

SCOTTISH METEOROLOGICAL SOCIETY.

Observations taken at Leith, County of Edinburgh, in Lat. 55° 57' N, Long. 3° 10' W, Distance from Sea half miles.Height of Cistern of the Barometer above Mean Sea-Level 69 feet, above Ground 36 feet.During the MONTH of January 1900.

The Hours of Observation are of Greenwich Time.

| ELECTRICITY. | Days of Month. | BAROMETER. | | | | SELF-REGISTERING THERMOMETERS. | | | | HYGROMETER. | | | | Rain. | WIND. | | | | CLOUDS. | | | | THERMOMETERS under Ground. | | | SEA. | OZONE. | GENERAL REMARKS. | Days of Month. | | | | |
|--------------|----------------------------------------------|------------|---------------------------|------------|---------------------------|------------------------------------------|------|-----------------------|-------------------|-------------|-----------|-----------|-----------|------------|-----------------------------------------|-------------------|------------|------------|------------|----------|------------|----------------------------------------|--------------------------------------|------------|--------------|----------|------------|------------------|----------------|-----|---------------|-----|---------------|
| | | 9 h. A.M. | | 9 h. P.M. | | Protected in Shade, 4 feet above Ground. | | Exposed Black Bulbs. | | 9 h. A.M. | | 9 h. P.M. | | | 9 h. A.M. | | 9 h. P.M. | | 9 A.M. | | 9 P.M. | | 9 h. A.M. | | | | | | | | | | |
| | | Barometer. | Attached Ther- mometer | Barometer. | Attached Ther- mometer | Max. | Min. | Max. in Sun's rays | Min. on Grass. | Dry bulb. | Wet bulb. | Dry bulb. | Wet bulb. | | No. of hours in which it fell. | Amount inches. | Direction. | Force. | Direction. | Force. | No. | Velocity (0-10), and Species. | Amount (0-10), and Species. | No. | 3 inches. | | | | | No. | 12 inches. | No. | 22 inches. |
| | | * No. | inches. | * No. | inches. | No. | No. | No. | No. | No. | No. | No. | No. | | No. | No. | No. | No. | No. | No. | No. | No. | No. | No. | No. | | | | | No. | No. | No. | No. | No. |
| | | 29.907 | | 29.927 | | 40.932.1 | | 35.533.9 | | 34.733.9 | | 0.00 | Calu. 0 | E 0.5 | 11.4.10.5 | 0 | 0 | 11.4.10.5 | 0 | 0 | 11.4.10.5 | 0 | 0 | 11.4.10.5 | 0 | 0 | 11.4.10.5 | 1 | | | | | |
| | 2 | 29.703 | | 29.458 | | 40.434.2 | | 40.634.1 | | 40.442.0 | | .44 | 65.63.0 | E 2.2.5 | 36.56.10 | Cal. 10 | 10 | 36.56.10 | Cal. 10 | 10 | 36.56.10 | Cal. 10 | 10 | 36.56.10 | Cal. 10 | 10 | 36.56.10 | 2 | | | | | |
| | 3 | 29.368 | | 29.685 | | 43.138.6 | | 39.638.9 | | 38.637.6 | | .48 | 11.62.0 | N 2.2.5 | 27.11.6.10 | Cal. 10 | 10 | 27.11.6.10 | Cal. 10 | 10 | 27.11.6.10 | Cal. 10 | 10 | 27.11.6.10 | Cal. 10 | 10 | 27.11.6.10 | 3 | | | | | |
| | 4 | 29.822 | | 29.982 | | 39.737.8 | | 38.634.9 | | 37.836.3 | | .00 | 11.11.5 | E 1.6.15.2 | 15.6.10.5 | Cal. 10 | 10 | 15.6.10.5 | Cal. 10 | 10 | 15.6.10.5 | Cal. 10 | 10 | 15.6.10.5 | Cal. 10 | 10 | 15.6.10.5 | 4 | | | | | |
| | 5 | 30.034 | | 29.972 | | 37.835.6 | | 36.634.1 | | 35.633.1 | | .01 | 11.1.0 | E 1.0.2.5 | 2.6.10.5 | Cal. 10 | 10 | 2.6.10.5 | Cal. 10 | 10 | 2.6.10.5 | Cal. 10 | 10 | 2.6.10.5 | Cal. 10 | 10 | 2.6.10.5 | 5 | | | | | |
| | 6 | 29.704 | | 29.568 | | 41.434.9 | | 36.034.8 | | 38.037.2 | | .13 | 5.1.5 | S 6.0.2.5 | 10.10.5 | Cal. 10 | 10 | 10.10.5 | Cal. 10 | 10 | 10.10.5 | Cal. 10 | 10 | 10.10.5 | Cal. 10 | 10 | 10.10.5 | 6 | | | | | |
| | 7 | 29.729 | | 29.956 | | 41.036.3 | | 36.634.8 | | 39.637.9 | | .38 | 11.1.0 | S 1.1.5 | 15.11.5 | Cal. 10 | 10 | 15.11.5 | Cal. 10 | 10 | 15.11.5 | Cal. 10 | 10 | 15.11.5 | Cal. 10 | 10 | 15.11.5 | 7 | | | | | |
| | 8 | 29.916 | | 29.734 | | 45.638.9 | | 41.840.1 | | 45.642.4 | | .03 | 11.1.4 | S 2.3 | 0 | 0 | 2.11.4.8 | Cal. 10 | 10 | 2.11.4.8 | Cal. 10 | 10 | 2.11.4.8 | Cal. 10 | 10 | 2.11.4.8 | 8 | | | | | | |
| | 9 | 29.848 | | 29.898 | | 45.935.9 | | 36.634.8 | | 39.837.3 | | .09 | 11.2.2.5 | W 2.2.5 | 2.11.4.8 | Cal. 10 | 10 | 2.11.4.8 | Cal. 10 | 10 | 2.11.4.8 | Cal. 10 | 10 | 2.11.4.8 | Cal. 10 | 10 | 2.11.4.8 | 9 | | | | | |
| | 10 | 30.116 | | 30.387 | | 42.336.4 | | 37.734.3 | | 36.634.1 | | .00 | 11.1.5 | Calu. 0 | 0 | 0 | 11.1.5 | Calu. 0 | 0 | 0 | 11.1.5 | Calu. 0 | 0 | 0 | 11.1.5 | Calu. 0 | 0 | 0 | 10 | | | | |
| | 11 | 30.384 | | 30.333 | | 39.533.8 | | 34.734.1 | | 39.538.9 | | .06 | Calu. 0 | Calu. 0 | 0 | 0 | 11.1.5 | Calu. 0 | 0 | 0 | 11.1.5 | Calu. 0 | 0 | 0 | 11.1.5 | Calu. 0 | 0 | 0 | 11 | | | | |
| | 12 | 30.239 | | 30.196 | | 41.739.0 | | 42.741.9 | | 46.044.7 | | .17 | 5.1.0 | Calu. 0 | 0 | 0 | 11.1.5 | Calu. 0 | 0 | 0 | 11.1.5 | Calu. 0 | 0 | 0 | 11.1.5 | Calu. 0 | 0 | 0 | 12 | | | | |
| | 13 | 30.025 | | 29.879 | | 46.741.1 | | 43.141.1 | | 43.741.3 | | .00 | 5.1.4 | S 1.5 | 5.1.5 | 2.5 | 11.1.5 | Calu. 0 | 0 | 0 | 11.1.5 | Calu. 0 | 0 | 0 | 11.1.5 | Calu. 0 | 0 | 0 | 13 | | | | |
| | 14 | 29.801 | | 29.508 | | 45.042.2 | | 42.740.9 | | 43.640.6 | | .01 | 5.1.5 | S 1.5 | 5.1.5 | 2.5 | 11.1.5 | Calu. 0 | 0 | 0 | 11.1.5 | Calu. 0 | 0 | 0 | 11.1.5 | Calu. 0 | 0 | 0 | 14 | | | | |
| | 15 | 29.162 | | 29.364 | | 45.236.2 | | 44.141.0 | | 36.634.8 | | .07 | 11.2.0 | W 1.2 | 0 | 0 | 11.2.0 | Calu. 0 | 0 | 0 | 11.2.0 | Calu. 0 | 0 | 0 | 11.2.0 | Calu. 0 | 0 | 0 | 15 | | | | |
| | 16 | 29.296 | | 29.472 | | 40.436.1 | | 37.836.8 | | 38.436.4 | | .11 | 11.3.4 | W 1.5 | 0 | 0 | 11.3.4 | Calu. 0 | 0 | 0 | 11.3.4 | Calu. 0 | 0 | 0 | 11.3.4 | Calu. 0 | 0 | 0 | 16 | | | | |
| | 17 | 29.392 | | 29.226 | | 40.934.9 | | 37.435.8 | | 39.637.0 | | .04 | 5.1.0 | W 2.3 | 0 | 0 | 11.3.4 | Calu. 0 | 0 | 0 | 11.3.4 | Calu. 0 | 0 | 0 | 11.3.4 | Calu. 0 | 0 | 0 | 17 | | | | |
| | 18 | 29.699 | | 30.061 | | 41.736.2 | | 36.834.3 | | 40.938.2 | | .01 | 11.1.5 | W 1.5 | 0 | 0 | 11.3.4 | Calu. 0 | 0 | 0 | 11.3.4 | Calu. 0 | 0 | 0 | 11.3.4 | Calu. 0 | 0 | 0 | 18 | | | | |
| | 19 | 29.648 | | 29.702 | | 50.238.6 | | 47.043.9 | | 39.637.3 | | .14 | 5.1.0 | W 2.5 | 0 | 0 | 11.3.4 | Calu. 0 | 0 | 0 | 11.3.4 | Calu. 0 | 0 | 0 | 11.3.4 | Calu. 0 | 0 | 0 | 19 | | | | |
| | 20 | 29.928 | | 30.108 | | 43.338.3 | | 40.838.9 | | 41.939.7 | | .00 | 11.2.2.5 | S 1.5 | 0 | 0 | 11.3.4 | Calu. 0 | 0 | 0 | 11.3.4 | Calu. 0 | 0 | 0 | 11.3.4 | Calu. 0 | 0 | 0 | 20 | | | | |
| | 21 | 29.945 | | 29.699 | | 44.538.9 | | 42.038.9 | | 43.440.0 | | .13 | 5.1.0 | W 2.0 | 0 | 0 | 11.3.4 | Calu. 0 | 0 | 0 | 11.3.4 | Calu. 0 | 0 | 0 | 11.3.4 | Calu. 0 | 0 | 0 | 21 | | | | |
| | 22 | 29.499 | | 29.581 | | 52.740.7 | | 45.643.0 | | 52.744.4 | | .01 | 11.3.3.5 | W 2.5 | 0.3.5 | 5.1.4 | 3.11.4.8 | Cal. 10 | 10 | 3.11.4.8 | Cal. 10 | 10 | 3.11.4.8 | Cal. 10 | 10 | 3.11.4.8 | 22 | | | | | | |
| | 23 | 29.708 | | 29.856 | | 52.744.8 | | 50.948.8 | | 50.048.0 | | .00 | 11.2.5 | W 2.0 | 0 | 0 | 3.11.4.8 | Cal. 10 | 10 | 3.11.4.8 | Cal. 10 | 10 | 3.11.4.8 | Cal. 10 | 10 | 3.11.4.8 | 23 | | | | | | |
| | 24 | 29.552 | | 29.596 | | 50.740.8 | | 44.742.1 | | 40.838.4 | | .02 | 11.2.5 | W 2.0 | 0 | 0 | 3.11.4.8 | Cal. 10 | 10 | 3.11.4.8 | Cal. 10 | 10 | 3.11.4.8 | Cal. 10 | 10 | 3.11.4.8 | 24 | | | | | | |
| | 25 | 30.018 | | 30.117 | | 48.638.5 | | 42.639.1 | | 47.544.3 | | .00 | 11.2.0 | S 1.5 | 2.5 | 0 | 0 | 3.11.4.8 | Cal. 10 | 10 | 3.11.4.8 | Cal. 10 | 10 | 3.11.4.8 | Cal. 10 | 10 | 3.11.4.8 | 25 | | | | | |
| | 26 | 29.671 | | 29.640 | | 50.134.4 | | 48.245.0 | | 35.633.8 | | .03 | 5.1.0 | W 2.0 | 0 | 0 | 3.11.4.8 | Cal. 10 | 10 | 3.11.4.8 | Cal. 10 | 10 | 3.11.4.8 | Cal. 10 | 10 | 3.11.4.8 | 26 | | | | | | |
| | 27 | 29.348 | | 29.306 | | 39.233.6 | | 36.634.9 | | 34.032.4 | | .04 | 11.2.0 | W 1.0 | 0 | 0 | 3.11.4.8 | Cal. 10 | 10 | 3.11.4.8 | Cal. 10 | 10 | 3.11.4.8 | Cal. 10 | 10 | 3.11.4.8 | 27 | | | | | | |
| | 28 | 29.486 | | 29.905 | | 39.732.3 | | 35.733.2 | | 38.636.3 | | .00 | 11.1.4 | W 2.2.5 | 0 | 0 | 3.11.4.8 | Cal. 10 | 10 | 3.11.4.8 | Cal. 10 | 10 | 3.11.4.8 | Cal. 10 | 10 | 3.11.4.8 | 28 | | | | | | |
| | 29 | 29.962 | | 30.063 | | 40.236.8 | | 37.636.1 | | 38.636.1 | | .06 | 11.6.2.0 | E 1.6.2.4 | 0 | 0 | 3.11.4.8 | Cal. 10 | 10 | 3.11.4.8 | Cal. 10 | 10 | 3.11.4.8 | Cal. 10 | 10 | 3.11.4.8 | 29 | | | | | | |
| | 30 | 29.976 | | 30.026 | | 39.035.9 | | 37.535.8 | | 38.736.6 | | .05 | 11.6.2.4 | E 1.6.2.4 | 0 | 0 | 3.11.4.8 | Cal. 10 | 10 | 3.11.4.8 | Cal. 10 | 10 | 3.11.4.8 | Cal. 10 | 10 | 3.11.4.8 | 30 | | | | | | |
| | 31 | 30.032 | | 29.903 | | 38.735.1 | | 37.036.0 | | 35.634.8 | | .21 | 11.6.2.0 | W 1.0 | 0 | 0 | 3.11.4.8 | Cal. 10 | 10 | 3.11.4.8 | Cal. 10 | 10 | 3.11.4.8 | Cal. 10 | 10 | 3.11.4.8 | 31 | | | | | | |
| | Sums. | 922.918 | | 924.018 | | 1356.811544 | | 1245.211813 | | 1254.011908 | | 2.72 | | | | | | | | | | | | | | | | | | | | | |
| | Means. | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | + Total Corrections for Instrumental Errors. | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | + Corrections for Diurnal Range. | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | + Corrected Means. | 29.772 | | 29.807 | | 43.837.2 | | 40.238.1 | | 40.438.4 | | 2.72 | | | | | | | | | | | | | | | | | | | | | |
| | No. of Column. | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 | 25 | 26 | 27 | | | | | |

BAROMETER, "corrected Mean" at 9 A.M., minus the Correction for Temp. (Col. 2), = 29.772
"Corrected Mean" of Barometer at 9 P.M., minus the Correction for Temp. (Col. 4), = 29.807
Mean at Station, corrected, and at 32°, = 29.789
Correction for height, feet above Mean Sea-level, = 0.77
Mean, reduced to 32°, and Sea-level, = 29.789
Highest Reading, corrected for Index error, on the 10 th, = 30.1387
Lowest Do. Do., at 9 a.m. on the 15 th, = 29.162
Difference, or Monthly Range, = 1.225

S.R. THERMOMETER, (in shade, etc.), Highest in Month, (corrected for Index Errors), on the 22.11.2.5 = 52.7
Lowest in Month, corrected for Index errors, on the 12.11. = 32.1
Difference, or Monthly Range, = 20.6
"Corrected Mean" of all the Highest, (Col. 5), = 43.8
"Corrected Mean" of all the Lowest, (Col. 6), = 37.2
Difference, or Mean Daily Range, = 6.6
** Calculated Mean Temperature of Month, = 40.5
S.R. THERMOMETER, Black Bulb in Sun, Highest, (corrected for Index Errors), on the th, =
"Corrected Mean," (Col. 7), of Black Bulb, Max. in Sun, =
Lowest at Night, Black Bulb (corrected for Index errors), on the th, =
"Corrected Mean," (Col. 8), of Black Bulb, Min. on grass, =
Difference of above means or range ("exposed"), =

HYGROMETER, Mean (corrected) A.M. and P.M. Reading of Dry Bulb, (Cols. 9 and 11), = 40.3
Mean (corrected) A.M. and P.M. Reading of Wet Bulb, (Cols. 10 and 12), = 38.2
†† Computed Temperature of Dew-Point, = 35.5
†† Do. Elastic Force of Vapour, = 0.208
†† Do. Weight of Vapour in a Cubic Foot of Air, =
†† Relative Humidity (Saturation = 100), = 84
RAIN fell on 23 Days; Amount in Inches, = 2.72

| WIND. | | SUMMARY. | | | | | | | | | |
|------------|---|----------|---|----|---|----|----|----|-------------------|-------------|--------------------------------|
| Direction. | N | NE | E | SE | S | SW | W | NW | Calu or Variable. | Mean Force. | Mean Velocity in miles per day |
| A.M. | 1 | 3 | 1 | 1 | 3 | 5 | 13 | 1 | 3 | 173 | |
| P.M. | 1 | 4 | 2 | 1 | 1 | 8 | 10 | 1 | 3 | 152 | |
| Mean. | 1 | 3 | 2 | 1 | 2 | 7 | 11 | 1 | 3 | 162 | |

Observations made and
Return verified by

(Signed) Jas. Pollock & Geo. Redpath.

INSTRUCTIONS

ONE of the chief objects that the SCOTTISH METEOROLOGICAL SOCIETY proposed to itself when the Society was established in 1855, was to secure PERFECT UNIFORMITY in the system of observation pursued at all its Stations. Uniformity in the observations is absolutely necessary to justify the publication of Monthly Results from different observations, it being found that differences between the Returns from two Stations, so very considerable as to render them quite incomparable, may arise from dissimilarity in the position or shelter of instruments, different hours of observation, or even from the use of differently constructed instruments. It is therefore hoped, that those who kindly furnish Reports to the Society will, by a scrupulous attention to the following Directions, secure for their Monthly Returns an accuracy and value commensurate with the labour and pains involved in making them; and, for the Tables published by the Society, an entire comparableness among the several Returns, without which the Society's Reports must inevitably fail in achieving one of the main objects of Meteorological Observation.

The Council recommend that Observations be made precisely at 9 A.M. and 9 P.M. (Greenwich or Railway Time only), as specified in the following remarks, or at the top of the hour of the columns of the Schedule. It is hoped that the utmost punctuality in the time of reading the instruments will be observed. Observers, in some few cases, may find this impossible; in such instances they are specially requested to mark opposite every reading the time at which it was taken, if not at 9 A.M. or 9 P.M. Weather-Glasses and Aneroids, though well suited to indicate roughly variations of atmospheric pressure, are not fitted for scientific purposes. No Barometer should be used for Meteorological Observation that is not supplied with some means of adjustment or compensation which will secure that the height of the mercury in the tube is accurately measured from the fluctuating surface of the mercury in the cistern.

The Barometer in which the error arising from the fluctuating surface of the mercury in the cistern is entirely got rid of is Fortin's Barometer; the arrangement consisting in applying pressure by means of a screw to the bottom of the cistern, which is made of flexible leather, thus raising or depressing the surface till it just meets the ivory point which forms the zero point of the fixed scale.

The Barometer originally constructed by Mr. Adie of London, and usually called the Board of Trade Barometer, has the great convenience of requiring no adjustment of the cistern. Its scale-inches are not true inches, but so much shorter as to compensate the error that would otherwise arise from the fluctuations of the surface of mercury in the cistern. This is an excellent Barometer for ordinary Observers, inasmuch as it is entirely eliminates the error of observation likely to arise in not a few cases in setting the instrument to the zero point of the fixed scale when the light is not good. To show the accuracy with which these Barometers are made, it may be stated, that one was compared, during a whole year, with the Society's Standard Barometer, particular care being given to make the comparison when atmospheric pressure was rising or falling very rapidly, with the result that none of the readings differed from those of the Standard more than 0.003 inch.

A modification of Fortin's Barometer is used at a number of the Society's Stations, by which the coincidence of the zero point with the surface of the mercury is indicated by a little ivory float, whose stem passes freely through the lid and case of the cistern. When the index-line on this little piston-rod is brought, by the adjusting screw, to form one straight line with those on its ivory frame, the scale is graduated. In taking an observation, this preliminary setting must be made with scrupulous accuracy; as a slight error here will vitiate the readings from the vernier.

It is absolutely necessary that the Barometer which is to be used shall have been compared with a Standard Barometer. The Barometer should be suspended in as good a light as can be secured, and to facilitate the reading a piece of white paper may be put behind the tube. It must be hung truly perpendicular, and exposed to neither the sun's direct rays nor the heat of a fire, and must not be hung against a wall heated by a fire. The object being to secure that the whole instrument, including the brass fittings, the contained mercury, and the attached Thermometer, shall be, when read, at one uniform temperature, it is evident that the best position is that which is least liable to sudden changes of temperature.

In taking an observation, the Attached Thermometer is first noted; the tube must then be gently tapped, and the cistern-adjustment carefully made. The eye, by raising and lowering it, must be brought into the plane of the back and front of the index—usually the lower edge of the vernier, which must be carefully adjusted so as to form exactly a tangent to the convex surface of the mercury in the tube. Observations must be taken quickly, so as to prevent heat from the observer's hands and person from affecting the mercury. The use of a lens will facilitate an accurate adjustment and reading of the Barometer. A mistake not infrequently made by those beginning to observe, consisting in setting the edge of the vernier to the level of the clear surface of the mercury which is in direct contact with the glass tube, must be carefully avoided.

The errors most frequently made in reading the Barometer are errors of 1.000 inch, 0.500 inch, and 0.050 inch; that is to say, instead of 29.365 inches, either of the following is sometimes set down—viz. as 30.365 inches, 28.365 inches, 29.865 inches, or 29.815 inches. Experience having shown that even the very best Observers make these mistakes, particular attention is directed to the matter. When a Barometer having adjustable surfaces has to be removed from its fastenings, the ivory peg must first be screwed so as to form a tight plug to the cistern, thus preventing the escape of the mercury. Then screw up the mercury not quite to the top of the tube, but to within a quarter of an inch of it, and take down the instrument; it should then be carried with the cistern uppermost. Before suspending the Barometer for use, it must be ascertained whether the space above the mercury in the tube is a complete vacuum; this is the case if, on inclining the instrument, a sharp tap is produced when there is air in the tube, which must be got rid of.

As Barometers are liable to be deranged by the introduction of air into their tubes, on removal from place to place, or in being roughly handled, it may be useful to Observers to know how the air may be expelled. First close up the cistern by screwing the ivory peg tight, so as to prevent the escape of mercury; then screw up the mercury to about half an inch from the top of the tube; and, having slowly inverted the instrument, place the top of it on a yielding substance, such as the foot, and gently tap on the cistern with the palm of the hand, so as to induce the air to ascend through the column to the cistern, whence it may escape. Since there is the weight of two atmospheres—the pressure of the mercury in the Barometer, and the air outside—pressing on any air that may be inside the tube, it is usually a tedious operation to get it wholly expelled. After repeated trials, however, it is generally accomplished; and the clear metallic sound of the mercury, when gently struck against the top of the glass tube, will show when the whole of the air has been expelled. On hanging up the Barometer, care must be taken to screw down the mercury in the tube before unfastening the float of the cistern, for, if this be not attended to, the mercury will flow out, and the instrument be seriously damaged.

FOR TAKING METEOROLOGICAL OBSERVATIONS,

WITH REMARKS ON THE USE OF INSTRUMENTS.

correct numbering of the scale of every instrument; the rejection of Thermometers the frameworks of which are not likely to stand exposure to the weather, as shown in the past by repeated and annoying breakages of Thermometers of similar construction; and as regards Maximum Thermometers, either Negretti and Zambra's, or Phillips's, whether they will act at the highest temperatures they may be required to register. By the laws of the Society, Members and Observers have a right to have their instruments compared by the Secretary, and to advise with him regarding the purchase of instruments. Very great care should be bestowed on the Observations of the wind.

Wind, the accuracy of which, both as regards Direction and Force, is so essential towards the right discussion of many of the more important problems of the science. A Wind-Vane ought to be elevated at least 12 feet above surrounding objects. When it oscillates incessantly, the mean direction should be taken. In all cases, but especially when the Vane is stationary, and when the wind is feeble, reference may be made to the direction of smoke, etc., in well-exposed situations. Careful observations are recommended to be made on the changes in the direction of the wind; and during storms, extra observations at every hour of Greenwich time. Such a system of simultaneous observation, pursued at different Stations, is likely to give highly valuable and important results, particularly in connection with the system of thickly-planted Stations over a limited district round Edinburgh called STORM STATIONS, in the course of being established by the Society for the systematic investigation of the relation of the force of the wind to BAROMETRIC GRADIENTS, and other points connected with storms.

The Council would recommend the Hemispherical Cup Anemometer, a self-registering instrument which shows the amount of Wind that passes it per day, from which also the mean Velocity of the Wind at the time of observation may be ascertained. For indicating the Force of the Wind at any particular hour of observation, the Pressure Anemometers recently brought under the notice of the Society by Mr. T. Stevenson, the Honorary Secretary, and Mr. R. Ballingall, the Society's Observer at Ballinab, are recommended as likely to secure uniformity in making observations on the Force of the Wind.

Many causes conspire to produce anomalies in Rain Returns, arising partly from the difficulty of obtaining a perfectly unobstructed situation for observation, and partly from the defective nature of the instruments used. The Rain Gauge should not be placed on a slope or terrace, but on a level piece of ground, in an open situation as the Observer can secure for it. As it is often difficult to obtain a position as free and unobstructed by surrounding objects as is desirable, care should be taken to place it at some distance from shrubs, trees, buildings, or other obstructions, at least, as many feet from their base as they are in height. The more important directions, towards which it is most desirable to have a free exposure, are, in the order of their importance, S.W., N.E., S.E., and W. The rim of the gauge must be perfectly level, and fixed so that it will remain level in all weathers, and be at a height of one foot above ground, over grass. In such gauges as Fleming's, which are furnished with a measuring-rod attached to a float, the rod ought to be fixed down, and the float use to its height only at the time the instrument is read, it being found that a stem projecting above the rim of the gauge seriously interferes with the proper measurement of the Rain-fall. When a measuring-glass is used, care should be taken to hold it quite perpendicular. The Rain Gauge ought to be read daily at 9 A.M., and the reading entered in the Returns of the previous day. If the Gauge is read once a month, the reading is to be made on the first of the month, and the amount entered for the previous month. Snow-falls may, for convenience, be registered in the rain columns, under the following conditions:—When a 'Snow shower' occurs, it should be noted in the 'Remarks,' and the letter S affixed to the depth of water received in Gauge. The depth of the snow must be measured in some open place where no drift is observed, and registered in addition to, and as a check upon, the indications of the Rain Gauge. For wind, rain, and snow, as indicated in every column, the Observer cannot be too careful to register observations only; and nothing that partakes of the nature of deduction or inference.

Convenient abbreviations for the nomenclature of Clouds will be found on the other side. The amount of Cloud ought to be estimated from the greater or less obscuration of the sky overhead (i.e. within 20° or 30° of the zenith). The strata of Clouds that appear near the horizon are viewed obliquely; and thus, being unable to judge of their amount, we ought not to take them into account in the Clouds column, though their appearance and changes may be noted among the Remarks. The amount of Cloud is entered from a scale of 0 to 10; thus, when the sky overhead is free from Clouds it is entered 0, when half-covered by Clouds, 5, wholly covered, 10, and so on. Observations of the Clouds are made at 9 A.M. and at sunset, as illustrating the condition and currents of the upper and lower regions of the atmosphere. The entries in the schedule are to be made in the following manner:—Thus, in the column Velocity and Direction, 6, S. W. will indicate that the upper strata of Clouds travel with extreme velocity from S.W., and those in the lower regions from W., with one-third the speed of the former. Again, in the second column, an entry of 2, cu-st. will indicate that the higher regions are covered to the amount of 4-tenths with stratus Clouds; and that the sky is further obscured to the extent of 2-tenths by lower Clouds of the cumulo stratus kind. Remarks on peculiar Clouds, accompanied with drawings, will assist materially in the development of a more exact nomenclature of Clouds, as well as throw light on the electrical, and other of the more obscure phenomena of Meteorology. The approximate number of Hours in which objects in the sun's rays cast shadows, should be entered in the proper sunshine column.

As the germination and growth of crops and plants generally depend greatly on the temperature of the soil,—its amount and constancy,—the Council recommend that Observations in this interesting department be made at 9 A.M., by Thermometers permanently fixed in the soil, their bulbs being sunk to depths of 3, 12, and 22 inches, and the stems above ground protected from the sun's rays, and fitted with sloping tin collars, to prevent rain-water being conveyed to the bulbs by the stems or wooden frames. A knowledge of the Temperature of the Sea is not only in itself, but in its relations to that of our island, a most important branch of Meteorology. The Council therefore recommend that the Temperature of the Sea be carefully taken by a properly constructed apparatus from boats or coast, where it is not influenced by that of river water, and as little influenced as possible by currents sweeping along the coast, and thus acquiring the temperature of the land, either greatly heated by the sun or cooled by nocturnal radiation. At or near the time of high

water, in cases where the observations cannot be taken daily, the observation may be made on the 5th, 15th, and 25th of each month. When convenient, extra Sea Observations might be taken for other and greater depths, noting always the Temperature of the Air, and the Hour of Observation. It is also very desirable that observations on the daily Maxima and Minima by Thermometers continuously immersed, be instituted at points along the coast, by the method proposed by Mr. T. Stevenson, and already commenced at Peterhead and Liverpool. The Temperature of the water at the bottom of Wells ought, in the temperature being practicable, to be taken, both the depth of the temperature Well and of the water being noted.

Mention what Test-Papers are used, Schönbein's or Mofatt's, etc. The Paper is affixed by a pin to a board in the Thermometer Box, and the indications registered at 9 A.M. and 9 P.M. It is desired that these indications be registered in connection with the force and direction of the wind at the time of observation, in the following manner:—thus 3^{sw}, as an Ozone entry in the schedule will indicate that the Ozone paper is tinted as 3 on the scale, that the wind is from the N.W., and that its force on the scale 0—5 is 4, or blowing fresh.

Too much importance cannot be attached to the electric condition of the atmosphere in connection with terrestrial magnetism, barometrical, thermometrical, and meteorological phenomena generally. A proper Electrometer is, in truth, necessary to every complete meteorological observatory.

The Remarks column is unavoidably too narrow. Some of the most valuable Observations that can be taken are those for which no rules can be given nor hours assigned. The use of contractions ought, therefore, to be taken every advantage of, and a list of such as are in general use is given at the foot of the column. Besides special and extraordinary Observations, great prominence ought to be given in this column to Prevalent Diseases, differences in character, colour, velocity, and direction between the Lower and Upper Strata of clouds, the colour of the Barometer, Thunder-storms, and remarkable falls of Snow, Hail, or Rain, the Hour of Storms of Wind commencing, attaining their maximum, and ending, as well as such Notes on Storms as have been hinted at above. When lofty hills are in the vicinity of a Station, the Height of Clouds and of the Snow-line in the vicinity of a Station, the By the use of observations, the state of the weather at 9 A.M. and 9 P.M. should be registered, either in two columns, otherwise occupied, or ruled off for the purpose, from the column of 'Remarks.' Observations in connection with the Periodic Return of the Seasons, possess not only great scientific value, but are of considerable importance in connection with the Periodic Agriculture, Horticulture, and Natural History. The Council would direct the special attention of Observers to the registration of such phenomena, so that the published Summaries may fairly represent the whole of Scotland.

Observations ought to be confined to individual trees and shrubs; to particular species of birds, and, in the case of crops, to specified sorts reared from year to year on a selected piece of ground or farm. The Annual Table, published yearly in the Society's Journal, will indicate the species of plants and animals to which special attention is more particularly directed.

The Council recommend Observers before purchasing new instruments, and in repairing old ones, to communicate with the Meteorological Secretary in order that every instrument may be examined and improved before being used, and they consider it necessary that he should have full power to reject any instrument which, on being presented for comparison, does not afford him satisfaction. (By Order)

ENDURANT, December 1891.

OBSERVATIONS IN CONNECTION WITH THE PERIODICAL RETURN OF THE SEASONS.

| FOREST TREES. | IN FLOWERS. | IN LEAF. | DISSEMINATED OF | CROPS. | PLANTING OR SOWING OF ABOVE GROUND. | IN BAR OR FIELDS. | First Cut |
|------------------------|-------------------|----------------|-------------------|-----------------|-------------------------------------|-------------------|-------------------|
| Alder. | | | | Barley. | | | |
| Ash. | | | | Oats. | | | |
| Beech. | | | | Wheat. | | | |
| Birch. | | | | Beans. | | | |
| Elm. | | | | Peas. | | | |
| Larch. | | | | Turnips. | | | |
| Oak. | | | | Rye Grass. | | | |
| Sycamore or Plane. | | | | | | | |
| SHRUBS, ETC. | First in Blossom. | PRUITS. | First in Blossom. | First in Fruit. | First in Blossom. | First in Fruit. | First in Blossom. |
| Barberry. | | Apple. | | Cuckoo. | | | |
| Bouquet or Elder. | | Black Currant. | | Goutweed. | | | |
| Broom. | | Cherry. | | House-Swallow. | | | |
| Hazel. | | Corn. | | Lapwing. | | | |
| Hawthorn. | | Gooseberry. | | Plover. | | | |
| Holly. | | Peach. | | Sand-Martin. | | | |
| Laburnum. | | Pear. | | Starling. | | | |
| Lilac. | | Plum. | | Swan. | | | |
| Mazeween. | | Strawberry. | | | | | |
| Mountain Ash or Rowan. | | | | | | | |
| Red Flowering Currant. | | | | | | | |
| Rhododendron Ponticum. | | | | | | | |
| Whin. | | | | | | | |

Have the goodness also to state any information you may be able to collect relative to the Crops of Grain, Hay, Potatoes, Turnips, Fruits, etc., whether plentiful, or in perfection; whether any have suffered from blight, disease, etc. Whether Epizootic disease prevails among cattle; and the Agricultural condition of the district generally.

To the SECRETARY

Scottish Meteorological Society,

122 George Street,

EDINBURGH.

BOOK POST.



SCOTTISH METEOROLOGICAL SOCIETY.

Observations taken at Leith, County of Edinburgh, in Lat. 55° 59' N, Long. 3° 10' W, Distance from Sea half mile.Height of Cistern of the Barometer above Mean Sea-Level 69 feet, above Ground 36 feet.During the MONTH of February 1890.

The Hours of Observation are of Greenwich Time.

| ELECTRICITY. | Days of Month. | BAROMETER. | | | | SELF-REGISTERING THERMOMETERS. | | | | HYGROMETER. | | | | Rain. | WIND. | | | | CLOUDS. | | | | SUNSHINE. | THERMOMETERS under Ground. | | | SEA. | OZONE. | GENERAL REMARKS. | Days of Month. | | | | | |
|--------------|----------------|------------|------------|-----------|------------|------------------------------------------|--------|----------------------|--------|-------------|--------|-----------|--------|--------|-----------|--------|-----------|--------|-----------|--------|-----------|--------|-----------|----------------------------|--------|-----------|--------|--------|------------------|----------------|------|-------|------|-------|------|
| | | 9 h. A.M. | | 9 h. P.M. | | Protected in Shade, 4 feet above Ground. | | Exposed Black Bulbs. | | 9 h. A.M. | | 9 h. P.M. | | | 9 h. A.M. | | 9 h. P.M. | | 9 h. A.M. | | 9 h. P.M. | | | 9 h. A.M. | | 9 h. P.M. | | | | | | | | | |
| | | No. | Barometer. | No. | Barometer. | No. | Max. | No. | Min. | No. | Max. | No. | Min. | | No. | Max. | No. | Min. | No. | Max. | No. | Min. | | No. | Max. | No. | | | | | Min. | No. | Max. | No. | Min. |
| | | * No. | Barometer. | * No. | Barometer. | * No. | Max. | * No. | Min. | * No. | Max. | * No. | Min. | | * No. | Max. | * No. | Min. | * No. | Max. | * No. | Min. | | * No. | Max. | * No. | | | | | Min. | * No. | Max. | * No. | Min. | * No. | Max. |
| | | inches. | | inches. | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | 1 | 29.722 | 29.832 | 29.832 | 29.832 | 29.832 | 29.832 | 29.832 | 29.832 | 29.832 | 29.832 | 29.832 | 29.832 | 29.832 | 29.832 | 29.832 | 29.832 | 29.832 | 29.832 | 29.832 | 29.832 | 29.832 | 29.832 | 29.832 | 29.832 | 29.832 | 29.832 | 29.832 | 29.832 | 1 | | | | | |
| | 2 | 29.959 | 29.981 | 29.981 | 29.981 | 29.981 | 29.981 | 29.981 | 29.981 | 29.981 | 29.981 | 29.981 | 29.981 | 29.981 | 29.981 | 29.981 | 29.981 | 29.981 | 29.981 | 29.981 | 29.981 | 29.981 | 29.981 | 29.981 | 29.981 | 29.981 | 29.981 | 29.981 | 29.981 | 2 | | | | | |
| | 3 | 30.022 | 29.965 | 29.965 | 29.965 | 29.965 | 29.965 | 29.965 | 29.965 | 29.965 | 29.965 | 29.965 | 29.965 | 29.965 | 29.965 | 29.965 | 29.965 | 29.965 | 29.965 | 29.965 | 29.965 | 29.965 | 29.965 | 29.965 | 29.965 | 29.965 | 29.965 | 29.965 | 29.965 | 3 | | | | | |
| | 4 | 29.844 | 29.788 | 29.788 | 29.788 | 29.788 | 29.788 | 29.788 | 29.788 | 29.788 | 29.788 | 29.788 | 29.788 | 29.788 | 29.788 | 29.788 | 29.788 | 29.788 | 29.788 | 29.788 | 29.788 | 29.788 | 29.788 | 29.788 | 29.788 | 29.788 | 29.788 | 29.788 | 29.788 | 4 | | | | | |
| | 5 | 29.779 | 29.818 | 29.818 | 29.818 | 29.818 | 29.818 | 29.818 | 29.818 | 29.818 | 29.818 | 29.818 | 29.818 | 29.818 | 29.818 | 29.818 | 29.818 | 29.818 | 29.818 | 29.818 | 29.818 | 29.818 | 29.818 | 29.818 | 29.818 | 29.818 | 29.818 | 29.818 | 29.818 | 5 | | | | | |
| | 6 | 29.938 | 29.964 | 29.964 | 29.964 | 29.964 | 29.964 | 29.964 | 29.964 | 29.964 | 29.964 | 29.964 | 29.964 | 29.964 | 29.964 | 29.964 | 29.964 | 29.964 | 29.964 | 29.964 | 29.964 | 29.964 | 29.964 | 29.964 | 29.964 | 29.964 | 29.964 | 29.964 | 29.964 | 6 | | | | | |
| | 7 | 29.809 | 29.835 | 29.835 | 29.835 | 29.835 | 29.835 | 29.835 | 29.835 | 29.835 | 29.835 | 29.835 | 29.835 | 29.835 | 29.835 | 29.835 | 29.835 | 29.835 | 29.835 | 29.835 | 29.835 | 29.835 | 29.835 | 29.835 | 29.835 | 29.835 | 29.835 | 29.835 | 29.835 | 7 | | | | | |
| | 8 | 29.906 | 29.922 | 29.922 | 29.922 | 29.922 | 29.922 | 29.922 | 29.922 | 29.922 | 29.922 | 29.922 | 29.922 | 29.922 | 29.922 | 29.922 | 29.922 | 29.922 | 29.922 | 29.922 | 29.922 | 29.922 | 29.922 | 29.922 | 29.922 | 29.922 | 29.922 | 29.922 | 29.922 | 8 | | | | | |
| | 9 | 29.899 | 29.815 | 29.815 | 29.815 | 29.815 | 29.815 | 29.815 | 29.815 | 29.815 | 29.815 | 29.815 | 29.815 | 29.815 | 29.815 | 29.815 | 29.815 | 29.815 | 29.815 | 29.815 | 29.815 | 29.815 | 29.815 | 29.815 | 29.815 | 29.815 | 29.815 | 29.815 | 29.815 | 9 | | | | | |
| | 10 | 29.702 | 29.504 | 29.504 | 29.504 | 29.504 | 29.504 | 29.504 | 29.504 | 29.504 | 29.504 | 29.504 | 29.504 | 29.504 | 29.504 | 29.504 | 29.504 | 29.504 | 29.504 | 29.504 | 29.504 | 29.504 | 29.504 | 29.504 | 29.504 | 29.504 | 29.504 | 29.504 | 29.504 | 10 | | | | | |
| | 11 | 29.308 | 29.302 | 29.302 | 29.302 | 29.302 | 29.302 | 29.302 | 29.302 | 29.302 | 29.302 | 29.302 | 29.302 | 29.302 | 29.302 | 29.302 | 29.302 | 29.302 | 29.302 | 29.302 | 29.302 | 29.302 | 29.302 | 29.302 | 29.302 | 29.302 | 29.302 | 29.302 | 29.302 | 11 | | | | | |
| | 12 | 29.293 | 29.295 | 29.295 | 29.295 | 29.295 | 29.295 | 29.295 | 29.295 | 29.295 | 29.295 | 29.295 | 29.295 | 29.295 | 29.295 | 29.295 | 29.295 | 29.295 | 29.295 | 29.295 | 29.295 | 29.295 | 29.295 | 29.295 | 29.295 | 29.295 | 29.295 | 29.295 | 29.295 | 12 | | | | | |
| | 13 | 29.426 | 29.474 | 29.474 | 29.474 | 29.474 | 29.474 | 29.474 | 29.474 | 29.474 | 29.474 | 29.474 | 29.474 | 29.474 | 29.474 | 29.474 | 29.474 | 29.474 | 29.474 | 29.474 | 29.474 | 29.474 | 29.474 | 29.474 | 29.474 | 29.474 | 29.474 | 29.474 | 29.474 | 13 | | | | | |
| | 14 | 29.723 | 29.879 | 29.879 | 29.879 | 29.879 | 29.879 | 29.879 | 29.879 | 29.879 | 29.879 | 29.879 | 29.879 | 29.879 | 29.879 | 29.879 | 29.879 | 29.879 | 29.879 | 29.879 | 29.879 | 29.879 | 29.879 | 29.879 | 29.879 | 29.879 | 29.879 | 29.879 | 29.879 | 14 | | | | | |
| | 15 | 29.665 | 28.756 | 28.756 | 28.756 | 28.756 | 28.756 | 28.756 | 28.756 | 28.756 | 28.756 | 28.756 | 28.756 | 28.756 | 28.756 | 28.756 | 28.756 | 28.756 | 28.756 | 28.756 | 28.756 | 28.756 | 28.756 | 28.756 | 28.756 | 28.756 | 28.756 | 28.756 | 28.756 | 15 | | | | | |
| | 16 | 28.682 | 28.951 | 28.951 | 28.951 | 28.951 | 28.951 | 28.951 | 28.951 | 28.951 | 28.951 | 28.951 | 28.951 | 28.951 | 28.951 | 28.951 | 28.951 | 28.951 | 28.951 | 28.951 | 28.951 | 28.951 | 28.951 | 28.951 | 28.951 | 28.951 | 28.951 | 28.951 | 28.951 | 16 | | | | | |
| | 17 | 28.812 | 28.999 | 28.999 | 28.999 | 28.999 | 28.999 | 28.999 | 28.999 | 28.999 | 28.999 | 28.999 | 28.999 | 28.999 | 28.999 | 28.999 | 28.999 | 28.999 | 28.999 | 28.999 | 28.999 | 28.999 | 28.999 | 28.999 | 28.999 | 28.999 | 28.999 | 28.999 | 28.999 | 17 | | | | | |
| | 18 | 29.044 | 28.964 | 28.964 | 28.964 | 28.964 | 28.964 | 28.964 | 28.964 | 28.964 | 28.964 | 28.964 | 28.964 | 28.964 | 28.964 | 28.964 | 28.964 | 28.964 | 28.964 | 28.964 | 28.964 | 28.964 | 28.964 | 28.964 | 28.964 | 28.964 | 28.964 | 28.964 | 28.964 | 18 | | | | | |
| | 19 | 28.626 | 28.392 | 28.392 | 28.392 | 28.392 | 28.392 | 28.392 | 28.392 | 28.392 | 28.392 | 28.392 | 28.392 | 28.392 | 28.392 | 28.392 | 28.392 | 28.392 | 28.392 | 28.392 | 28.392 | 28.392 | 28.392 | 28.392 | 28.392 | 28.392 | 28.392 | 28.392 | 28.392 | 19 | | | | | |
| | 20 | 28.669 | 29.083 | 29.083 | 29.083 | 29.083 | 29.083 | 29.083 | 29.083 | 29.083 | 29.083 | 29.083 | 29.083 | 29.083 | 29.083 | 29.083 | 29.083 | 29.083 | 29.083 | 29.083 | 29.083 | 29.083 | 29.083 | 29.083 | 29.083 | 29.083 | 29.083 | 29.083 | 29.083 | 20 | | | | | |
| | 21 | 29.352 | 29.465 | 29.465 | 29.465 | 29.465 | 29.465 | 29.465 | 29.465 | 29.465 | 29.465 | 29.465 | 29.465 | 29.465 | 29.465 | 29.465 | 29.465 | 29.465 | 29.465 | 29.465 | 29.465 | 29.465 | 29.465 | 29.465 | 29.465 | 29.465 | 29.465 | 29.465 | 29.465 | 21 | | | | | |
| | 22 | 29.269 | 29.427 | 29.427 | 29.427 | 29.427 | 29.427 | 29.427 | 29.427 | 29.427 | 29.427 | 29.427 | 29.427 | 29.427 | 29.427 | 29.427 | 29.427 | 29.427 | 29.427 | 29.427 | 29.427 | 29.427 | 29.427 | 29.427 | 29.427 | 29.427 | 29.427 | 29.427 | 29.427 | 22 | | | | | |
| | 23 | 29.284 | 29.324 | 29.324 | 29.324 | 29.324 | 29.324 | 29.324 | 29.324 | 29.324 | 29.324 | 29.324 | 29.324 | 29.324 | 29.324 | 29.324 | 29.324 | 29.324 | 29.324 | 29.324 | 29.324 | 29.324 | 29.324 | 29.324 | 29.324 | 29.324 | 29.324 | 29.324 | 29.324 | 23 | | | | | |
| | 24 | 29.528 | 29.645 | 29.645 | 29.645 | 29.645 | 29.645 | 29.645 | 29.645 | 29.645 | 29.645 | 29.645 | 29.645 | 29.645 | 29.645 | 29.645 | 29.645 | 29.645 | 29.645 | 29.645 | 29.645 | 29.645 | 29.645 | 29.645 | 29.645 | 29.645 | 29.645 | 29.645 | 29.645 | 24 | | | | | |
| | 25 | 29.797 | 29.939 | 29.939 | 29.939 | 29.939 | 29.939 | 29.939 | 29.939 | 29.939 | 29.939 | 29.939 | 29.939 | 29.939 | 29.939 | 29.939 | 29.939 | 29.939 | 29.939 | 29.939 | 29.939 | 29.939 | 29.939 | 29.939 | 29.939 | 29.939 | 29.939 | 29.939 | 29.939 | 25 | | | | | |
| | 26 | 29.938 | 29.810 | 29.810 | 29.810 | 29.810 | 29.810 | 29.810 | 29.810 | 29.810 | 29.810 | 29.810 | 29.810 | 29.810 | 29.810 | 29.810 | 29.810 | 29.810 | 29.810 | 29.810 | 29.810 | 29.810 | 29.810 | 29.810 | 29.810 | 29.810 | 29.810 | 29.810 | 29.810 | 26 | | | | | |
| | 27 | 29.812 | 29.993 | 29.993 | 29.993 | 29.993 | 29.993 | 29.993 | 29.993 | 29.993 | 29.993 | 29.993 | 29.993 | 29.993 | 29.993 | 29.993 | 29.993 | 29.993 | 29.993 | 29.993 | 29.993 | 29.993 | 29.993 | 29.993 | 29.993 | 29.993 | 29.993 | 29.993 | 29.993 | 27 | | | | | |
| | 28 | 30.168 | 30.291 | 30.291 | 30.291 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

OBSERVATIONS,

correct numbering of the scale of every instrument; the rejection of Thermometers the frameworks of which are not likely to stand exposure to the weather, as shown in the past by repeated and annoying breakages of Thermometers of similar construction; and as regards Maximum Thermometers, either Negretti and Zambra's, or Phillips's, whether they will act at the highest temperatures they may be required to register. By the laws of the Society, Members and Observers have a right to have their instruments compared by the Secretary, and to advise with him regarding the purchase of instruments. A very great care should be bestowed on the Observations of the Wind.

Wind, and Force, of which, both as regards Direction and Force, is so essential towards the right discussion of many of the more important problems of the science of Meteorology.

A Wind-vane, and original object, which it oscillates incessantly, to show the mean direction should be taken. In all cases, but especially when the Vane is stationary, or when the wind is feeble, reference may be made to the direction of smoke, etc., in well-exposed situations. Careful observations are recommended to be made on the changes in the direction of the wind; and during storms, extra observations at every hour of Greenwich time. Such

a system of simultaneous observation, pursued at different Stations, is likely to give highly valuable and important results, particularly in connection with the system of thickly-planted Stations, over a limited district round Edinburgh called STORM STATIONS, in the course of being established by the Society for the systematic investigation of the relation of the force of the wind to BAROMETRIC GRADIENTS, and other points connected with storms.

The Council have recommended that the Edinburgh City Anemometer, a self-registering instrument, which shows the amount of Wind that passes it per day: from which Velocity and also the mean Velocity of the Wind at the time of

observation may be ascertained. For indicating the Force of the Wind at any particular hour of observation, the Pressure Anemometer recently brought under the notice of the Society by Mr. T. Stevenson, the Honorary Secretary, and Mr. R. Ballingall, the Society's Observer at Ellabur, are recommended as likely to secure uniformity in making observations on the Force of the Wind.

Many causes conspire to produce anomalies in Rain Returns, arising partly from the difficulty of obtaining a perfectly unobjectionable situation for observation, and partly from the defective nature of the instruments used. The Rain Gauge should not be placed on a slope or terrace, but on a level piece of ground, in as open a situation as the Observer can secure for it. As it is often difficult to obtain a position as free and unobstructed by surrounding objects as is desirable, care should be taken to place it at some distance from shrubs, trees, buildings, or other obstructions, at least as many feet from their base as they are in height. The more important directions, towards which it is most desirable to have a free exposure are, in the order of their importance, S.W., N.E., S.E., S., and W. The rim of the gauge must be perfectly level, and fixed so that it will remain level in all weathers, and be at a height of one foot above ground, over grass. In such gauges as Fleming's, which is furnished

with a measuring-rod attached a float, the rod ought to be fixed down, and the float rise to its height only at the time the instrument is read, it being found that a stem projecting above the rim of the gauge seriously interferes with the proper measurement of the Rain-fall. When a measuring-glass is used, care should be taken to hold it quite perpendicular. The Rain Gauge ought to be read daily at 9 A.M., and the reading entered in the Returns of the previous day. If the Gauge is read once a month, the reading is to be made on the first of the month, and the amount entered for the previous month. Snow-falls may, for convenience, be registered in the rain columns, under the following conditions:—When a Snow shower occurs, it should be noted in the 'Remarks,' and the letter S affixed to the depth of water received in Gauge. The depth of the Snow must be measured in some open place where

no drift is observed, and registered in addition 60, and as a check upon the indications of the Rain Gauge. For wind, rain, and snow, as indicated in every column, the Observer cannot be too careful to register observations only; and nothing that partakes of the nature of deduction or inference.

Convenient abbreviations for the nomenclature of Clouds will be found on the other side. The amount of Clouds ought to be estimated from the greater or less obscuration of the sky overhead (i.e. within 20° or 30° of the zenith). The strata of Clouds that appear near the horizon are viewed obliquely; and thus, being unable to judge of their amount, we ought not to take them into account in the Clouds' column, though their appearance and changes may be noted among the Remarks. The amount of Cloud is entered from a scale of 0 to 10; thus, when the sky overhead is free from Clouds it is entered 0, when half-covered by Clouds 5, wholly covered, 10, and so on.

Observations of the Clouds are made at 9 A.M. and at sunset, as illustrating the condition and currents of the upper and lower regions of the atmosphere. The entries in the schedule are to be made in the following manner:—Thus, in the column Velocity a Direction,

6, S. W. _____ will indicate that the upper strata of Clouds travel with 2. Wt. _____ extreme velocity from S. W., and those in the lower regions from W., with one-third the speed of the former. Again, in the second _____, 4, st. _____ will indicate that the higher Cloud column, an entry of _____, 2, east- _____ regions are covered to the amount of 4-tenths with stratus Clouds; and that the sky is further obscured to the extent of 2-tenths by lower Clouds of the cumulo stratus kind.

Remarks on peculiar Clouds, accompanied with drawings, will assist materially in the development of a more exact nomenclature of Clouds, as well as throw light on the electrical, and other of the more obscure phenomena of Meteorology.

The approximate number of Hours in which objects in the sun's rays cast shadows, should be entered. The proper _____

As the germination and growth of crops and plants generally depend greatly on the Temperature of the soil,—its underground amount and constancy,—the Council recommend that Meteorometers. Observations in this interesting department be made at 9 A.M. by Thermometers permanently fixed in the soil, their bulbs being sunk to depths of 3, 12, and 22 inches, and the stems above ground protected from the sun's rays, and fitted with sloping tin collars, to prevent rain-water being conveyed to the bulbs by the stems or woollen frames.

A knowledge of the Temperature of the Sea is not only in itself, but in its relations to that of our island, a most important branch of Meteorology. The Council therefore recommend that the Temperature of the Sea be carefully taken by a properly constructed apparatus, from boats, or, if this be impracticable, from the ends of piers and rocks round the coast, where it is not influenced by that of river water, and as little influenced as possible by currents sweeping along the coast, and thus acquiring the temperature of the land, either greatly heated by the sun or cooled by nocturnal radiation. At or near the bottom of high

BOOK POST.

122 George S. ...

street,

EDD

NBURGH.

| PLANT TREES. | Flower. | Leaf buds first appear. | In leaf. | Decided of leaves. | CROPS, mentioning variety. | Sowing or above ground. | Appearing above ground. | In ear or flower. | Harvested. |
|----------------|---------|-------------------------|----------|--------------------|----------------------------|-------------------------|-------------------------|-------------------|------------|
| Apple or Pear, | | | | | Barley, | ..... | ..... | ..... | ..... |
| | | | | | Bere or Bigg, | ..... | ..... | ..... | ..... |
| | | | | | Oats, | ..... | ..... | ..... | ..... |
| | | | | | Wheat, | ..... | ..... | ..... | ..... |
| | | | | | Beans, | ..... | ..... | ..... | ..... |
| | | | | | Pease, | ..... | ..... | ..... | ..... |
| | | | | | Potatoes, | ..... | ..... | ..... | ..... |
| | | | | | Turnips, | ..... | ..... | ..... | ..... |
| | | | | | Rye Grass, | ..... | ..... | ..... | ..... |

[illegible][illegible]

BOOK POST.

122 George Street

EDINBURGH.

[illegible]

The Hours of Observation are of Greenwich Time.

[illegible]

| | | |
|----------------------------------------------------------------------------------------|---|------------|
| BAROMETER, "corrected Mean" at 9 A.M., minus the Correction $\frac{+}{-}$ | = | 30.071 |
| for Temp. (Col. 2), = | | |
| "Corrected Mean" of Barometer at 9 P.M., minus the Correction $\frac{+}{-}$ | = | 30.068 |
| for Temp. (Col. 4), = | | |
| Mean at Station, corrected, and at 32°..... | = | 29.992 |
| Correction for height, feet above Mean Sea-level,..... | = | 77 |
| Mean, reduced to 32°, and Sea-level,..... | = | 30.069 |
| Highest Reading, corrected for Index error, on the 13 th,..... | = | 30.665.651 |
| Lowest Do. Do., ^{at 7 hrs} on the 13 th,..... | = | 30.279 309 |
| Difference, or Monthly Range,..... | = | 1.386 342 |

| | | |
|---------------------------------------------------------------------------------------------------------------------------------|---|--------------|
| S.-R. THERMOMETER , (in shade, etc.), Highest in Month , (corrected for Index Errors), on the <u>14</u> th, | = | <u>53° 8</u> |
| Lowest in Month , corrected for Index errors, on the <u>18</u> th, | = | <u>22° 9</u> |
| Difference, or Monthly Range , | = | <u>30° 9</u> |
| "Corrected Mean " of all the Highest , (Col. 5), | = | <u>43° 2</u> |
| "Corrected Mean " of all the Lowest , (Col. 6), | = | <u>34° 4</u> |
| Difference, or Mean Daily Range , | = | <u>8° 8</u> |
| ** Calculated Mean Temperature of Month, | = | <u>38° 8</u> |

| | |
|-----------------------------------------------------------------------------------------------------------|---|
| S.-R. THERMOMETER, Black Bulb in Sun, Highest, (corrected for Index Errors), on the _____ th,..... | = |
| “Corrected Mean ,” (Col. 7), of Black Bulb, Max. in Sun , | = |
| Lowest at Night , Black Bulb (corrected for Index errors), on the _____ th, | = |
| “Corrected Mean ,” (Col. 8), of Black Bulb, Min. on grass, | = |
| Difference of above means or range (“exposed”), | = |

| | | |
|------------------------------------------------------------------------------------------------|---|-------|
| HYGROMETER, Mean (corrected) A.M. and P.M. Reading of Dry Bulb, (Cols. 9 and 11), | = | 38° 4 |
| Mean (corrected) A.M. and P.M. Reading of Wet Bulb, (Cols. 10 and 12), | = | 36° 0 |
| ‡ Computed Temperature of Dew-Point, | = | 32° 8 |
| ‡ Do. Elastic Force of Vapour, | = | 0.186 |
| ‡ Do. Weight of Vapour in a Cubic Foot of Air, | = | |
| ‡ Relative Humidity (Saturation = 100), | = | 78.0 |
| RAIN fell on 10 Days; Amount in Inches, | = | 1.14 |

| WIND. | | SUMMARY. | | | | | | | | | |
|------------|---|----------|---|----|---|----|---|----|-------------------|-------------|--------------------------------|
| Direction. | N | NE | E | SE | S | SW | W | NW | Calm or Variable. | Mean Force. | Mean Velocity in miles per day |
| A.M. | 3 | 2 | 8 | . | 1 | . | 8 | 7 | 2 | 1.42 | |
| P.M. | 2 | 7 | 7 | 1 | 1 | 2 | 7 | 3 | 1 | 1.16 | |
| Mean. | 3 | 4 | 7 | 1 | 1 | 1 | 8 | 5 | 1 | 1.29 | |

1.66

Observations made and
Return verified by

(Signed) James Colman & George Redpath.

INSTRUCTIONS FOR TAKING

WITH REMARKS ON THE USE OF INSTRUMENTS.

MÉTÉOROLOGICAL OBSERVATIONS,

IN CONNECTION WITH THE PERIODICAL RETURN OF THE SEASONS.

ONE of the chief objects that the SCOTTISH METEOROLOGICAL SOCIETY proposed to itself when the Society was established in 1855, was to secure uniformity in the system of observation pursued at all its Stations. Uniformity in the observations is absolutely necessary to justify the publication of Monthly Results from different observations, it being found that differences between the Returns from two Stations, so very considerable as to render them quite incomparable, may arise from dissimilarity in the position or shelter of instruments, different hours of observation, or even from the use of differently constructed instruments. It is therefore hoped, that those who kindly furnish Reports to the Society will, by a scrupulous attention to the following Directions, secure for their Monthly Returns an accuracy and value commensurate with the labour and pains involved in making them; and, for the Tables published by the Society, an entire comparableness among the several Returns, without which the Society's Reports must inevitably fall in achieving one of the main objects of Meteorological Observation.

The Council recommend that Observations be made precisely at 9 A.M. and 9 P.M. (Greenwich or Railway Time only), as specified in the following remarks, or at the top of the hour, if the columns of the Schedule. It is hoped that the utmost punctuality in the time of reading the instruments will be observed. Observers, in some few cases, may find this impossible, in such instances, they are specially requested to mark opposite every reading the time at which it was taken, if not at 9 A.M. or 9 P.M. Weather-Glasses and Aneroids, though well suited to indicate roughly variations of atmospheric pressure, are not fitted for scientific purposes. No Barometer should be used for Meteorological Observation that is not supplied with some means of adjustment or compensation which will secure that the height of the mercury in the tube is accurately measured from the fluctuating surface of the mercury in the cistern.

The Barometer in which the error arising from the fluctuating surface of the mercury in the cistern is entirely got rid of is FORTIN'S Barometer; the arrangement consisting in applying pressure by means of a screw to the bottom of the cistern, which is made of flexible leather, thus raising or depressing the surface till it just meets the ivory point which forms the zero point of the fixed scale.

The Barometer originally constructed by Mr. ADIE of London, and usually called the Board of Trade Barometer, has the great convenience of requiring no adjustment of the cistern. Its scale-inches are not true inches, but so much shorter as to compensate the error that would otherwise arise from the fluctuations of the surface of mercury in the cistern. This is an excellent Barometer for ordinary Observers, inasmuch as it entirely eliminates the error of observation likely to arise in a few cases in setting the instrument to the zero point of the fixed scale when the light is not good. To show the accuracy with which these Barometers are made, it may be stated, that one was compared, during a whole year, with the Society's Standard Barometer, particular care being given to make the comparison when atmospheric pressure was rising or falling very rapidly, with the result that none of the readings differed from those of the Standard more than 0.003 inch.

A modification of Fortin's Barometer is used at a number of the Society's Stations by which the coincidence of the zero point with the surface of the mercury is indicated by a little ivory foot, whose stem passes freely through the lid and case of the cistern. When the index line on this little piston-rod is brought by the adjusting screw to form one straight line with those on its ivory frame, the surface of the mercury is then at the exact height from which the scale is graduated. In taking an observation, this preliminary setting will be made with scrupulous accuracy; as a slight error here will vitiate the readings from the vernier.

It is absolutely necessary that the Barometer which is to be used shall have been compared with a Standard Barometer. The Barometer should be suspended in as good a light as can be secured, and to facilitate the reading a piece of white paper may be put behind the tube. It must hang truly perpendicular, and be exposed to neither the sun's direct rays nor the heat of a fire, and must not be hung against a wall heated by a fire. The object being to secure that the whole instrument, including the brass fittings, the read and compass, and the attached Thermometer, shall be when in that which is best fitted to sudden changes of temperature.

In taking an Observation, the Attached Thermometer is first noted: the bulb must then be gently tapped, and the cistern-adjustment set to zero. The eye, by raising and lowering it must be brought into the plane of the bulb, and the index—usually the lower edge of the vernier, which must be carefully adjusted so as to form exactly a tangent to the convex surface of the mercury in the tube. Observations must be taken quickly, so as to prevent heat from the observer's hands and person from affecting the mercury. The observer must facilitate an accurate adjustment by those beginning of the Barometer. A mistake not infrequently made by those beginning of the Barometer, is setting the edge of the vernier to the exact surface of the mercury, any way which is in direct contact with the glass tube, must be entirely avoided.

The eye must be carefully made in taking the Barometer are errors of 0.0005 inch, 0.0010 inch, and 0.0020 inch; that is to say, instead of 29.365 inches, the following is sometimes set down, 29.366, 29.367, or 29.368 inches, or 29.365, 29.366, or 29.367 inches. Experience having shown that even the very best Observers make these mistakes, particular attention is directed to the matter. Then a Barometer having adjustable surfaces has to be removed from its fastenings, the ivory peg must first be screw of the mercury, then screw up the mercury till it is level with the top of the ivory peg, so as to prevent the escape of mercury; then screw up the mercury to about half an inch from the top of the tube; and having slowly inverted the instrument, place the top of it, with the palm of the hand, so as to induce the air to ascend through the column to the cistern, whence it may escape. Since there is the height of two atmospheres—the pressure of the air that the Barometer, and the air outside—pressing on any air that may be inside the tube, it is usually a tedious operation to get it wholly expelled. After repeated trials, however, it is generally accomplished, and the clear metallic sound of the mercury, when gently struck against the top of the glass tube, will show when the whole of the air has been expelled. On hanging up the Barometer, care must be taken to screw down the mercury in the tube before fastening the float of the cistern, for, if this be not attended to, the mercury will flow out, and the instrument be seriously damaged.

The Council of the Society recommend that the Self-Registering Thermometers, and the Dry and Wet Bulb Hygrometers, be kept in Stevenson's Louvre-boarded Box for Thermometers, painted white inside and outside, and arranged as follows:—The four stout posts, also painted white, firmly fixed in the ground. The posts must be of such a length that when the Thermometers are hung in position the Bulbs of the Minimum Thermometer, and of the Dry and Wet Bulb Thermometers, will be exactly at the same height of four feet above the ground, the Maximum Thermometer being hung immediately above the Minimum Thermometer. The thermometer Box is to be placed over a plot of grass, and in a free open space to which the sun's rays have free access during as much of the day as surrounding conditions enable the Observer to secure. The Thermometers are suspended on cross-laths in the centre of the Box and face the door, which should be open to the north.

The Council regard the question of UNIFORMITY OF HEIGHT ABOVE GROUND, AND METHOD IN PROTECTING THE THERMOMETERS, as vital in every system of Meteorological Observation, since without it Observations made at different Stations are incomparable, thus rendering it impossible to compare the Climates of places with each other as regards their most important features.

Professor Phillips, and Negretti and Zambra's Maximum Thermometers, and Negretti and Zambra's Minimum Thermometer, are recommended. It is recommended that these Thermometers be graduated on the glass stem. The Minimum Thermometer is liable to two demerits—viz., the column of spirit breaking, and part of the spirit distilling by high temperature and lodging at the top of the tube. This demerit is of occasional occurrence with protected Thermometers, but of frequent occurrence with exposed Thermometers. Hence a systematic examination of Minimum Thermometers ought to be a regular part of the work carried on by each Observer.

Fortunately, Spirit Thermometers may be easily set right by any one, when the column of spirit changes to separate. Let the thermometer be taken in the hand by the end farthest from the bulb, raised above the head, and then forcibly swung down towards the feet; the object being, on the principle of centrifugal force, to send down the detached portion of spirit till it unites with the column. A few throws, or swinging strokes, will generally be sufficient for this purpose; after which the thermometer should be placed in a slanting position, to allow the rest of the spirit still adhering to the sides of the tube to drain down to the column. But another method must be adopted, if the portion of spirit in the top of the tube be small. Heat should be applied slowly and cautiously to the top end of the tube where the detached portion of spirit is, which, being turned into vapour by the heat, will condense on the surface of the unbroken column of spirit. Care must be taken that the heat is not applied too quickly; for, if this be done, the tube will break and the instrument be destroyed. The best way to apply the requisite amount of heat is by bringing the end of the tube slowly down towards a minute flame from a gas-burner; or, if gas be not at hand, a piece of heated metal will serve instead.

The bulbs of the Thermometers for registering the greatest heat from the sun's rays, and the least from radiation during night, have a black coating, which may easily be made, or mended, by the application of a mixture of lampblack and printer's ink. They are placed in shallow blackened boxes, whose sides protect the bulbs from the wind. The Maximum should be freely exposed to the sun, and the Minimum should rest on wooden supports a few inches from the surface of the grass, in an open situation. Now the sun's heat to affect cover either of these Thermometers; nor must it be allowed to in 'glass jackets' may also be used, being indeed preferable to the above. It must, however, be added, that the whole subject of the observation of Solar and Terrestrial Radiation is not yet in a sufficiently advanced state to warrant the exclusive recommendation of any one of these methods.

The Hygrometer, in use at the Society's Stations consists of two Thermometers usually, but not necessarily, mounted on a single frame. As apparently slight deviations from the Hygrometrical Observations, Observers are specially requested to attend to the following conditions:—The bulbs must hang down by at least an inch free from the scales and frame to which they are attached; the frame must be such as will bring the tubes forward by an inch from any board on which it may be suspended; the water-cistern must be covered, and altogether placed to the side, and a little below the level of the wet bulb, but in no case under the bulb; the main must be of medium fineness, and fastened at the neck of the bulb by the cotton, which also supplies it with water. It must be seen by the Observer that the mistle is always clean and moist, and the water pure. In frosty weather, observation is a matter of much delicacy, and must be made with great care. The bulb must be moistened by immersion from 15 to 30 minutes before the hour of observation. From the film of ice thus formed evaporation will proceed as from the moist cloth in ordinary circumstances.

In reading the Thermometer great care must be taken to bring the eye exactly opposite the tip of the index or column of mercury. The reading ought to be taken to tenths of a degree, and noted in decimals. Thus the Thermometer will be read—39.9, 40.0, or 40.1; or again, 40.4, 40.5, 40.6, according as it indicates a little under, an exact coincidence with, or a little over 40° or 40.5° respectively. So also 40.1° and 40.2° more or less, must be registered 40.2, or 40.3, and 40.7 or 40.8 respectively. In reading Rathford's Minimum Thermometer the indication of that end of the index which is next the surface of the spirit is alone noted. On opening the Thermometer Box the Dry and Wet Bulb Thermometers are to be first, and rapidly read, inasmuch as they are readily affected by heat from the person of the Observer.

The Hygrometer is read at 9 A.M. and 9 P.M. The Self-Registering Thermometers are read at 9 P.M. only, as in the hour of observing the greatest and least degrees of temperature in the 24 hours preceding. It is not a matter of indifference when the Self-Registering Thermometers are read, since, in winter at least, the extremes may occur at any hour; and it is necessary to refer their occurrence to their proper meteorological day. In the Society's schedules, the indications registered on the 3d are those of a series of phenomena commencing at 9 P.M. on the 2d, and extending till 9 P.M. on the 3d.

No instrument ought to be used for Meteorological purposes till it has been carefully tested by comparison with a standard Thermometer. When such Thermometers are attached scales, as are not graduated on the stem, but merely on an attached scale, undergo repairs, they are very liable to be moved from their position on the scale, and ought never afterwards to be used without being re-tested. The Self-Registering, especially the Minimum Thermometers, ought frequently to be compared with the dry bulb of the Hygrometer. The freezing-point of each Thermometer, marked by a scratch on the tube, ought to be tested once a year, in snow or melting ice.

In selecting instruments, the following points require attention:—The divisions of the vernier of Barometers in reference to their scales, and the perfect freedom of the Barometer from air; the

correct numbering of the scale of every instrument; the rejection of Thermometers the frameworks of which are not likely to stand exposure to the weather, as shown in the past by repeated and annoying breakages of Thermometers of similar construction; and as regards Maximum Thermometers, either Negretti and Zambra's, or Phillips's, whether they will act at the highest temperatures they may be required to register. By the laws of the Society, Members and Observers have a right to have their instruments compared by the Secretary, and to advise with him regarding the purchase of instruments. Very great care should be bestowed on the Observations of the

Wind, the accuracy of which, both as regards Direction and Force, is so essential towards the right discussion of many of the more important problems of the science. A Wind-Vane ought to be elevated at least 12 feet above surrounding objects. When it oscillates incessantly, the mean direction should be taken. In all cases, but especially when the Vane is stationary, and when the wind is feeble, reference may be made to the direction of smoke, etc., in well-exposed situations. Careful observations are recommended to be made on the changes in the direction of the wind; and during storms, extra observations at every hour of Greenwich time. Such a system of simultaneous observation, pursued at different Stations, is likely to give highly valuable and important results, particularly in connection with the system of thickly-planted stratus over a limited district round Edinburgh called STORM STATIONS, in the course of being established by the Society for the systematic investigation of the relation of the force of the wind to BAROMETRIC GRADIENTS, and other points connected with storms.

The Council would recommend the Hemispherical Cup Anemometer, a self-registering instrument which shows the amount of Wind that passes it per day; from which also the mean Velocity of the Wind at the time of observation may be ascertained. For indicating the Force of the Wind at any particular hour of observation, the Pressure Anemometers recently brought under the notice of the Society by Mr. T. Stevenson, the Honorary Secretary, and Mr. R. Ballingall, the Society's Observer at Edinburg, are recommended as likely to secure uniformity in making observations on the Force of the Wind.

Many causes conspire to produce anomalies in Rain Returns, arising partly from the difficulty of obtaining a perfectly unobjectionable situation for observations, and partly from the defective nature of the instruments used. The Rain Gauge should not be placed on a slope or terrace, but on a level piece of ground, in as open a situation as the Observer can secure for it. As it is often difficult to obtain a position as free and unobstructed by surrounding objects as is desirable, care should be taken to place it at some distance from shrubs, trees, buildings, or other obstructions, at least as many feet from their base as they are in height. The more important directions, towards which it is most desirable to have a free exposure, are, in the order of their importance, S.W., N.E., S.E., S., and W. The rim of the gauge must be perfectly level, and fixed so that it will remain level in all weathers, and be at a height of one foot above ground, over grass. In such gauges as Fleming's, which are furnished with a measuring-rod attached to a float, the rod ought to be fixed down, and the float rise to its height only at the time the instrument is read, it being found that a stem projecting above the rim of the gauge seriously interferes with the proper measurement of the Rain-fall. When a measuring-glass is used, care should be taken to hold it quite perpendicular. The Rain Gauge ought to be read daily at 9 A.M., and the reading entered in the Returns of the previous day. If the Gauge is read once a month, the reading is to be made on the first of the month, and the amount entered for the previous month.

Snow-falls may, for convenience, be registered in the rain columns, under the following conditions:—When a Snow-shower occurs, it should be noted in the 'Remarks,' and the letter S affixed to the depth of water received in Gauge. The depth of the snow must be measured in some open place where no drift is observed, and registered in addition to, and as a check upon, the indications of the Rain Gauge. For wind, rain, and snow, as indicated in every column, the Observer cannot be too careful to register observations only; and nothing that partakes of the nature of Deduction or inference.

Convenient abbreviations for the nomenclature of Clouds will be found on the other side. The amount of Cloud ought to be estimated from the greater or less obscuration of Clouds that appear near the horizon or 30° of the zenith. The strata of Clouds that appear near the horizon are viewed obliquely; and thus, being unable to judge of their amount, we ought not to take them into account in the Clouds' column, though their appearance and changes may be noted among the Remarks. The amount of Cloud is entered from a scale of 0 to 10; thus, when the sky over Clouds is free from clouds, it is entered 0, when half-covered by Clouds, 5, wholly covered, 10, and so on.

Observations of the Clouds are made at 9 A.M. and at sunset, as illustrating the condition and currents of the upper and lower regions of the atmosphere. The entries in the schedule are to be made in the following manner:—Thus, in the column Velocity and Direction, 6 S. W. will indicate that the upper strata of Clouds travel with an extreme velocity from S.W., and those in the lower regions from W., with one-third the speed of the former. Again, in the second Cloud column, an entry of 2, east, will indicate that the higher regions are covered to the amount of 4-tenths with stratus Clouds; and that the sky is further obscured to the extent of 2-tenths by lower Clouds of the cumulo stratus kind.

Remarks on peculiar Clouds, accompanied with drawings, will assist materially in the development of a more exact nomenclature of Clouds, as well as throw light on the electrical, and other of the more obscure phenomena of Meteorology. The approximate number of Hours in which objects in the sun's rays cast shadows, should be entered in the proper column.

As the germination and growth of crops and plants generally depend greatly on the temperature of the soil, it is recommended that the temperature of the soil be carefully taken by a properly constructed apparatus, from boats, the coast, where it is not influenced by the effects of river water, and as little as possible by the temperature of the land, after greatly heated by the sun or cooled by nocturnal radiation. At or near the time of high

water, in cases where the observations cannot be taken daily, the observation may be made on the 5th, 15th, and 25th of each month. When convenient, extra Sea Observations might be taken for other and greater depths, noting always the Temperature of the Air, and the Hour of Observation. It is also very desirable that Observations on the daily Maxima and Minima by Thermometers continuously immersed, be instituted at points along the coast, by the method proposed by Mr. T. Stevenson, and already commenced at Peterhead and Liverpool.

The Temperature of the water at the bottom of Wells ought, when practicable, to be taken, both the depth of the temperature well and of the water being noted.

Mention what Test-Papers are used, Schönbien's or Mofatt's, etc. The Paper is affixed by a pin to a board in the Thermometer Box, and the indications registered at 9 A.M. and 9 P.M. It is desired that these indications be registered in connection with the force and direction of the wind at the time of observation, in the following manner:—thus 3 S.W., as an Ozone entry in the schedule will indicate that the Ozone paper is tried as 3 on the scale, that the wind is from the N.W., and that its force on the scale 0—5 is 4, or blowing fresh.

Too much importance cannot be attached to the electric condition of the atmosphere in connection with terrestrial magnetism, barometrical, thermometrical, and electrical meteorological phenomena generally. A proper Electrometer is, in truth, necessary to every complete meteorological observatory.

The Remarks column is unavoidably too narrow. Some of the most valuable Observations that can be taken are those of contractions ought, therefore, to be taken every advantage of, and a list of such as are in general use is given at the foot of the column. Besides special and extraordinary Observations, great prominence ought to be given in this column to Precipitation, differences in character, colour, velocity, and direction, between the Lower and Upper Strata of clouds, the Colour of the Sky, etc. Remarks ought to be made on the occurrence of Meteors, Auroræ Boreales, remarkable depressions, elevations, and fluctuations of the Barometer, Thunder-Storms, and remarkable falls of Snow, Hail, or Rain, the Hour of Storms of Wind commencing, attaining their maximum, and ending as well as such Notes on Storms as have been limited at above. When lofty hills are in the vicinity of a Station, the Height of Clouds and of the Snow-line in winter should be recorded.

By the use of abbreviations, the state of the weather at 9 A.M. and 9 P.M. should be registered, either in two columns, otherwise unoccupied, or ruled off for the purpose, from the column of 'Remarks.' Observations in connection with the Periodic Return of the Seasons possess not only great scientific value, but are of considerable importance in connection with Agriculture, Horticulture, and Natural History. The Council would direct the special attention of Observers to the registration of such phenomena, so that the published Summaries may fairly represent the whole of Scotland.

Observations ought to be confined to individual trees and shrubs; to particular species of birds, and in the case of crops to specified particular year to year on a selected piece of ground or farm. This Annual Table, published yearly in the Society's Journal, will indicate the special points of plants and animals to which special attention is particularly directed.

The Council recommend Observers, before purchasing new instruments, and recommending old ones to communicate with the Meteorological Secretary, order that every instrument may be examined and approved, few being used, and they consider it necessary that it should have full power to reject any instrument which, on being presented for comparison, does not afford him satisfaction.

EDINBURGH, December 1891. (By Order) A. B.

| First Out | In Bar | In Flower | Appearing | Planting | SOILS | Barley | Oats | Wheat | Beans | Peas | Potatoes | Turnips | Rye (Grass) |
|-----------|------------|-----------|---------------|----------|-------|----------|-------|-------|---------|-----------------------|-----------------------|-----------------------|-------------|
| Plum | Strawberry | Apple | Black Currant | Cherry | Cream | Hawthorn | Holly | Lilac | Mazeton | Mountain Ash or Rowan | Red Flowering Currant | Rhododendron Ponticum | Whin |

| SHRUBS, ETC. | Blossom | First in | First in | First in | First in | First in | First in | First in | First in | First in | First in | First in | First in |
|--------------|---------|----------|----------|----------|----------|----------|----------|-------------------|----------|----------|----------|----------|----------|
| Alder | Ash | Beech | Birch | Elm | Larch | Lime | Oak | Sycamore or Plane | Barberry | Broom | Hazel | Hawthorn | Holly |

Have the goodness also to state any information you may be able to collect relative to the Crops of Grain, Hay, Potatoes, Turnips, Fruits, etc., whether plentiful, or in perfection; whether any have suffered from blight, disease, etc. Whether Epizootic disease prevails among cattle; and the Agricultural condition of the district generally.

To the SECRETARY

Scottish Meteorological Society,

122 George Street,

EDINBURGH.

BOOK POST.

SCOTTISH METEOROLOGICAL SOCIETY.

Observations taken at Lith, County of Edinburgh, in Lat. 55° 59' N, Long. 3° 10' W, Distance from Sea half miles.Height of Cistern of the Barometer above Mean Sea-Level 69 feet, above Ground 36 feet.During the MONTH of April 1900.

The Hours of Observation are of Greenwich Time.

| ELECTRICITY. | Days of Month. | BAROMETER. | | | | SELF-REGISTERING THERMOMETERS. | | | | HYGROMETER. | | | | Rain. | WIND. | | | | CLOUDS. | | | | THERMOMETERS under Ground. | | | SEA. | OZONE. | GENERAL REMARKS. | Days of Month. | | |
|--------------|----------------------------------------------|------------|----------------------------|------------|----------------------------|------------------------------------------|-------|------------------------|-------------------|-------------|-----------|-----------|-----------|-------|-----------------------------------------|------------|-----------|------------|-------------------------------------------------------|-----------|--------------------------------------|--------|--------------------------------------|---------------------------------------------------------------------------------------|-------------------|------|--------|------------------|----------------|-------------------|----|
| | | 9 h. A.M. | | 9 h. P.M. | | Protected in Shade, 4 feet above Ground. | | Exposed Black Bulbs. | | 9 h. A.M. | | 9 h. P.M. | | | 9 h. A.M. | | 9 h. P.M. | | 9 A.M. | | 9 P.M. | | 9 h. A.M. | | | | | | | | |
| | | Barometer. | Attached Ther- mometer. | Barometer. | Attached Ther- mometer. | Max. | Min. | Max. in Sun's rays. | Min. on Grass. | Dry bulb. | Wet bulb. | Dry bulb. | Wet bulb. | | No. of hours in which it fell. | Direction. | Force. | Direction. | Force. | 9 h. A.M. | Amount (0-10), and Species. | 9 P.M. | Amount (0-10), and Species. | No. 3 inches. | No. 12 inches. | | | | | No. 22 inches. | |
| | | * No. | | No. | | No. | No. | No. | No. | | | | | | | | | | | | | | | | | | | | | | |
| | | inches. | ° | inches. | ° | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | 1 | 30.211 | | 30.138 | | 49.2 | 35.3 | | | 42.0 | 39.1 | 42.0 | 39.1 | 0.00 | Variable | 0.25 | Calcu | 0 | India: 7 thick Co-A | 0 | 0 | 0 | 0 | India: mostly cloudy; haze. Part of So. has visible at 2.25 p.m. | | | | | 1 | | |
| | 2 | 30.059 | | 29.929 | | 51.5 | 32.8 | | | 42.4 | 39.1 | 42.4 | 39.1 | 0.00 | W | 1.4 | NE | 1.0 | 20 W. 11. 7 thin Co India: 10 Stf. | | | | | Morning, thick h. fr.; day fine, mostly sunny. | | | | | 2 | | |
| | 3 | 29.660 | | 29.316 | | 44.6 | 37.9 | | | 38.1 | 37.1 | 38.1 | 37.1 | 1.0 | E | 1.0 | E | 1.5 | 13: 10 India: 10 Stf. India: 10 Stf.? | | | | | Cloudy, with sunny mts. dur. afternoon; sho. early morn.; conet. n. aft. 6 p.m. | | | | | 3 | | |
| | 4 | 29.178 | | 29.311 | | 44.8 | 38.1 | | | 39.0 | 38.4 | 43.6 | 41.1 | 1.8 | W | 1.0 | SW | 1.0 | 20 W. 10 Stf. 20 W. 10 Stf.? | | | | | Overcast, n. fr. w. night and a few li. sho. during day. | | | | | 4 | | |
| | 5 | 29.515 | | 29.754 | | 53.5 | 37.9 | | | 45.3 | 41.9 | 44.7 | 38.9 | 0.00 | W | 1.4 | W | 2.0 | 20 W. 3 Cu. 15: 6 India Cu. | | | | | Fine; mostly sunny. | | | | | 5 | | |
| | 6 | 29.786 | | 29.742 | | 50.7 | 33.9 | | | 42.6 | 40.8 | 41.2 | 38.5 | 0.00 | Var. | 0.75 | SE | 1.5 | 20 W. 7 Cu. 15 Ely: 5 India Cu. | | | | | Fine; bright sunshine at times; thick h. fr. in the morning. | | | | | 6 | | |
| | 7 | 29.846 | | 30.000 | | 45.0 | 38.1* | | | 40.0 | 38.0 | 38.1 | 37.3 | 0.00 | E | 1.4 | Ely | 0.25 | India: 10 Stf.? | | | | | Fine; cloudy till about 1 p.m., then mostly sunny. | | | | | 7 | | |
| | 8 | 29.971 | | 29.819 | | 46.7 | 36.2 | | | 44.2 | 41.0 | 41.6 | 39.4 | 0.00 | E | 1.0 | SE | 1.0 | 3: 21: 10 India 1: 36: 3: 3 Cu. 15 W. 10 Cu. | | | | | Fine, overcast; evening cloudy. | | | | | 8 | | |
| | 9 | 29.609 | | 29.550 | | 53.3 | 38.0 | | | 45.4 | 42.6 | 43.6 | 39.0 | 0.00 | W | 2.0 | W | 2.0 | 1: 4 W. 10 Stf. 0 0 | | | | | Fine; cloudy, with frequent bright sunshine after 11 a.m. | | | | | 9 | | |
| | 10 | 29.444 | | 29.544 | | 52.7 | 38.9 | | | 46.6 | 41.4 | 44.6 | 40.3 | 0.00 | W | 2.4 | W | 2.0 | 2: 4 W. 10 Stf. 8 Cu. India: 10 Stf. | | | | | Fine; mostly sunny; squally between 4 + 5 a.m. | | | | | 10 | | |
| | 11 | 29.202 | | 29.248 | | 54.7 | 39.6 | | | 49.5 | 45.4 | 45.5 | 43.9 | 1.7 | W | 3.3 | W | 2.0 | 2: 4 W. 1 Cu. 20 W. 3 Cu. India. | | | | | Sho. till 7.30 a.m., and after 5 p.m. freq. bright sunshine; squally at times | | | | | 11 | | |
| | 12 | 29.432 | | 29.142 | | 52.7 | 42.9 | | | 48.6 | 44.9 | 47.6 | 44.4 | 1.6 | W | 2.4 | W | 2.0 | 2: 4 W. 10 Cu. 20 W. 10 Cu. | | | | | Cloudy, with sunny mts.; freq. bright sho. during afternoon | | | | | 12 | | |
| | 13 | 29.238 | | 29.770 | | 55.7 | 40.4 | | | 49.6 | 44.7 | 42.8 | 39.1 | 2.4 | W | 2.0 | W | 2.0 | 2: 4 W. 10 Cu. 7 Cu. India: 2 Stf. | | | | | Stronger, with thick sho. till 6 a.m.; day mostly sunny, with li. sho. dur. afternoon | | | | | 13 | | |
| | 14 | 29.599 | | 29.751 | | 56.4 | 42.8 | | | 53.5 | 50.1 | 47.9 | 44.1 | 0.6 | W | 3.0 | W | 1.3 | 2: 4 W. 9 Cu. India: 8 Stf. | | | | | Mostly fine; a few sho. - End-ha. at 8.40 p.m. | | | | | 14 | | |
| | 15 | 29.440 | | 29.507 | | 55.0 | 43.1* | | | 51.5 | 47.8 | 44.7 | 41.9 | 0.5 | W | 3.0 | W | 2.5 | 2: 4 W. 7 Cu. India: 7 Stf. | | | | | Changeable; showers, very squally. | | | | | 15 | | |
| | 16 | 29.540 | | 30.047 | | 52.7 | 42.0 | | | 50.0 | 44.1 | 45.3 | 40.1 | 1.5 | W | 2.4 | W | 1.4 | 2: 4 W. 5 Cu. India: 9 Cu. India | | | | | Fine; clear; li. sho. at 11 a.m. and 4 p.m. | | | | | 16 | | |
| | 17 | 29.945 | | 30.188 | | 59.8 | 41.9 | | | 49.6 | 45.8 | 49.5 | 44.1 | 0.3 | W | 2.0 | W | 2.0 | 2: 4 W. 4 Cu. India: 9 Cu. India | | | | | Sho. at and about 5 a.m.; day fine, mostly sunny. | | | | | 17 | | |
| | 18 | 30.298 | | 30.435 | | 53.0 | 43.0 | | | 51.0 | 48.7 | 51.5 | 48.7 | 0.00 | W | 2.0 | W | 2.0 | 2: 4 W. 10 Stf. India: 10 Stf. | | | | | Cloudy; sho. at 6.15 a.m. | | | | | 18 | | |
| | 19 | 30.483 | | 30.481 | | 66.1 | 46.5 | | | 54.4 | 49.2 | 55.5 | 51.7 | 0.00 | W | 2.0 | W | 1.0 | 2: 4 W. 2 India Cu. 0 0 | | | | | Fine; bright sunshine. | | | | | 19 | | |
| | 20 | 30.446 | | 30.358 | | 72.8 | 44.9 | | | 61.6 | 55.1 | 58.8 | 54.3 | 0.00 | W | 2.0 | W | 0.25 | 0 0 0 0 | | | | | Fine, sunny; nearly cloudless; rather hazy. | | | | | 20 | | |
| | 21 | 30.318 | | 30.296 | | 64.9 | 44.9* | | | 63.4 | 53.9 | 44.9 | 44.7 | 0.00 | W | 1.5 | NE | 2.0 | 0 0 India: 10 Stf. | | | | | Fine, sunny; cloudless during day; evening cloudy. | | | | | 21 | | |
| | 22 | 30.255 | | 30.202 | | 49.7 | 42.1 | | | 42.9 | 42.9 | 46.0 | 45.1 | 0.9 | W | 1.0 | NE | 1.0 | 15: 50 India: 10 Stf. India: 10 Stf. | | | | | Cloudy; sho. till 9.30 a.m.; sunny at times after 2.30 p.m. | | | | | 22 | | |
| | 23 | 30.169 | | 30.105 | | 54.6 | 44.1 | | | 46.0 | 45.1 | 45.8 | 45.1 | 0.2 | SE | 1.0 | NE | 0.5 | India: 10 Stf. India: 10 Stf. | | | | | Fine, except sho. bet. 5 + 6 p.m.; mostly sunny dur. afternoon. | | | | | 23 | | |
| | 24 | 30.072 | | 30.019 | | 54.3 | 45.0 | | | 49.8 | 48.0 | 48.8 | 46.8 | 0.2 | SW | 1.0 | E | 1.0 | 1: 15 India: 10 Cu. 10 W. 10 Stf. 10 Stf. | | | | | Cloudy; sho. early morning; and li. sho. after 5.30 p.m. | | | | | 24 | | |
| | 25 | 30.166 | | 30.245 | | *49.7 | 37.4* | | | 42.1 | 38.9 | 37.4 | 35.0 | 0.00 | E | 1.6 | SE | 1.0 | 2: 4 W. 6 Cu. 0 0 | | | | | Fine; bright sunshine. | | | | | 25 | | |
| | 26 | 30.094 | | 29.927 | | 49.4 | 36.7 | | | 45.6 | 40.3 | 46.6 | 44.6 | 0.00 | W | 2.4 | W | 2.0 | India: 10 Stf. India: 10 Stf. | | | | | Overcast; rather squally at times; li. sho. after 6.30 p.m. | | | | | 26 | | |
| | 27 | 30.112 | | 30.048 | | 50.3 | 41.4 | | | 43.5 | 39.8 | 47.0 | 41.1 | 0.3 | E | 2.0 | W | 1.5 | 2: 4 W. 10 Cu. 0 0 | | | | | Cloudy till noon, then mostly sunny. | | | | | 27 | | |
| | 28 | 30.008 | | 29.765 | | 53.7 | 39.5 | | | 50.6 | 45.2 | 48.5 | 45.2 | 0.00 | W | 2.4 | W | 2.5 | 2: 4 W. 2 Cu. 2: 5 W. 10 Stf. | | | | | Fine; cloudy, with occasional sunny mts. during afternoon. | | | | | 28 | | |
| | 29 | 29.522 | | 29.671 | | 59.7 | 43.9* | | | 52.5 | 48.7 | 45.9 | 41.9 | 0.00 | W | 2.0 | NE | 1.5 | 15 W. 2 Cu. India: 10 Stf. 15 W. 2 Cu. India: 10 Stf. | | | | | Fine; frequent bright sunshine; pass. sho. about 11.40 a.m. | | | | | 29 | | |
| | 30 | 29.763 | | 29.715 | | 50.2 | 41.9 | | | 44.6 | 41.9 | 45.6 | 41.1 | 0.00 | E | 1.4 | W | 2.0 | 15: 10 Cu. India: 10 Stf. India: 10 Stf. | | | | | Mostly cloudy; li. sho. between 7 + 8 a.m. | | | | | 30 | | |
| | 31 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | 31 | |
| | Sums. | 895.371 | | 896.073 | | 1612.4 | 121.1 | | | 1425.9 | 1316.9 | 1357.2 | 1272.5 | 1.30 | | | | | | 7 | | | | | | | | | | | |
| | Means. | | | | | | | | | | | | | | | | | | | 198 | | | | | | | | | | | |
| | + Total Corrections for Instrumental Errors. | | | | | | | | | | | | | | | | | | | 66 | | | | | | | | | | | |
| | + Corrections for Diurnal Range. | | | | | | | | | | | | | | | | | | | 6.1 | | | | | | | | | | | |
| | "Corrected Means." | 29.846 | | 29.869 | | 53.7 | 40.4 | | | 47.5 | 43.9 | 45.2 | 41.4 | 1.30 | | | | | | | | | | | | | | | | | |
| | No. of Column. | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 | 25 | 26 | 27 | 28 | 29 | 30 |

| NOTATION USED IN GENERAL REMARKS. | | | | | |
|-----------------------------------|-----------------|----------|-----------------------|--|--|
| a. | denotes aurora. | m. | denotes meteor. | | |
| ci. | cirrus. | ms. | meteors. | | |
| ci.-cu. | cirro-cumulus. | n. | nimbus. | | |
| cl.-s. | cirro-stratus. | r. | rain. | | |
| cu. | cumulus. | h. r. | heavy rain. | | |
| cu.-s. | cumulo-stratus. | c. h. r. | continued heavy rain. | | |
| d. | dew. | s. | stratus. | | |
| f. | fog. | sc. | sleet. | | |
| fr. | frost. | s. | snow. | | |
| h.-fr. | hoar-frost. | s. | solar halo. | | |
| h. | haze. | so. la. | squall. | | |
| h. d. | heavy dew. | sgs. | squalls. | | |
| hl. | hail. | t. | thunder. | | |
| li. | lightning. | t. s. | thunder-storm. | | |
| li. cl. | light clouds. | w. | wind. | | |
| li. sh. | light showers. | g. | gale of wind. | | |
| lu. co. | lunar corona. | | | | |
| lu. ha. | lunar halo. | | | | |

| TABLE FOR ESTIMATING FORCE OF WIND. | | | | | |
|-------------------------------------|---------------------|-----------------------|---------------------|-----------------------|---------------------|
| Estimated Force, 0-6. | Common Designation. | Estimated Force, 0-6. | Common Designation. | Estimated Force, 0-6. | Common Designation. |
| 0 | Calm | 1.5 | Light breeze | 4 | Blowing hard |
| 0.5 | Fresh breeze | 2 | Very light air | 5 | Blowing a gale |
| 1 | Light air | 3 | Very fresh | 6 | Violent gale |

BAROMETER, "corrected Mean" at 9 A.M., minus the Correction for Temp. (Col. 2), = 29.846
"Corrected Mean" of Barometer at 9 P.M., minus the Correction for Temp. (Col. 4), = 29.869
Mean at Station, corrected, and at 32°, = 29.780
Correction for height, feet above Mean Sea-level, = 77
Mean, reduced to 32°, and Sea-level, = 29.857
Highest Reading, corrected for Index error, on the 19th, = 30.488 ⁴⁸³
Lowest Do. Do., at 6 a.m. on the 13th, = 29.017 ¹⁴²
Difference, or Monthly Range, = 1.471 ^{1.341}

S.R. THERMOMETER, (in shade, etc.), Highest in Month, (corrected for Index Errors), on the 20th, = 72.8
Lowest in Month, corrected for Index errors, on the 22nd, = 32.8
Difference, or Monthly Range, = 40.0
"Corrected Mean" of all the Highest, (Col. 5), = 53.9
"Corrected Mean" of all the Lowest, (Col. 6), = 40.4
Difference, or Mean Daily Range, = 13.3
** Calculated Mean Temperature of Month, = 47.0
S.R. THERMOMETER, Black Bulb in Sun, Highest, (corrected for Index Errors), on the th, =
"Corrected Mean," (Col. 7), of Black Bulb, Max. in Sun, =
Lowest at Night, Black Bulb (corrected for Index errors), on the th, =
"Corrected Mean," (Col. 8), of Black Bulb, Min. on grass, =
Difference of above means or range ("exposed"), =

HYGROMETER, Mean (corrected) A.M. and P.M. Reading of Dry Bulb, (Cols. 9 and 11), = 46.4
Mean (corrected) A.M. and P.M. Reading of Wet Bulb, (Cols. 10 and 12), = 43.1
†† Computed Temperature of Dew-Point, = 39.4
†† Do. Elastic Force of Vapour, = 0.342
†† Do. Weight of Vapour in a Cubic Foot of Air, =
†† Relative Humidity (Saturation = 100), = 78
RAIN fell on 13 Days; Amount in Inches, = 1.30

| WIND. | | SUMMARY. | | | | | | | | | |
|------------|--|----------|----|---|----|---|----|----|----|-------------------|-------------|
| Direction. | | N | NE | E | SE | S | SW | W | NW | Calm or Variable. | Mean Force. |
| A.M. | | 1 | 1 | 4 | 1 | 2 | - | 16 | 3 | 2 | 1.77 |
| P.M. | | - | 5 | 4 | 2 | - | 2 | 14 | 2 | 1 | 1.47 |
| Mean. | | 1 | 3 | 4 | 2 | 1 | 1 | 15 | 2 | 1 | 1.62 |

* Each instrument tested at the Office in Edinburgh bears the stamp "S.M.S."; and a number to be entered in the Heading; or the Number and Initials of the Maker may be here given.
† Enabling corrections for both capillarity and Index Errors.
‡ The Diurnal Range for Scotland is as yet unknown.
†† Practically, though not absolutely a minus correction.
†† These "Hygrometrical Deductions" are calculated from Glaisher's Hygrometrical Tables, Second Edition only.
* While the Diurnal Range is unknown, the Arithmetical Mean of Cols. 5 and 6 will be entered as the "Calculated Mean Temperature."
Any observations not taken under the Conditions specified in the Directions on the other side, or noted at the Top of each column, must be marked as such by the observer, in each Schedule. See over.

Observations made and
Return verified by

(Signed) James Pollock & George Redpath.

SCOTTISH METEOROLOGICAL SOCIETY.

Observations taken at Leith, County of Edinburgh, in Lat. 55° 57' N, Long 3° 10' W, Distance from Sea half miles.Height of Cistern of the Barometer above Mean Sea-Level 69 feet, above Ground 36 feet.During the MONTH of May 1890.

The Hours of Observation are of Greenwich Time.

| ELECTRICITY. | Days of Month. | BAROMETER. | | | | SELF-REGISTERING THERMOMETERS. Read Daily, at 9 P.M. | | | | HYGROMETER. | | | | Rain. | WIND. | | | | CLOUDS. | | | | SUNSHINE. | THERMOMETERS under Ground. | | | SEA. | OZONE. | GENERAL REMARKS. As to occurrence of Thunder, Lightning, Storms, Hail, Meteors, Remarkable Depression or Elevation of Barometer, Prevalent Diseases, etc. Mention the hour at which Storms, including Thunder and Lightning, began and ended. | Days of Month. | | |
|----------------------------------------------|----------------|------------|--------------------------|------------|--------------------------|---------------------------------------------------------|--------|-------------------------|------|-------------|-----------|-----------|-----------|-------|-----------------------------------------|------------|-----------|------------|---------|------|---------------------------------------|--------------------------------------|-----------|----------------------------------------|--------------------------------------|-----|------|--------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------|-----|-----|
| | | 9 h. A.M. | | 9 h. P.M. | | Protected in Shade, 4 feet above Ground. | | Exposed Black Bulbs. | | 9 h. A.M. | | 9 h. P.M. | | | 9 h. A.M. | | 9 h. P.M. | | 9 A.M. | | 9 P.M. | | | 9 h. A.M. | | | | | | | | |
| | | Barometer. | Attached Thermometer. | Barometer. | Attached Thermometer. | Max. | Min. | Max. | Min. | Dry bulb. | Wet bulb. | Dry bulb. | Wet bulb. | | No. of hours in which it fell. | Direction. | Force. | Direction. | Force. | No. | Velocity (0-10) and Species. | Amount (0-10), and Species. | | Velocity (0-10), and Species. | Amount (0-10), and Species. | No. | | | | | No. | No. |
| | | * No. | | No. | | No. | No. | No. | No. | No. | No. | No. | No. | | No. | No. | No. | No. | No. | No. | No. | No. | | No. | No. | No. | | | | | No. | No. |
| | | inches. | ° | inches. | ° | ° | ° | ° | ° | ° | ° | ° | ° | | | | | | | | | | | | | | | | | | | |
| | 1 | 29.884 | | 29.904 | | 53.7 | 41.9 | | | 48.5 | 40.5 | 47.5 | 38.3 | 0.01 | W | 2.0 | S | 2.0 | 2 | 11.0 | 6 | 10.0 | 16 | 20 | 20 | 20 | | | | 1 | | |
| | 2 | 29.622 | | 29.625 | | 62.4 | 44.2 | | | 54.2 | 49.6 | 52.8 | 48.1 | 0.00 | SW | 3.5 | S | 2.3 | 3 | 11.0 | 9 | 10.0 | 16 | 20 | 20 | 20 | | | | 2 | | |
| | 3 | 29.150 | | 29.293 | | 55.3 | 45.3 | * | | 54.0 | 49.7 | 45.3 | 42.9 | 0.05 | S | 2.3 | W | 2.5 | 3.5 | 2 | 11.0 | 9 | 10.0 | 16 | 20 | 20 | 20 | | | | 3 | |
| | 4 | 29.518 | | 29.661 | | 57.8 | 43.5 | | | 53.8 | 49.1 | 55.5 | 49.4 | 0.2 | SW | 3.5 | S | 2.7 | 2.4 | 2 | 11.0 | 9 | 10.0 | 16 | 20 | 20 | 20 | | | | 4 | |
| | 5 | 29.574 | | 29.762 | | 60.3 | 49.5 | * | | 56.4 | 50.9 | 50.5 | 44.9 | 0.05 | S | 2.7 | S | 2.0 | | 2 | 11.0 | 9 | 10.0 | 16 | 20 | 20 | 20 | | | | 5 | |
| | 6 | 29.771 | | 29.622 | | 52.7 | 40.9 | | | 52.3 | 47.0 | 45.7 | 45.7 | 0.19 | NE | 1.0 | E | 1.5 | 2.2 | 2 | 11.0 | 9 | 10.0 | 16 | 20 | 20 | 20 | | | | 6 | |
| | 7 | 29.415 | | 29.604 | | 54.7 | 45.2 | | | 47.5 | 46.8 | 51.9 | 48.0 | 0.30 | E | 1.0 | SW | 1.0 | | 2 | 11.0 | 9 | 10.0 | 16 | 20 | 20 | 20 | | | | 7 | |
| | 8 | 29.735 | | 29.738 | | 59.6 | 42.0 | | | 52.9 | 49.3 | 49.5 | 48.5 | 0.01 | W | 0.5 | E | 0.5 | | 2 | 11.0 | 9 | 10.0 | 16 | 20 | 20 | 20 | | | | 8 | |
| | 9 | 29.836 | | 30.067 | | 50.3 | 44.0 | * | | 46.1 | 43.4 | 44.1 | 42.8 | 0.05 | E | 1.0 | E | 1.0 | 2.5 | 2 | 11.0 | 9 | 10.0 | 16 | 20 | 20 | 20 | | | | 9 | |
| | 10 | 30.156 | | 30.134 | | 46.4 | 44.6 | * | | 42.8 | 40.0 | 41.6 | 38.8 | 0.00 | E | 2.5 | E | 1.5 | | 2 | 11.0 | 9 | 10.0 | 16 | 20 | 20 | 20 | | | | 10 | |
| | 11 | 30.116 | | 30.119 | | 47.7 | 40.1 | | | 44.6 | 40.6 | 42.6 | 37.9 | 0.00 | E | 2.0 | E | 1.0 | | 2 | 11.0 | 9 | 10.0 | 16 | 20 | 20 | 20 | | | | 11 | |
| | 12 | 30.128 | | 30.158 | | 48.7 | 40.9 | | | 46.0 | 41.7 | 42.7 | 38.0 | 0.00 | E | 2.0 | NE | 1.5 | 2 | 2 | 11.0 | 9 | 10.0 | 16 | 20 | 20 | 20 | | | | 12 | |
| | 13 | 30.255 | | 30.329 | | 48.6 | 38.9 | | | 47.5 | 41.7 | 43.6 | 40.4 | 0.00 | NE | 2.0 | NE | 1.5 | | 2 | 11.0 | 9 | 10.0 | 16 | 20 | 20 | 20 | | | | 13 | |
| | 14 | 30.261 | | 30.248 | | 52.7 | 40.9 | | | 46.4 | 40.1 | 43.6 | 41.0 | 0.00 | E | 1.5 | E | 1.0 | | 2 | 11.0 | 9 | 10.0 | 16 | 20 | 20 | 20 | | | | 14 | |
| | 15 | 30.246 | | 30.189 | | 68.9 | 42.1 | | | 54.5 | 48.0 | 52.5 | 47.9 | 0.00 | W | 1.0 | NE | 0.5 | 2.5 | 2 | 11.0 | 9 | 10.0 | 16 | 20 | 20 | 20 | | | | 15 | |
| | 16 | 30.262 | | 30.192 | | 57.7 | 42.6 | | | 55.7 | 47.8 | 48.5 | 46.0 | 0.00 | SE | 1.0 | NE | 0.5 | | 2 | 11.0 | 9 | 10.0 | 16 | 20 | 20 | 20 | | | | 16 | |
| | 17 | 30.116 | | 30.068 | | 64.7 | 46.1 | | | 55.4 | 47.4 | 44.9 | 47.8 | 0.00 | W | 1.0 | W | 0.5 | | 2 | 11.0 | 9 | 10.0 | 16 | 20 | 20 | 20 | | | | 17 | |
| | 18 | 30.096 | | 30.069 | | 51.9 | 45.2 | | | 46.6 | 41.5 | 45.7 | 39.1 | 0.00 | NE | 1.0 | NE | 1.5 | 2.5 | 2 | 11.0 | 9 | 10.0 | 16 | 20 | 20 | 20 | | | | 18 | |
| | 19 | 30.113 | | 30.057 | | 55.7 | 40.0 | | | 47.5 | 39.7 | 45.8 | 42.2 | 0.00 | NE | 1.5 | W | 0.5 | | 2 | 11.0 | 9 | 10.0 | 16 | 20 | 20 | 20 | | | | 19 | |
| | 20 | 29.939 | | 29.911 | | 57.7 | 45.1 | | | 52.5 | 47.0 | 53.7 | 48.5 | 0.00 | W | 2.0 | W | 1.0 | | 2 | 11.0 | 9 | 10.0 | 16 | 20 | 20 | 20 | | | | 20 | |
| | 21 | 29.776 | | 29.452 | | 57.6 | 48.9 | | | 52.6 | 49.5 | 52.5 | 50.7 | 0.18 | SE | 1.0 | S | 1.0 | | 2 | 11.0 | 9 | 10.0 | 16 | 20 | 20 | 20 | | | | 21 | |
| | 22 | 29.326 | | 29.204 | | 61.9 | 50.3 | | | 57.5 | 50.6 | 57.8 | 48.9 | 0.03 | SW | 1.5 | SW | 2.0 | | 2 | 11.0 | 9 | 10.0 | 16 | 20 | 20 | 20 | | | | 22 | |
| | 23 | 29.327 | | 29.494 | | 60.4 | 47.6 | | | 55.4 | 48.8 | 51.0 | 46.8 | 0.08 | SW | 2.0 | SW | 1.5 | 2.2 | 2 | 11.0 | 9 | 10.0 | 16 | 20 | 20 | 20 | | | | 23 | |
| | 24 | 29.632 | | 29.751 | | 62.8 | 44.0 | | | 54.3 | 48.5 | 50.7 | 48.8 | 0.01 | W | 1.0 | W | 1.5 | | 2 | 11.0 | 9 | 10.0 | 16 | 20 | 20 | 20 | | | | 24 | |
| | 25 | 29.979 | | 30.106 | | 62.7 | 47.0 | | | 53.7 | 49.3 | 47.7 | 46.1 | 0.03 | W | 1.5 | SE | 1.5 | | 2 | 11.0 | 9 | 10.0 | 16 | 20 | 20 | 20 | | | | 25 | |
| | 26 | 30.157 | | 30.161 | | 63.7 | 41.8 | | | 53.0 | 48.8 | 53.2 | 49.2 | 0.00 | W | 1.0 | NE | 0.5 | | 2 | 11.0 | 9 | 10.0 | 16 | 20 | 20 | 20 | | | | 26 | |
| | 27 | 30.086 | | 29.995 | | 60.7 | 52.1 | | | 59.4 | 53.9 | 54.5 | 51.0 | 0.02 | SE | 0.5 | SW | 2.0 | | 2 | 11.0 | 9 | 10.0 | 16 | 20 | 20 | 20 | | | | 27 | |
| | 28 | 29.919 | | 30.206 | | 61.7 | 51.0 | | | 54.0 | 50.8 | 51.8 | 47.9 | 0.04 | W | 2.5 | W | 2.0 | | 2 | 11.0 | 9 | 10.0 | 16 | 20 | 20 | 20 | | | | 28 | |
| | 29 | 30.292 | | 30.382 | | 67.0 | 47.8 | | | 59.4 | 51.2 | 51.8 | 48.8 | 0.00 | NE | 1.5 | SE | 1.0 | | 2 | 11.0 | 9 | 10.0 | 16 | 20 | 20 | 20 | | | | 29 | |
| | 30 | 30.406 | | 30.393 | | 58.2 | 45.4 | | | 53.5 | 49.7 | 48.5 | 46.2 | 0.00 | E | 1.0 | E | 1.0 | 2.0 | 2 | 11.0 | 9 | 10.0 | 16 | 20 | 20 | 20 | | | | 30 | |
| | 31 | 30.446 | | 30.473 | | 51.7 | 45.9 | | | 47.5 | 45.3 | 47.6 | 45.4 | 0.00 | E | 1.5 | NE | 1.5 | | 2 | 11.0 | 9 | 10.0 | 16 | 20 | 20 | 20 | | | | 31 | |
| Sums. | | 927.509 | | 928.273 | | 1776.9 | 1381.6 | | | 1605.4 | 1450.2 | 1514.7 | 1406.0 | 1.07 | | | | | | | | | | | | | | | | | | |
| Means. | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| + Total Corrections for Instrumental Errors. | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| + Corrections for Diurnal Range. | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| "Corrected Means." | | 29.920 | | 29.948 | | 57.3 | 44.6 | | | 51.8 | 46.8 | 48.9 | 45.4 | 1.07 | | | | | | | | | | | | | | | | | | |
| No. of Column. | | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 | 25 | 26 | 27 | 28 | 29 | 30 | |

| NOTATION USED IN GENERAL REMARKS. | | | | | |
|-----------------------------------|-----------------|----------|-----------------------|--|--|
| a. | denotes aurora. | m. | denotes meteor. | | |
| ci. | cirrus. | ms. | meteors. | | |
| ci.-cu. | cirro-cumulus. | u. | nimbus. | | |
| ci.-s. | cirro-stratus. | r. | rain. | | |
| cu. | cumulus. | h. r. | heavy rain. | | |
| cu.-s. | cumulo-stratus. | c. h. r. | continued heavy rain. | | |
| d. | dew. | sc. | sleet. | | |
| f. | fog. | s. | snow. | | |
| fr. | frost. | so. ha. | solar halo. | | |
| h.-fr. | hoar-frost. | sq. | squall. | | |
| h. | haze. | sgs. | squalls. | | |
| h. d. | heavy dew. | t. | thunder. | | |
| hl. | hail. | t. s. | thunder-storm. | | |
| li. cl. | light clouds. | w. | wind. | | |
| li. sh. | light showers. | g. | gale of wind. | | |
| lu. co. | lunar corona. | | | | |
| lu. ha. | lunar halo. | | | | |

| TABLE FOR ESTIMATING FORCE OF WIND. | | | | | |
|-------------------------------------|---------------------|-----------------------|---------------------|-----------------------|---------------------|
| Estimated Force, 0-6. | Common Designation. | Estimated Force, 0-6. | Common Designation. | Estimated Force, 0-6. | Common Designation. |
| 0 | Calm | 1.5 | Light breeze | 4 | Blowing hard |
| 0.5 | Very light air | 2. | Fresh breeze | 5 | Blowing gale |
| 1. | Light air | 3. | Very fresh | 6 | Violent gale |

BAROMETER, "corrected Mean" at 9 A.M., minus the Correction \pm = 29.920
for Temp. (Col. 2), =
"Corrected Mean" of Barometer at 9 P.M., minus the Correction \pm = 29.948
for Temp. (Col. 4), =
Mean at Station, corrected, and at 32°, = 29.858
Correction for height, feet above Mean Sea-level, = 76
Mean, reduced to 32°, and Sea-level, = 29.934
Highest Reading, corrected for Index error, on the 31st, = 30.473
Lowest Do. Do., at 1 p.m. on the 3rd, = 29.055
Difference, or Monthly Range, = 1.418

S.-R. THERMOMETER, (in shade, etc.), Highest in Month, (corrected for Index Errors), on the 15th, = 68.9
Lowest in Month, corrected for Index errors, on the 13th, = 38.9
Difference, or Monthly Range, = 30.0
"Corrected Mean" of all the Highest, (Col. 5), = 57.3
"Corrected Mean" of all the Lowest, (Col. 6), = 44.6
Difference, or Mean Daily Range, = 12.7
** Calculated Mean Temperature of Month, = 50.9
S.-R. THERMOMETER, Black Bulb in Sun, Highest, (corrected for Index Errors), on the th, =
"Corrected Mean," (Col. 7), of Black Bulb, Max. in Sun, =
Lowest at Night, Black Bulb (corrected for Index errors), on the th, =
"Corrected Mean," (Col. 8), of Black Bulb, Min. on grass, =
Difference of above means or range ("exposed"), =

HYGROMETER, Mean (corrected) A.M. and P.M. Reading of Dry Bulb, (Cols. 9 and 11), = 50.3
Mean (corrected) A.M. and P.M. Reading of Wet Bulb, (Cols. 10 and 12), = 46.6
Computed Temperature of Dew-Point, = 43.7
Do. Elastic Force of Vapour, = 0.285
Do. Weight of Vapour in a Cubic Foot of Air, =
Relative Humidity (Saturation = 100), = 75
RAIN fell on 15 Days; Amount in Inches, = 1.07

| WIND. | | SUMMARY. | | | | | | | | | |
|------------|---|----------|---|----|---|----|---|----|-------------------|-------------|--------------------------------|
| Direction. | N | NE | E | SE | S | SW | W | NW | Calm or Variable. | Mean Force. | Mean Velocity in miles per day |
| A.M. | 3 | 3 | 9 | 2 | 4 | 1 | 8 | 1 | - | 150 | |
| P.M. | 5 | 2 | 1 | 7 | 2 | 7 | 3 | - | - | 137 | |
| Mean. | 4 | 3 | 6 | 2 | 3 | 2 | 7 | 2 | 0 | 145 | |

Observations made and
Return verified by

(Signed)

SCOTTISH METEOROLOGICAL SOCIETY.

Observations taken at Lith, County of Edinburgh, in Lat. 55° 59' N, Long. 3° 10' W, Distance from Sea half miles.
Height of Cistern of the Barometer above Mean Sea-Level 76 feet, above Ground 3 feet. During the MONTH of June 1890.
The Hours of Observation are of Greenwich Time.

| ELECTRICITY. | Days of Month. | BAROMETER. | | | | SELF-REGISTERING THERMOMETERS. Read Daily, at 9 P.M. | | | | HYGROMETER. | | | | Rain. | WIND. | | | | CLOUDS. | | | | THERMOMETERS under Ground. | | | | SEA. | OZONE. | GENERAL REMARKS. As to occurrence of Thunder, Lightning, Storms, Hail, Meteors, Remarkable Depression or Elevation of Barometer, Prevalent Diseases, etc. | Days of Month. | | | |
|------------------------------------------------------------|----------------|------------|-------------------------|------------|-------------------------|---------------------------------------------------------|--------|-------------------------|-------------------|-------------|-----------|--------------------------------------|----------------------------------------------------------------------------------------------------------------|-------|-----------------------------------------|------------|-----------|------------|---------|-----|------------------------------------------|--------------------------------------|-------------------------------|------------------------------------------|--------------------------------------|-----|------|--------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------|-----|-----|-----|
| | | 9 h. A.M. | | 9 h. P.M. | | Protected in Shade, & feet above Ground. | | Exposed Black Bulbs. | | 9 h. A.M. | | 9 h. P.M. | | | 9 h. A.M. | | 9 h. P.M. | | 9 A.M. | | P.M. | | 9 h. A.M. | | | | | | | | | | |
| | | Barometer. | Attached Thermometer | Barometer. | Attached Thermometer | Max. | Min. | Max. in Sun's rays | Min. on Grass. | Dry bulb. | Wet bulb. | Dry bulb. | Wet bulb. | | No. of hours in which it fell. | Direction. | Force. | Direction. | Force. | No. | Velocity (0-10), and Direction. | Amount (0-10), and Species. | No. | Velocity (0-10), and Direction. | Amount (0-10), and Species. | No. | | | | | No. | No. | |
| | | * No. | No. | No. | No. | No. | No. | No. | No. | No. | No. | No. | No. | | No. | No. | No. | No. | No. | No. | No. | No. | No. | No. | No. | No. | | | | | No. | No. | No. |
| | | inches. | " | inches. | " | " | " | " | " | " | " | " | " | | " | " | " | " | " | " | " | " | " | " | " | " | | | | | " | " | " |
| | | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | | | | | ° | ° | ° |
| 1 | 30.471 | 30.406 | 51.445 | 46.744 | 46.744 | 0.00 | E | 1.4 | E | 1.6 | 1.5 | Drizzle: 10 spec? 25MB: 10 Clf. | Fine, cloudy. | | | | | | | | | | | | | | 1 | | | | | | |
| 2 | 30.349 | 30.275 | 54.744 | 46.744 | 46.744 | 0.00 | E | 1.4 | E | 1.0 | 1.0 | Drizzle: 10 spec? Drizzle: 10 spec? | Cloudy, with bright sunshine at times during afternoon. | | | | | | | | | | | | | | 2 | | | | | | |
| 3 | 30.222 | 30.172 | 61.842 | 46.744 | 46.744 | 0.00 | NW | 0.25 | E | 1.5 | 1.5 | 0 0 2E: 10 lower st. | Thick & hazy till 6.30 am., then fine; bright sunshine. | | | | | | | | | | | | | | 3 | | | | | | |
| 4 | 30.176 | 30.146 | 52.441 | 46.744 | 46.744 | 0.00 | E | 1.0 | E | 2.0 | 2.0 | Drizzle: 10 spec? Drizzle: 10 spec? | Fine, cloudy. | | | | | | | | | | | | | | 4 | | | | | | |
| 5 | 30.117 | 30.048 | 52.744 | 46.744 | 46.744 | 0.00 | E | 1.0 | E | 1.5 | 1.5 | Drizzle: 10 spec? 1H: 9 small cl. | Cloudy, with occas. sunshine dur. afternoon. | | | | | | | | | | | | | | 5 | | | | | | |
| 6 | 29.960 | 29.871 | 53.647 | 46.744 | 46.744 | 0.00 | E | 1.4 | E | 1.6 | 1.5 | Drizzle: 10 spec? 15MB: 10 spec? | Moderately cloudy, very sh. sho. aft. 7.45 pm. | | | | | | | | | | | | | | 6 | | | | | | |
| 7 | 29.742 | 29.716 | 50.747 | 46.744 | 46.744 | 0.08 | NW | 1.4 | E | 1.5 | 1.5 | Drizzle: 10 spec? 2Cl: 10 spec? | Overcast; sho. till 9.30 am.; hazy. | | | | | | | | | | | | | | 7 | | | | | | |
| 8 | 29.752 | 29.772 | 54.845 | 46.744 | 46.744 | .11 | E | 1.5 | E | 1.4 | 1.4 | 29% spec: 10 spec? 1SSW: 7 spec? | Cloudy; sho. till 10.15 am.; sunny intro. after 5 pm. | | | | | | | | | | | | | | 8 | | | | | | |
| 9 | 29.753 | 29.770 | 61.746 | 46.744 | 46.744 | .07 | SE | 1.5 | SW | 2.0 | 2.0 | 2SSW: 10 spec? 2SSW: 10 spec? | Cloudy; occas. sho. after 6 am. | | | | | | | | | | | | | | 9 | | | | | | |
| 10 | 29.841 | 29.748 | 75.955 | 46.744 | 46.744 | .00 | SE | 1.5 | SE | 1.0 | 1.0 | 1SSW: 10 spec? 1SSW: 10 spec? | Fine; mostly sunny. | | | | | | | | | | | | | | 10 | | | | | | |
| 11 | 29.852 | 29.920 | 72.955 | 46.744 | 46.744 | .19 | SE | 1.0 | SE | 1.0 | 1.0 | 1SSW: 10 spec? 1SSW: 10 spec? | Fine, sunny till aft. 3 pm.; then cloudy; T.L. bet. 4.10 & 5 pm. foll. by drizzle r. till 6 pm. | | | | | | | | | | | | | | 11 | | | | | | |
| 12 | 29.946 | 29.963 | 68.853 | 46.744 | 46.744 | .61 | SE | 1.0 | SE | 1.0 | 1.0 | Drizzle: 10 spec? 1SSW: 10 spec? | Fine, mostly sunny till 3 pm. T.S. bet. 3.20 & 4 pm. with large cl. in v. at 3.45 pm. severe T.S. till 4 pm. | | | | | | | | | | | | | | 12 | | | | | | |
| 13 | 29.842 | 29.870 | 59.052 | 46.744 | 46.744 | .05 | E | 1.4 | NW | 0.25 | 0.25 | 1SSW: 10 spec? 1SSW: 10 spec? | Cloudy, with occas. sunshine; T.L. with broke ch. at 4.5 pm. | | | | | | | | | | | | | | 13 | | | | | | |
| 14 | 29.986 | 29.979 | 67.451 | 46.744 | 46.744 | .05 | W | 1.5 | W | 0.5 | 0.5 | 1SSW: 8 spec? 1SSW: 8 spec? | Fine, frequent bright sunshine; li. pass. sho. dur. afternoon. | | | | | | | | | | | | | | 14 | | | | | | |
| 15 | 29.892 | 29.855 | 62.846 | 46.744 | 46.744 | .00 | E | 1.6 | SE | 0 | 0 | 1SSW: 8 spec? 1SSW: 8 spec? | Fine; bright sunshine at times. | | | | | | | | | | | | | | 15 | | | | | | |
| 16 | 29.911 | 29.936 | 72.853 | 46.744 | 46.744 | .00 | W | 1.4 | NW | 1.4 | 1.4 | 2H: 3 cu. Drizzle: 10 spec? | Fine; mostly sunny; f. at 9 pm. | | | | | | | | | | | | | | 16 | | | | | | |
| 17 | 29.893 | 29.995 | 71.953 | 46.744 | 46.744 | .03 | W | 2.0 | W | 1.0 | 1.0 | 2H: 10 cu. 0 0 0 | Sho. prev. night; day fine, sunny after 9.30 am. | | | | | | | | | | | | | | 17 | | | | | | |
| 18 | 30.053 | 30.014 | 68.849 | 46.744 | 46.744 | .00 | W | 1.4 | NW | 0.25 | 0.25 | 1H: 3 cu. 15: 10 spec? | Fine, bright sunshine till noon, then cloudy. | | | | | | | | | | | | | | 18 | | | | | | |
| 19 | 29.886 | 29.701 | 61.254 | 46.744 | 46.744 | .10 | SE | 1.5 | SE | 0.5 | 0.5 | 1SS: 10 Clf. 1SSW: 5 cu. 1SSW: 5 cu. | Cloudy; fr. bet. 7.10 & 10.15 am., and li. sho. at intro. later. | | | | | | | | | | | | | 19 | | | | | | | |
| 20 | 29.598 | 29.606 | 62.953 | 46.744 | 46.744 | .21 | W | 1.5 | W | 2.0 | 2.0 | 2H: 9 cu. 1SSW: 7 spec? | Cloudy; broke sho. till 5.30 am., and at 1 pm., & a few li. sho. dur. day. | | | | | | | | | | | | | 20 | | | | | | | |
| 21 | 29.656 | 29.667 | 64.853 | 46.744 | 46.744 | .19 | NW | 1.0 | NW | 0.25 | 0.25 | 1H: 10 spec? 1SSW: 10 spec? | Sunny at times; sho. bet. 6.15 pm. & 10.15 pm., & T.L. bet. 11.30 pm. with heavy r. till 1.45 pm. | | | | | | | | | | | | | 21 | | | | | | | |
| 22 | 29.718 | 29.704 | 67.253 | 46.744 | 46.744 | .01 | NW | 1.0 | W | 0.5 | 0.5 | 1H: 7 cu. 1SSW: 8 spec? | Fine; mostly sunny; li. sho. at 7.30 am. and 4 pm. | | | | | | | | | | | | | 22 | | | | | | | |
| 23 | 29.768 | 29.910 | 71.349 | 46.744 | 46.744 | .26 | NW | 1.0 | W | 0.25 | 0.25 | 1H: 6 cu. 1SSW: 8 spec? | Bright sun. till aft. 4 pm., dist. T. at 4.45 pm. & T.L. bet. 5.53 & 6 pm. foll. by h. r. & rain till 6.30 pm. | | | | | | | | | | | | | 23 | | | | | | | |
| 24 | 29.822 | 29.636 | 61.749 | 46.744 | 46.744 | .67 | SE | 1.5 | E | 2.4 | 2.4 | 1SSW: 7 cu. 2H: 10 spec? | Cloudy; sho. aft. 10.45 am. & cont. r. bet. 2.4 & 1.5 pm., and after 6 pm. | | | | | | | | | | | | | 24 | | | | | | | |
| 25 | 29.722 | 29.989 | 54.750 | 46.744 | 46.744 | .48 | NW | 1.4 | SE | 0.25 | 0.25 | 2SSW: 10 cu. 1SSW: 10 cu. | Cloudy; cont. r. till aft. 5 am., and sho. during forenoon. | | | | | | | | | | | | | 25 | | | | | | | |
| 26 | 29.854 | 29.945 | 66.151 | 46.744 | 46.744 | .00 | NW | 0.5 | W | 0 | 0 | 1H: 9 cu. 1H: 10 cu. & 2H: | Fine; cloudy, with sunny intro. during afternoon. | | | | | | | | | | | | | 26 | | | | | | | |
| 27 | 30.004 | 30.006 | 62.253 | 46.744 | 46.744 | .02 | NW | 0.5 | NW | 0.25 | 0.25 | 1H: 9 cu. 1SSW: 10 spec? | Sho. previous night; day fine, cloudy; rather hazy. | | | | | | | | | | | | | 27 | | | | | | | |
| 28 | 29.983 | 29.928 | 65.851 | 46.744 | 46.744 | .00 | NW | 1.0 | W | 1.0 | 1.0 | 1SSW: 7 cu. Drizzle: 3 spec? | Fine; cloudy, with occasional sunshine. | | | | | | | | | | | | | 28 | | | | | | | |
| 29 | 29.828 | 29.601 | 61.753 | 46.744 | 46.744 | .00 | NW | 1.5 | SW | 2.25 | 2.25 | 2H: 10 spec? 1SSW: 10 spec? | Fine, cloudy. | | | | | | | | | | | | | 29 | | | | | | | |
| 30 | 29.498 | 29.446 | 68.853 | 46.744 | 46.744 | .15 | W | 2.4 | SW | 1.5 | 1.5 | 2H: 10 cu. 2SSW: 10 spec? | Frequent bright sunshine; sho. aft. 10 am., & broke r. at times after 6.15 pm. | | | | | | | | | | | | | 30 | | | | | | | |
| 31 | | | | | | | | | | | | | | | | | | | | | | | | | | | 31 | | | | | | |
| Sums. | 897.095 | 896.395 | 1882.51035 | | | 1708.8 | 1581.4 | 1630.2 | 1560.5 | 3.28 | | | 9 | 6 | | | | 8 | 4 | | | | | | | | | | | | | | |
| Means. | | | | | | | | | | | | | 380 | 305 | | | | 246 | 236 | | | | | | | | | | | | | | |
| + Total Corrections for Instru- mental Errors. | | | | | | | | | | | | | 1.27 | 1.02 | | | | 8.2 | 7.8 | | | | | | | | | | | | | | |
| + Corrections for Diurnal Range. | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| "Cor- rected Means." | 29.903 | 29.880 | 62.750 | | | 56.9 | 53.0 | 54.3 | 52.0 | 3.28 | | | | | | | | | | | | | | | | | | | | | | | |
| No. of Column. | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 | 25 | 26 | 27 | 28 | 29 | 30 | | | |

| | |
|----------------------------------------------------------------------------------------------------------------|---------------|
| Barometer, "Corrected Mean" at 9 A.M., $\frac{\text{minus the Correction } +1}{\text{for Temp. (Col. 2)}} =$ | <u>29.903</u> |
| "Corrected Mean" of Barometer at 9 P.M., $\frac{\text{minus the Correction } +1}{\text{for Temp. (Col. 4)}} =$ | <u>29.880</u> |
| Mean at Station, corrected, and at 32°, | <u>29.816</u> |
| Correction for height, feet above Mean Sea-level, | <u>75</u> |
| Mean, reduced to 32°, and Sea-level, | <u>29.891</u> |
| Highest Reading, corrected for Index error, on the 1st, | <u>30.473</u> |
| Lowest Do. Do., at 9 p.m. on the 30th, | <u>29.446</u> |
| Difference, or Monthly Range, | <u>1.027</u> |

| | | |
|-------------------------------------------------------------------------------------------------------------------------------|---|-------------|
| S.-R. THERMOMETER, (in shade, etc.), Highest in Month, (corrected for Index Errors), on the <i>10</i> th, | = | <u>75.9</u> |
| Lowest in Month, corrected for Index errors, on the <i>4</i> th, | = | <u>41.9</u> |
| Difference, or Monthly Range, | = | <u>34.0</u> |
| "Corrected Mean " of all the Highest, (Col. 5), | = | <u>62.7</u> |
| "Corrected Mean " of all the Lowest, (Col. 6), | = | <u>50.1</u> |
| Difference, or Mean Daily Range, | = | <u>12.6</u> |
| ** Calculated Mean Temperature of Month, | = | <u>56.4</u> |
| S.-R. THERMOMETER, Black Bulb in Sun, Highest, (corrected for Index Errors), on the th, | | |
| "Corrected Mean, " (Col. 7), of Black Bulb, Max. in Sun, | = | |
| Lowest at Night, Black Bulb (corrected for Index errors), on the th, | = | |
| "Corrected Mean, " (Col. 8), of Black Bulb, Min. on grass, | = | |
| Difference of above means or range ("exposed"), | = | |

| | | |
|------------------------------------------------------------------------------------------------|---|-------|
| HYGROMETER, Mean (corrected) A.M. and P.M. Reading of Dry Bulb, (Cols. 9 and 11), | = | 58°·6 |
| Mean (corrected) A.M. and P.M. Reading of Wet Bulb, (Cols. 10 and 12), | = | 52·5 |
| ‡ Computed Temperature of Dew-Point , | = | 49·6 |
| ‡ Do. Elastic Force of Vapour , | = | 0·357 |
| ‡ Do. Weight of Vapour in a Cubic Foot of Air , | = | |
| ‡ Relative Humidity (Saturation = 100), | = | 80 |
| RAIN fell on <i>17</i> Days; Amount in Inches, | = | 3·28 |

| WIND. | | SUMMARY. | | | | | | | | | |
|------------|---|----------|----|----|---|----|----|----|-------------------|-------------|--------------------------------|
| Direction. | N | NE | E | SE | S | SW | W | NW | Calm or Variable. | Mean Force. | Mean Velocity in miles per day |
| A.M. | 3 | 1 | 9 | 2 | 3 | - | 10 | 2 | - | 1.27 | |
| P.M. | - | 1 | 10 | 4 | 4 | - | 7 | 1 | 3 | 10.2 | |
| Mean. | 2 | 1 | 9 | 3 | 4 | 0 | 8 | 2 | 1 | 1.15 | |

1.32

Observations made and
Return verified by

(Signed) James Boland & George Redpath.

SCOTTISH METEOROLOGICAL SOCIETY.

Observations taken at Leith, County of Edinburgh, in Lat. 55° 59' N, Long. 3° 10' W, Distance from Sea half mile.
Height of Cistern of the Barometer above Mean Sea-level 76 feet, above Ground 3 feet.
During the MONTH of July 1900.
The Hours of Observation are of Greenwich Time.

| ELECTRICITY. | Days of Month. | BAROMETER. | | | | SELF-REGISTERING THERMOMETERS. | | | | HYGROMETER. | | | | RAIN. | WIND. | | | | CLOUDS. | | | | THERMOMETERS under Ground. | | | SEA. | OZONE. | GENERAL REMARKS. | Days of Month. |
|--------------|----------------------------------------------|------------|-----------------------|-------------|-----------------------|------------------------------------------|----------|----------------------|----------------|-------------|-----------|-----------|-----------|-------|--------------------------------|-------------------|------------|--------|------------|--------|---------------------------------|-----------------------------|---------------------------------|-----------------------------|---------------|------|--------|------------------|----------------|
| | | 9 h. A.M. | | 9 h. P.M. | | Protected in Shade, 4 feet above Ground. | | Exposed Black Bulbs. | | 9 h. A.M. | | 9 h. P.M. | | | 9 h. A.M. | | 9 h. P.M. | | 9 A.M. | | P.M. | | 9 h. A.M. | | | | | | |
| | | Barometer. | Attached Thermometer. | Barometer. | Attached Thermometer. | Max. No. | Min. No. | Max. in Sun's rays. | Min. on Grass. | Dry bulb. | Wet bulb. | Dry bulb. | Wet bulb. | | No. of hours in which it fell. | Amount in inches. | Direction. | Force. | Direction. | Force. | Velocity (0-10), and Direction. | Amount (0-10), and Species. | Velocity (0-10), and Direction. | Amount (0-10), and Species. | No. 3 inches. | | | | |
| | | inches. | ° | inches. | ° | ° | ° | ° | ° | ° | ° | ° | | | | | | | | | | | | | | | | | |
| | 1 | 29.441 | 29.484 | 68.9 | 52.6 | 59.6 | 56.7 | 57.4 | 54.7 | 0.03 | SW | 1.0 | 1.5 | 1.5 | SW | 1.0 | 1.5 | 1.5 | SW | 1.0 | 1.5 | 1.5 | 1.5 | 1.5 | 1.5 | 1.5 | 1.5 | | |
| | 2 | 29.546 | 29.606 | 68.6 | 52.8 | 60.4 | 58.7 | 57.4 | 54.7 | 0.03 | W | 1.5 | 1.5 | 1.5 | W | 1.5 | 1.5 | 1.5 | W | 1.5 | 1.5 | 1.5 | 1.5 | 1.5 | 1.5 | 1.5 | 1.5 | | |
| | 3 | 29.741 | 30.021 | 62.4 | 52.8 | 56.6 | 54.7 | 53.0 | 50.7 | 2.7 | SW | 1.5 | 1.5 | 1.5 | SW | 1.5 | 1.5 | 1.5 | SW | 1.5 | 1.5 | 1.5 | 1.5 | 1.5 | 1.5 | 1.5 | 1.5 | | |
| | 4 | 30.095 | 29.982 | 58.7 | 48.8 | 52.2 | 48.7 | 53.8 | 51.7 | 1.6 | SE | 1.5 | 1.5 | 1.5 | SE | 1.5 | 1.5 | 1.5 | SE | 1.5 | 1.5 | 1.5 | 1.5 | 1.5 | 1.5 | 1.5 | 1.5 | | |
| | 5 | 29.848 | 29.809 | 67.9 | 52.9 | 61.5 | 57.0 | 55.2 | 51.7 | 0.2 | W | 2.0 | 2.0 | 1.5 | W | 2.0 | 2.0 | 1.5 | W | 2.0 | 2.0 | 1.5 | 1.5 | 1.5 | 1.5 | 1.5 | 1.5 | | |
| | 6 | 29.798 | 30.072 | 64.7 | 50.9 | 56.5 | 51.8 | 54.5 | 49.7 | 0.0 | W | 2.0 | 2.0 | 1.5 | W | 2.0 | 2.0 | 1.5 | W | 2.0 | 2.0 | 1.5 | 1.5 | 1.5 | 1.5 | 1.5 | 1.5 | | |
| | 7 | 30.198 | 30.252 | 63.7 | 49.0 | 57.4 | 49.7 | 54.5 | 50.1 | 0.0 | W | 2.0 | 2.0 | 1.5 | W | 2.0 | 2.0 | 1.5 | W | 2.0 | 2.0 | 1.5 | 1.5 | 1.5 | 1.5 | 1.5 | 1.5 | | |
| | 8 | 30.225 | 30.168 | 65.9 | 47.4 | 60.0 | 53.0 | 55.8 | 52.7 | 0.0 | W | 1.5 | 1.5 | 1.5 | W | 1.5 | 1.5 | 1.5 | W | 1.5 | 1.5 | 1.5 | 1.5 | 1.5 | 1.5 | 1.5 | 1.5 | | |
| | 9 | 30.078 | 30.032 | 60.8 | 55.8 | 59.5 | 57.8 | 56.8 | 55.8 | 2.8 | W | 2.0 | 1.5 | 1.5 | W | 2.0 | 1.5 | 1.5 | W | 2.0 | 1.5 | 1.5 | 1.5 | 1.5 | 1.5 | 1.5 | 1.5 | | |
| | 10 | 29.965 | 29.896 | 78.9 | 56.8 | 68.5 | 59.1 | 63.5 | 55.7 | 0.7 | W | 1.5 | 1.5 | 1.5 | W | 1.5 | 1.5 | 1.5 | W | 1.5 | 1.5 | 1.5 | 1.5 | 1.5 | 1.5 | 1.5 | 1.5 | | |
| | 11 | 29.854 | 29.844 | 74.4 | 56.3 | 68.4 | 60.8 | 63.4 | 60.1 | 0.0 | W | 1.0 | 1.0 | 1.0 | W | 1.0 | 1.0 | 1.0 | W | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | | |
| | 12 | 29.747 | 29.719 | 70.7 | 57.8 | 66.9 | 62.2 | 59.3 | 57.4 | 0.5 | SW | 1.0 | 1.5 | 1.5 | SW | 1.0 | 1.5 | 1.5 | SW | 1.0 | 1.5 | 1.5 | 1.5 | 1.5 | 1.5 | 1.5 | 1.5 | | |
| | 13 | 29.786 | 29.794 | 69.2 | 54.0 | 60.9 | 56.9 | 59.4 | 57.7 | 0.4 | W | 0.5 | 1.0 | 1.5 | W | 0.5 | 1.0 | 1.5 | W | 0.5 | 1.0 | 1.5 | 1.5 | 1.5 | 1.5 | 1.5 | 1.5 | | |
| | 14 | 29.756 | 29.844 | 72.2 | 56.9 | 63.3 | 58.9 | 62.5 | 58.9 | 0.2 | W | 1.0 | 1.5 | 1.5 | W | 1.0 | 1.5 | 1.5 | W | 1.0 | 1.5 | 1.5 | 1.5 | 1.5 | 1.5 | 1.5 | 1.5 | | |
| | 15 | 30.019 | 30.099 | 74.9 | 55.8 | 65.0 | 58.7 | 60.6 | 57.9 | 0.0 | W | 1.5 | 1.5 | 1.5 | W | 1.5 | 1.5 | 1.5 | W | 1.5 | 1.5 | 1.5 | 1.5 | 1.5 | 1.5 | 1.5 | 1.5 | | |
| | 16 | 30.016 | 29.999 | 69.2 | 56.5 | 58.7 | 57.9 | 63.5 | 59.7 | 9.2 | W | 1.5 | 1.5 | 1.5 | W | 1.5 | 1.5 | 1.5 | W | 1.5 | 1.5 | 1.5 | 1.5 | 1.5 | 1.5 | 1.5 | 1.5 | | |
| | 17 | 30.128 | 30.174 | 71.9 | 58.1 | 64.4 | 59.6 | 63.7 | 59.9 | 0.1 | W | 2.0 | 1.5 | 1.5 | W | 2.0 | 1.5 | 1.5 | W | 2.0 | 1.5 | 1.5 | 1.5 | 1.5 | 1.5 | 1.5 | 1.5 | | |
| | 18 | 30.076 | 30.033 | 76.9 | 62.2 | 70.9 | 65.1 | 67.8 | 63.0 | 0.0 | W | 2.0 | 1.5 | 1.5 | W | 2.0 | 1.5 | 1.5 | W | 2.0 | 1.5 | 1.5 | 1.5 | 1.5 | 1.5 | 1.5 | 1.5 | | |
| | 19 | 30.018 | 30.082 | 72.9 | 59.5 | 67.5 | 62.7 | 59.5 | 57.7 | 0.0 | W | 1.5 | 1.5 | 1.5 | W | 1.5 | 1.5 | 1.5 | W | 1.5 | 1.5 | 1.5 | 1.5 | 1.5 | 1.5 | 1.5 | 1.5 | | |
| | 20 | 30.174 | 30.190 | 61.5 | 55.7 | 56.4 | 55.3 | 55.7 | 54.8 | 1.2 | E | 2.0 | 1.5 | 1.5 | E | 2.0 | 1.5 | 1.5 | E | 2.0 | 1.5 | 1.5 | 1.5 | 1.5 | 1.5 | 1.5 | 1.5 | | |
| | 21 | 30.136 | 30.114 | 55.8 | 54.0 | 55.5 | 54.7 | 54.5 | 54.5 | 2.3 | E | 2.0 | 1.5 | 1.5 | E | 2.0 | 1.5 | 1.5 | E | 2.0 | 1.5 | 1.5 | 1.5 | 1.5 | 1.5 | 1.5 | 1.5 | | |
| | 22 | 30.118 | 30.075 | 72.4 | 53.4 | 57.0 | 55.7 | 65.5 | 62.1 | 0.3 | E | 2.0 | 1.5 | 1.5 | E | 2.0 | 1.5 | 1.5 | E | 2.0 | 1.5 | 1.5 | 1.5 | 1.5 | 1.5 | 1.5 | 1.5 | | |
| | 23 | 30.058 | 29.918 | 72.9 | 60.8 | 63.2 | 58.6 | 66.8 | 64.8 | 0.1 | W | 2.0 | 1.5 | 1.5 | W | 2.0 | 1.5 | 1.5 | W | 2.0 | 1.5 | 1.5 | 1.5 | 1.5 | 1.5 | 1.5 | 1.5 | | |
| | 24 | 29.914 | 29.886 | 72.0 | 62.0 | 67.8 | 64.0 | 63.4 | 62.7 | 1.5 | W | 2.0 | 1.5 | 1.5 | W | 2.0 | 1.5 | 1.5 | W | 2.0 | 1.5 | 1.5 | 1.5 | 1.5 | 1.5 | 1.5 | 1.5 | | |
| | 25 | 29.855 | 29.890 | 71.9 | 58.1 | 62.4 | 60.5 | 58.4 | 57.0 | 0.1 | W | 1.0 | 1.5 | 1.5 | W | 1.0 | 1.5 | 1.5 | W | 1.0 | 1.5 | 1.5 | 1.5 | 1.5 | 1.5 | 1.5 | 1.5 | | |
| | 26 | 29.988 | 30.079 | 72.9 | 54.8 | 66.3 | 59.3 | 60.6 | 55.8 | 0.0 | W | 1.5 | 1.5 | 1.5 | W | 1.5 | 1.5 | 1.5 | W | 1.5 | 1.5 | 1.5 | 1.5 | 1.5 | 1.5 | 1.5 | 1.5 | | |
| | 27 | 30.092 | 30.028 | 71.9 | 52.8 | 65.6 | 57.2 | 56.7 | 55.3 | 0.0 | W | 1.5 | 1.5 | 1.5 | W | 1.5 | 1.5 | 1.5 | W | 1.5 | 1.5 | 1.5 | 1.5 | 1.5 | 1.5 | 1.5 | 1.5 | | |
| | 28 | 29.848 | 29.683 | 58.7 | 54.9 | 58.1 | 56.8 | 57.4 | 56.7 | 3.8 | E | 1.5 | 1.5 | 1.5 | E | 1.5 | 1.5 | 1.5 | E | 1.5 | 1.5 | 1.5 | 1.5 | 1.5 | 1.5 | 1.5 | 1.5 | | |
| | 29 | 29.620 | 29.588 | 67.5 | 55.1 | 59.1 | 58.1 | 57.7 | 55.9 | 0.1 | Var. | 0.25 | 1.5 | 1.5 | Var. | 0.25 | 1.5 | 1.5 | Var. | 0.25 | 1.5 | 1.5 | 1.5 | 1.5 | 1.5 | 1.5 | 1.5 | | |
| | 30 | 29.675 | 29.883 | 69.3 | 55.9 | 61.4 | 55.8 | 58.7 | 55.6 | 0.6 | W | 1.5 | 1.5 | 1.5 | W | 1.5 | 1.5 | 1.5 | W | 1.5 | 1.5 | 1.5 | 1.5 | 1.5 | 1.5 | 1.5 | 1.5 | | |
| | 31 | 29.943 | 29.686 | 71.2 | 52.2 | 62.8 | 57.1 | 61.5 | 60.0 | 2.1 | W | 1.5 | 1.5 | 1.5 | W | 1.5 | 1.5 | 1.5 | W | 1.5 | 1.5 | 1.5 | 1.5 | 1.5 | 1.5 | 1.5 | 1.5 | | |
| | Sums. | 927.757 | 927.930 | 21308.17066 | 1514 | 1913.8 | 1780.1 | 1835.5 | 1755.0 | 301 | | | | | | | | | | | | | | | | | | | |
| | Means. | 29.928 | 29.933 | 68.7551 | 57.4593 | 61.7574 | 56.6 | 301 | | | | | | | | | | | | | | | | | | | | | |
| | † Total Corrections for Instrumental Errors. | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | † Corrections for Diurnal Range. | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | “Corrected Means.” | 29.928 | 29.933 | 68.7551 | 57.4593 | 61.7574 | 56.6 | 301 | | | | | | | | | | | | | | | | | | | | | |
| | No. of Column. | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 | 25 | 26 | 27 | 28 |

BAROMETER, “corrected Mean” at 9 A.M., minus the Correction† = 29.928
for Temp. (Col. 2) =
Corrected Mean” of Barometer at 9 P.M., minus the Correction† = 29.933
for Temp. (Col. 4) =
Mean at Station, corrected, and at 32°, 29.855
Correction for height, feet above Mean Sea-level, = 75
Mean, reduced to 32°, and Sea-level, = 29.930
Highest Reading, corrected for Index error, on the 7 th, = 20.252
Lowest Do. Do., on the 1 th, = 29.441
Difference, or Monthly Range, = 0.811

S.-R. THERMOMETER, (in shade, etc.), Highest in Month, (corrected for Index Errors), on the 10 th, = 78.9
Lowest in Month, corrected for Index errors, on the 8 th, = 47.4
Difference, or Monthly Range, = 31.5
“Corrected Mean” of all the Highest, (Col. 5), = 68.7
“Corrected Mean” of all the Lowest, (Col. 6), = 55.1
Difference, or Mean Daily Range, = 13.6
** Calculated Mean Temperature of Month, = 61.9
S.-R. THERMOMETER, Black Bulb in Sun, Highest, (corrected for Index Errors), on the th, =
“Corrected Mean,” (Col. 7), of Black Bulb, Max. in Sun, =
Lowest at Night, Black Bulb, (corrected for Index errors), on the th, =
“Corrected Mean,” (Col. 8), of Black Bulb, Min. on grass, =
Difference of above Means or Range (“exposed”), =

HYGROMETER, Mean (corrected) A.M. and P.M. Reading of Dry Bulb, (Cols. 9 and 11), = 60.5
Mean (corrected) A.M. and P.M. Reading of Wet Bulb, (Cols. 10 and 12), = 57.0
† Computed Temperature of Dew-Point, = 54.9
† Do. Elastic Force of Vapour, = 0.416
† Do. Weight of Vapour in a Cubic Foot of Air, ... =
† Relative Humidity, (Saturation = 100), = 79
RAIN fell on 22 Days; Amount in Inches, = 3.01

| WIND. | | SUMMARY. | | | | | | | | | |
|------------|---|----------|---|----|----|----|----|----|-------------------|-------------|---------------------------------|
| Direction. | N | NE | E | SE | S | SW | W | NW | Calm or Variable. | Mean Force. | Mean Velocity in miles per day. |
| A.M. | 3 | 4 | 1 | 3 | 19 | 1 | 1 | 1 | 1 | 1.48 | |
| P.M. | 4 | 1 | 4 | 3 | 1 | 14 | 2 | 2 | 1 | 1.26 | |
| Mean. | 3 | 1 | 4 | 1 | 2 | 2 | 16 | 1 | 1 | 1.37 | |

Observations made and
Return verified by

(Signed) Jas. Colman & Geo. Redpath.

SCOTTISH METEOROLOGICAL SOCIETY.

Observations taken at Leth, County of Edinburgh, in Lat. 55° 59' N, Long. 3° 10' W, Distance from Sea half mile.

Height of Cistern of the Barometer above Mean Sea-Level 76 feet, above Ground 3 feet.

During the MONTH of August 1890

The Hours of Observation are of Greenwich Time.

| ELECTRICITY. | | BAROMETER. | | | | SELF-REGISTERING THERMOMETERS. | | | | HYGROMETER. | | | | RAIN. | | WIND. | | | | CLOUDS. | | | | THERMOMETERS under Ground. | | | | SEA. | | OZONE. | | GENERAL REMARKS. | | Days of Month. | | | | | | | | |
|----------------|--------|------------|------|------------|------|------------------------------------------|------|----------------------|------|-------------|-----|-----------|-----|--------------------------------|--------|-----------|------|-----------|------|------------|------|------------|------|----------------------------|-----|---------------------------------------|-----|-------------------------------------|--------|---------|------|------------------------------------------------------------------------------------------------------------------------------------------|------|----------------|------|------|------|----|-----|----|-----|---|
| Days of Month. | | 9 h. A.M. | | 9 h. P.M. | | Protected in Shade, 4 feet above Ground. | | Exposed Black Bulbs. | | 9 h. A.M. | | 9 h. P.M. | | No. of hours in which it fell. | | 9 h. A.M. | | 9 h. P.M. | | 9 A.M. | | 9 P.M. | | 9 h. A.M. | | Temperature of Well at depth of feet. | | Temperature at 1 fathoms and Depth. | | 0-10. | | As to occurrence of Thunder, Lightning, Storms, Hail, Meteors, Remarkable Depression or Elevation of Barometer, Prevalent Diseases, etc. | | Days of Month. | | | | | | | | |
| No. | | Barometer. | | Barometer. | | Max. Min. | | Max. Min. | | Dry bulb. | | Wet bulb. | | No. | | Dry bulb. | | Wet bulb. | | Direction. | | Direction. | | No. | | No. | | No. | | 9 A.M. | | Mention the hour at which Storms, including Thunder and Lightning, began and ended. | | Days of Month. | | | | | | | | |
| inches. | | inches. | | inches. | | inches. | | inches. | | inches. | | inches. | | inches. | | inches. | | inches. | | inches. | | inches. | | inches. | | inches. | | inches. | | inches. | | inches. | | inches. | | | | | | | | |
| 1 | 24.586 | 24.439 | 60.8 | 56.0 | 63.4 | 56.6 | 57.4 | 53.6 | 0.18 | SW | 2.5 | SW | 1.5 | 2 | 24.586 | 24.439 | 60.8 | 56.0 | 63.4 | 56.6 | 57.4 | 53.6 | 0.18 | SW | 2.5 | SW | 1.5 | 2 | 24.586 | 24.439 | 60.8 | 56.0 | 63.4 | 56.6 | 57.4 | 53.6 | 0.18 | SW | 2.5 | SW | 1.5 | 2 |
| 2 | 24.586 | 24.439 | 60.8 | 56.0 | 63.4 | 56.6 | 57.4 | 53.6 | 0.18 | SW | 2.5 | SW | 1.5 | 2 | 24.586 | 24.439 | 60.8 | 56.0 | 63.4 | 56.6 | 57.4 | 53.6 | 0.18 | SW | 2.5 | SW | 1.5 | 2 | 24.586 | 24.439 | 60.8 | 56.0 | 63.4 | 56.6 | 57.4 | 53.6 | 0.18 | SW | 2.5 | SW | 1.5 | 2 |
| 3 | 24.586 | 24.439 | 60.8 | 56.0 | 63.4 | 56.6 | 57.4 | 53.6 | 0.18 | SW | 2.5 | SW | 1.5 | 2 | 24.586 | 24.439 | 60.8 | 56.0 | 63.4 | 56.6 | 57.4 | 53.6 | 0.18 | SW | 2.5 | SW | 1.5 | 2 | 24.586 | 24.439 | 60.8 | 56.0 | 63.4 | 56.6 | 57.4 | 53.6 | 0.18 | SW | 2.5 | SW | 1.5 | 2 |
| 4 | 24.586 | 24.439 | 60.8 | 56.0 | 63.4 | 56.6 | 57.4 | 53.6 | 0.18 | SW | 2.5 | SW | 1.5 | 2 | 24.586 | 24.439 | 60.8 | 56.0 | 63.4 | 56.6 | 57.4 | 53.6 | 0.18 | SW | 2.5 | SW | 1.5 | 2 | 24.586 | 24.439 | 60.8 | 56.0 | 63.4 | 56.6 | 57.4 | 53.6 | 0.18 | SW | 2.5 | SW | 1.5 | 2 |
| 5 | 24.586 | 24.439 | 60.8 | 56.0 | 63.4 | 56.6 | 57.4 | 53.6 | 0.18 | SW | 2.5 | SW | 1.5 | 2 | 24.586 | 24.439 | 60.8 | 56.0 | 63.4 | 56.6 | 57.4 | 53.6 | 0.18 | SW | 2.5 | SW | 1.5 | 2 | 24.586 | 24.439 | 60.8 | 56.0 | 63.4 | 56.6 | 57.4 | 53.6 | 0.18 | SW | 2.5 | SW | 1.5 | 2 |
| 6 | 24.586 | 24.439 | 60.8 | 56.0 | 63.4 | 56.6 | 57.4 | 53.6 | 0.18 | SW | 2.5 | SW | 1.5 | 2 | 24.586 | 24.439 | 60.8 | 56.0 | 63.4 | 56.6 | 57.4 | 53.6 | 0.18 | SW | 2.5 | SW | 1.5 | 2 | 24.586 | 24.439 | 60.8 | 56.0 | 63.4 | 56.6 | 57.4 | 53.6 | 0.18 | SW | 2.5 | SW | 1.5 | 2 |
| 7 | 24.586 | 24.439 | 60.8 | 56.0 | 63.4 | 56.6 | 57.4 | 53.6 | 0.18 | SW | 2.5 | SW | 1.5 | 2 | 24.586 | 24.439 | 60.8 | 56.0 | 63.4 | 56.6 | 57.4 | 53.6 | 0.18 | SW | 2.5 | SW | 1.5 | 2 | 24.586 | 24.439 | 60.8 | 56.0 | 63.4 | 56.6 | 57.4 | 53.6 | 0.18 | SW | 2.5 | SW | 1.5 | 2 |
| 8 | 24.586 | 24.439 | 60.8 | 56.0 | 63.4 | 56.6 | 57.4 | 53.6 | 0.18 | SW | 2.5 | SW | 1.5 | 2 | 24.586 | 24.439 | 60.8 | 56.0 | 63.4 | 56.6 | 57.4 | 53.6 | 0.18 | SW | 2.5 | SW | 1.5 | 2 | 24.586 | 24.439 | 60.8 | 56.0 | 63.4 | 56.6 | 57.4 | 53.6 | 0.18 | SW | 2.5 | SW | 1.5 | 2 |
| 9 | 24.586 | 24.439 | 60.8 | 56.0 | 63.4 | 56.6 | 57.4 | 53.6 | 0.18 | SW | 2.5 | SW | 1.5 | 2 | 24.586 | 24.439 | 60.8 | 56.0 | 63.4 | 56.6 | 57.4 | 53.6 | 0.18 | SW | 2.5 | SW | 1.5 | 2 | 24.586 | 24.439 | 60.8 | 56.0 | 63.4 | 56.6 | 57.4 | 53.6 | 0.18 | SW | 2.5 | SW | 1.5 | |

| | |
|------------------------------------------------------------------------------------------------------------|---------------|
| BAROMETER, "corrected Mean" at 9 A.M., minus the Correction $\frac{+}{-}$ = | <u>29.943</u> |
| for Temp. (Col. 2), = | |
| "Corrected Mean" of Barometer at 9 P.M., minus the Correction $\frac{+}{-}$ = | <u>29.952</u> |
| for Temp. (Col. 4), = | |
| Mean at Station, corrected, and at 32°,..... | <u>29.872</u> |
| Correction for height, feet above Mean Sea-level,..... | <u>75</u> |
| Mean, reduced to 32°, and Sea-level,..... | <u>29.947</u> |
| Highest Reading, corrected for Index error, ^{at 9 p.m.} on the 28 th,..... | <u>30.439</u> |
| Lowest Do. Do., ^{at 9 p.m.} on the 6 th,..... | <u>29.234</u> |
| Difference, or Monthly Range, | <u>1.205</u> |

| | | |
|-----------------------------------------------------------------------------------------------------------------------------|---|-------------|
| S.-R. THERMOMETER, (in shade, etc.), Highest in Month, (corrected for Index Errors), on the <u>14</u> th..... | = | <u>76.8</u> |
| Lowest in Month, corrected for Index errors, on the <u>9</u> th, | = | <u>42.1</u> |
| Difference, or Monthly Range, | = | <u>34.7</u> |
| "Corrected Mean " of all the Highest, (Col. 5), | = | <u>62.7</u> |
| "Corrected Mean " of all the Lowest, (Col. 6),..... | = | <u>51.8</u> |
| Difference, or Mean Daily Range, | = | <u>10.9</u> |
| ** Calculated Mean Temperature of Month, | = | <u>57.2</u> |
| S.-R. THERMOMETER, Black Bulb in Sun, Highest, (corrected for Index Errors), on the th, | | |
| "Corrected Mean, " (Col. 7), of Black Bulb, Max. in Sun, | = | |
| Lowest at Night, Black Bulb (corrected for Index errors), on the th, | = | |
| "Corrected Mean, " (Col. 8), of Black Bulb, Min. on grass, | = | |
| Difference of above means or range ("exposed"), | = | |

| | | |
|--------------------------------------------------------------------------------------------------|---|-------|
| HYGROMETER, Mean (corrected) A.M. and P.M. Reading of Dry Bulb , (Cols. 9 and 11), | = | 56° 4 |
| Mean (corrected) A.M. and P.M. Reading of Wet Bulb , (Cols. 10 and 12), | = | 53° 8 |
| ‡‡ Computed Temperature of Dew-Point , | = | 51° 2 |
| ‡‡ Do. Elastic Force of Vapour , | = | 0.380 |
| ‡‡ Do. Weight of Vapour in a Cubic Foot of Air , | = | |
| ‡‡ Relative Humidity (Saturation = 100), | = | 84 |
| RAIN fell on / Days; Amount in Inches, | = | 4.49 |

| WIND. | | SUMMARY. | | | | | | | | | |
|------------|---|----------|----|----|---|----|---|----|-------------------|-------------|---------------------------------|
| Direction. | N | NE | E | SE | S | SW | W | NW | Calm or Variable. | Mean Force. | Mean Velocity in miles per day. |
| A.M. | 4 | 4 | 10 | 2 | - | 2 | 5 | 2 | 2 | 1.42 | |
| P.M. | 4 | - | 10 | 1 | - | 1 | 7 | 2 | 6 | 1.19 | |
| Mean. | 4 | 2 | 10 | 2 | 0 | 1 | 6 | 2 | 4 | 1.30 | |

Observations made and
Return verified by

(Signed) Jas. Boland & Geo. Redpath

The Hours of Observation are of Greenwich Time.

[illegible]

| | | |
|---------------------------------------------------------------------------------------------------|---|------------|
| BAROMETER, "corrected Mean" at 9 A.M., minus the Correction $\frac{1}{4}$ | = | 30.012 |
| for Temp. (Col. 2), = | | |
| "Corrected Mean" of Barometer at 9 P.M., minus the Correction $\frac{1}{4}$ | = | 29.993 |
| for Temp. (Col. 4), = | | |
| Mean at Station, corrected, and at 32°, | = | 29.926 |
| Correction for height, feet above Mean Sea-level, | = | 76 |
| Mean, reduced to 32°, and Sea-level, | = | 30.002 |
| Highest Reading, corrected for Index error, on the 13 th , | = | 30.496 494 |
| Lowest Do. Do., at 7 a.m. on the 27 th , | = | 29.173 215 |
| Difference, or Monthly Range, | = | 1.323 281 |

| | | |
|-------------------------------------------------------------------------------------------------------------------------------|---|-------------------------|
| S.-R. THERMOMETER, (in shade, etc.), Highest in Month, (corrected for Index Errors), on the <u>14</u> th, | = | <u>69⁰.8</u> |
| Lowest in Month, corrected for Index errors, on the <u>3rd</u> , | = | <u>40.1</u> |
| Difference, or Monthly Range, | = | <u>29.7</u> |
| "Corrected Mean " of all the Highest, (Col. 5), | = | <u>62.9</u> |
| "Corrected Mean " of all the Lowest, (Col. 6), | = | <u>49.1</u> |
| Difference, or Mean Daily Range, | = | <u>13.8</u> |
| ** Calculated Mean Temperature of Month, | = | <u>56.0</u> |
| <hr/> | | |
| S.-R. THERMOMETER, Black Bulb in Sun, Highest, (corrected for Index Errors), on the ..... | = | ..... |
| "Corrected Mean, " (Col. 7), of Black Bulb, Max. in Sun, ..... | = | ..... |
| Lowest at Night, Black Bulb (corrected for Index errors), on the ..... | = | ..... |
| "Corrected Mean, " (Col. 8), of Black Bulb, Min. on grass, ..... | = | ..... |
| Difference of above means or range ("exposed"), ..... | = | ..... |

| | | |
|--------------------------------------------------------------------------------------------------------|---|-------|
| HYGROMETER, Mean (corrected) A.M. and P.M. Reading of Dry Bulb , (Cols. 9 and 11), | = | 55° 0 |
| Mean (corrected) A.M. and P.M. Reading of Wet Bulb , (Cols. 10 and 12), | = | 52° 1 |
| †† Computed Temperature of Dew-Point , | = | 49° 3 |
| †† Do. Elastic Force of Vapour , | = | 0.352 |
| †† Do. Weight of Vapour in a Cubic Foot of Air , | = | 82 |
| †† Relative Humidity (Saturation = 100), | = | |
| RAIN fell on <u>14</u> Days; Amount in Inches, | = | 1.40 |

| WIND. | | SUMMARY. | | | | | | | | | |
|------------|---|----------|---|----|---|----|----|----|-------------------|-------------|---------------------------------|
| Direction. | N | NE | E | SE | S | SW | W | NW | Calm or Variable. | Mean Force. | Mean Velocity in miles per day. |
| A.M. | 2 | - | 4 | - | 1 | 1 | 19 | 3 | - | 153 | |
| P.M. | - | - | 1 | - | - | 3 | 19 | - | 7 | 130 | |
| Mean. | 1 | 0 | 2 | 0 | 1 | 2 | 19 | 2 | 3 | 142 | |

Observations made and
Return verified by

(Signed) James Boland & Geo. Redpath

SCOTTISH METEOROLOGICAL SOCIETY.

Observations taken at Leith, County of Edinburgh, in Lat. 55° 54' N, Long. 3° 10' W, Distance from Sea half miles.
 Height of Cistern of the Barometer above Mean Sea-Level 76 feet, above Ground 3 feet. During the MONTH of October 1900.
 The Hours of Observation are of Greenwich Time.

| ELECTRICITY. | Days of Month. | BAROMETER. | | | | SELF-REGISTERING THERMOMETERS. | | | | HYGROMETER. | | | | Rain. | WIND. | | | | CLOUDS. | | | | THERMOMETERS under Ground. | | | SEA. | OZONE. | GENERAL REMARKS. | Days of Month. | | |
|--------------|----------------------------------------------|------------|-----------------------|------------|-----------------------|------------------------------------------|-------|----------------------|-------|-------------|-----------|-----------|-----------|-------|--------------------------------|----------------------------------------------------------------------------------------------------|------------|--------|------------|--------|-------------------------------|-----------------------------|-------------------------------|-----------------------------|-----|------|--------|------------------|----------------|-----|-----|
| | | 9 h. A.M. | | 9 h. P.M. | | Protected in Shade, 4 feet above Ground. | | Exposed Black Bulbs. | | 9 h. A.M. | | 9 h. P.M. | | | 9 h. A.M. | | 9 h. P.M. | | 9 A.M. | | 9 P.M. | | 9 h. A.M. | | | | | | | | |
| | | Barometer. | Attached Thermometer. | Barometer. | Attached Thermometer. | Max. | Min. | Max. | Min. | Dry bulb. | Wet bulb. | Dry bulb. | Wet bulb. | | No. of hours in which it fell. | Amount in inches. | Direction. | Force. | Direction. | Force. | Velocity (0-9) and Direction. | Amount (0-10), and Species. | Velocity (0-9) and Direction. | Amount (0-10), and Species. | No. | | | | | No. | No. |
| | | * No. | No. | No. | No. | No. | No. | No. | No. | No. | No. | No. | No. | | No. | No. | No. | No. | No. | No. | No. | No. | No. | No. | No. | | | | | No. | No. |
| | | inches. | | inches. | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | 1 | 29.635 | 29.673 | 55.9 | 46.5 | 52.5 | 48.0 | 46.7 | 45.0 | 0.11 | W | 2.0 | W | 1.5 | 2W: 46W. S.W. 38.1 | Sho. till 5.30 am, and after 3.30 pm. | | | | | | | | | | | 1 | | | | |
| | 2 | 29.656 | 29.580 | 57.9 | 44.1 | 52.0 | 47.9 | 48.3 | 47.0 | 1.5 | SW | 1.4 | W | 1.0 | 1SW: 36W. S.W. 10.9 | Changeable; fine, sunny at times till noon; sho. aft. 2.30 pm, and dist. T. with h. v. at 3.30 pm. | | | | | | | | | | | 2 | | | | |
| | 3 | 29.806 | 29.985 | 56.3 | 40.4 | 46.6 | 43.1 | 42.3 | 40.9 | 0.2 | W | 1.5 | W | 1.5 | 0 0 0 0 | Fine; mostly sunny; sho. bet 3.40 am. - S.W. ha. at 8 pm. | | | | | | | | | | | 3 | | | | |
| | 4 | 29.784 | 29.271 | 53.5 | 36.3 | 45.5 | 41.9 | 53.5 | 50.3 | 0.7 | E | 3.0 | W | 1.2 | 1W: 10.8 | Overcast; clear. v. bet 0.30 pm. and 5 pm. | | | | | | | | | | | | 4 | | | |
| | 5 | 29.425 | 29.486 | 55.8 | 46.1 | 50.7 | 47.0 | 46.6 | 43.9 | 1.7 | W | 2.0 | W | 2.0 | 2SW: 16W. 2W: 15C. | Frequent brisk sho. early morning; day fine, sunny at times; sho. aft. 6.40 pm. | | | | | | | | | | | | 5 | | | |
| | 6 | 29.635 | 29.701 | 52.7 | 44.3 | 50.0 | 45.5 | 45.6 | 44.8 | 3.6 | SW | 1.5 | W | 1.5 | 1W: 10.8 | Cloudy; v. chiefly after 2.30 pm. - Dist. W. ha. at 9.30 pm. | | | | | | | | | | | | 6 | | | |
| | 7 | 29.834 | 29.913 | 64.7 | 43.1 | 47.6 | 47.2 | 59.5 | 55.0 | 1.5 | SE | 0.5 | W | 2.5 | 2SW: 10.8 | Changeable; showery; sunny inters.; equally at times after 10 am. | | | | | | | | | | | | 7 | | | |
| | 8 | 29.896 | 29.991 | * 61.2 | 54.6 | 61.2 | 57.5 | 54.6 | 53.7 | 2.6 | W | 2.0 | W | 1.5 | 2W: 10.8 | Cloudy; sho. after 7.40 am, and nearly cont. v. after 9.15 am. | | | | | | | | | | | | 8 | | | |
| | 9 | 30.036 | 29.995 | * 54.6 | 49.0 | 50.9 | 47.7 | 49.3 | 47.9 | 4.3 | W | 1.5 | W | 0.25 | SW: 10.8 | Overcast; cont. v. between 6.40 am and 3.30 pm. | | | | | | | | | | | | 9 | | | |
| | 10 | 30.058 | 30.127 | 50.3 | 45.6 | 47.5 | 46.8 | 45.6 | 43.9 | 3.4 | E | 1.4 | W | 1.5 | 2E: 8.6 | W. v. at times bet 3.30 and 5.30 am, and pass sho. about 3.30 pm. | | | | | | | | | | | | 10 | | | |
| | 11 | 29.968 | 29.872 | 53.7 | 44.9 | 49.6 | 46.4 | 50.3 | 46.9 | 0.0 | W | 2.4 | W | 2.4 | 2W: 8.6 | Cloudy, with short sunny inters.; pass sho. at 3.30 pm. | | | | | | | | | | | | 11 | | | |
| | 12 | 29.909 | 29.725 | 52.0 | 43.2 | 48.7 | 43.5 | 47.6 | 46.8 | 0.6 | W | 2.0 | W | 1.0 | 1W: 8.6 | Fine at times; frequent li. sho.; much cloud. - So. ha. at 8.30 am. | | | | | | | | | | | | 12 | | | |
| | 13 | 29.380 | 29.376 | 51.3 | 38.7 | 47.0 | 45.8 | 38.7 | 36.9 | 3.3 | W | 2.0 | W | 2.5 | 2W: 10.8 | Frequent v. sho. with li. at 11.40 am; sunny inters.; squally. | | | | | | | | | | | | 13 | | | |
| | 14 | 29.547 | 29.562 | 46.7 | 37.4 | 39.6 | 36.8 | 38.7 | 36.0 | 0.0 | W | 2.0 | W | 2.0 | 0 0 0 0 | Fine, sunny. | | | | | | | | | | | | 14 | | | |
| | 15 | 29.668 | 29.812 | 51.7 | 38.1 | 46.6 | 41.9 | 41.0 | 38.9 | 0.0 | W | 2.0 | W | 0.25 | 2W: 10.8 | Fine; mostly sunny. | | | | | | | | | | | | | 15 | | |
| | 16 | 29.865 | 29.797 | 50.4 | 33.0 | 35.8 | 34.9 | 43.7 | 42.9 | 0.2 | W | 0.0 | W | 0.25 | SW: 10.8 | Morning thick h. fr.; day fine, sunny; dist. li. to mod. v. aft. 7.45 pm. | | | | | | | | | | | | | 16 | | |
| | 17 | 29.644 | 29.698 | 49.6 | 43.0 | 46.7 | 46.1 | 49.6 | 47.9 | 0.4 | SE | 1.0 | W | 1.4 | SW: 10.8 | Overcast; cont. v. till noon. | | | | | | | | | | | | | 17 | | |
| | 18 | 29.936 | 30.161 | 52.3 | 47.4 | 49.5 | 46.8 | 49.5 | 48.8 | 0.5 | W | 1.0 | W | 0.25 | 2W: 10.8 | Cloudy; li. to mod. sho. after 4.30 pm; hazy. | | | | | | | | | | | | | 18 | | |
| | 19 | 30.253 | 30.269 | 54.7 | 46.2 | 49.2 | 47.0 | 46.6 | 45.2 | 0.2 | W | 1.0 | W | 0.0 | 1E: 8.6 | Fine; mostly sunny till noon, then cloudy. | | | | | | | | | | | | | 19 | | |
| | 20 | 30.272 | 30.306 | 48.2 | 44.4 | 46.0 | 44.1 | 44.6 | 41.1 | 0.2 | W | 1.0 | W | 0.0 | 1W: 10.8 | Moderately fine; a few light sho. | | | | | | | | | | | | | 20 | | |
| | 21 | 30.430 | 30.557 | 48.5 | 40.1 | 44.6 | 41.1 | 44.4 | 38.9 | 0.0 | W | 1.4 | W | 1.0 | 1W: 10.8 | Fine; very clear; evening hazy. | | | | | | | | | | | | | 21 | | |
| | 22 | 30.502 | 30.373 | 53.7 | 40.6 | 46.6 | 43.8 | 52.6 | 50.7 | 0.0 | W | 2.0 | W | 2.0 | 2W: 10.8 | Fine; mostly sunny till 3 pm. - So. ha. at 10.45 am. | | | | | | | | | | | | | 22 | | |
| | 23 | 30.279 | 30.246 | 56.7 | 51.6 | 54.5 | 53.2 | 54.5 | 52.9 | 1.1 | W | 2.0 | W | 2.0 | 2W: 10.8 | Overcast; li. to mod. v. between 6.30 and 11.45 am. | | | | | | | | | | | | | 23 | | |
| | 24 | 30.108 | 29.949 | 58.6 | 50.7 | 55.9 | 54.1 | 50.7 | 47.3 | 0.0 | W | 2.4 | W | 1.5 | 2W: 10.8 | Mostly cloudy; a few very cli. sho. | | | | | | | | | | | | | 24 | | |
| | 25 | 29.535 | 29.354 | * 50.7 | 40.6 | 48.5 | 45.0 | 40.6 | 38.9 | 0.5 | W | 2.0 | W | 2.0 | 1W: 10.8 | Cloudy, with sunny inters. at alt. noon; brisk sho. aft. 3.30 pm; cloudless | | | | | | | | | | | | | 25 | | |
| | 26 | 29.190 | 29.197 | 42.7 | 37.4 | 38.8 | 38.1 | 42.7 | 39.9 | 4.5 | W | 2.0 | W | 2.0 | 2W: 10.8 | Overcast; v. till noon, and after 5.30 pm; fair at 9 pm. | | | | | | | | | | | | | 26 | | |
| | 27 | 29.351 | 29.538 | 49.2 | 40.8 | 46.7 | 43.1 | 40.8 | 38.1 | 0.0 | W | 2.4 | W | 1.5 | 2W: 10.8 | Fine; mostly sunny. | | | | | | | | | | | | | 27 | | |
| | 28 | 29.590 | 29.451 | 47.7 | 38.4 | 41.6 | 38.7 | 43.6 | 40.9 | 0.0 | W | 2.0 | W | 1.5 | 2W: 10.8 | Fine, sunny. | | | | | | | | | | | | | 28 | | |
| | 29 | 29.396 | 29.514 | 48.8 | 39.1 | 42.7 | 40.3 | 47.5 | 45.0 | 0.0 | W | 2.0 | W | 2.0 | 2W: 10.8 | Fine; mostly cloudy. | | | | | | | | | | | | | 29 | | |
| | 30 | 29.720 | 29.898 | 50.2 | 39.7 | 43.8 | 41.9 | 39.7 | 38.9 | 0.0 | W | 1.5 | W | 0.0 | 0 0 0 0 | Fine, sunny; hazy. | | | | | | | | | | | | | 30 | | |
| | 31 | 29.558 | 29.744 | 51.8 | 38.8 | 45.0 | 44.7 | 50.8 | 49.9 | 3.2 | E | 1.0 | E | 0.5 | SW: 10.8 | Overcast; nearly cont. v. between 5 and 11.45 am, and sho. at 11 pm. | | | | | | | | | | | | | 31 | | |
| | Sums. | 175.4 | 168.4 | 163.2 | 132.4 | 147.3 | 139.1 | 144.7 | 138.5 | 4.4 | | | | | | | | | | | | | | | | | | | | | |
| | Means. | 25 | 25 | 25 | 25 | 25 | 25 | 25 | 25 | 25 | 25 | 25 | 25 | 25 | 25 | 25 | 25 | 25 | 25 | 25 | 25 | 25 | 25 | 25 | 25 | 25 | 25 | 25 | 25 | 25 | |
| | + Total Corrections for Instrumental Errors. | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | + Corrections for Diurnal Range. | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | "Corrected Means." | 29.812 | 29.810 | 52.7 | 42.7 | 47.5 | 44.7 | 46.7 | 44.7 | 4.4 | | | | | | | | | | | | | | | | | | | | | |
| | No. of Column. | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 | 25 | 26 | 27 | 28 | 29 | 30 |

BAROMETER, "corrected Mean" at 9 A.M., minus the Correction for Temp. (Col. 2), = 29.812
 "Corrected Mean" of Barometer at 9 P.M., minus the Correction for Temp. (Col. 4), = 29.810
 Mean at Station, corrected, and at 32°, = 29.735
 Correction for height, feet above Mean Sea-level, = 76
 Mean, reduced to 32°, and Sea-level, = 29.811
 Highest Reading, corrected for Index error, on the 21st, = 30.565.55
 Lowest Do. Do. at 7 pm on the 26th, = 29.187.19
 Difference, or Monthly Range, = 1.378.57

S.-R. THERMOMETER, (in shade, etc.), Highest in Month, (corrected for Index Errors), on the 7th, = 64.7
 Lowest in Month, corrected for Index errors, on the 16th, = 33.0
 Difference, or Monthly Range, = 31.7
 "Corrected Mean" of all the Highest, (Col. 5), = 52.7
 "Corrected Mean" of all the Lowest, (Col. 6), = 42.7
 Difference, or Mean Daily Range, = 10.0
 ** Calculated Mean Temperature of Month, = 47.7
 S.-R. THERMOMETER, Black Bulb in Sun, Highest, (corrected for Index Errors), on the 7th, = 64.7
 "Corrected Mean," (Col. 7), of Black Bulb, Max. in Sun, = 64.7
 Lowest at Night, Black Bulb (corrected for Index errors), on the 16th, = 33.0
 "Corrected Mean," (Col. 8), of Black Bulb, Min. on grass, = 33.0
 Difference of above means or range ("exposed"), = 31.7

HYGROMETER, Mean (corrected) A.M. and P.M. Reading of Dry Bulb, (Cols. 9 and 11), = 47.0
 Mean (corrected) A.M. and P.M. Reading of Wet Bulb, (Cols. 10 and 12), = 44.8
 Computed Temperature of Dew-Point, = 42.3
 Do. Elastic Force of Vapour, = 0.270
 Do. Weight of Vapour in a Cubic Foot of Air, = 8.4
 Relative Humidity (Saturation = 100), = 84
 RAIN fell on 21 Days; Amount in Inches, = 4.43

| WIND. | | SUMMARY. | | | | | | | | | |
|------------|--|----------|----|---|----|---|----|----|----|-------------------|-------------|
| Direction. | | N | NE | E | SE | S | SW | W | NW | Calm or Variable. | Mean Force. |
| A.M. | | 3 | - | 3 | 2 | 1 | 2 | 18 | 1 | 1 | 1.65 |
| P.M. | | 2 | - | 1 | 1 | - | - | 22 | 3 | 2 | 1.35 |
| Mean. | | 2 | 0 | 2 | 2 | 1 | 1 | 20 | 2 | 1 | 1.50 |

* Each instrument tested at the Office in Edinburgh bears the stamp "S.M.S.," and a number to be entered in the Heading or the Number and Initials of the Maker may be here given.
 † Embracing corrections for both capillary and Index Errors.
 ‡ The Diurnal Range for Scotland is as yet unknown.
 § These "Hygrometric Deductions" are calculated from Glaisher's Hygrometric Tables, Second Edition only.
 || While the Diurnal Range is unknown, the Arithmetical Mean of Cols. 5 and 6 will be entered as the "Calculated Mean Temperature."
 ** Any observations not taken under the Conditions specified in the Directions on the other side, or noted at the Top of each column, must be marked as such by the observer, in each Schedule. See over.

Observations made and Return verified by _____

(Signed) Jas. Pollock & Geo. Redpath.

INSTRUCTIONS

FOR TAKING METEOROLOGICAL

OBSERVATIONS,

WITH REMARKS ON THE USE OF INSTRUMENTS.

ONE of the chief objects of the SCOTTISH METEOROLOGICAL SOCIETY proposed to itself when the Society was established in 1855, was to secure uniformity in the system of observation pursued at all its Stations. Uniformity in the observations is absolutely necessary to justify the publication of Monthly Results from different observations, it being found that differences between the returns from two Stations, so very considerable as to render them quite incomparable, may arise from dissimilarity in the position of the instruments, different hours of observation, or even from the use of differently constructed instruments. It is therefore, of the utmost importance that those who kindly furnish Reports to the Society will, by a scrupulous attention to the following Directions, secure for their Monthly Returns an accuracy and value commensurate with the labour and pains involved in making them; and, for the Tables published by the Society, an entire correspondence among the several Returns, without which the Society's Reports must inevitably fall in achieving one of the main objects of Meteorological Observation.

The Council recommend that Observations be made precisely at 9 A.M. and 9 P.M. (Greenwich or Railway Time only), as specified in the following remarks, or at the top of the column of the Schedule. It is hoped that the utmost punctuality in the time of reading the instruments will be observed. Observers, in some few cases, may find this impossible; in such instances, they are specially requested to mark opposite every reading the time at which it was taken, if not at 9 A.M. or 9 P.M. Weather-Glasses and Aneroids, though well suited to indicate roughly variations of atmospheric pressure, are not fitted for scientific purposes. No Barometer should be used for Meteorological Observation that is not supplied with some means of adjustment or compensation which will secure that the height of the mercury in the tube is accurately measured from the fluctuating surface of the mercury in the cistern.

The Barometer in which the error arising from the fluctuating surface of the mercury in the cistern is entirely got rid of is FORTIN'S Barometer, the arrangement consisting in applying pressure by means of a screw to the bottom of the cistern, which is made of flexible leather, thus raising or depressing the surface till it just meets the ivory point which forms the zero point of the fixed scale.

The Barometer originally constructed by Mr. Adie of London, and usually called the Board of Trade Barometer, has the great convenience of requiring no adjustment of the cistern. Its scale-inches are not true inches, but so much shorter as to compensate the error that would otherwise arise from the fluctuations of the surface of mercury in the cistern. This is an excellent Barometer for ordinary Observers, inasmuch as it entirely eliminates the error of observation likely to arise in not a few cases in setting the instrument to the zero point of the fixed scale when the light is not good. To show the accuracy with which these Barometers are made, it may be stated, that one was compared, during a whole year, with the Society's Standard Barometer, particular care being given to make the comparison when atmospheric pressure was rising or falling very rapidly, with the result that none of the readings differed from those of the Standard more than 0.003 inch.

A modification of Fortin's Barometer is used at a number of the Society's Stations, by which the coincidence of the zero point with the surface of the mercury is indicated by a little ivory float, whose stem passes freely through the lid and case of the cistern. When the index-line on this little piston-rod is brought, by the adjusting screw, to form one straight line with those on its ivory frame, the scale is graduated. In taking an observation, this preliminary setting must be made with scrupulous accuracy; as a slight error here will vitiate the readings from the vernier.

It is absolutely necessary that the Barometer which is to be used shall have been compared with a Standard Barometer. The Barometer should be suspended in as good a light as can be secured, and to facilitate the reading a piece of white paper may be put behind the tube. It must be hung truly perpendicular, and exposed to neither the sun's direct rays nor the heat of a fire, and must not be hung against a wall heated by a fire. The object being to secure that the whole instrument, including the brass fittings, the contained mercury, and the attached Thermometer, shall be, when read, at one uniform temperature, it is evident that the best position is that which is least liable to sudden changes of temperature.

In taking an Observation, the Attached Thermometer is first noted: the tube must then be gently tapped, and the cistern-adjustment carefully made. The eye, by raising and lowering it, must be brought into the plane of the back and front of the index—usually the lower edge of the vernier, which must be carefully adjusted so as to form exactly a tangent to the convex surface of the mercury in the tube. Observations must be taken quickly, so as to prevent heat from the observer's hands and person from affecting the mercury. The use of a lens will facilitate an accurate adjustment and reading of the Barometer. A mistake not unfrequently made by those beginning to observe, consisting in setting the edge of the vernier to the level of the clear surface of the mercury which is in direct contact with the glass tube, must be carefully avoided.

The errors most frequently made in reading the Barometer are errors of 1.000 inch, 0.050 inch, and 0.050 inch; that is to say, instead of 29.365 inches, either of the following is sometimes set down—viz. as 30.365 inches, 29.365 inches, or 29.815 inches. Experience having shown that even the very best Observers make these mistakes, particular attention is directed to the matter. When a Barometer having adjustable surfaces has to be removed from its fastenings the ivory peg must first be screwed so as to form a tight plug to the cistern, thus preventing the escape of the mercury. Then screw up the mercury not quite to the top of the tube, but to within a quarter of an inch of it, and take down the instrument; it should then be carried with the cistern uppermost. Before suspending the Barometer for use, it must be ascertained whether the space above the mercury in the tube is a complete vacuum; this is the case if, on inclining the instrument, a sharp tap is produced when the mercury strikes the top of the tube. If a dull tap is heard, there is air in the tube, which must be got rid of.

As Barometers are liable to be deranged by the introduction of air into their tubes, on removal from place to place, or in being roughly handled, it may be useful to Observers to know how the air may be expelled. First close up the cistern by screwing the ivory peg tight, so as to prevent the escape of mercury; then screw up the mercury to about half an inch from the top of the tube; and having slowly inverted the instrument, place the top of it on a yielding substance, such as the book, and gently tap on the cistern with the palm of the hand, so as to induce the air to ascend through the column to the cistern, whence it may escape. Since there is the weight of two atmospheres—the pressure of the mercury in the Barometer, and the air outside—pressing on any air that may be inside the tube, it is usually a tedious operation to get it wholly expelled. After repeated trials, however, it is generally accomplished; and the clear metallic sound of the mercury, when gently struck against the top of the glass tube, will show when the whole of the air has been expelled. On hanging up the Barometer, care must be taken to screw down the mercury in the tube before unscrewing the float of the cistern, for, if this is not attended to, the mercury will flow out, and the instrument be seriously damaged.

The Council of the Society recommend that the Self-Registering Thermometers, and the Dry and Wet Bulb Hygrometers, be kept in Stevenson's Ivory-boarded Box for Protection. Thermometers painted white inside and outside, and Thermometers served to four stout posts, also painted white, firmly fixed in the ground. The posts must be of the length that will immerse the Thermometers at the same height of four feet above the ground, the Maximum Thermometer and of the Dry and Wet Bulb Thermometers, will be exactly at the same height of four feet above the ground, the Maximum Thermometer being hung immediately above the Minimum Thermometer. The thermometer box is to be placed over a plot of grass, and in a free open space to which the sun's rays have free access during as much of the day as surrounding conditions enable the Observer to secure. The Thermometers are suspended on cross-laths in the centre of the box, and free the door, which should open to the north.

The Council regard the question of UNIFORMITY OF HEIGHT ABOVE GROUND, AND METHOD IN PROTECTING THE THERMOMETERS, as vital in every system of Meteorological Observation, since without it, if Observations made at different Stations are incomparable, thus rendering it impossible to compare the climates of places with each other as regards their most important features. Professor Phillips, and Negretti and Zambra's Maximum Thermometers, are recommended. It is recommended that these self-registering thermometers, and Negretti and Zambra's Maximum Thermometer, be graduated on the glass stem. The Minimum Thermometer is liable to two demerits—viz., the column of spirit breaking, and part of the spirit distilling by high temperature and lodging at the top of the tube. This demerit is of occasional occurrence with protected Thermometers, but of frequent occurrence with exposed Thermometers. Hence a systematic examination of Minimum Thermometers ought to be a regular part of the work carried on by each Observer.

Fortunately, Spirit Thermometers may be easily set right by any one, when the column of spirit changes to separate. Let the thermometer be taken in the hand by the end farthest from the bulb, raised above the head, and then forcibly swung down towards the feet; the object being, on the principle of centrifugal force, to send down the detached portion of spirit till it unites with the column. A few throws, or swinging strokes, will generally be sufficient for the purpose; after which the thermometer should be placed in a slanting position, to allow the rest of the spirit still adhering to the sides of the tube to drain down to the column. But another method must be adopted, if the portion of spirit in the top of the tube be small. Heat should be applied slowly and cautiously to the top and of the tube where the detached portion of spirit is, which, being turned into vapour by the heat, will condense on the surface of the unbroken column of spirit. Care must be taken that the heat is not applied too quickly; for, if this be done, the tube will break and the instrument be destroyed. The best way to apply the requisite amount of heat is by bringing the end of the tube slowly down towards a minute flame from a gas-burner; or, if gas be not at hand, a piece of heated metal will serve instead.

The bulbs of the Thermometers for registering the greatest heat from the sun's rays, and the least from radiation during night, have a black coating, which may easily be made, or mended, by the application of a mixture of lampblack and primer's ink. They are placed in shallow blackened boxes, whose sides protect the bulbs from the wind. The Maximum should be freely exposed to the sun, and the Minimum should rest on wooden supports a few inches from the surface of the grass, in an open situation. Snow must not be allowed to cover either of these Thermometers. Nor must it be allowed to fall on the Minimum Thermometer by distillation. Black-bulbs enclosed in 'glass jackets' may also be used, being indeed preferable to the above. It must, however, be added, that the whole subject of the recently advanced state to warrant the exclusive recommendation of any one of these methods.

The Hygrometer in use at the Society's Stations consists of two Thermometers usually, but not necessarily, mounted on a single frame. As apparently slight deviations from the Hygrometrical Observations, Observers are specially requested to attend to the following conditions:—The bulbs must hang down by at least an inch free from the scales and frame to which they are attached; the frame must be such as will bring the tubes forward by an inch from any board on which it may be suspended; the water-cup must be covered, and altogether placed to the side, and a little below the level of the wet bulb, but in no case under the bulb; the muslin must be of medium fineness, and fastened at the neck of the bulb by the cotton, which also supplies it with water. It must be sent to by the Observer that the muslin is always clean and moist, and the water pure. In frosty weather, observation is a matter of much difficulty, and must be made with great care. The bulb must be moistened by immersion from 15 to 30 minutes before the hour of observation. From the film of ice thus formed, evaporation will proceed as from the moist cloth in ordinary circumstances.

In reading from the Thermometer great care must be taken to bring the eye exactly opposite the tip of the index or column of mercury. The reading ought to be taken to tenths of a degree, and noted in decimals. Thus the Thermometer will be read—39.9, 40.0, or 40.1; or again, 40.3, 40.5, 40.6, according as it indicates a little under, an exact coincidence with, or a little over 40°, or 40.3, respectively. So also 40.3, 40.5, 40.6, or more or less, must be registered 40.2, or 40.3, and 40.7, or 40.8, respectively. In reading Rutherford's Minimum Thermometer, the indication of that end of the index which is next the surface of the spirit is alone noted. On opening the Thermometer Box, the Dry and Wet Bulb Thermometers are to be first, and rapidly, read, inasmuch as they are readily affected by heat from the person of the Observer.

The Hygrometer is read at 9 A.M. and 9 P.M. The Self-Registering Thermometers are read at 9 P.M. only, as, in the 24 hours preceding. It is not a matter of indifference when the Self-Registering Thermometers are read, since, in winter at least, the extremes may occur at any hour; and it is necessary to refer their occurrence to their proper meteorological day. In the Society's schedules, the indications registered on the 3d are those of a series of phenomena commencing at 9 P.M. on the 2d, and extending till 9 P.M. on the 3d.

No instrument ought to be used for Meteorological purposes till it has been carefully tested by comparison with a standard Thermometer. When such Thermometers are used, as are not graduated on the stem, but merely on an attached scale, undergo repairs, they are very liable to be moved from their position on the Scale, and ought never afterwards to be used without being re-tested. The Self-Registering, especially the Minimum Thermometers, ought frequently to be compared with the dry bulb of the Hygrometer. The freezing-point of each Thermometer, marked by a scratch on the tube, ought to be tested once a year, in snow or melting ice.

In selecting instruments, the following points require attention:—The divisions of the vernier of Barometers in reference to their scales, and the perfect freedom of the Barometer from air; the

correct numbering of the scale of every instrument; the rejection of Thermometers the frameworks of which are not likely to stand exposure to the weather, as shown in the past by repeated and annoying breakages of Thermometers of similar construction; and as regards Maximum Thermometers, either Negretti and Zambra's, or Phillips's, whichever they will act at the highest temperatures they may be registered to register. By the laws of the Society, Members and Observers have a right to have their instruments compared by the Secretary, and to advise with him regarding the purchase of instruments. Very great care should be bestowed on the Observations of the wind.

Wind, the accuracy of which, both as regards Direction and Force, is so essential towards the right discussion of many of the more important problems of the science. A Wind-Vane ought to be elevated at least 12 feet above surrounding objects. When it oscillates incessantly, the mean direction should be taken. In all cases, but especially when the Vane is stationary, and when the wind is feeble, reference may be made to the direction of smoke, etc., in well-exposed situations. Careful observations are recommended to be made on the changes in the direction of the wind; and during storms, extra observations at every hour of Greenwich time. Such a system of simultaneous observation, pursued at different Stations, is likely to give highly valuable and important results, particularly in connection with the system of thickly-planted Stations over a limited district round Edinburgh called STORM STATIONS, in the course of being established by the Society for the systematic investigation of the relation of the force of the wind to BAROMETRIC GRADIENTS, and other points connected with storms.

The Council would recommend the Hemispherical Cup Anemometer—a self-registering instrument which shows the amount of Wind that passes it per day; from which also the mean Velocity of the Wind at the time of observation may be ascertained. For indicating the Force of the Wind at any particular hour of observation, the Pressure Anemometers recently brought under the notice of the Society by Mr. T. Stevenson, the Honorary Secretary, and Mr. R. Ballingall, the Society's Observer at Pallabus, are recommended as likely to secure uniformity in making observations on the Force of the Wind.

Many causes conspire to produce anomalies in Rain Returns, arising partly from the difficulty of obtaining a perfectly unobscured situation for observation, and partly from the defective nature of the instruments used. The Rain Gauge should not be placed on a slope or terrace, but on a level piece of ground, in as open a situation as the Observer can secure for it. As it is often difficult to obtain a position as free and unobstructed by surrounding objects as is desirable, care should be taken to place it at some distance from shrubs, trees, buildings, or other obstructions, at least as many feet from their base as they are in height. The more important directions, towards which it is most desirable to have a free exposure, are, in the order of their importance, S.W., N.E., S.E., S., and W. The rim of the gauge must be perfectly level, and fixed so that it will remain level in all weathers, and be at a height of one foot above ground, over grass. In such gauges as Fleming's, which are furnished with a measuring-rod attached to a float, the rod ought to be fixed down, and the float rise to its height only at the time the instrument is read, it being found that a stem projecting above the rim of the gauge seriously interferes with the proper measurement of the Rain-fall. When a measuring-glass is used, care should be taken to hold it quite perpendicular. The Rain Gauge ought to be read daily at 9 A.M., and the reading entered in the Returns of the previous day.

If the Gauge is read once a month, the reading is to be made on the first of the month, and the amount entered for the previous month. Snow-falls may, for convenience, be registered in the rain columns, under the following conditions:—When a 'Snow-fall' shower occurs, it should be noted in the 'Remarks,' and the letter S affixed to the depth of water received in Gauge. The depth of the snow must be measured in some open place where no drift is observed, and registered in addition to, and as a check upon, the indications of the Rain Gauge. For wind, rain, and snow, as indicated in every column, the Observer cannot be too careful to register observations only; and nothing that partakes of the nature of deduction or inference.

Convenient abbreviations for the nomenclature of Clouds will be found on the other side. The amount of Cloud ought to be estimated from the greater or less obscuration of the sky overhead (i.e. within 20° or 30° of the zenith). The strata of Clouds that appear near the horizon are viewed obliquely; and thus, being unable to judge of their amount, we ought not to take them into account in the Clouds' column, though their appearance and changes may be noted among the Remarks. The amount of Cloud is entered from a scale of 0 to 10; thus, when the sky overhead is free from Clouds it is entered 0, when half-covered by Clouds, 5, wholly covered, 10, and so on. Observations of the Clouds are made at 9 A.M. and at sunset, as illustrating the condition and currents of the upper and lower regions of the atmosphere. The entries in the schedule are to be made in the following manner:—Thus, in the column Velocity and Direction, 9, S. W. will indicate that the upper strata of Clouds travel with extreme velocity from S.W., and those in the lower regions from W., with one-third the speed of the former. Again, in the second column, an entry of $\frac{2}{4}$ will indicate that the higher regions are covered to the amount of 4-tenths with stratus Clouds; and that the sky is further obscured to the extent of 2-tenths by lower Clouds of the cumulo stratus kind. Remarks on peculiar Clouds, accompanied with drawings, will assist materially in the development of a more exact nomenclature of Clouds, as well as throw light on the electrical, and other of the more obscure phenomena of Meteorology. The approximate number of Hours in which objects in the sun's rays cast shadows, should be entered in the proper sunshine column.

As the germination and growth of crops and plants generally depend greatly on the temperature of the soil—its amount and constancy—the Council recommend that Underground Observations in this interesting department be made at 9 A.M.; by Thermometers permanently fixed in the soil, their bulbs being sunk to depths of 3, 12, and 22 inches, and the stems above ground protected from the sun's rays, and fitted with sloping tin collars, to prevent rain-water being conveyed to the bulbs by the stems or wooden frames. A knowledge of the Temperature of the Sea is not only in itself, but in its relations to that of our island, a most important branch of Meteorology. The Council therefore carefully take by a properly constructed apparatus from boats or coast, where it is not influenced by that of river water, and as little influenced as possible by currents sweeping along the coast, and thus acquiring the temperature of the land, other greatly heated by the sun or cooled by nocturnal radiation. At or near the time of high

water, in cases where the observations cannot be taken daily, the observation may be made on the 5th, 15th, and 25th of each month. When convenient, extra Sea Observations might be taken for other and greater depths, noting always the Temperature of the Air, and the Hour of Observation. It is also very desirable that observations on the daily Maxima and Minima by Thermometers continuously immersed, be instituted at points along the coast, by the method proposed by Mr. T. Stevenson, and already commenced at Peterhead and Liverpool. The Temperature of the water at the bottom of Wells ought, when practicable, to be taken, both the depth of the temperature well and of the water being noted.

Mention what Test-Papers are used, Schönbein's or Mofatt's, etc. The Paper is affixed by a pin to a board in the Thermometer Box, and the indications registered at 9 A.M. and 9 P.M. It is desired that these indications be registered in connection with the force and direction of the wind at the time of observation, in the following manner:—thus 35°, as an Ozone entry in the schedule will indicate that the Ozone paper is tinted as 3 on the scale, that the wind is from the N.W., and that its force on the scale 0—5 is 4, or blowing fresh.

Too much importance cannot be attached to the electric condition of the atmosphere in connection with terrestrial trial magnetism, barometrical, thermometrical, and electricity, meteorological phenomena generally. A proper electrometer is, in truth, necessary to every complete meteorological observatory.

The Remarks column is unavoidably too narrow. Some of the most valuable Observations that can be taken are those for which no rules can be given nor hours assigned. The use of contractions ought, therefore, to be taken every advantage of, and a list of such as are in general use is given at the foot of the column. Besides special and extraordinary Observations, great prominence ought to be given in this column to Prevailing Diseases, differences in character, colour, velocity, and direction between the Lower and Upper Strata of clouds, the Colour of the Sky, etc. Remarks ought to be made on the occurrence of Meteors, Auroral Boreas, remarkable depressions, elevations, and fluctuations of the Barometer, Thunder-Storms, and remarkable falls of Snow, Hail or Rain, the Hour of Storms of Wind commencing, attaining their maximum, and ending, as well as such Notes on Storms as have been hinted at above. When lofty hills are in the vicinity of a Station, the Height of Clouds and of the Snow-line in winter should be recorded. By the use of abbreviations, the state of the weather at 9 A.M. and 9 P.M. should be registered, either in two columns, otherwise occupied, or ruled off for the purpose, from the column of 'Remarks.' Observations in connection with the Periodic Return of the Seasons, possess not only great scientific value, but are of considerable importance in connection with the Periodic Return of Agriculture, Horticulture, and Natural History. The Council would direct the special attention of Observers to the registration of such phenomena, so that the published Summaries may fairly represent the whole of Scotland.

Observations ought to be confined to individual trees and shrubs; to particular species of birds, and, in the case of crops, to specified sorts reared from year to year on a selected piece of ground or farm. The Annual Table, published yearly in the Society's Journal, will indicate the species of plants and animals to which special attention is more particularly directed. The Council recommend Observers, before purchasing new instruments, and in replacing old ones, to communicate with the Meteorological Secretary, in order that every instrument may be examined and improved before being used; and they consider it necessary that he should have full power to reject any instrument which, on being presented for comparison, does not afford him satisfaction.

(By Order)
BIRMINGHAM, December 1891.

| FOREST TREES. | Alder, | Ash, | Beech, | Birch, | Elm, | Larch, | Lime, | Oak, | Sycamore or Plane, |
|--------------------|--------|----------------|---------|-----------|--------|----------|--------|----------|------------------------|
| In Flower. | | | | | | | | | |
| Last Buds In Leaf. | | | | | | | | | |
| First in Blossom. | | | | | | | | | |
| FRUIT. | Apple, | Black Currant, | Cherry, | Hawthorn, | Holly, | Laurumn, | Lilac, | Mazzeon, | Mountain Ash or Rowan, |
| First in Blossom. | | | | | | | | | |
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| First in Blossom. | | | | | | | | | |
| FRUIT. | Apple, | Black Currant, | Cherry, | Hawthorn, | Holly, | Laurumn, | Lilac, | Mazzeon, | Mountain Ash or Rowan, |
| First in Blossom. | | | | | | | | | |
| FRUIT. | Apple, | Black Currant, | Cherry, | Hawthorn, | Holly, | Laurumn, | Lilac, | Mazzeon, | Mountain Ash or Rowan, |
| First in Blossom. | | | | | | | | | |
| FRUIT. | Apple, | Black Currant, | Cherry, | Hawthorn, | Holly, | Laurumn, | Lilac, | Mazzeon, | Mountain Ash or Rowan, |
| First in Blossom. | | | | | | | | | |
| FRUIT. | Apple, | Black Currant, | Cherry, | Hawthorn, | Holly, | Laurumn, | Lilac, | Mazzeon, | Mountain Ash or Rowan, |
| First in Blossom. | | | | | | | | | |
| FRUIT. | Apple, | Black Currant, | Cherry, | Hawthorn, | Holly, | Laurumn, | Lilac, | Mazzeon, | Mountain Ash or Rowan, |
| First in Blossom. | | | | | | | | | |
| FRUIT. | Apple, | Black Currant, | Cherry, | Hawthorn, | Holly, | Laurumn, | Lilac, | Mazzeon, | Mountain Ash or Rowan, |
| First in Blossom. | | | | | | | | | |
| FRUIT. | Apple, | Black Currant, | Cherry, | Hawthorn, | Holly, | Laurumn, | Lilac, | Mazzeon, | Mountain Ash or Rowan, |
| First in Blossom. | | | | | | | | | |
| FRUIT. | Apple, | Black Currant, | Cherry, | Hawthorn, | Holly, | Laurumn, | Lilac, | Mazzeon, | Mountain Ash or Rowan, |
| First in Blossom. | | | | | | | | | |
| FRUIT. | Apple, | Black Currant, | Cherry, | Hawthorn, | Holly, | Laurumn, | Lilac, | Mazzeon, | Mountain Ash or Rowan, |
| First in Blossom. | | | | | | | | | |
| FRUIT. | Apple, | Black Currant, | Cherry, | Hawthorn, | Holly, | Laurumn, | Lilac, | Mazzeon, | Mountain Ash or Rowan, |
| First in Blossom. | | | | | | | | | |
| FRUIT. | Apple, | Black Currant, | Cherry, | Hawthorn, | Holly, | Laurumn, | Lilac, | Mazzeon, | Mountain Ash or Rowan, |
| First in Blossom. | | | | | | | | | |
| FRUIT. | Apple, | Black Currant, | Cherry, | Hawthorn, | Holly, | Laurumn, | Lilac, | Mazzeon, | Mountain Ash or Rowan, |
| First in Blossom. | | | | | | | | | |
| FRUIT. | Apple, | Black Currant, | Cherry, | Hawthorn, | Holly, | Laurumn, | Lilac, | Mazzeon, | Mountain Ash or Rowan, |
| First in Blossom. | | | | | | | | | |
| FRUIT. | Apple, | Black Currant, | Cherry, | Hawthorn, | Holly, | Laurumn, | Lilac, | Mazzeon, | Mountain Ash or Rowan, |
| First in Blossom. | | | | | | | | | |
| FRUIT. | Apple, | Black Currant, | Cherry, | Hawthorn, | Holly, | Laurumn, | Lilac, | Mazzeon, | Mountain Ash or Rowan, |
| First in Blossom. | | | | | | | | | |
| FRUIT. | Apple, | Black Currant, | Cherry, | Hawthorn, | Holly, | Laurumn, | Lilac, | Mazzeon, | Mountain Ash or Rowan, |
| First in Blossom. | | | | | | | | | |
| FRUIT. | Apple, | Black Currant, | Cherry, | Hawthorn, | Holly, | Laurumn, | Lilac, | Mazzeon, | Mountain Ash or Rowan, |
| First in Blossom. | | | | | | | | | |
| FRUIT. | Apple, | Black Currant, | Cherry, | Hawthorn, | Holly, | Laurumn, | Lilac, | Mazzeon, | Mountain Ash or Rowan, |
| First in Blossom. | | | | | | | | | |
| FRUIT. | Apple, | Black Currant, | Cherry, | Hawthorn, | Holly, | Laurumn, | Lilac, | Mazzeon, | Mountain Ash or Rowan, |
| First in Blossom. | | | | | | | | | |
| FRUIT. | Apple, | Black Currant, | Cherry, | Hawthorn, | Holly, | Laurumn, | Lilac, | Mazzeon, | Mountain Ash or Rowan, |
| First in Blossom. | | | | | | | | | |
| FRUIT. | Apple, | Black Currant, | Cherry, | Hawthorn, | Holly, | Laurumn, | Lilac, | Mazzeon, | Mountain Ash or Rowan, |
| First in Blossom. | | | | | | | | | |
| FRUIT. | Apple, | Black Currant, | Cherry, | Hawthorn, | Holly, | Laurumn, | Lilac, | Mazzeon, | Mountain Ash or Rowan, |
| First in Blossom. | | | | | | | | | |
| FRUIT. | Apple, | Black Currant, | Cherry, | Hawthorn, | Holly, | Laurumn, | Lilac, | Mazzeon, | Mountain Ash or Rowan, |
| First in Blossom. | | | | | | | | | |
| FRUIT. | Apple, | Black Currant, | Cherry, | Hawthorn, | Holly, | Laurumn, | Lilac, | Mazzeon, | Mountain Ash or Rowan, |
| First in Blossom. | | | | | | | | | |
| FRUIT. | Apple, | Black Currant, | Cherry, | Hawthorn, | Holly, | Laurumn, | Lilac, | Mazzeon, | Mountain Ash or Rowan, |
| First in Blossom. | | | | | | | | | |
| FRUIT. | Apple, | Black Currant, | Cherry, | Hawthorn, | Holly, | Laurumn, | Lilac, | Mazzeon, | Mountain Ash or Rowan, |
| First in Blossom. | | | | | | | | | |
| FRUIT. | Apple, | Black Currant, | Cherry, | Hawthorn, | Holly, | Laurumn, | Lilac, | Mazzeon, | Mountain Ash or Rowan, |
| First in Blossom. | | | | | | | | | |
| FRUIT. | Apple, | Black Currant, | Cherry, | Hawthorn, | Holly, | Laurumn, | Lilac, | Mazzeon, | Mountain Ash or Rowan, |
| First in Blossom. | | | | | | | | | |
| FRUIT. | Apple, | Black Currant, | Cherry, | Hawthorn, | Holly, | Laurumn, | Lilac, | Mazzeon, | Mountain Ash or Rowan, |
| First in Blossom. | | | | | | | | | |
| FRUIT. | Apple, | Black Currant, | Cherry, | Hawthorn, | Holly, | Laurumn, | Lilac, | Mazzeon, | Mountain Ash or Rowan, |
| First in Blossom. | | | | | | | | | |
| FRUIT. | Apple, | Black Currant, | Cherry, | Hawthorn, | Holly, | Laurumn, | Lilac, | Mazzeon, | Mountain Ash or Rowan, |
| First in Blossom. | | | | | | | | | |
| FRUIT. | Apple, | Black Currant, | Cherry, | Hawthorn, | Holly, | Laurumn, | Lilac, | Mazzeon, | Mountain Ash or Rowan, |
| First in Blossom. | | | | | | | | | |
| FRUIT. | Apple, | Black Currant, | Cherry, | Hawthorn, | Holly, | Laurumn, | Lilac, | Mazzeon, | Mountain Ash or Rowan, |
| First in Blossom. | | | | | | | | | |
| FRUIT. | Apple, | Black Currant, | Cherry, | Hawthorn, | Holly, | Laurumn, | Lilac, | Mazzeon, | Mountain Ash or Rowan, |
| First in Blossom. | | | | | | | | | |
| FRUIT. | Apple, | Black Currant, | Cherry, | Hawthorn, | Holly, | Laurumn, | Lilac, | Mazzeon, | Mountain Ash or Rowan, |
| First in Blossom. | | | | | | | | | |
| FRUIT. | Apple, | Black Currant, | Cherry, | Hawthorn, | Holly, | Laurumn, | Lilac, | Mazzeon, | Mountain Ash or Rowan, |
| First in Blossom. | | | | | | | | | |
| FRUIT. | Apple, | Black Currant, | Cherry, | Hawthorn, | Holly, | Laurumn, | Lilac, | Mazzeon, | Mountain Ash or Rowan, |
| First in Blossom. | | | | | | | | | |
| FRUIT. | Apple, | Black Currant, | Cherry, | Hawthorn, | Holly, | Laurumn, | Lilac, | Mazzeon, | Mountain Ash or Rowan, |
| First in Blossom. | | | | | | | | | |
| FRUIT. | Apple, | Black Currant, | Cherry, | Hawthorn, | Holly, | Laurumn, | Lilac, | Mazzeon, | Mountain Ash or Rowan, |
| First in Blossom. | | | | | | | | | |
| FRUIT. | Apple, | Black Currant, | Cherry, | Hawthorn, | Holly, | Laurumn, | Lilac, | Mazzeon, | Mountain Ash or Rowan, |
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| FRUIT. | Apple, | Black Currant, | Cherry, | Hawthorn, | Holly, | Laurumn, | Lilac, | Mazzeon, | Mountain Ash or Rowan, |
| First in Blossom. | | | | | | | | | |

SCOTTISH METEOROLOGICAL SOCIETY.

Observations taken at Leith, County of Edinburgh, in Lat 55° 59' N, Long 3° 10' W, Distance from Sea half mile.
 Height of Cistern of the Barometer above Mean Sea-Level 76 feet, above Ground three feet. During the MONTH of November 1900.
 The Hours of Observation are of Greenwich Time.

| ELECTRICITY. | Days of Month. | BAROMETER. | | | | SELF-REGISTERING THERMOMETERS. | | | | HYGROMETER. | | | | Rain. | WIND. | | | | CLOUDS. | | | | THERMOMETERS under Ground. | | | SEA. | OZONE. | GENERAL REMARKS. | | Days of Month. | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
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| | | 9 h. A.M. | | 9 h. P.M. | | Protected in Shade, 4 feet above Ground. | | Exposed Black Bulbs. | | 9 h. A.M. | | 9 h. P.M. | | | No. of hours in which it fell. | Amount in inches. | 9 h. A.M. | | 9 h. P.M. | | 9 h. A.M. | 9 h. P.M. | SUNSHINE. | Hours. | 9 h. A.M. | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | Barometer. | | Barometer. | | Max. Min. | | Max. Min. | | Dry bulb. | | Wet bulb. | | | | | Direction. | | Force. | | | | | | Velocity (0-10), and Direction. | | | | | | Amount (0-10), and Direction. | | No. 3 inches. | No. 12 inches. | No. 22 inches. | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | * No. | ° | * No. | ° | No. | ° | No. | ° | Dry bulb. | Wet bulb. | Dry bulb. | Wet bulb. | | | | Direction. | Force. | Direction. | Force. | | | | | Velocity (0-10), and Direction. | | | | | | Amount (0-10), and Direction. | Velocity (0-10), and Direction. | Amount (0-10), and Direction. | No. 3 inches. | No. 12 inches. | No. 22 inches. | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | inches. | ° | inches. | ° | ° | ° | ° | ° | ° | ° | ° | ° | | | | ° | ° | ° | ° | | | | | ° | | | | | | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° |

BAROMETER, "corrected Mean" at 9 A.M., minus the Correction for Temp. (Col. 2) = 29.693
 "Corrected Mean" of Barometer at 9 P.M., minus the Correction for Temp. (Col. 4) = 29.701
 Mean at Station, corrected, and at 32° = 29.697
 Correction for height, feet above Mean Sea-Level, = 9.0
 Mean, reduced to 32°, and Sea-Level, = 30.540
 Highest Reading, corrected for Index error, on the 18 th, = 30.540
 Lowest Do. Do., at 11 upon the 15 th, = 29.058
 Difference, or Monthly Range, = 1.482

S.R. THERMOMETER, (in shade, etc.), Highest in Month, (corrected for Index Errors), on the 3rd, = 56.9
 Lowest in Month, corrected for Index errors, on the 19 th, = 31.1
 Difference, or Monthly Range, = 25.8
 "Corrected Mean" of all the Highest, (Col. 5), = 46.9
 "Corrected Mean" of all the Lowest, (Col. 6), = 40.6
 Difference, or Mean Daily Range, = 6.3
 ** Calculated Mean Temperature of Month, = 43.7
 S.R. THERMOMETER, Black Bulb in Sun, Highest, (corrected for Index Errors), on the th, = 56.9
 "Corrected Mean," (Col. 7), of Black Bulb, Max. in Sun, = 56.9
 Lowest at Night, Black Bulb (corrected for Index errors), on the th, = 31.1
 "Corrected Mean," (Col. 8), of Black Bulb, Min. on grass, = 31.1
 Difference of above means or range ("exposed"), = 25.8

HYGROMETER, Mean (corrected) A.M. and P.M. Reading of Dry Bulb, (Cols. 9 and 11), = 43.05
 Mean (corrected) A.M. and P.M. Reading of Wet Bulb, (Cols. 10 and 12), = 42.1
 Computed Temperature of Dew-Point, = 40.4
 Do. Elastic Force of Vapour, = 0.251
 Do. Weight of Vapour in a Cubic Foot of Air, = 89
 Relative Humidity (Saturation = 100), = 89
 RAIN fell on 22 Days; Amount in Inches, = 5.49

| WIND. | | SUMMARY. | | | | | | | | | |
|------------|--|----------|----|---|----|---|----|----|----|-------------------|-------------|
| Direction. | | N | NE | E | SE | S | SW | W | NW | Calm or Variable. | Mean Force. |
| A.M. | | 1 | 1 | 6 | 2 | 6 | 1 | 10 | 1 | 2 | 1.37 |
| P.M. | | 3 | - | 8 | 2 | 1 | - | 10 | - | 6 | 1.10 |
| Mean. | | 2 | 1 | 7 | 2 | 3 | 1 | 10 | 0 | 4 | 1.24 |

Observations made and Return verified by

(Signed) James Colman & George Redpath

SCOTTISH METEOROLOGICAL SOCIETY.

Observations taken at Leith, County of Edinburgh, in Lat. 55° 59' N, Long. 3° 10' W, Distance from Sea half mile.Height of Cistern of the Barometer above Mean Sea-Level 76 feet, above Ground three feet.During the MONTH of December 1890.

The Hours of Observation are of Greenwich Time.

| ELECTRICITY. | Days of Month. | PAROMETER. | | | | SELF-REGISTERING THERMOMETERS. | | | | HYGROMETER. | | | | Rain. | WIND. | | | | CLOUDS. | | | | THERMOMETERS under Ground. | | | SEA. | OZONE. | GENERAL REMARKS. | Days of Month. | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|--------------|----------------|------------|-----------------------|------------|-----------------------|------------------------------------------|------|----------------------|-------|-------------|-----------|-----------|-----------|---------|--------------------------------|------------|-----------|------------|---------|------------------|----------------|------------------|----------------------------|---------|---------|---------|---------|------------------|----------------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|-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| | | 9 h. A.M. | | 9 h. P.M. | | Protected in Shade, 4 feet above Ground. | | Exposed Black Bulbs. | | Dry No. | | Wet No. | | | 9 h. A.M. | | 9 h. P.M. | | 9 A.M. | | 9 P.M. | | 9 h. A.M. | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | Barometer. | Attached Thermometer. | Barometer. | Attached Thermometer. | Max. | Min. | Max. | Min. | Dry bulb. | Wet bulb. | Dry bulb. | Wet bulb. | | No. of hours in which it fell. | Direction. | Force. | Direction. | Force. | Velocity (0-10). | Amount (0-10). | Velocity (0-10). | Amount (0-10). | No. | No. | | | | | No. | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | * No. | inches. | * No. | inches. | No. | No. | No. | No. | No. | No. | No. | No. | | No. | No. | No. | No. | No. | No. | No. | No. | No. | No. | No. | | | | | No. | No. | No. | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | 29.800 | 29.816 | 45.1 39.3 | 42.6 41.9 | 43.3 41.9 | 0.05 | 6 1.5 | 6 1.0 | 1.5 5.6 | 1.5 5.6 | 1.5 5.6 | 1.5 5.6 | 1.5 5.6 | 1.5 5.6 | 1.5 5.6 | 1.5 5.6 | 1.5 5.6 | 1.5 5.6 | 1.5 5.6 | 1.5 5.6 | 1.5 5.6 | 1.5 5.6 | 1.5 5.6 | 1.5 5.6 | 1.5 5.6 | 1.5 5.6 | 1.5 5.6 | 1.5 5.6 | 1.5 5.6 | 1.5 5.6 | 1.5 5.6 | 1.5 5.6 | 1.5 5.6 | 1.5 5.6 | 1.5 5.6 | 1.5 5.6 | 1.5 5.6 | 1.5 5.6 | 1.5 5.6 | 1.5 5.6 | 1.5 5.6 | 1.5 5.6 | 1.5 5.6 | 1.5 5.6 | 1.5 5.6 | 1.5 5.6 | 1.5 5.6 | 1.5 5.6 | 1.5 5.6 | 1.5 5.6 | 1.5 5.6 | 1.5 5.6 | 1.5 5.6 | 1.5 5.6 | 1.5 5.6 | 1.5 5.6 | 1.5 5.6 | 1.5 5.6 | 1.5 5.6 | 1.5 5.6 | 1.5 5.6 | 1.5 5.6 | 1.5 5.6 | 1.5 5.6 | 1.5 5.6 | 1.5 5.6 | 1.5 5.6 | 1.5 5.6 | 1.5 5.6 | 1.5 5.6 | 1.5 5.6 | 1.5 5.6 | 1.5 5.6 | 1.5 5.6 | 1.5 5.6 | 1.5 5.6 | 1.5 5.6 | 1.5 5.6 | 1.5 5.6 | 1.5 5.6 | 1.5 5.6 | 1.5 5.6 | 1.5 5.6 | 1.5 5.6 | 1.5 5.6 | 1.5 5.6 | 1.5 5.6 | 1.5 5.6 | 1.5 5.6 | 1.5 5.6 | 1.5 5.6 | 1.5 5.6 | 1.5 5.6 | 1.5 5.6 | 1.5 5.6 | 1.5 5.6 | 1.5 5.6 | 1.5 5.6 | 1.5 5.6 | 1.5 5.6 | 1.5 5.6 | 1.5 5.6 | 1.5 5.6 | 1.5 5.6 | 1.5 5.6 | 1.5 5.6 | 1.5 5.6 | 1.5 5.6 | 1.5 5.6 | 1.5 5.6 | 1.5 5.6 | 1.5 5.6 | 1.5 5.6 | 1.5 5.6 | 1.5 5.6 | 1.5 5.6 | 1.5 5.6 | 1.5 5.6 | 1.5 5.6 | 1.5 5.6 | 1.5 5.6 | 1.5 5.6 | 1.5 5.6 | 1.5 5.6 | 1.5 5.6 | 1.5 5.6 | 1.5 5.6 | 1.5 5.6 | 1.5 5.6 | 1.5 5.6 | 1.5 5.6 | 1.5 5.6 | 1.5 5.6 | 1.5 5.6 | 1.5 5.6 | 1.5 5.6 | 1.5 5.6 | 1.5 5.6 | 1.5 5.6 | 1.5 5.6 | 1.5 5.6 | 1.5 5.6 | 1.5 5.6 | 1.5 5.6 | 1.5 5.6 | 1.5 5.6 | 1.5 5.6 | 1.5 5.6 | 1.5 5.6 | 1.5 5.6 | 1.5 5.6 | 1.5 5.6 | 1.5 5.6 | 1.5 5.6 | 1.5 5.6 | 1.5 5.6 | 1.5 5.6 | 1.5 5.6 | 1.5 5.6 | 1.5 5.6 | 1.5 5.6 | 1.5 5.6 | 1.5 5.6 | 1.5 5.6 | 1.5 5.6 | 1.5 5.6 | 1.5 5.6 | 1.5 5.6 | 1.5 5.6 | 1.5 5.6 | 1.5 5.6 | 1.5 5.6 | 1.5 5.6 | 1.5 5.6 | 1.5 5.6 | 1.5 5.6 | 1.5 5.6 | 1.5 5.6 | 1.5 5.6 | 1.5 5.6 | 1.5 5.6 | 1.5 5.6 | 1.5 5.6 | 1.5 5.6 | 1.5 5.6 | 1.5 5.6 | 1.5 5.6 | 1.5 5.6 | 1.5 5.6 | 1.5 5.6 | 1.5 5.6 | 1.5 5.6 | 1.5 5.6 | 1.5 5.6 | 1.5 5.6 | 1.5 5.6 | 1.5 5.6 | 1.5 5.6 | 1.5 5.6 | 1.5 5.6 | 1.5 5.6 | 1.5 5.6 | 1.5 5.6 | 1.5 5.6 | 1.5 5.6 | 1.5 5.6 | 1.5 5.6 | 1.5 5.6 | 1.5 5.6 | 1.5 5.6 | 1.5 5.6 | 1.5 5.6 | 1.5 5.6 | 1.5 5.6 | 1.5 5.6 | 1.5 5.6 | 1.5 5.6 | 1.5 5.6 | 1.5 5.6 | 1.5 5.6 | 1.5 5.6 | 1.5 5.6 | 1.5 5.6 | 1.5 5.6 | 1.5 5.6 | 1.5 5.6 | 1.5 5.6 | 1.5 5.6 | 1.5 5.6 | 1.5 5.6 | 1.5 5.6 | 1.5 5.6 | 1.5 5.6 | 1.5 5.6 | 1.5 5.6 | 1.5 5.6 | 1.5 5.6 | 1.5 5.6 | 1.5 5.6 | 1.5 5.6 | 1.5 5.6 | 1.5 5.6 | 1.5 5.6 | 1.5 5.6 | 1.5 5.6 | 1.5 5.6 | 1.5 5.6 | 1.5 5.6 | 1.5 5.6 | 1.5 5.6 | 1.5 5.6 | 1.5 5.6 | 1.5 5.6 | 1.5 5.6 | 1.5 5.6 | 1.5 5.6 | 1.5 5.6 | 1.5 5.6 | 1.5 5.6 | 1.5 5.6 | 1.5 5.6 | 1.5 5.6 | 1.5 5.6 | 1.5 5.6 | 1.5 5.6 | 1.5 5.6 | 1.5 5.6 | 1.5 5.6 | 1.5 5.6 | 1.5 5.6 | 1.5 5.6 | 1.5 5.6 | 1.5 5.6 | 1.5 5.6 | 1.5 5.6 | 1.5 5.6 | 1.5 5.6 | 1.5 5.6 | 1.5 5.6 | 1.5 5.6 | 1.5 5.6 | 1.5 5.6 | 1.5 5.6 | 1.5 5.6 | 1.5 5.6 | 1.5 5.6 | 1.5 5.6 | 1.5 5.6 | 1.5 5.6 | 1.5 5.6 | 1.5 5.6 | 1.5 5.6 | 1.5 5.6 | 1.5 5.6 | 1.5 5.6 | 1.5 5.6 | 1.5 5.6 | 1.5 5.6 | 1.5 5.6 | 1.5 5.6 | 1.5 5.6 | 1.5 5.6 | 1.5 5.6 | 1.5 5.6 | 1.5 5.6 | 1.5 5.6 | 1.5 5.6 | 1.5 5.6 | 1.5 5.6 | 1.5 5.6 | 1.5 5.6 | 1.5 5.6 | 1.5 5.6 | 1.5 5.6 | 1.5 5.6 | 1.5 5.6 | 1.5 5.6 | 1.5 5.6 | 1.5 5.6 | 1.5 5.6 | 1.5 5.6 | 1.5 5.6 | 1.5 5.6 | 1.5 5.6 | 1.5 5.6 | 1.5 5.6 | 1.5 5.6 | 1.5 5.6 | 1.5 5.6 | 1.5 5.6 | 1.5 5.6 | 1.5 5.6 | 1.5 5.6 | 1.5 5.6 | 1.5 5.6 | 1.5 5.6 | 1.5 5.6 | 1.5 5.6 | 1.5 5.6 | 1.5 5.6 | 1.5 5.6 | 1.5 5.6 | 1.5 5.6 | 1.5 5.6 | 1.5 5.6 | 1.5 5.6 | 1.5 5.6 | 1.5 5.6 | 1.5 5.6 | 1.5 5.6 | 1.5 5.6 | 1.5 5.6 | 1.5 5.6 | 1.5 5.6 | 1.5 5.6 | 1.5 5.6 | 1.5 5.6 | 1.5 5.6 | 1.5 5.6 | 1.5 5.6 | 1.5 5.6 | 1.5 5.6 | 1.5 5.6 | 1.5 5.6 | 1.5 5.6 | 1.5 5.6 | 1.5 5.6 | 1.5 5.6 | 1.5 5.6 | 1.5 5.6 | 1.5 5.6 | 1.5 5.6 | 1.5 5.6 | 1.5 5.6 | 1.5 5.6 | 1.5 5.6 | 1.5 5.6 | 1.5 5.6 | 1.5 5.6 | 1.5 5.6 | 1.5 5.6 | 1.5 5.6 | 1.5 5.6 | 1.5 5.6 | 1.5 5.6 | 1.5 5.6 | 1.5 5.6 | 1.5 5.6 | 1.5 5.6 | 1.5 5.6 | 1.5 5.6 | 1.5 5.6 | 1.5 5.6 | 1.5 5.6 | 1.5 5.6 | 1.5 5.6 | 1.5 5.6 | 1.5 5.6 | 1.5 5.6 | 1.5 5.6 | 1.5 5.6 | 1.5 5.6 | 1.5 5.6 | 1.5 5.6 | 1.5 5.6 | 1.5 5.6 | 1.5 5.6 | 1.5 5.6 | 1.5 5.6 | 1.5 5.6 | 1.5 5.6 | 1.5 5.6 | 1.5 5.6 | 1.5 5.6 | 1.5 5.6 | 1.5 5.6 | 1.5 5.6 | 1.5 5.6 | 1.5 5.6 | 1.5 5.6 | 1.5 5.6 | 1.5 5.6 | 1.5 5.6 | 1.5 5.6 | 1.5 5.6 | 1.5 5.6 | 1.5 5.6 | 1.5 5.6 | 1.5 5.6 | 1.5 5.6 | 1.5 5.6 | 1.5 5.6 | 1.5 5.6 | 1.5 5.6 | 1.5 5.6 | 1.5 5.6 | 1.5 5.6 | 1.5 5.6 | 1.5 5.6 | 1.5 5.6 | 1.5 5.6 | 1.5 5.6 | 1.5 5.6 | 1.5 5.6 | 1.5 5.6 | 1.5 5.6 | 1.5 5.6 | 1.5 5.6 | 1.5 5.6 | 1.5 5.6 | 1.5 5.6 | 1.5 5.6 | 1.5 5.6 | 1.5 5.6 | 1.5 5.6 | 1.5 5.6 | 1.5 5.6 | 1.5 5.6 | 1.5 5.6 | 1.5 5.6 | 1.5 5.6 | 1.5 5.6 | 1.5 5.6 | 1.5 5.6 | 1.5 5.6 | 1.5 5.6 | 1.5 5.6 | 1.5 5.6 | 1.5 5.6 | 1.5 5.6 | 1.5 5.6 | 1.5 5.6 | 1.5 5.6 | 1.5 5.6 | 1.5 5.6 | 1.5 5.6 | 1.5 5.6 | 1.5 5.6 | 1.5 5.6 | 1.5 5.6 | 1.5 5.6 | 1.5 5.6 | 1.5 5.6 | 1.5 5.6 | 1.5 5.6 | 1.5 5.6 | 1.5 5.6 | 1.5 5.6 | 1.5 5.6 | 1.5 5.6 | 1.5 5.6 | 1.5 5.6 | 1.5 5.6 | 1.5 5.6 | 1.5 5.6 | 1.5 5.6 | 1.5 5.6 | 1.5 5.6 | 1.5 5.6 | 1.5 5.6 | 1.5 5.6 | 1.5 5.6 | 1.5 5.6 | 1.5 5.6 | 1.5 5.6 | 1.5 5.6 | 1.5 5.6 | 1.5 5.6 | 1.5 5.6 | 1.5 5.6 | 1.5 5.6 | 1.5 5.6 | 1.5 5.6 | 1.5 5.6 | 1.5 5.6 | 1.5 5.6 | 1.5 5.6 | 1.5 5.6 | 1.5 5.6 | 1.5 5.6 | 1.5 5.6 | 1.5 5.6 | 1.5 5.6 | 1.5 5.6 | 1.5 5.6 | 1.5 5.6 | 1.5 5.6 | 1.5 5.6 | 1.5 5.6 | 1.5 5.6 | 1.5 5.6 | 1.5 5.6 | 1.5 5.6 | 1.5 5.6 | 1.5 5.6 | 1.5 5.6 | 1.5 5.6 | 1.5 5.6 | 1.5 5.6 | 1.5 5.6 | 1.5 5.6 | 1.5 5.6 | 1.5 5.6 | 1.5 5.6 | 1.5 5.6 | 1.5 5.6 | 1.5 5.6 | 1.5 5.6 | 1.5 5.6 | 1.5 5.6 | 1.5 5.6 | 1.5 5.6 | 1.5 5.6 | 1.5 5.6 | 1.5 5.6 | 1.5 5.6 | 1.5 5.6 | 1.5 5.6 | 1.5 5.6 | 1.5 5.6 | 1.5 5.6 | 1.5 5.6 | 1.5 5.6 | 1.5 5.6 | 1.5 5.6 | 1.5 5.6 | 1.5 5.6 | 1.5 5.6 | 1.5 5.6 | 1.5 5.6 | 1.5 5.6 | 1.5 5.6 | 1.5 5.6 | 1.5 5.6 | 1.5 5.6 | 1.5 5.6 | 1.5 5.6 | 1.5 5.6 | 1.5 5.6 | 1.5 5.6 | 1.5 5.6 | 1.5 5.6 | 1.5 5.6 | 1.5 5.6 | 1.5 5.6 | 1.5 5.6 | 1.5 5.6 | 1.5 5.6 | 1.5 5.6 | 1.5 5.6 | 1.5 5.6 | 1.5 5.6 | 1.5 5.6 | 1.5 5.6 | 1.5 5.6 | 1.5 5.6 | 1.5 5.6 | 1.5 5.6 | 1.5 5.6 | 1.5 5.6 | 1.5 5.6 | 1.5 5.6 | 1.5 5.6 | 1.5 5.6 | 1.5 5.6 | 1.5 5.6 | 1.5 5.6 | 1.5 5.6 | 1.5 5.6 | 1.5 5.6 | 1.5 5.6 | 1.5 5.6 | 1.5 5.6 | 1.5 5.6 | 1.5 5.6 | 1.5 5.6 | 1.5 5.6 | 1.5 5.6 | 1.5 5.6 | 1.5 5.6 | 1.5 5.6 | 1.5 5.6 | 1.5 5.6 | 1.5 5.6 | 1.5 5.6 | 1.5 5.6 | 1.5 5.6 | 1.5 5.6 | 1.5 5.6 | 1.5 5.6 | 1.5 5.6 | 1.5 5.6 | 1.5 5.6 | 1.5 5.6 | 1.5 5.6 | 1.5 5.6 | 1.5 5.6 | 1.5 5.6 | 1.5 5.6 | 1.5 5.6 | 1.5 5.6 | 1.5 5.6 | 1.5 5.6 | 1.5 5.6 | 1.5 5.6 | 1.5 5.6 | 1.5 5.6 | 1.5 5.6 | 1.5 5.6 | 1.5 5.6 | 1.5 5.6 | 1.5 5.6 | 1.5 5.6 | 1.5 5.6 | 1.5 5.6 | 1.5 5.6 | 1.5 5.6 | 1.5 5.6 | 1.5 5.6 | 1.5 5.6 | 1.5 5.6 | 1.5 5.6 | 1.5 5.6 | 1.5 5.6 | 1.5 5.6 | 1.5 5.6 | 1.5 5.6 | 1.5 5.6 | 1.5 5.6 | 1.5 5.6 | 1. |

