed by lightning during the calendar year 1899 was 5,527, about three times as many as were received during the previous year. In addition to the above number, 729 buildings caught fire as a result of exposure to other buildings that had been set on fire by lightning. The approximate loss in the 2,825 known cases was $3,016,520, or an average loss of nearly $1,100 per building. It would not be correct to assume that the same rate of loss was maintained in the remaining 3,431 buildings, for, as a general rule, it is only in the small and insignificant cases of damage or loss that the details are lacking. The number of insured buildings in the United States struck by lightning during 1899, according to the Chronicle Fire Tables, New York, 1900, was 2,760, with a total loss, including exposures, of $3,913,525, or an average of a little over $1,400 per building. These figures are largely in excess of the corresponding values for 1897 and 1898.

A summary of the material on which the report is based will be found in Table 1. The classification of buildings adopted in that table is practically the same as that of 1898.

The value of the data included in columns 7 to 13 is somewhat impaired by the fact that no information was obtainable in regard to a large proportion of the cases. The results, so far as obtained, agree closely with those of the previous year. The great majority of buildings struck by lightning were not provided with lightning rods, as was the case in 1898, but on the other hand 70 buildings provided with rods were struck and damaged.

Columns 17 and 18 have been added from the Chronicle Fire Tables for the purpose of comparison. It will be seen that, while there is a general agreement between the amounts reported in columns 16 and 18, respectively, there are several wide discrepancies. It is quite evident that the statistics collected by the Weather Bureau, which include both insured and uninsured property, fall short of representing the entire amount of loss by lightning. One of the significant facts of the table is the large number (3,431) of unknown cases of loss or damage. A conservative estimate of the total loss by lightning during the year would probably be $6,000,000.

In addition to the statistics of Table 1, a considerable number of strokes was reported as falling upon various structures,