OREGON.

Temperature.—The mean was 0.4 above the normal; maximum, 106, at Pendleton and Weston, 24th; minimum, 31, at Happy Valley, 6th.

Precipitation.—The average was 1.15 above the normal; greatest monthly, 2.98, at Pendleton; least monthly, trace, at Corvallis.

Wind.—Prevailing direction, north.—*Hon. H. E. Hayes, Master State Grange, Portland, director; B. S. Pague, Observer, Weather Bureau, asst.*

PENNSYLVANIA.

Temperature.—The mean was 4.4 below the normal; maximum, 97, at Huntingdon, 14th, and Wilkes Barre, 15th; greatest monthly range, 53, at Huntingdon; least monthly range, 32, at Swarthmore.

Precipitation.—The average was about 2.00 above the normal; greatest monthly, 11.61, at Coatesville; least monthly, 2.63, at Wysox.

Wind.—Prevailing direction, west.—*Under direction of the Franklin Institute, Philadelphia; L. M. Dey, Observer, Weather Bureau, assistant.*

SOUTH CAROLINA.

Temperature.—Maximum, 93, at Brewer Mine, 15th; minimum, 56, at Brewer Mine, 8th, and at Greenwood, 10th; greatest monthly range, 43, at Brewer Mine; least monthly range, 24, at Walhalla.

Precipitation.—Greatest monthly, 9.94, at Hardeeville; least monthly, 2.81, at Winnsborough.

Wind.—Prevailing direction, southwest.—*A. P. Butler, Observer, Weather Bureau, Columbia, director.*

TENNESSEE.

The month was characterized by generally low temperature and an abnormal amount of rainfall.

Temperature.—The mean was 2.4 below the normal, and with the exception of 1883 was the lowest mean on record for July; maximum, 96, at Union City, 21st; minimum, 52, at Hohenwald and Jackson, 9th and 10th, and at Dunlap, 20th; greatest monthly range, 43, at Union City; least monthly range, 26, at Rugby and Greeneville.

Precipitation.—The average was 0.50 above the normal; greatest monthly, 9.91, at Fayetteville; least monthly, 0.95, at Union City.

Wind.—Prevailing directions, south and southwest.—*J. D. Plunket, M. D., Nashville, director; H. C. Bate, Observer, Weather Bureau, assistant.*

TEXAS.

Temperature.—The mean was 1.0 above the normal, except in the eastern part of the state and in the Rio Grande Valley, where it was deficient; maximum, 107, at Menardville, 7th; minimum, 54, at Weatherford, 12th; greatest monthly range, 52, at Weatherford; least monthly range, 23, at Galveston, Brownsville, Brazoria, and Burnet.

Precipitation.—The average was generally deficient, except along the coast, where there was an excess, and over the Panhandle, where it was about normal; greatest monthly, 11.57, at Brazoria; least monthly, 0.00, at Menardville.—*D. D. Bryan, Galveston, director; I. M. Cline, Observer, Weather Bureau, assistant.*

VIRGINIA.

Temperature.—Maximum, 98, at Richmond; minimum, 46, at Lexington.

Precipitation.—Greatest monthly, 8.90, at Norfolk; least monthly, 2.90, at Blacksburgh.—*Dr. E. A. Craighill, Lynchburgh, director; J. N. Ryker, Observer, Weather Bureau, assistant.*

WASHINGTON.

Temperature.—The mean was generally in excess throughout the state; maximum, 108, at Walla Walla, 24th; minimum, 33, at Waterville, 6th; greatest monthly range, 69, at Waterville; least monthly range, 40, at Fort Canby.

Precipitation.—The average was deficient on the coast and Sound and excessive in the eastern part of the state; greatest monthly, 1.83, at Baker City, Oregon; least monthly, 0.05, at Tacoma.

Wind.—Prevailing directions, south and north.—*E. B. Olney, Observer, Weather Bureau, Olympia, director.*

WISCONSIN.

Temperature.—The mean averaged 5 to 10 below the normal, the greatest deficiency being in the cranberry region; maximum, 96, at Beaver Dam and Crandon, 13th; minimum, 33, at Crandon, 20th and 26th, at Florence, 8th and 20th, and at Shawano, 9th.

Precipitation.—The average was below the normal, except in the southeast part of the state where there was a small excess; greatest monthly, 4.63, at Peshtigo; least monthly, 0.84, at Cumberland.—*W. L. Moore, Observer, Weather Bureau, Milwaukee, in charge.*

CONTRIBUTIONS AND ORIGINAL ARTICLES.

SOME EXPERIMENTS IN ATMOSPHERIC ELECTRICITY.

By ALEXANDER MCADIE, M. A.

[Read before Section B (Physics), meeting of American Association for the Advancement of Science, Washington, D. C., August, 1891.]

Some interesting observations of atmospheric electricity have been made this summer at Blue Hill Observatory, Readville, Mass. The location is excellent, as the summit of the hill has an elevation of about 195 metres above mean tide, and is not only the highest land in eastern Massachusetts, but the highest point within ten miles of the coast from Maine to Florida. Continuous observations of the potential of the air at the summit and base were attempted. The base station is 126 metres below the summit and 1,178 metres northwest. Two similar Mascart photographic registers were used, with similar water-droppers. Continuous observations of atmospheric electricity have been made only at a few of the best equipped observatories, and, up to the present time, always with the bifilar suspension. The records, although exceedingly delicate, as a rule show very marked disturbances not due to the electricity of the air: *e. g.*, the variation due to the inconstancy of the suspension. The apparatus can be fairly judged, perhaps, by the discussion which followed Dr. Fine's paper on the variations of atmospheric electricity at Perpignan, read at the Congress of Meteorologists, held in Paris, 1889. These records were begun in 1882, and have been carried on since with all skill and thoroughness. A comparison of these curves obtained at the College de France, by Mascart, since 1881, at the Parc St. Maur, at Greenwich, and elsewhere, in the effort to deduce the normal diurnal variation, makes plain discrepancies and disagreements which are, without doubt, directly due to the apparatus and its installation. In the United States the only observations that I know of, with this apparatus, are those obtained at Baltimore by the United States Signal Service for some three years, and some, for some months, at Worcester, Mass. The chief cause of this paucity of observations is undoubtedly the difficulty of manipulating and the expense of maintaining the photographic register. The expense of the necessary incidentals is considerable, and the various difficulties met in installing the apparatus make it impossible to use the method elsewhere than in a well-equipped observatory. The Mascart self-register requires, for a true record, a dark room, stone piers, constant hygrometric and temperature conditions, and the successful fixing of the record by photography. Observations of the potential of the air are therefore not likely to become general with such apparatus. And, furthermore, it is impossible, where photography is employed, to know what the value of the potential is at any moment. The electrometer for general use, say, for example, for use at the various stations of the Weather Bureau, at experimental stations, etc., must, first of all, be one giving a record that can be easily read at any hour of the day. The above considerations have led to the construction of a new type of electrometer, known as the Multiple Quadrant Electrometer, and a working model has been built, and some tests of its efficiency made. Accompanying curves show records of potential values obtained in this way. The instrument is essentially an enlarged Quadrant Electrometer, with the parts so arranged as to be convenient of access, and instead of the four quadrants, single needle, and bifilar suspension, we use some eighty large quadrants, a needle with twenty blades, and a very fine platinum wire for suspension and directive force. The present instrument has its defects, plenty of them, no doubt; but besides the great advantages of the mechanically registered curve, recording the actual motion of the needle, is the greater one of seeing and getting at any moment the potential of the air, not having to wait 24 hours therefor, and the ability to compare directly these curves with the curves of atmospheric pressure, temperature, humidity, wind direction, wind velocity, cloudiness, etc., as given by self-recording instruments.

Charts obtained, but omitted here:

1. Curves of electrical potential, with pressure, temperature, and relative humidity.
2. Statoscope curve, showing changes in pressure during thunderstorm.
3. Cinemograph curve, showing velocity of wind at each moment during thunderstorm.

FLUCTUATIONS OF TEMPERATURE AND PRESSURE AT THE BASE AND SUMMIT OF MOUNT WASHINGTON.

By Professor H. A. HAZEN, Weather Bureau.

A great deal of interest has been developed in the study and discussion of temperature at mountain stations, both in the United States and abroad.

Continuous observations were maintained at Mount Washington, N. H., by the Signal Service from 1871 to September, 1887, and it is believed that these are the most satisfactory that have ever been taken at a mountain station, since this summit rises 6,279 feet above sea-level, and is crossed by a very large number of storms and high areas. The observations at the base were made by Dr. Hiram Cutting at Lunenburgh, Vt., which is about 1,100 feet above sea-level, and 23 miles distant in a direction nw. by w. from Mount Washington.

At the end of the charts in this REVIEW there are given tracings of the temperature fluctuations at Mount Washington and Lunenburgh, and of pressure at the latter station alone, for the months of January, February, and March, and for the years 1871, 1872, 1873, and 1874.

The pressures are projected from observations made three times each day, without modification, but the diurnal range has been eliminated from the temperature in the following manner: The night observation was projected without change, but to each morning observation there was added the difference between the mean monthly temperature at night and in the morning, while in the afternoon the difference between the means for the month was subtracted from each observation. It is proposed to publish these curves for the observations of at least 12 years.

Fluctuations of pressure and temp. near Mt. Washington, N.H.

1871.

1872.

1873.

1874.

Mt. Washington Temperature.
Sea Level Pressure.

January. February. March.

Fluctuations of pressure and temperature near Mount Washington, N.H. 1871–1874