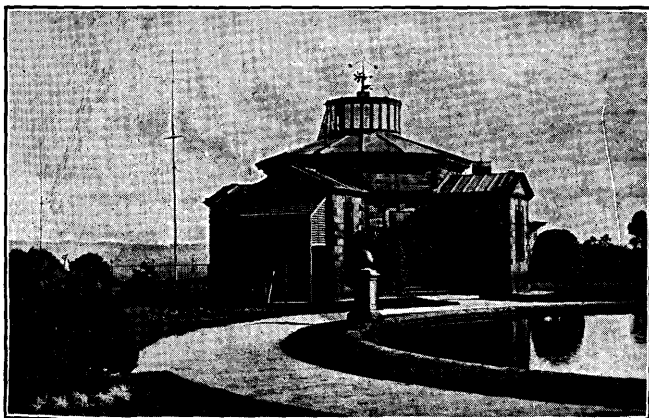


STONYHURST COLLEGE OBSERVATORY.

Lat. $53^{\circ} 50' 38.5''$ N. Long. $9^{\text{m}} 52^{\text{s}}.88$ W.
Height of the Barometer above the Sea, 381 feet.



(FOUNDED 1838.)

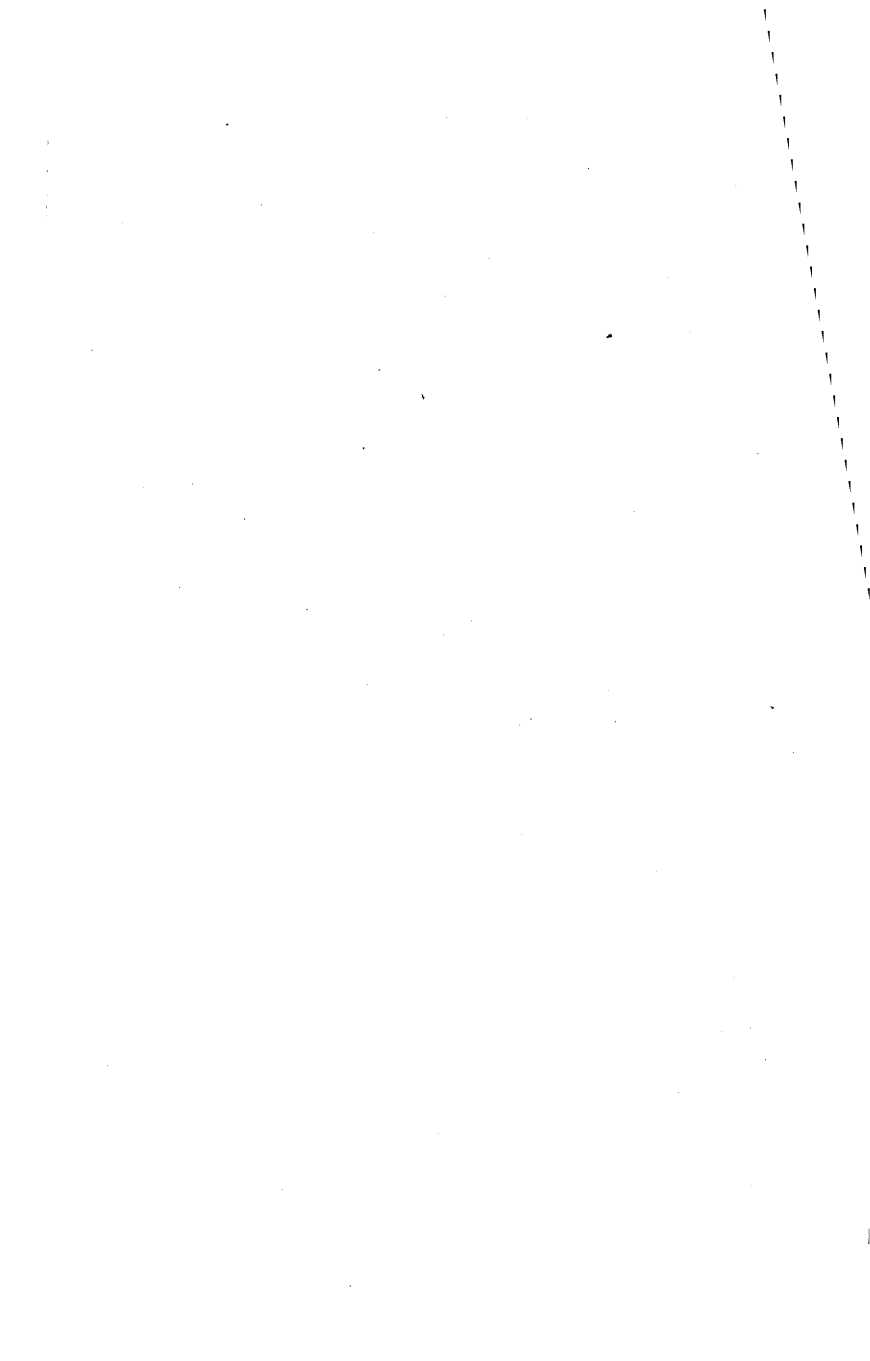
Results of Geophysical and Solar Observations, 1933.

With Report and Notes of the Director,
Rev. J. P. ROWLAND, S.J., B.Sc., F.R.A.S., F.R.Met.Soc.

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REPORT AND NOTES.

GENERAL.—The Staff of the Observatory is at present seriously depleted—Father J. F. Fleming, S.J., having been withdrawn in August for other work, and the Rev. T. Corbishley, S.J., B.A. (Oxon), having left at the same time to pursue his theological studies. Father H. Machlin, S.J., B.Sc. (Oxon.), who is on the teaching staff of the College, continues to give part-time assistance, and Mr. Wilfred Brown, as the only full-time assistant, is responsible for the routine Meteorological work, the changing of the recording instruments and development of photographic records.

We greatly regret to record the death of Mr. Joseph Burns, who joined the staff of the Observatory as Meteorological Assistant in July, 1892, in the third year of Father Sidgreaves' Directorate, and continued till August, 1926, when failing health compelled him to retire. It is worthy of note that of the seventy-eight years during which, up to that time systematic meteorological records had been kept, the registers of thirty-four are a record of the devoted and painstaking work of Mr. Burns.

Of quiet and unassuming character, his devotion to duty and the interests of the Observatory was un-failing. He never spared himself, and was always ready, when occasion required, to put in extra time at the Observatory outside his regular hours, and Father Sidgreaves, especially in his own later years and growing infirmities, came to rely greatly on him for much that was outside his ordinary routine. Father Cortie also held him in high esteem, and the present Director,

from seven years association with him in the work of the Observatory, and continued friendship till the end of his life, can testify to his sterling worth.

His first notable breakdown in health occurred on July 9th, 1924, when he was incapacitated by a slight stroke while at his work in the Observatory, but after a period of three months' convalescence he returned to work on October 6th, and continued, though greatly enfeebled in health, till August 10th, 1926, when a second attack necessitated his final retirement. During the long period of infirmity which followed, his patience and resignation were unailing, and were a most edifying example to all who came in contact with him. He passed away peacefully between midnight and 1 a.m. on Sunday, February 25th, 1934, in his 78th year, and was buried in the Hurst Green Cemetery on the 28th, the Director of the Observatory attending the funeral.

The Director gave a number of lectures to various societies during the year, and attended the Meeting of the British Association at Leicester, in September, on which occasion he read a paper on "The Wensleydale Earthquake of 1933, January 14."

In March, the various telescope mounts, which had occupied positions on the lawns adjacent to the Observatory for many years, were dismantled and the sites cleared. At the same time the 8-in. rain-gauge was moved 5-ft. to the East of its former position, from a location $3\frac{1}{2}$ -ft. N.W. to one $3\frac{1}{2}$ -ft. N.E. of the Beckley gauge—the two old $11\frac{1}{4}$ -in. gauges which had stood on either side of the latter for a great many years, and were obsolete, being removed.

The asphalt covering of the magnetic room and dark room, which was laid in June, 1932, having developed many serious cracks during the winter, was stripped off and relaid in May, and appears now to be quite satisfactory. Consequent on this the interior repairs have been completed. The rooms are, however, still very damp from condensation, the only remedy for which will be to instal some form of heating, which is now under consideration.

In view of the increasing calls of the Press for the services of the Observatory, chiefly in the matter of weather forecasts, telephone extensions to the Director's room and the Observatory were installed in May, and have enabled these services to be rendered with much less inconvenience and loss of time.

A notable event of some importance occurred on July 7, when in a severe thunderstorm the iron tubular mast of the Dines Anemograph was struck by lightning at 1400. As the mast was effectively earthed through one of the stay wires when it was erected, no serious damage was done, but the telephone was temporarily put out of action by the blowing of line fuses, and an electric light ceiling rose in the anemometer room was split, apparently by a lateral discharge from the foot of the mast. The mechanical shock to the building was recorded on the seismograph, but the most notable effect was a sudden and quasi-permanent *increase* in the ordinates of the Magnetographs—the Declination ordinate being increased by 4.5, and the Horizontal Force ordinate by 36 γ . These effects are satisfactorily accounted for by supposing that the effect of the lightning flash was to discharge the acquired polarity of the mast, which it may be assumed will gradually

return to its former value under the influence of the vertical component of the earth's magnetic field. When the mast was erected on 1929, April 12, the Declination Ordinate was *decreased* by 1'·0, and the H.F. ordinate by 9γ.

METEOROLOGICAL.—The Meteorological records have been continued without interruption throughout the year, and Weekly and Monthly Reports have been supplied as heretofore to the Meteorological Office, London.

The most notable feature of the year's weather was the great deficiency of rainfall. The total precipitation for the year, 32·723 in., is the second lowest in our records, being 31% below the average, and exceeding that of the driest year, 1887, by only 1·473 in. The number of days of recorded precipitation was 168. Monthly totals were below the average in every month, except February and October, which had falls slightly above the average. The amounts were especially low in April, May, September, November and December, the last month being the driest in the year, with a total of only 0·729 in., of which 0·410 in. fell on the 30th. But for this it would have been the driest December in the whole 87 years of our records. A notable partial drought extended from November 20th to December 29th inclusive, a period of 40 days, during which less than half an inch of rain, distributed in very small amounts, was recorded.

Heavy falls of rain of one inch or more in twenty-four hours occurred on :—

February 3rd, and October 10th.

A severe blizzard swept over the country on February 24th and 25th, with wind reaching 50 miles per hour in gusts, and a total precipitation in the two days of .86 in., equivalent to about 10 in. of snow. The snow, however, in sheltered places varied in depth from 6 in. to 18 in., and reached as much as 7 ft. in drifts. In contrast to last year snow was more frequent in the early months, there being ten days with snow in January and February, and one in April, but again there was very little in the later months, there being none in November, and only two slight falls in December.

The total amount of bright sunshine for the year, 1539.1 hours, was in excess of the average by 231 hours, or 17.7%, and was recorded on 307 days, which constitutes a record, the previous best being 300 days, in 1905. The total number of hours, however, was below that of the record year 1887, by 74.6 hours. The two relatively dullest months of the year were April and May, with respectively 27.4% and 30.4% of the possible total, against average values of 34.5% and 36.9%. February, in spite of two dull periods, —1st to 10th, and 24th to 28th—was a sunny month, with 50% above the average, 13 days in the middle of the month having an average of 5.5 hours each. June, July, August and September were brilliantly sunny, with a total for the four months of 831 hours, or 45.4% of the possible, as compared with an average of 627 hours, or 33.8% of the possible. September was the finest month of the year, with a record total of 204.1 hours on 29 days,—27.6 hours above the previous record in September, 1914, and 65% above the average for the previous 52 years.

Rainless periods of five days or more occurred as follows :

| | | |
|----------------|----------------|------------|
| Jan. 19—29 | Feb. 10—14 | Mar. 9—14 |
| Mar. 20—28 | Apr. 11—18 | Jun. 3—7 |
| Jun. 25—Jul. 6 | Jul. 21—27 | Sep. 2—14 |
| Sep. 22—Oct. 6 | Nov. 24—Dec. 5 | Dec. 13—18 |

A total of 12 periods, with an average of 9·1 days each.

Bright sunshine for 10 hours or more was recorded on :

March 24th, 25th, 26th ; April 13th and 14th ;
 May 14th, 25th, 26th, 28th ; June 3rd, 4th, 5th, 6th,
 7th, 12th, 15th, 23rd, 25th, 27th ; July 2nd, 3rd, 4th,
 5th, 16th, 19th, 20th, 22nd, 23rd ; August 1st, 10th,
 13th, 16th, 26th ; Sept. 7th, 8th, 9th, 10th, 14th, 15th.
 A total of 40 days, with an average of 12·0 hours each
 day.

*Days on which notable continuous Sunshine occurred
 were :—*

January 9th ; February 2nd, 13th, 17th, 22nd,
 23rd ; March 11th, 12th, 13th, 24th, 25th, 26th ;
 April 14th ; May 28th ; June 4th, 5th, 6th, 7th, 12th,
 15th, 25th, 27th ; July 3rd, 4th, 5th ; August 10th ;
 September 7th, 8th, 9th, 15th ; October 26th ; Novem-
 ber 2nd, 17th ; December 4th, 31st.

No extreme temperatures were recorded during
 the year. The adopted mean temperature is $48^{\circ}\cdot3$,
 $1^{\circ}\cdot3$ above the average. The highest shade tem-
 perature, $81^{\circ}\cdot2$, on July 3rd and 7th, is $0^{\circ}\cdot1$ above
 the average, and the lowest, $22^{\circ}\cdot0$, on January 23rd
 and 24th, is $5^{\circ}\cdot2$ above the average. The three winter
 months, January, November and December, were
 somewhat colder than usual, while the remaining nine
 months, from February to October, had temperatures
 which were above normal, June, July and September

having the greatest excess, being each $3^{\circ}\cdot3$ above the average, whilst March and August were respectively $3^{\circ}\cdot1$ and $3^{\circ}\cdot0$ above the average.

Four gales of wind of 37 m.p.h. mean hourly velocity, or more, were recorded :—January 2nd, 3rd, 4th and 5th. The highest mean hourly velocity of the year was 47 m.p.h. on the 2nd, at 1,800 G.M.T., in direction South. February was the only month in which the total wind mileage was above the average, 7,947 miles, being 22% in excess. November and December were exceptionally calm. November, with a total of 4,854 miles, which constitutes a 66 years record for the least number of miles registered in the month, was 31% below the average, and December, with another record minimum total, 4,477 miles, was 42% below the average. The total mileage for the year, 71,671 miles, was 15% in defect of the normal, and was only 1,048 miles, or 1·5% above the record minimum of 70,623 miles in 1915.

The year on the whole was exceedingly dry, calm, and sunny.

SYNOPTIC METEOROLOGY.—The service has been continued throughout the year. A daily chart—for 0700 G.M.T.—was posted up in the College, and a daily forecast of local weather supplied to the *Lancashire Daily Post*. Occasional forecasts have been supplied to other newspapers, on request.

MAGNETICAL.—Absolute measures of Horizontal Magnetic Force have been made once each month, by the method of Vibration and Deflection. The constants of the magnetometer needles were described in our 1921 Annual Report (*p.* vii). The Inclination

is also measured, once each month, by two needles, with Dover's Circle, No. 159. The Declination is observed each week, and usually at about 16 hours. The Differential Instruments, or Photo-Magneto-graphs, which have been in practically continuous action since the year 1866, are of the Kew Observatory pattern, except that the radial distances between the centres of the magnets and the surfaces of the respective cylinders are somewhat shorter, being 152·4 Cms. The time-scale is provided by cutting off the light every two hours, by means of an electro-magnet actuated from the Synchronome Clock. The scale values of the instruments are as follows:—

| | | | |
|---------------------|-----|---------|----------------------|
| For the Unifilar | ... | 11·28' | per Cm. of Ordinate. |
| „ Bifilar to July 7 | | ·000500 | C.G.S. „ „ |
| „ „ after „ | | ·000505 | „ „ „ |

Owing to the cumulative effect of secular variation in Declination, it has become impossible to maintain the Vertical Force Balance in the Magnetic Meridian, and accordingly the instrument was dismantled on June 11th, 1930, and has since remained out of action.

Four daily readings are measured on the curves, the highest, the lowest, and those at the hours 4 and 16. The Base-line values are determined from the measures of the curve ordinates at the times of the absolute observations, the adopted value for each month being, in the case of Declination, the mean of the four or five observations of the month, and in the case of the Horizontal Force, the single value obtained from the observation about the middle of the month.

In the Tabular Summary on p. 37 the Absolute Measures of Horizontal Direction and Force are corrected by the difference between the curve ordinate at the time of observation and the monthly mean of the four daily readings on the five quietest days of the month, according to the rule stated on page xii of our Report for 1908.

The Vertical and Total Forces are deduced from the measures of the Horizontal Force, and the angle of Inclination or Dip.

In the Table of Magnetic Disturbances (page 38) the intention is that a *calm* (c) shall mean a smooth curve ; *small* (s) a disturbance noteworthy only as opposed to a calm ; *moderate* (m) a disturbance not to be neglected for any comparison with other phenomena, solar or terrestrial ; *greater* (g) a marked disturbance ; and *very great* (v.g.) a decided storm.

The rule followed in assigning these letters to denote the magnetic character of a day is as follows:—

From the measured ranges of D and H in minutes of arc on the five quietest days of a month a mean value is obtained of D and H combined. Similarly for each day of the month a mean value in minutes of arc of the range of D and H combined is set down. The excess of this mean daily range over the mean for the five quietest days gives the magnetic character of the day. Till the year 1927, inclusive, the following values of the excess were adopted for the table of magnetic disturbances :— 0 to 2 calm, 3 to 7 small, 8 to 15 moderate, 16 to 20 great, above 20 very great.

It has, however, been felt for some time (*cf.* Report 1925, p. xxiv) that the ranges assigned for the higher

character letters were too low, and accordingly a change was made in 1928 and the following scale adopted: (c) 0-2, (s) 3-7, (m) 8-20, (g) 21-65, (v.g.) over 65.

It follows from the nature of the process that these indications are not absolute, but relative to the mean amount of disturbance on the quiet days.

Corresponding tabulations are sent quarterly to the Meteorological Institute at De Bilt (Holland), for the International Committee on Terrestrial Magnetism. In these the significant notes are restricted to three—0 (quiet), 1 (moderately disturbed), and 2 (highly disturbed). The character figures are assigned according to the scheme detailed in the *Annuaire* for 1918 of the Royal Dutch Meteorological Institute. The civil day is used for both the international figures and for our own characteristic letters.

Magnetic activity, which showed a slight increase in 1932, has now declined to its lowest value so far in the expiring solar cycle, the variations in Solar and Magnetic activity for the past four years being as shown in the following Table:—

| | Solar | | | Magnetic Mean Daily Range | |
|------|------------------|-------------------------------|--------|------------------------------|--|
| | Spotless Days | Mean Area (1/5000 of Disc) | Decln. | H.F. γ | |
| 1930 | 4 | 2.44 | 16.9 | 88.7 | |
| 1931 | 46 | 1.26 | 13.8 | 59.5 | |
| 1932 | 118 | 0.81 | 14.4 | 62.8 | |
| 1933 | 249 | 0.41 | 13.4 | 58.1 | |

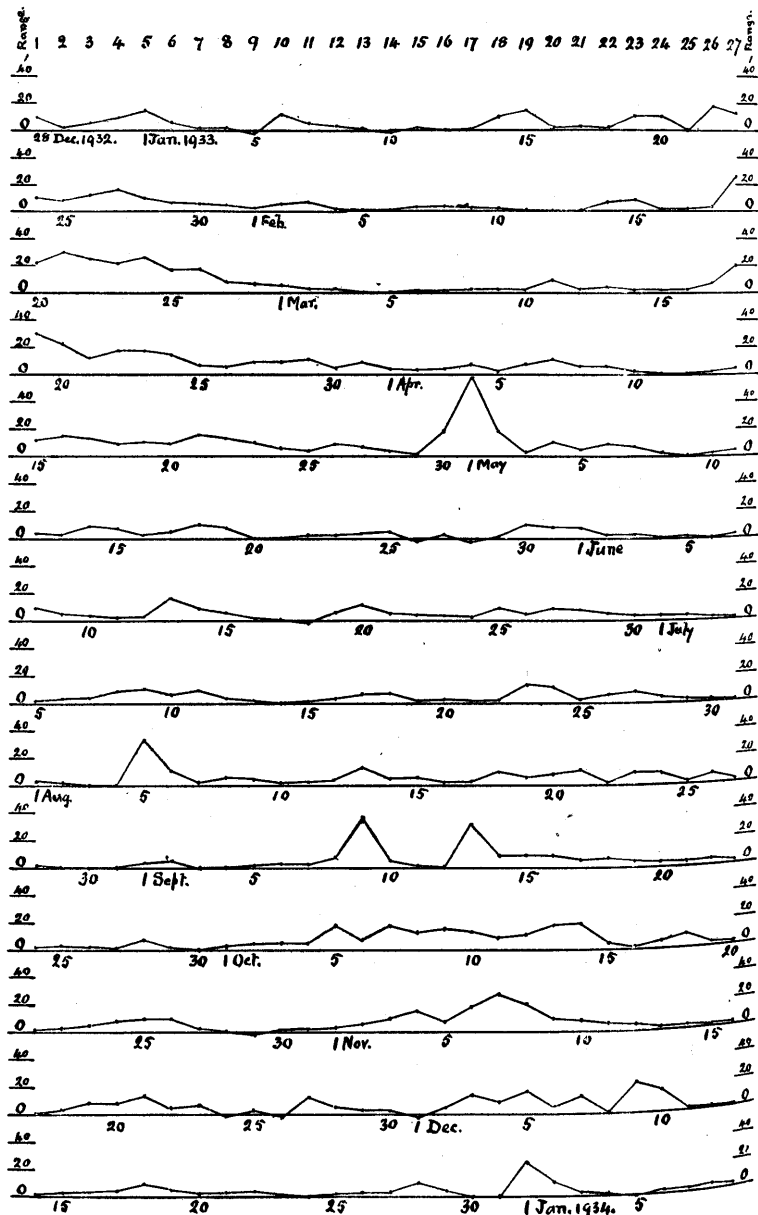
There were again no disturbances classed as "very great," and the number of days of "greater" disturbance fell from 22 to 15, and of "moderate"

from 104 to 102, whilst the number ranking as "small" increased from 122 to 127, and of "calms," from 117 to 121.

The chart on p. xvi. shows the magnetic character of each day of the year, divided into 27 day periods, the ordinates representing the values of diurnal range from which our character letters are determined, as explained on pp. xiii-xiv. Whilst there are indications of the persistence of some ill defined disturbances over several periods, the sequences are less marked than in previous years, and in certain cases there appears to be a tendency for distinct disturbances of small magnitude to coalesce into single disturbances of greater intensity and longer duration. The greatest disturbance of the year, on May 1st, appears to be an isolated one, not falling into any sequence.

Only one well defined "Sudden Commencement" was recorded during the year, on April 30th, at 16 h. 27 m., followed by the large disturbance of May 1st. On three other occasions movements were noted which may doubtfully be so classed, viz., May 29th, 6 h. 24 m. ; June 25th, 10 h. 3 m. ; and July 23rd, 9 h. 44 m. All were followed by moderate disturbances.

ASTRONOMICAL TIME SERVICE.—The rhythmic time signals from Rugby at 1000 G.M.T. have been regularly taken throughout the year, and the errors and rates of the sidereal and mean time clocks and chronometers determined from them. On occasion, supplementary time signals have also been received. Time marks are made by the Synchronome Clock every minute on the Milne-Shaw Seismograph, and every two hours on the Magnetographs.



1933. DAILY MAGNETIC CHARACTER IN 27-DAY PERIODS.

ASTRONOMICAL.—Only a few occultations were observed during the year, the results of which were forwarded to the Nautical Almanac Office. Observation on a number of occasions was prevented by clouds. A watch was kept for the Leonids throughout the night of November 16—17, but none were seen.

On August 3rd a conspicuous white spot on the equatorial zone of Saturn was discovered by Mr. W. Hay, F.R.A.S., and notice of the occurrence having been given in a British Astronomical Association circular, the object was observed and its time of central meridian passage determined on every possible occasion from August 9th to September 16th. It was unfortunate that persistently cloudy skies prevented any observation between August 9th and 23rd, so that the total number of determinations was small. The method of observation adopted, however, on all occasions, except the first, on August 9th, was not to rely on a single eye estimate of the time of Central Meridian transit, or on a single micrometer measure of the occurrence, but to make series of measurements with a filar micrometer of the time and position of the centre of the object as it passed across the disc of the planet, and to determine graphically from these observations the time at which it was on the central meridian. In this way errors of individual settings were largely eliminated, and a very consistent value of the rotation period was obtained. Observations on August 23rd, 26th and 29th, over periods of seven rotations gave identical values, uncorrected for differences in the time of light transmission and change of geocentric longitude of the planet, of 10 h. 14·14 m. The results of the investigation, with a correlation of

all the observations by others which were available, was embodied in a paper communicated to the Royal Astronomical Society, and published in the November issue of *The Monthly Notices*. The following Table gives a summary of the results obtained from the writer's own observations :—

| DATE 1933. | CENTRAL MERIDIAN PASSAGE | | ROTATIONS | | | PERIOD | |
|---------------|-----------------------------|----|-----------|-----|-----|--------|-------|
| | H. | M. | | | | H. | M. |
| Aug. 9 | 22 | 00 | ... | ... | ... | ... | ... |
| „ 23 | 23 | 46 | ... | 33 | ... | 10 | 14·12 |
| „ 26 | 23 | 25 | ... | 7 | ... | 10 | 14·14 |
| „ 29 | 23 | 04 | ... | 7 | ... | 10 | 14·14 |
| Sept. 1 | 22 | 39 | ... | 7 | ... | 10 | 13·57 |
| „ 16 | 20 | 57 | ... | 35 | ... | 10 | 14·23 |

SOLAR OBSERVATIONS.—Observation of the Solar Surface was made on 296 days, with the results shown in the table on pp. 39–40. Of the 296 days of observation 294 yielded drawings, of which 278 are complete, and show all spots and faculæ, and of the remaining 16, 12 are complete for spots. Professor Brunner, of Zurich, supplied 23 drawings used for measurement, and 37 observations of spotless days to fill gaps in our own observations, and eight of the Catania drawings, kindly put at our disposal by Professor Favaro, were used to further complete the record, and others were used for comparison purposes.

The work of Solar drawing was in the hands of Father Fleming till August, and has since been performed by the Director. Father Macklin is responsible for the measurements and reductions.

Owing to the difficulties mentioned in the general notes, it has not been possible to carry out any systematic

spectroscopic observations of the Sun, or to complete the spectrohelioscope.

Sun-spot statistics have been sent regularly to Professor Brunner, of Zurich, for the preparation of the "Sun-Spot Numbers," published in the quarterly Bulletin under the auspices of the I.A.U.

The observation days and daily projected areas in units $1/5000$ of the disc, are recorded on pages 39 and 40. The horizontal lines on these pages indicate the commencement of a new solar rotation in accordance with the Greenwich Convention.

There were no spots on 249 days, including the Zurich and Catania observations, as against 118 in 1932.

The Sun-Spot Statistics are given on pp. 41—42. The groups are numbered in the order of their appearance in the Stonyhurst drawings. Spots special to the Zurich or Catania drawings receive the same number with an accent (') as the Stonyhurst group which is nearest to them. There was only one such group this year, numbered 4', of area 0.12 units, which was only present for one day.

Finally, a few of the values of maximum area were obtained from the Zurich drawings. These have been duly indicated.

The following Table shows the distribution of spot groups in the Northern and Southern Hemispheres for the four quarters of the year, with their maximum projected areas. The last column but one gives the sum of the maximum projected areas of all the groups on the sun during the period in question.

| Quarter | Northern Hemisphere | | Southern Hemisphere | | Sum. of Max'm Areas | Daily Mean Areas |
|---------------------|---------------------|--------------|---------------------|-------------|---------------------|------------------|
| | No. of Groups | Max'm Areas | No. of Groups | Max'm Areas | | |
| Jan.—March ... | 11 | 22·06 | 1 | 0·03 | 22·09 | 1·44 |
| April—June ... | 6 | 3·19 | 3 | 0·32 | 3·51 | 0·14 |
| July—Sept. ... | 4 | 0·75 | 3 | 1·35 | 2·10 | 0·05 |
| Oct.—Dec. ... | 2 | 1·97 | 1 | 0·13 | 2·10 | 0·08 |
| TOTALS | 23 | 27·97 | 8 | 1·83 | 29·80 | 0·42 |

As indicated in the table under Magnetical Notes on p. xiv, both in the increase in the number of spotless days from 118 to 249, and in the decrease in mean daily disc area of spots from 0·81 to 0·41, solar activity shows a progressive decline towards minimum, whilst the appearance of a small group on October 29th, in 32° S. Latitude is indicative of the beginning of the new cycle.

SEISMOLOGICAL.—The total number of earthquakes recorded during the year was 106, as against 82 last year, distributed as follows :—

| | | | | | | | | | | | | |
|------|------|------|-------|-----|------|------|------|-------|------|------|------|-------|
| Jan. | Feb. | Mar. | April | May | June | July | Aug. | Sept. | Oct. | Nov. | Dec. | Total |
| 7 | 6 | 11 | 9 | 8 | 11 | 16 | 7 | 8 | 4 | 9 | 10 | 106 |

On January 14th, at about 8·30 a.m., an earthquake shock of somewhat unusual severity for British earthquakes was felt over a wide area in the North of England, and was recorded at all the British Seismological stations, and at a few on the Continent. As stated in the general notes this earthquake was made the subject of a detailed investigation, the results of which were communicated to the British Association at the Leicester meeting. The conclusions arrived at were that the epicentre was in Upper Wensleydale, in

Lat. $54^{\circ} 20' N.$, Long. $2^{\circ} 18' W.$, and that the intensity in the epicentral area was about 7 on the Rossi-Forel scale, whilst the disturbed area over which the shock could be just sensibly felt was about 25,000 square miles, which is about the average given for British earthquakes of this central intensity. A slight after-shock of the same origin was recorded on the 17th. A very slight tremor, reported as having been felt at Great Harwood, (five miles to the S.E. of Stonyhurst), about noon on July 7th, was recorded at the Observatory.

Of the recorded earthquakes, the greatest, as measured by amplitude of displacement on our records, was on March 2nd, having its origin off the coast of Japan. This was the greatest earthquake so far recorded since the installation of the Milne-Shaw seismograph, in September, 1923, with a range of oscillation of the recording light spot beyond the limits of registration, but estimated to be 24 inches, which, by calculation from the instrumental constants, gives the very large range of ground oscillation at Stonyhurst of about 1 inch, though the origin of the earthquake was at a distance of about 5,700 miles. Though the movement was so large, it would not be felt, owing to the long period of vibration of about 30 seconds.

Others of note were :—

| | | | |
|-------|----|-----|-----------------------|
| Feb. | 8 | ... | Chile. |
| April | 23 | ... | Island of Cos, Ægean. |
| „ | 27 | ... | Alaska. |
| May | 11 | ... | Greece. |
| June | 21 | ... | N. of Japan. |
| „ | 24 | ... | Sumatra. |

| | | | |
|-------|----|-----|-------------------|
| Aug. | 25 | ... | Tibet. |
| „ | 28 | ... | Sandwich Islands. |
| Sept. | 25 | ... | Mongolia. |
| Nov. | 20 | ... | Baffin Bay. |

The Californian earthquake of March 11th, though destructive at Long Beach and neighbouring towns, does not rank as a large earthquake according to our record.

Preliminary measurements of the principal shocks have been sent to the Official Centres, and complete bulletins are in preparation.

A number of original records or photographic copies of particular earthquakes have been supplied on request for special investigations.

Our grateful thanks are tendered to the Governments, Institutions, Observatories and individuals who have kindly contributed presentations to the Library during the year.

J. P. ROWLAND, S.J.,

Director.

MAXIMUM GUSTS FOR EACH DAY OF THE YEAR, 1933.

RECORDED BY THE DINES TUBE ANEMOGRAPH.

| 1933 | Jan. | Feb. | Mar. | April | May | June | July | Aug. | Sept. | Oct. | Nov. | Dec. | 1933 |
|------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|------|
| DAY | | | | | | | | | | | | | DAY |
| 1 | 33 | 51 | 35 | 41 | 27 | 30 | 24 | 40 | 29 | 26 | 46 | 40 | 1 |
| 2 | 55 | 50 | 24 | 42 | 49 | 26 | 20 | 28 | 22 | 25 | 40 | 26 | 2 |
| 3 | 53 | 27 | 28 | 42 | 50 | 23 | 23 | 22 | 20 | 12 | 32 | 54 | 3 |
| 4 | 47 | 43 | 32 | 26 | 25 | 21 | 19 | 14 | 13 | 23 | 27 | 51 | 4 |
| 5 | 51 | 56 | 44 | 18 | 40 | 27 | 26 | 13 | 24 | 15 | 12 | 34 | 5 |
| 6 | 42 | 25 | 40 | 18 | 30 | 17 | 27 | 22 | 22 | 14 | 14 | 22 | 6 |
| 7 | 43 | 31 | 36 | 22 | 21 | 18 | 28 | 27 | 27 | 23 | 16 | 28 | 7 |
| 8 | 39 | 40 | 32 | 19 | 20 | 24 | 30 | 30 | 31 | 25 | 10 | 25 | 8 |
| 9 | 38 | 48 | 29 | 34 | 45 | 30 | 35 | 40 | 33 | 46 | 25 | 37 | 9 |
| 10 | 15 | 37 | 19 | 23 | 22 | 29 | 37 | 20 | 30 | 32 | 25 | 28 | 10 |
| 11 | 25 | 15 | 25 | 18 | 26 | 25 | 37 | 11 | 32 | 50 | 12 | 10 | 11 |
| 12 | 8 | 26 | 18 | 32 | 26 | 28 | 40 | 11 | 30 | 36 | 11 | 24 | 12 |
| 13 | 10 | 23 | 19 | 24 | 18 | 32 | 36 | 24 | 34 | 30 | 32 | 32 | 13 |
| 14 | 36 | 23 | 34 | 20 | 28 | 23 | 33 | 20 | 27 | 30 | 20 | 34 | 14 |
| 15 | 36 | 26 | 36 | 37 | 24 | 23 | 18 | 38 | 22 | 32 | 40 | 21 | 15 |
| 16 | 20 | 31 | 46 | 22 | 19 | 38 | 35 | 27 | 22 | 51 | 40 | 10 | 16 |
| 17 | 14 | 30 | 17 | 27 | 20 | 38 | 27 | 42 | 32 | 31 | 30 | 12 | 17 |
| 18 | 7 | 46 | 37 | 37 | 14 | 40 | 29 | 42 | 30 | 20 | 38 | 8 | 18 |
| 19 | 13 | 40 | 30 | 39 | 16 | 21 | 24 | 36 | 23 | 33 | 36 | 9 | 19 |
| 20 | 23 | 25 | 32 | 24 | 34 | 15 | 24 | 37 | 20 | 38 | 20 | 4 | 20 |
| 21 | 23 | 28 | 24 | 24 | 15 | 26 | 18 | 32 | 27 | 35 | 24 | 5 | 21 |
| 22 | 22 | 40 | 37 | 14 | 22 | 18 | 18 | 29 | 20 | 19 | 15 | 12 | 22 |
| 23 | 16 | 20 | 35 | 28 | 28 | 19 | 24 | 37 | 27 | 17 | 11 | 12 | 23 |
| 24 | 23 | 48 | 25 | 20 | 31 | 23 | 27 | 20 | 32 | 30 | 28 | 10 | 24 |
| 25 | 27 | 42 | 25 | 25 | 35 | 38 | 28 | 26 | 36 | 42 | 26 | 15 | 25 |
| 26 | 25 | 39 | 14 | 30 | 24 | 21 | 29 | 20 | 16 | 50 | 20 | 12 | 26 |
| 27 | 32 | 32 | 20 | 30 | 15 | 27 | 32 | 26 | 20 | 38 | 22 | 18 | 27 |
| 28 | 26 | 24 | 15 | 20 | 20 | 20 | 32 | 24 | 37 | 40 | 25 | 26 | 28 |
| 29 | 31 | | 28 | 10 | 22 | 27 | 36 | 20 | 13 | 34 | 26 | 10 | 29 |
| 30 | 17 | | 31 | 22 | 15 | 28 | 37 | 27 | 21 | 30 | 21 | 32 | 30 |
| 31 | 44 | | 32 | | 18 | | 52 | 28 | | 46 | | 28 | 31 |

METEOROLOGICAL REPORT.

JANUARY, 1933.

| Results of Observations taken during the Month. | | Mean for the last 86 years. | | | | | | |
|---------------------------------------------------------------|---------------|-----------------------------|-----|-----|------|------|---------------|-----|
| Mean Reading of the Barometer | inches 29·655 | 29·484 | | | | | | |
| Highest „ „ on the 24th | „ 30·302 | 30·129 | | | | | | |
| Lowest „ „ on the 2nd | „ 28·815 | 28·598 | | | | | | |
| Range of Barometer Readings | „ 1·487 | 1·531 | | | | | | |
| Highest Reading of a Max. Therm. on the 2nd ... | 53·0 | 51·4 | | | | | | |
| Lowest Reading of a Min. Therm. on 23rd & 24th | 22·0 | 21·9 | | | | | | |
| Range of Thermometer Readings | 31·0 | 29·5 | | | | | | |
| Mean of Highest Daily Readings | 40·4 | 42·6 | | | | | | |
| Mean of Lowest Daily Readings | 31·6 | 33·3 | | | | | | |
| Mean Daily Range | 8·8 | 9·3 | | | | | | |
| Deduced Mean Temp. (from mean of Max. and Min.) | 35·8 | 37·7 | | | | | | |
| Mean Temperature from Dry Bulb | 36·4 | 38·0 | | | | | | |
| Adopted Mean Temperature | 36·1 | 37·9 | | | | | | |
| Mean Temperature of Evaporation | 34·9 | 36·6 | | | | | | |
| Mean Temperature of Dew Point | 32·7 | 34·6 | | | | | | |
| Mean elastic force of Vapour | inches 0·187 | 0·202 | | | | | | |
| Mean weight of Vapour in a cub. ft. of air, grains | 2·1 | 2·4 | | | | | | |
| Mean additional weight required for saturation „ | 0·4 | 0·4 | | | | | | |
| Mean degree of Humidity (saturation 100) | 85 | 87 | | | | | | |
| Mean weight of a cubic foot of air | grains 554·1 | 549·1 | | | | | | |
| Mean amount of Cloud (0—10) | 6·7 | 7·7 | | | | | | |
| Fall of Rain | inches 3·687 | 4·452 | | | | | | |
| Greatest Rainfall in one day (8th) [†] | „ 0·822 | 0·831 | | | | | | |
| No. of days on which ·005 in. or more Rain fell... | 16 | 19·8 | | | | | | |
| Wind:—Direction..... | N | NE | E | SE | S | SW | W | NW |
| No. of days..... | 7 | 2 | 5 | 1 | 5 | 7 | 3 | 1 |
| Mean Velocity in miles per hr. | 3·5 | 7·9 | 8·1 | 8·3 | 14·5 | 1·2 | 11·4 | 3·3 |
| Total No. of miles..... | 588 | 381 | 970 | 198 | 1741 | 2089 | 822 | 79 |
| Total No. of miles registered | 6868 | | | | | | Mean* 8286 | |
| Greatest hourly velocity (2nd, at 1800 G.M.T., Dir. S.) | 47 | | | | | | 41 | |

* For the last 66 years.

JANUARY, 1933.

DIFFERENCES.

The signs + and — mean respectively above and below the MONTHLY average.

| | | | | | |
|------------------------------------|-----|-----|-----|---|-----------|
| Mean barometric pressure | ... | ... | ... | + | 0·171 in. |
| Monthly range | " | " | " | — | 0·044 in. |
| Mean of highest daily temperatures | ... | ... | ... | — | 2·2° |
| Mean of lowest | " | " | " | — | 1·7° |
| Mean daily range | ... | ... | ... | — | 0·5° |
| Adopted mean temperature | ... | ... | ... | — | 1·8° |
| Total rainfall | ... | ... | ... | — | 0·765 in. |

Ground Frost on the 10th—12th and 18th—31st. Hoar Frost on the 10th, 12th, 23rd, and 26th. Snow on the 16th, 17th, 19th, and 30th. Hail on the 5th and 6th. Heavy Rain on the 2nd, 8th, and 31st. Gales of wind on the 2nd, 3rd, 4th, and 5th. Fog on the 8th, 10th, 12th, 13th, 14th, 18th, 19th, and 20th. Solar Halo on the 26th.

EXTREME READINGS FOR JANUARY.

During 86 Years.

| | | | |
|-----------------------------------|-----|-------------|------------|
| Highest reading of Barometer | ... | 1896 (9th) | 30·597 in. |
| Lowest | " | 1884 (26th) | 27·803 in. |
| Highest temperature | ... | 1877 (7th) | 59·9° |
| Lowest | " | 1881 (15th) | 4·6° |
| Highest adopted mean temperature | ... | 1916 | 44·7° |
| Lowest | " | 1881 | 29·2° |
| Greatest fall of rain | ... | 1928 | 12·267 in. |
| Least | " | 1881 | 0·472 in. |
| Greatest fall of rain in one day | ... | 1914 (8th) | 2·074 in. |
| Greatest No. of days on which | | | |
| ·005 in. or more rain fell | ... | 1890 | 30 |
| Least | " | †1850 | 8 |
| *Greatest hourly velocity of wind | ... | 1899 (12th) | 63 mls. |
| *Greatest No. of miles registered | ... | 1890 | 11661 |
| *Least | " | 1881 | 4352 |

* Since 1867 only. † And in other years.

FEBRUARY, 1933.

| Results of Observations taken during the Month. | | Mean for the last 86 years. | | | | | | |
|-------------------------------------------------------------------|---------------|-----------------------------|------|----|---|------|-------|------|
| Mean Reading of the Barometer | inches 29.510 | 29.498 | | | | | | |
| Highest " " on the 11th... | " 30.210 | 30.109 | | | | | | |
| Lowest " " on the 1st ... | " 28.747 | 28.662 | | | | | | |
| Range of Barometer Readings | " 1.463 | 1.447 | | | | | | |
| Highest Reading of a Max. Therm. on the 9th ... | 53.6 | 52.1 | | | | | | |
| Lowest Reading of a Min. Therm. on the 20th..... | 24.2 | 22.6 | | | | | | |
| Range of Thermometer Readings | 29.4 | 29.5 | | | | | | |
| Mean of Highest Daily Readings | 43.2 | 43.8 | | | | | | |
| Mean of Lowest Daily Readings | 33.8 | 33.6 | | | | | | |
| Mean Daily Range | 9.4 | 10.2 | | | | | | |
| Deduced Mean Temp. (from mean of Max. and Min.) | 38.1 | 38.2 | | | | | | |
| Mean Temperature from Dry Bulb | 39.0 | 38.5 | | | | | | |
| Adopted Mean Temperature | 38.6 | 38.4 | | | | | | |
| Mean Temperature of Evaporation | 37.0 | 36.8 | | | | | | |
| Mean Temperature of Dew Point | 34.4 | 34.6 | | | | | | |
| Mean elastic force of Vapour | inches 0.199 | 0.196 | | | | | | |
| Mean weight of Vapour in a cub. ft. of air, grains | 2.3 | 2.4 | | | | | | |
| Mean additional weight required for saturation .. | 0.5 | 0.4 | | | | | | |
| Mean degree of Humidity (saturation 100) | 82 | 86 | | | | | | |
| Mean weight of a cubic foot of air | grains 548.4 | 548.7 | | | | | | |
| Mean amount of Cloud (0—10) | 6.5 | 7.5 | | | | | | |
| Fall of Rain | inches 4.823 | 3.510 | | | | | | |
| Greatest Rainfall in one day (3rd) | " 1.291 | 0.757 | | | | | | |
| No. of days on which .005 in. or more Rain fell... | 15 | 16.7 | | | | | | |
| Wind:—Direction..... | N | NE | E | SE | S | SW | W | NW |
| No. of days..... | 8 | 2 | 4 | 0 | 0 | 3 | 9 | 2 |
| Mean Velocity in miles per hr. | 9.1 | 9.2 | 16.1 | 0 | 0 | 12.7 | 12.9 | 10.9 |
| Total No. of miles..... | 1749 | 442 | 1543 | 0 | 0 | 913 | 2777 | 523 |
| Total No. of miles registered | 7947 | | | | | | Mean* | |
| Greatest hourly velocity (5th, at 1100 G.M.T., Dir. W.S.W.) | 34 | | | | | | 7348 | |
| | | | | | | | 40 | |

* For the last 86 years

FEBRUARY, 1933.

DIFFERENCES.

The signs + and — mean respectively above and below the MONTHLY average.

| | | | | | | |
|------------------------------------|-----|-----|-----|-----|---|-----------|
| Mean barometric pressure | ... | ... | ... | ... | + | 0·012 in. |
| Monthly range | .. | .. | .. | .. | + | 0·016 in. |
| Mean of highest daily temperatures | ... | ... | ... | ... | — | 0·6° |
| Mean of lowest | .. | .. | .. | .. | + | 0·2° |
| Mean daily range | ... | ... | ... | ... | — | 0·8° |
| Adopted mean temperature | ... | ... | ... | ... | + | 0·2° |
| Total rainfall | ... | ... | ... | ... | + | 1·546 in. |

Ground Frost on the 3rd, and 11th—26th. Hoar Frost on the 11th, 13th, 14th, and 20th. Snow on the 18th, 19th, 21st, 24th, 25th, and 26th. Hail on the 17th. Heavy Rain on the 3rd, 9th and 25th. Fog on the 6th, 7th, and 8th. Solar Halo on the 3rd.

EXTREME READINGS FOR FEBRUARY,

During 86 Years.

| | | | | | | |
|-----------------------------------|-------|------------|-------|-------------|-------|------------|
| Highest reading of Barometer | ... | 1902 (1st) | ..... | 30·476 in. | | |
| Lowest | .. | .. | ... | 1900 (19th) | | 27·870 in. |
| Highest temperature | ... | ... | ... | 1877 (8th) | | 58·3° |
| Lowest | .. | | ... | 1902 (11th) | | 5·0° |
| Highest adopted mean temperature | ..... | 1869 | ..... | 44·0° | | |
| Lowest | .. | .. | ... | 1855 | | 28·6° |
| Greatest fall of rain | ..... | 1848 | ..... | 8·882 in. | | |
| Least | .. | | ... | 1932 | | 0·123 in. |
| Greatest fall of rain in one day | ... | 1909 (3rd) | ..... | 2·000 in. | | |
| Greatest No. of days on which | ..... | 1910 | ..... | 27 | | |
| ·005 or more rain fell | ..... | 1855 | ..... | 4 | | |
| Least | .. | .. | ... | 1903 (27th) | | 60 mls. |
| *Greatest hourly velocity of wind | .. | 1868 | ..... | 12577 | | |
| *Greatest No. of miles registered | ... | 1917 | ..... | 3160 | | |
| *Least | .. | .. | ... | | | |

* Since 1867 only.

MARCH, 1933.

| Results of Observations taken during the Month. | | Mean for the last 86 years. | | | | | | |
|---------------------------------------------------------------|---------------|-----------------------------|------|----|------|------|---------------|----|
| Mean Reading of the Barometer | inches 29·434 | 29·456 | | | | | | |
| Highest " " on the 27th ... | " 29·994 | 30·045 | | | | | | |
| Lowest " " on the 17th ... | " 28·453 | 28·669 | | | | | | |
| Range of Barometer Readings | " 1·541 | 1·376 | | | | | | |
| Highest Reading of a Max. Therm. on the 28th... | 58·8 | 56·9 | | | | | | |
| Lowest Reading of a Min. Therm. on the 28th... | 29·4 | 23·5 | | | | | | |
| Range of Thermometer Readings | 29·4 | 33·4 | | | | | | |
| Mean of Highest Daily Readings | 51·2 | 47·0 | | | | | | |
| Mean of Lowest Daily Readings | 36·7 | 34·5 | | | | | | |
| Mean Daily Range | 14·5 | 12·5 | | | | | | |
| Deduced Mean Temp. (from mean of Max. and Min.) | 43·0 | 39·8 | | | | | | |
| Mean Temperature from Dry Bulb | 43·4 | 40·4 | | | | | | |
| Adopted Mean Temperature | 43·2 | 40·1 | | | | | | |
| Mean Temperature of Evaporation | 40·8 | 38·2 | | | | | | |
| Mean Temperature of Dew Point | 37·7 | 35·8 | | | | | | |
| Mean elastic force of Vapour | inches 0·226 | 0·210 | | | | | | |
| Mean weight of Vapour in a cub. ft. of air, grains | 2·6 | 2·4 | | | | | | |
| Mean additional weight required for saturation .. | 0·6 | 0·5 | | | | | | |
| Mean degree of Humidity (saturation 100) | 79 | 85 | | | | | | |
| Mean weight of a cubic foot of air | grains 542·0 | 546·1 | | | | | | |
| Mean amount of Cloud (0—10) | 5·7 | 7·4 | | | | | | |
| Fall of Rain | inches 2·683 | 3·277 | | | | | | |
| Greatest Rainfall in one day (3rd) | " 0·470 | 0·747 | | | | | | |
| No. of days on which ·005 in. or more Rain fell... | 16 | 16·5 | | | | | | |
| Wind :—Direction..... | N | NE | E | SE | S | SW | W | NW |
| No. of Days | 1 | 5 | 5 | 0 | 4 | 6 | 10 | 0 |
| Mean Velocity in miles per hr. | 4·7 | 6·6 | 8·9 | 0 | 12·2 | 13·4 | 8·7 | 0 |
| Total No. of miles..... | 113 | 786 | 1072 | 0 | 1170 | 1926 | 2098 | 0 |
| Total No. of miles registered | 7165 | | | | | | Mean* 8254 | |
| Greatest hourly velocity (5th, at 2400 G.M.T., Dir. S..... | 34 | | | | | | 39 | |

* For the last 86 years.

MARCH, 1933.

DIFFERENCES.

The signs + and — mean respectively above and below the MONTHLY average.

| | | | | | |
|------------------------------------|-----|-----|-----|---|-----------|
| Mean barometric pressure | ... | ... | ... | — | 0·022 in. |
| Monthly range | .. | .. | .. | + | 0·165 in. |
| Mean of highest daily temperatures | ... | ... | ... | + | 4·2° |
| Mean of lowest | .. | .. | .. | + | 2·2° |
| Mean daily range | ... | ... | ... | + | 2·0° |
| Adopted mean temperature | ... | ... | ... | + | 3·1° |
| Total rainfall | ... | ... | ... | — | 0·594 in. |

Ground Frost on the 13th, 21st, 24th—29th. Hoar Frost on the 27th and 28th. Hail on the 30th. Fog on the 3rd, 4th, 13th, and 27th. Lightning on the 18th. Solar Halo on the 6th.

EXTREME READINGS FOR MARCH,

During 86 Years.

| | | | | |
|-----------------------------------|-------|-------------|-------|------------|
| Highest reading of Barometer | ... | 1854 (4th) | ..... | 30·452 in. |
| Lowest | .. | 1876 (10th) | ..... | 28·100 in. |
| Highest temperature | ... | 1871 (25th) | ..... | 68·0° |
| Lowest | .. | 1874 (10th) | ..... | 11·1° |
| Highest adopted mean temperature | ... | 1920 | ..... | 44·2° |
| Lowest | .. | 1883 | ..... | 34·4° |
| Greatest fall of rain | ..... | 1912 | ..... | 7·205 in. |
| Least | .. | 1852 | ..... | 0·352 in. |
| Greatest fall of rain in one day | ... | 1898 (17th) | ..... | 1·540 in. |
| Greatest No. of days on which | | | | |
| ·005 in. or more rain fell | ... | †1861 | ..... | 28 |
| Least | .. | 1852 | ..... | 3 |
| *Greatest hourly velocity of wind | ... | 1905 (15th) | ..... | 57 mls. |
| *Greatest No. of miles registered | ... | 1903 | ..... | 12773 |
| *Least | .. | 1929 | ..... | 4437 |

* Since 1867 only.

† And 1914.

APRIL, 1933.

| Results of Observations taken during the Month. | Mean for the last 86 years | |
|-------------------------------------------------------|----------------------------------|--------|
| Mean Reading of the Barometer inches | 29·654 | 29·481 |
| Highest " " on the 14th ... " | 30·079 | 29·955 |
| Lowest " " on the 29th ... " | 29·280 | 28·804 |
| Range of Barometer Readings | 0·799 | 1·151 |
| Highest Reading of a Max. Therm. on the 7th ... | 61·2 | 64·2 |
| Lowest Reading of a Min. Therm. on the 19th ... | 31·2 | 28·3 |
| Range of Thermometer Readings | 30·0 | 35·9 |
| Mean of Highest Daily Readings | 52·7 | 54·0 |
| Mean of Lowest Daily Readings | 40·8 | 37·9 |
| Mean Daily Range | 11·9 | 16·1 |
| Deduced Mean Temp. (from mean of Max. and Min.) | 45·3 | 43·8 |
| Mean Temperature from Dry Bulb | 47·0 | 44·7 |
| Adopted Mean Temperature | 46·2 | 44·3 |
| Mean Temperature of Evaporation | 43·8 | 41·6 |
| Mean Temperature of Dew Point | 40·2 | 38·2 |
| Mean elastic force of Vapour inches | 0·249 | 0·234 |
| Mean weight of Vapour in a cub. ft. of air, grains | 2·9 | 2·7 |
| Mean additional weight required for saturation .. | 0·8 | 0·7 |
| Mean degree of Humidity (saturation 100) | 76 | 80 |
| Mean weight of a cubic foot of air grains | 542·0 | 542·0 |
| Mean amount of Cloud (0—10) | 7·4 | 6·8 |
| Fall of Rain | 1·702 | 2·569 |
| Greatest Rainfall in one day (8th) | 0·470 | 0·595 |
| No. of days on which ·005 in. or more Rain fell... | 10 | 14·9 |

| Wind :—Direction..... | N | NE | E | SE | S | SW | W | NW |
|--------------------------------|-----|-----|-----|----|-----|------|------|-----|
| No. of days..... | 3 | 3 | 3 | 0 | 3 | 1 | 14 | 3 |
| Mean Velocity in miles per hr. | 4·8 | 5·3 | 8·0 | 0 | 9·3 | 11·0 | 9·2 | 7·7 |
| Total No. of miles..... | 349 | 382 | 579 | 0 | 671 | 265 | 3094 | 555 |

| | | | |
|------------------------------------------------------------------|------|-------|------|
| Total No. of miles registered | 5895 | Mean* | 7452 |
| Greatest hourly velocity (3rd, at 1200 G.M.T., Dir. W.) | 27 | | 36 |

* For the last 66 years.

APRIL, 1933.

DIFFERENCES.

The signs + and — mean respectively above and below the MONTHLY average.

| | | | | | | |
|------------------------------------|-----|-----|-----|-----|---|-----------|
| Mean barometric pressure | ... | ... | ... | ... | + | 0.173 in. |
| Monthly range | .. | .. | .. | .. | — | 0.352 in. |
| Mean of highest daily temperatures | ... | ... | ... | ... | — | 1.3° |
| Mean of lowest | .. | .. | .. | .. | + | 2.9° |
| Mean daily range | ... | ... | ... | ... | — | 4.2° |
| Adopted mean temperature | ... | ... | ... | ... | + | 1.9° |
| Total rainfall | ... | ... | ... | ... | — | 0.867 in. |

Ground Frost on the 2nd, 8th, 13th, 14th, and 19th—22nd.
 Hoar Frost on the 19th. Snow on the 19th. Hail on the 20th.
 Thunder on the 29th and 30th. Solar Halo on the 28th.

EXTREME READINGS FOR APRIL,

During 86 Years.

| | | | | |
|-------------------------------------------------------------|-------|-------------|-------|------------|
| Highest reading of Barometer | ... | 1906 (8th) | ..... | 30.317 in. |
| Lowest | .. | 1919 (14th) | ..... | 28.250 in. |
| Highest temperature | ..... | 1852 (14th) | ..... | 74.1° |
| Lowest | .. | 1917 (2nd) | ..... | 13.6° |
| Highest adopted mean temperature | ..... | 1865 | ..... | 48.5° |
| Lowest | .. | 1917 | ..... | 39.8° |
| Greatest fall of rain | ..... | 1867 | ..... | 5.672 in. |
| Least | .. | 1852 | ..... | 0.478 in. |
| Greatest fall of rain in one day | ... | 1923 (12th) | ..... | 1.260 in. |
| Greatest No. of days on which .005 in. or more rain fell | ..... | 1920 | ..... | 27 |
| Least | .. | 1852 | ..... | 4 |
| *Greatest hourly velocity of wind | .. | 1911 (19th) | ..... | 53 mls. |
| *Greatest No. of miles registered | ... | 1904 | ..... | 11016 |
| *Least | .. | 1884 | ..... | 5047 |

* Since 1867 only.

MAY, 1933.

| Results of Observations taken during the Month. | | | | | | | Mean for the last 86 years. | | |
|------------------------------------------------------------------|--------|--------|-----|-----|-----|-----|-----------------------------|--------|--|
| Mean Reading of the Barometer | inches | 29.541 | | | | | | 29.535 | |
| Highest " " on the 17th ... | " " | 29.796 | | | | | | 29.976 | |
| Lowest " " on the 7th ... | " " | 29.059 | | | | | | 28.949 | |
| Range of Barometer Readings | " | 0.737 | | | | | | 1.027 | |
| Highest Reading of a Max. Therm. on the 20th... | | 69.6 | | | | | | 71.9 | |
| Lowest Reading of a Min. Therm. on the 2nd ... | | 39.6 | | | | | | 32.2 | |
| Range of Thermometer Readings | | 30.0 | | | | | | 39.7 | |
| Mean of Highest Daily Readings | | 59.0 | | | | | | 59.2 | |
| Mean of Lowest Daily Readings | | 46.2 | | | | | | 42.7 | |
| Mean Daily Range | | 12.8 | | | | | | 16.5 | |
| Deduced Mean Temp. (from mean of Max. and Min.) | | 50.9 | | | | | | 49.2 | |
| Mean Temperature from Dry Bulb | | 52.4 | | | | | | 50.1 | |
| Adopted Mean Temperature | | 51.7 | | | | | | 49.7 | |
| Mean Temperature of Evaporation | | 47.5 | | | | | | 46.5 | |
| Mean Temperature of Dew Point | | 42.5 | | | | | | 43.0 | |
| Mean elastic force of Vapour | inches | 0.273 | | | | | | 0.280 | |
| Mean weight of Vapour in a cub. ft. of air, grains | | 3.1 | | | | | | 3.2 | |
| Mean additional weight required for saturation " | | 1.3 | | | | | | 0.8 | |
| Mean degree of Humidity (saturation 100) | | 67 | | | | | | 77 | |
| Mean weight of a cubic foot of air | grains | 534.2 | | | | | | 536.8 | |
| Mean amount of Cloud (0—10) | | 7.8 | | | | | | 7.0 | |
| Fall of Rain | inches | 1.765 | | | | | | 2.474 | |
| Greatest Rainfall in one day (3rd) | " | 0.340 | | | | | | 0.645 | |
| No. of days on which .005 in. or more Rain fell... | | 16 | | | | | | 14.8 | |
| Wind:—Direction | N | NE | E | SE | S | SW | W | NW | |
| No. of days..... | 2 | 4 | 3 | 1 | 5 | 5 | 10 | 1 | |
| Mean Velocity in miles per hr. | 6.4 | 8.5 | 9.8 | 5.0 | 7.5 | 6.4 | 8.9 | 4.6 | |
| Total No. of miles..... | 308 | 812 | 705 | 120 | 898 | 765 | 2129 | 111 | |
| Total No. of miles registered | 5848 | | | | | | Mean* 6831 | | |
| Greatest hourly velocity (3rd, at 0400 G.M.T., Dir. E.) | 30 | | | | | | 32 | | |

* For the last 66 years.

MAY, 1933.

DIFFERENCES.

The signs + and — mean respectively above and below the MONTHLY average.

| | | | | | |
|------------------------------------|-----|-----|-----|---|-----------|
| Mean barometric pressure | .. | ... | ... | + | 0.006 in. |
| Monthly range | .. | ... | ... | — | 0.290 in. |
| Mean of highest daily temperatures | ... | ... | ... | — | 0.2° |
| Mean of lowest | .. | .. | ... | + | 3.5° |
| Mean daily range | ... | ... | ... | — | 3.7° |
| Adopted mean temperature | ... | ... | ... | + | 2.0° |
| Total rainfall | ... | ... | ... | — | 0.709 in. |

Hail on the 14th. Fog on the 17th, 18th, 22nd and 23rd.
Thunder on the 6th and 27th. Lightning on the 6th and 22nd.

EXTREME READINGS FOR MAY,

During 86 Years.

| | | | | |
|-------------------------------------------------------------|-------|-------------|-------|------------|
| Highest reading of Barometer | ... | 1881 (10th) | ..... | 30.332 in. |
| Lowest | .. | 1887 (28th) | ..... | 28.559 in. |
| Highest temperature | ..... | 1864 (19th) | ..... | 82.5° |
| Lowest | .. | 1855 (4th) | ..... | 23.5° |
| Highest adopted mean temperature | ..... | 1848 | ..... | 55.1° |
| Lowest | .. | 1855 | ..... | 45.0° |
| Greatest fall of rain | ..... | 1924 | ..... | 6.765 in. |
| Least | .. | 1859 | ..... | 0.249 in. |
| Greatest fall of rain in one day | ... | 1881 (5th) | ..... | 1.647 in. |
| Greatest No. of days on which .005 in. or more rain fell | ... | †1860 | ..... | 22 |
| Least | .. | †1848 | ..... | 4 |
| *Greatest hourly velocity of wind... | ... | 1888 (2nd) | ..... | 49 mls. |
| *Greatest No. of miles registered | ... | 1888 | ..... | 9648 |
| *Least | .. | 1918 | ..... | 5113 |

* Since 1867 only.

† And in other years.

JUNE, 1933.

| Results of Observations taken during the Month. | | | | | | | | Mean for the last 86 years. |
|-----------------------------------------------------------------------|-----------------|--------|-----|-----|-----|------|------|-----------------------------------|
| Mean Reading of the Barometer | inches | 29.455 | | | | | | 29.560 |
| Highest | on the 9th ... | 29.936 | | | | | | 29.938 |
| Lowest | on the 18th ... | 28.763 | | | | | | 29.046 |
| Range of Barometer Readings | .. | 1.173 | | | | | | 0.892 |
| Highest Reading of a Max. Therm. on the 7th.... | | 81.0 | | | | | | 76.4 |
| Lowest Reading of a Min. Therm. on the 12th... | | 40.4 | | | | | | 39.2 |
| Range of Thermometer Readings | | 40.6 | | | | | | 37.2 |
| Mean of Highest Daily Readings | | 67.1 | | | | | | 64.9 |
| Mean of Lowest Daily Readings | | 51.4 | | | | | | 48.2 |
| Mean Daily Range | | 15.7 | | | | | | 16.7 |
| Deduced Mean Temp. (from mean of Max. and Min.) | | 57.5 | | | | | | 54.8 |
| Mean Temperature from Dry Bulb | | 59.1 | | | | | | 55.3 |
| Adopted Mean Temperature | | 58.3 | | | | | | 55.0 |
| Mean Temperature of Evaporation | | 53.8 | | | | | | 51.8 |
| Mean Temperature of Dew Point | | 49.1 | | | | | | 48.2 |
| Mean elastic force of Vapour | inches | 0.348 | | | | | | 0.345 |
| Mean weight of Vapour in a cub. ft. of air, grains | | 3.9 | | | | | | 3.8 |
| Mean additional weight required for saturation .. | | 1.7 | | | | | | 1.0 |
| Mean degree of Humidity (saturation 100) | | 69 | | | | | | 78 |
| Mean weight of a cubic foot of air | grains | 525.3 | | | | | | 531.3 |
| Mean amount of Cloud (0—10) | | 6.2 | | | | | | 7.2 |
| Fall of Rain | inches | 2.535 | | | | | | 3.444 |
| Greatest Rainfall in one day (17th) | .. | 0.800 | | | | | | 0.801 |
| No. of days on which .005 in. or more Rain fell... | | 10 | | | | | | 15.0 |
| Wind:—Direction | N | NE | E | SE | S | SW | W | NW |
| No. of days..... | 7 | 7 | 2 | 1 | 4 | 1 | 8 | 0 |
| Mean Velocity in miles per hr. | 5.7 | 6.2 | 5.8 | 8.9 | 9.1 | 11.2 | 8.9 | 0 |
| Total No. of miles..... | 957 | 1047 | 276 | 214 | 875 | 268 | 1700 | 0 |
| Total No. of miles registered | | | | | | | | Mean* |
| Greatest hourly velocity (1st, at 1300 G.M.T., Dir., S.S.E.) | | | | | | | | 6173 |
| | | | | | | | 24 | 29 |

* For the last 66 years.

JUNE, 1933.

DIFFERENCES.

The signs + and — mean respectively above and below the MONTHLY average.

| | | | | | |
|------------------------------------|-----|-----|-----|---|-----------|
| Mean barometric pressure | ... | ... | ... | — | 0·105 in. |
| Monthly range | „ | ... | ... | + | 0·281 in. |
| Mean of highest daily temperatures | ... | ... | ... | + | 2·2° |
| Mean of lowest | „ | „ | ... | + | 3·2° |
| Mean daily range | ... | ... | ... | — | 1·0° |
| Adopted mean temperature | ... | ... | ... | + | 3·3° |
| Total rainfall | ... | ... | ... | — | 0·909 in. |

Heavy Rain on the 17th and 18th. Thunder on the 8th, 20th, 21st and 22nd. Lightning on the 8th, 20th, 21st and 22nd. Solar Halo on the 7th.

EXTREME READINGS FOR JUNE,

During 86 Years.

| | | | | |
|--------------------------------------|-------|-------------|-------|------------|
| Highest reading of Barometer | ... | 1874 (15th) | ..... | 30·219 in |
| Lowest | „ | 1862 (12th) | ..... | 28·632 in. |
| Highest temperature | ..... | 1893 (18th) | ..... | 88·7° |
| Lowest | „ | 1902 (9th) | ..... | 32·0° |
| Highest adopted mean temperature | ..... | 1896 | ..... | 59·3° |
| Lowest | „ | 1907 | ..... | 51·5° |
| Greatest fall of rain | ..... | 1907 | ..... | 8·705 in. |
| Least | „ | 1925 | ..... | 0·282 in. |
| Greatest fall of rain in one day | ... | 1857 (8th) | ..... | 2·093 in. |
| Greatest No. of days on which | | | | |
| ·005 in. or more rain fell | ... | †1907 | ..... | 27 |
| Least | „ | 1887 | ..... | 4 |
| *Greatest hourly velocity of wind... | ... | 1897 (16th) | ..... | 45 mls |
| *Greatest No. of miles registered | ... | 1877 | ..... | 8384 |
| *Least | „ | 1915 | ..... | 3967 |

* Since 1867 only.

† And 1912.

JULY, 1933.

| Results of Observations taken during the Month. | | | Mean for the last 86 years. |
|----------------------------------------------------|--------|--------|-----------------------------------|
| Mean Reading of the Barometer | inches | 29.584 | 29.522 |
| Highest " " on the 3rd ... | " | 30.139 | 29.903 |
| Lowest " " on the 13th ... | " | 28.976 | 29.000 |
| Range of Barometer Readings | " | 1.163 | 0.903 |
| Highest Reading of a Max. Therm. on the 3rd, 7th | | 81.2 | 78.2 |
| Lowest Reading of a Min. Therm. on the 30th... | | 47.6 | 43.0 |
| Range of Thermometer Readings | | 33.6 | 35.2 |
| Mean of Highest Daily Readings | | 69.7 | 67.2 |
| Mean of Lowest Daily Readings | | 54.7 | 51.4 |
| Mean Daily Range | | 15.0 | 15.8 |
| Deduced Mean Temp. (from mean of Max. and Min.) | | 60.3 | 57.6 |
| Mean Temperature from Dry Bulb | | 62.0 | 58.1 |
| Adopted Mean Temperature | | 61.2 | 57.9 |
| Mean Temperature of Evaporation | | 58.2 | 54.8 |
| Mean Temperature of Dew Point | | 55.0 | 52.0 |
| Mean elastic force of Vapour | inches | 0.433 | 0.389 |
| Mean weight of Vapour in a cub. ft. of air, grains | | 4.8 | 4.4 |
| Mean additional weight required for saturation " | | 1.4 | 1.1 |
| Mean degree of Humidity (saturation 100) | | 78 | 81 |
| Mean weight of a cubic foot of air | grains | 524.0 | 527.4 |
| Mean amount of Cloud (0—10) | | 6.7 | 7.4 |
| Fall of Rain | inches | 3.465 | 4.056 |
| Greatest Rainfall in one day (30th) | " | 0.600 | 0.880 |
| No. of days on which .005 in. or more Rain fell... | | 15 | 16.8 |

| Wind:—Direction..... | N | NE | E | SE | S | SW | W | NW |
|--------------------------------|---|----|-----|----|------|------|------|-----|
| No. of days..... | 0 | 0 | 3 | 0 | 2 | 4 | 19 | 3 |
| Mean Velocity in miles per hr. | 0 | 0 | 9.2 | 0 | 12.9 | 10.0 | 7.5 | 5.1 |
| Total No. of Miles..... | 0 | 0 | 663 | 0 | 617 | 961 | 3448 | 367 |

| | | | |
|-----------------------------------------------------------------------|------|-------|------|
| Total No. of miles registered | 6056 | Mean* | 6307 |
| Greatest hourly velocity (31st, at 0800 G.M.T., Dir. W.S.W.) | 28 | | 28 |

* For the last 66 years.

JULY, 1933.

DIFFERENCES.

The signs + and — mean respectively above and below the
MONTHLY average.

| | | | | | |
|------------------------------------|-----|-----|-----|---|-----------|
| Mean barometric pressure | ... | ... | ... | + | 0·062 in. |
| Monthly range | " | " | " | + | 0·260 in. |
| Mean of highest daily temperatures | ... | ... | ... | + | 2·5° |
| Mean of lowest | " | " | " | + | 3·3° |
| Mean daily range | ... | ... | ... | — | 0·8° |
| Adopted mean temperature | ... | ... | ... | + | 3·3° |
| Total rainfall | ... | ... | ... | — | 0·591 in. |

Heavy Rain on the 9th, 10th and 30th. Thunder on the 7th,
11th, 19th and 27th. Lightning on the 7th and 19th.

EXTREME READINGS FOR JULY,

During 86 Years.

| | | | |
|-------------------------------------------------------------|-------|-------------|------------|
| Highest reading of Barometer | ... | 1911 (10th) | 30·203 in. |
| Lowest | " | 1922 (6th) | 28·493 in. |
| Highest temperature | ..... | 1901 (20th) | 89·0° |
| Lowest | " | 1857 (1st) | 36·0° |
| Highest adopted mean temperature | ..... | 1901 | 63·2° |
| Lowest | " | 1922 | 54·0° |
| Greatest fall of rain | ..... | 1888 | 8·475 in. |
| Least | " | 1868 | 0·669 in. |
| Greatest fall of rain in one day | ... | 1888 (2nd) | 2·482 in. |
| Greatest No. of days on which ·005 in. or more rain fell | ... | †1920 | 28 |
| Least | " | †1863 | 8 |
| *Greatest hourly velocity of wind | .. | 1892 (8th) | 44 mls. |
| *Greatest No. of miles registered | ... | 1879 | 8288 |
| *Least | " | 1913 | 4577 |

* Since 1867 only.

† And in other years.

AUGUST, 1933.

| Results of Observations taken during the Month. | | Mean for the last 86 years | | | | | | |
|--------------------------------------------------------------------|---------------|----------------------------|---|-----|-----|------|---------------|------|
| Mean Reading of the Barometer | inches 29.597 | 29.494 | | | | | | |
| Highest ,, ,, on the 3rd ... | ,, 29.952 | 29.897 | | | | | | |
| Lowest ,, ,, on the 15th ... | ,, 29.166 | 28.950 | | | | | | |
| Range of Barometer Readings | 0.786 | 0.947 | | | | | | |
| Highest Reading of a Max. Therm. on the 5th ... | 79.2 | 76.0 | | | | | | |
| Lowest Reading of a Min. Therm. on the 22nd & 23rd | 48.5 | 42.1 | | | | | | |
| Range of Thermometer Readings | 30.7 | 33.9 | | | | | | |
| Mean of Highest Daily Readings | 67.8 | 66.1 | | | | | | |
| Mean of Lowest Daily Readings | 54.8 | 51.0 | | | | | | |
| Mean Daily Range | 13.0 | 15.1 | | | | | | |
| Deduced Mean Temp. (from mean of Max. and Min.) | 59.6 | 56.9 | | | | | | |
| Mean Temperature from Dry Bulb | 61.2 | 57.9 | | | | | | |
| Adopted Mean Temperature | 60.4 | 57.4 | | | | | | |
| Mean Temperature of Evaporation | 57.3 | 54.5 | | | | | | |
| Mean Temperature of Dew Point | 53.9 | 51.8 | | | | | | |
| Mean elastic force of Vapour | inches 0.417 | 0.387 | | | | | | |
| Mean weight of Vapour in a cub. ft. of air, grains | 4.7 | 4.3 | | | | | | |
| Mean additional weight required for saturation ,, | 1.4 | 1.0 | | | | | | |
| Mean degree of Humidity (saturation 100) | 78 | 82 | | | | | | |
| Mean weight of a cubic foot of air | grains 525.1 | 527.2 | | | | | | |
| Mean amount of Cloud (0—10) | 6.5 | 7.3 | | | | | | |
| Fall of Rain | inches 3.172 | 5.119 | | | | | | |
| Greatest Rainfall in one day (31st) | ,, 0.570 | 1.072 | | | | | | |
| No. of days on which .005 in. or more Rain fell... | 20 | 18.7 | | | | | | |
| Wind :—Direction | N | NE | E | SE | S | SW | W | NW |
| No. of days..... | 0 | 3 | 0 | 1 | 4 | 6 | 16 | 1 |
| Mean Velocity in miles per hr. | 0 | 3.3 | 0 | 2.8 | 4.9 | 8.6 | 8.5 | 11.3 |
| Total No. of miles..... | 0 | 241 | 0 | 66 | 572 | 1244 | 3270 | 270 |
| Total No. of miles registered | 5663 | | | | | | Mean* 6290 | |
| Greatest hourly velocity (15th, at 1330 G.M.T., Dir., S.W. | 26 | | | | | | 30 | |

* For the last 66 years.

AUGUST, 1933.

DIFFERENCES.

The signs + and — mean respectively above and below the MONTHLY average.

| | | | | | |
|------------------------------------|-----|-----|-----|---|-----------|
| Mean barometric pressure | ... | ... | ... | + | 0.103 in. |
| Monthly range | .. | .. | .. | — | 0.161 in. |
| Mean of highest daily temperatures | ... | ... | ... | + | 1.7° |
| Mean of lowest | .. | .. | .. | + | 3.8° |
| Mean daily range | ... | ... | ... | — | 2.1° |
| Adopted mean temperature | ... | ... | ... | + | 3.0° |
| Total rainfall | ... | ... | ... | — | 1.947 in. |

Heavy Rain on the 31st. Fog on the 4th. Thunder on the 14th.
Lightning on the 14th. Solar Halo on the 5th.

EXTREME READINGS FOR AUGUST,

During 86 Years.

| | | | | |
|-----------------------------------|-------|-------------|-------|------------|
| Highest reading of Barometer | ... | 1932 (22nd) | ..... | 30.208 in. |
| Lowest | .. | 1917 (28th) | ..... | 28.156 in. |
| Highest temperature | ..... | 1868 (2nd) | ..... | 88.0° |
| Lowest | .. | 1887 (13th) | ..... | 33.4° |
| Highest adopted mean temperature | ..... | 1911 | ..... | 62.1° |
| Lowest | .. | 1848 | ..... | 52.5° |
| Greatest fall of rain | ..... | 1891 | ..... | 9.869 in. |
| Least | .. | 1932 | ..... | 1.653 in. |
| Greatest fall of rain in one day | ... | 1929 (23rd) | ..... | 2.350 in. |
| Greatest No. of days on which | | | | |
| .005 in. or more rain fell | ... | 1891 | ..... | 27 |
| Least | .. | 1880 | ..... | 6 |
| *Greatest hourly velocity of wind | ... | 1903 (31st) | ..... | 45 mls. |
| *Greatest No. of miles registered | ... | 1903 | ..... | 8486 |
| *Least | .. | 1915 | ..... | 3918 |

* Since 1867 only.

SEPTEMBER, 1933.

| Results of Observations taken during the Month. | | | | | | | | Mean for the last 86 years. |
|--------------------------------------------------------------------|--------|--------|------|-----|------|-----|------|-----------------------------------|
| Mean Reading of the Barometer | inches | 29.664 | | | | | | 29.545 |
| Highest " " on the 7th ... | " | 30.045 | | | | | | 30.007 |
| Lowest " " on the 23rd ... | " | 29.079 | | | | | | 28.892 |
| Range of Barometer Readings | " | 0.966 | | | | | | 1.115 |
| Highest Reading of a Max. Therm. on the 4th ... | | 75.2 | | | | | | 71.7 |
| Lowest Reading of a Min. Therm. on the 16th .. | | 40.3 | | | | | | 36.8 |
| Range of Thermometer Readings | | 34.9 | | | | | | 34.9 |
| Mean of Highest Daily Readings | | 65.3 | | | | | | 61.7 |
| Mean of Lowest Daily Readings | | 50.2 | | | | | | 47.4 |
| Mean Daily Range | | 15.1 | | | | | | 14.3 |
| Deduced Mean Temp. (from mean of Max. and Min.) | | 56.5 | | | | | | 53.3 |
| Mean Temperature from Dry Bulb | | 57.7 | | | | | | 54.3 |
| Adopted Mean Temperature | | 57.1 | | | | | | 53.8 |
| Mean Temperature of Evaporation | | 53.8 | | | | | | 51.1 |
| Mean Temperature of Dew Point | | 50.3 | | | | | | 48.4 |
| Mean elastic force of Vapour | inches | 0.365 | | | | | | 0.339 |
| Mean weight of Vapour in a cub. ft. of air, grains | | 4.1 | | | | | | 3.9 |
| Mean additional weight required for saturation .. | | 1.3 | | | | | | 0.9 |
| Mean degree of Humidity (saturation 100) | | 77 | | | | | | 82 |
| Mean weight of a cubic foot of air | grains | 530.1 | | | | | | 532.5 |
| Mean amount of Cloud (0—10) | | 4.9 | | | | | | 6.7 |
| Fall of Rain | inches | 1.002 | | | | | | 4.316 |
| Greatest Rainfall in one day (24th) | " | 0.630 | | | | | | 0.980 |
| No. of days on which .005 in. or more Rain fell... | | 7 | | | | | | 16.4 |
| Wind :—Direction | N | NE | E | SE | S | SW | W | NW |
| No. of days..... | 4 | 10 | 5 | 1 | 1 | 3 | 4 | 2 |
| Mean Velocity in miles per hr. | 6.0 | 6.9 | 8.6 | 5.7 | 11.5 | 5.2 | 6.7 | 4.8 |
| Total No. of miles | 575 | 1658 | 1035 | 138 | 277 | 371 | 646 | 232 |
| Total No. of miles registered | | | | | | | 4932 | Mean* |
| Greatest hourly velocity (17th, at 1500 G.M.T., Dir., S.) | | | | | | | 25 | 5989 |
| | | | | | | | | 31 |

* For the last 66 years.

SEPTEMBER, 1933.

DIFFERENCES.

The signs + and — mean respectively above and below the MONTHLY average.

| | | | | | |
|------------------------------------|-----|-----|-----|---|-----------|
| Mean barometric pressure | ... | ... | ... | + | 0·119 in. |
| Monthly range | .. | .. | .. | — | 0·149 in. |
| Mean of highest daily temperatures | ... | ... | ... | + | 3·6° |
| Mean of lowest | .. | .. | .. | + | 2·8° |
| Mean daily range | ... | ... | ... | + | 0·8° |
| Adopted mean temperature | ... | ... | ... | + | 3·3° |
| Total rainfall | ... | ... | ... | — | 3·314 in. |

Heavy Rain on the 24th. Fog on the 2nd and 3rd. Thunder on the 20th. Lightning on the 20th.

EXTREME READINGS FOR SEPTEMBER,

During 86 Years.

| | | | | |
|-----------------------------------|-------|--------------|-------|------------|
| Highest reading of Barometer | ... | 1851 (15th) | ..... | 30·247 in |
| Lowest | .. | 1918 (23rd) | ..... | 28·210 in. |
| Highest temperature | ..... | 1868 (6th) | ..... | 85·0° |
| Lowest | .. | †1885 (25th) | ..... | 29·8° |
| Highest adopted mean temperature | ..... | 1865 | ..... | 59·1° |
| Lowest | .. | 1863 | ..... | 50·9° |
| Greatest fall of rain | ..... | 1918 | ..... | 12·620 in. |
| Least | .. | 1910 | ..... | 0·652 in. |
| Greatest fall of rain in one day | ... | 1932 (2nd) | ..... | 2·800 in. |
| Greatest No. of days on which | | | | |
| ·005 in. or more rain fell | ... | 1918 | ..... | 29 |
| Least | .. | †1851 | ..... | 6 |
| *Greatest hourly velocity of wind | .. | 1875 (26th) | ..... | 53 mls. |
| *Greatest No. of miles registered | ... | 1869 | ..... | 9053 |
| *Least | .. | 1888 | ..... | 3261 |

* Since 1867 only.

† And in other years.

OCTOBER, 1933.

| Results of Observations taken during the Month. | | Mean for the last 86 years. | | | | | | |
|----------------------------------------------------------------|---------------|-----------------------------|------|----|-----|-----|---------------|------|
| Mean Reading of the Barometer | inches 29·461 | 29·445 | | | | | | |
| Highest ,, ,, on the 2nd ... | ,, 30·055 | 30·021 | | | | | | |
| Lowest ,, ,, on the 28th ... | ,, 28·627 | 28·687 | | | | | | |
| Range of Barometer Readings | ,, 1·428 | 1·334 | | | | | | |
| Highest Reading of a Max. Therm. on the 6th ... | 63·7 | 63·9 | | | | | | |
| Lowest Reading of a Min. Therm. on the 28th... | 31·3 | 29·9 | | | | | | |
| Range of Thermometer Readings | 32·4 | 34·0 | | | | | | |
| Mean of Highest Daily Readings | 54·0 | 54·4 | | | | | | |
| Mean of Lowest Daily Readings | 44·6 | 42·1 | | | | | | |
| Mean Daily Range | 9·4 | 12·3 | | | | | | |
| Deduced Mean Temp. (from mean of Max. and Min.) | 48·3 | 47·3 | | | | | | |
| Mean Temperature from Dry Bulb | 49·6 | 48·0 | | | | | | |
| Adopted Mean Temperature | 49·0 | 47·7 | | | | | | |
| Mean Temperature of Evaporation | 46·6 | 45·5 | | | | | | |
| Mean Temperature of Dew Point | 43·4 | 43·0 | | | | | | |
| Mean elastic force of Vapour | inches 0·282 | 0·279 | | | | | | |
| Mean weight of Vapour in a cub. ft. of air, grains | 3·2 | 3·2 | | | | | | |
| Mean additional weight required for saturation ,, | 0·8 | 0·6 | | | | | | |
| Mean degree of Humidity (saturation 100) | 79 | 84 | | | | | | |
| Mean weight of a cubic foot of air | grains 535·5 | 537·3 | | | | | | |
| Mean amount of Cloud (0—10) | 6·8 | 7·2 | | | | | | |
| Fall of Rain | inches 5·248 | 4·972 | | | | | | |
| Greatest Rainfall in one day (10th)..... | ,, 1·050 | 0·981 | | | | | | |
| No. of days on which ·005 in. or more Rain fell... | 17 | 18·8 | | | | | | |
| Wind :—Direction..... | N | NE | E | SE | S | SW | W | NW |
| No. of days..... | 6 | 5 | 3 | 0 | 3 | 3 | 9 | 2 |
| Mean Velocity in miles per hr. | 10·6 | 5·4 | 11·0 | 0 | 9·0 | 7·4 | 8·5 | 13·6 |
| Total No. of miles..... | 1526 | 646 | 790 | 0 | 641 | 535 | 1840 | 651 |
| Total No. of miles registered, | 6629 | | | | | | Mean* 6787 | |
| Greatest hourly velocity (9th, at 1900 G.M.T., Dir., S.) | 36 | | | | | | 37 | |

* For the last 66 years.

OCTOBER, 1933.

DIFFERENCES.

The signs + and — mean respectively above and below the
MONTHLY average.

| | | | | | |
|------------------------------------|-----|-----|-----|---|-----------|
| Mean barometric pressure | ... | ... | ... | + | 0·016 in. |
| Monthly range | .. | .. | .. | + | 0·094 in. |
| Mean of highest daily temperatures | ... | ... | ... | — | 0·4° |
| Mean of lowest | .. | .. | .. | + | 2·5° |
| Mean daily range | ... | ... | ... | — | 2·9° |
| Adopted mean temperature | ... | ... | ... | + | 1·3° |
| Total rainfall | ... | ... | ... | + | 0·276 in. |

Ground Frost on the 3rd and 28th. Hail on the 11th. Heavy Rain on the 9th, 10th and 11th. Fog on the 23rd. Solar Halo on the 3rd.

EXTREME READINGS FOR OCTOBER,

During 86 Years.

| | | | | |
|-----------------------------------|-------|---------------|-------|------------|
| Highest reading of Barometer | ... | 1884 (5th) | ..... | 30·306 in. |
| Lowest | .. | 1862 (19th) | ..... | 28·139 in. |
| Highest temperature | ..... | 1890 (12th) | ..... | 74·0° |
| Lowest | .. | 1895 (28th) | ..... | 17·8° |
| Highest adopted mean temperature | ..... | 1921 | ..... | 53·8° |
| Lowest | .. | 1895 | ..... | 42·8° |
| Greatest fall of rain | ..... | 1870 | ..... | 13·437 in. |
| Least | .. | 1922 | ..... | 0·918 in. |
| Greatest fall of rain in one day | ... | 1870 (8th) | ..... | 2·529 in. |
| Greatest No. of days on which | | | | |
| ·005 ins or more rain fell | ... | 1903 and 1923 | ..... | 29 |
| Least | .. | 1920 | ..... | 8 |
| *Greatest hourly velocity of wind | .. | 1877 (15th) | ..... | 52 mls. |
| *Greatest No. of miles registered | ... | 1874 | ..... | 9818 |
| *Least | .. | 1915 | ..... | 3965 |

* Since 1867 only.

NOVEMBER, 1933.

| Results of Observations taken during the Month. | | Mean for the last 86 years. | | | | | | |
|------------------------------------------------------------------|---------------|-----------------------------|-----|-----|-----|-----|-----|-----|
| Mean Reading of the Barometer | inches 29·530 | 29·459 | | | | | | |
| Highest " " on the 7th ... | " 29·852 | 30·065 | | | | | | |
| Lowest " " on the 15th ... | " 28·838 | 28·573 | | | | | | |
| Range of Barometer Readings | " 1·014 | 1·492 | | | | | | |
| Highest Reading of a Max. Therm. on the 19th ... | 51·8 | 55·8 | | | | | | |
| Lowest Reading of a Min. Therm. on the 26th ... | 28·9 | 25·7 | | | | | | |
| Range of Thermometer Readings | 22·9 | 30·1 | | | | | | |
| Mean of Highest Daily Readings | 45·7 | 47·1 | | | | | | |
| Mean of Lowest Daily Readings | 37·4 | 36·8 | | | | | | |
| Mean Daily Range | 8·3 | 10·3 | | | | | | |
| Deduced Mean Temp. (from mean of Max. and Min.) | 41·2 | 41·6 | | | | | | |
| Mean Temperature from Dry Bulb | 42·2 | 42·1 | | | | | | |
| Adopted Mean Temperature | 41·7 | 41·9 | | | | | | |
| Mean Temperature of Evaporation | 40·4 | 39·9 | | | | | | |
| Mean Temperature of Dew Point | 38·2 | 38·2 | | | | | | |
| Mean elastic force of Vapour | inches 0·231 | 0·231 | | | | | | |
| Mean weight of Vapour in a cub. ft. of air, grains | 2·7 | 2·8 | | | | | | |
| Mean additional weight required for saturation " | 0·5 | 0·4 | | | | | | |
| Mean degree of Humidity (saturation 100) | 84 | 87 | | | | | | |
| Mean weight of a cubic foot of air | grains 545·1 | 544·4 | | | | | | |
| Mean amount of Cloud (0—10) | 6·7 | 7·4 | | | | | | |
| Fall of Rain | inches 1·912 | 4·476 | | | | | | |
| Greatest Rainfall in one day (1st) | " 0·410 | 1·001 | | | | | | |
| No. of days on which ·005 in. or more Rain fell ... | 13 | 18·2 | | | | | | |
| Wind :—Direction | N | NE | E | SE | S | SW | W | NW |
| No. of days..... | 6 | 7 | 3 | 2 | 1 | 2 | 6 | 3 |
| Mean Velocity in miles per hr. | 5·7 | 7·6 | 7·5 | 9·7 | 4·9 | 3·4 | 5·6 | 9·3 |
| Total No. of miles..... | 814 | 1274 | 543 | 465 | 118 | 163 | 810 | 667 |
| Total No. of miles registered | 4854 | Mean* | | | | | | |
| Greatest hourly velocity (2nd, at 1300 G.M.T., Dir., N.W.) | 23 | 7096 | 41 | | | | | |

* For the last 66 years.

NOVEMBER, 1933.

DIFFERENCES.

The signs + and — mean respectively above and below the
MONTHLY average.

| | |
|------------------------------------|-------------|
| Mean barometric pressure | + 0.071 in. |
| Monthly range | — 0.478 in. |
| Mean of highest daily temperatures | — 1.4° |
| Mean of lowest | + 0.6° |
| Mean daily range | — 2.0° |
| Adopted mean temperature | — 0.2° |
| Total rainfall | — 2.564 in. |

Ground Frost on the 3rd, 5th, 11th—14th, 18th, 23rd—28th, and 30th. Hoar Frost on the 11th, 12th, 13th and 26th. Hail on the 10th. Fog on the 4th—8th, 13th, 14th, 20th and 23rd.

EXTREME READINGS FOR NOVEMBER,

During 86 Years.

| | |
|-------------------------------------------------------------|------------------------------|
| Highest reading of Barometer | 1922 (15th) 30.375 in. |
| Lowest | 1891 (11th) 27.938 in. |
| Highest temperature | 1900 (1st) 62.4° |
| Lowest | 1901 (15th) 17.5° |
| Highest adopted mean temperature | †1881 47.0° |
| Lowest | 1915 36.3° |
| Greatest fall of rain | 1866 9.026 in. |
| Least | 1855 1.158 in. |
| Greatest fall of rain in one day | 1866 (16th) 3.700 in. |
| Greatest No. of days on which .005 in. or more rain fell | 1913 28 |
| Least | 1848 6 |
| *Greatest hourly velocity of wind... | 1887 (1st) 62 mls. |
| *Greatest No. of miles registered... | 1888 12813 |
| *Least | 1933 4854 |

* Since 1867 only.

† And in other years.

DECEMBER, 1933.

| Results of Observations taken during the Month | | Mean for the last 86 years. | | | | | | |
|---------------------------------------------------------------|---------------|-----------------------------|------|-----|-----|-----|------------|-----|
| Mean Reading of the Barometer | inches 29.759 | 29.441 | | | | | | |
| Highest ,, ,, on the 3rd ... | ,, 30.270 | 30.076 | | | | | | |
| Lowest ,, ,, on the 28th ... | ,, 28.748 | 28.545 | | | | | | |
| Range of Barometer Readings | ,, 1.522 | 1.531 | | | | | | |
| Highest Reading of a Max. Therm. on the 22nd ... | 44.1 | 52.6 | | | | | | |
| Lowest Reading of a Min. Therm. on the 21st..... | 26.8 | 21.9 | | | | | | |
| Range of Thermometer Readings | 17.3 | 30.7 | | | | | | |
| Mean of Highest Daily Readings | 39.1 | 43.4 | | | | | | |
| Mean of Lowest Daily Readings | 31.8 | 33.9 | | | | | | |
| Mean Daily Range | 7.3 | 9.5 | | | | | | |
| Deduced Mean Temp. (from mean of Max. and Min.) | 35.5 | 38.7 | | | | | | |
| Mean Temperature from Dry Bulb | 36.0 | 39.3 | | | | | | |
| Adopted Mean Temperature | 35.8 | 39.0 | | | | | | |
| Mean Temperature of Evaporation | 34.2 | 37.4 | | | | | | |
| Mean Temperature of Dew Point | 31.5 | 35.4 | | | | | | |
| Mean elastic force of Vapour | inches 0.179 | 0.209 | | | | | | |
| Mean weight of Vapour in a cub. ft. of air, grains | 2.0 | 2.4 | | | | | | |
| Mean additional weight required for saturation ,, | 0.5 | 0.4 | | | | | | |
| Mean degree of Humidity (saturation 100) | 82 | 87 | | | | | | |
| Mean weight of a cubic foot of air | grains 556.6 | 547.1 | | | | | | |
| Mean amount of Cloud (0—10) | 8.0 | 7.7 | | | | | | |
| Fall of Rain | inches 0.729 | 4.601 | | | | | | |
| Greatest Rainfall in one day (30th) | ,, 0.410 | 0.824 | | | | | | |
| No. of days on which .005 in. or more Rain fell... | 13 | 20.1 | | | | | | |
| Wind :—Direction..... | N | NE | E | SE | S | SW | W | NW |
| No. of days..... | 8 | 7 | 8 | 1 | 4 | 1 | 1 | 1 |
| Mean Velocity in miles per hr. | 2.2 | 7.7 | 10.3 | 3.4 | 3.7 | 3.6 | 8.0 | 2.7 |
| Total No. of miles..... | 426 | 1293 | 1981 | 82 | 353 | 86 | 192 | 64 |
| Total No. of miles registered | 4477 | | | | | | *Mean 7770 | |
| Greatest hourly velocity (3rd, at 0930 G.M.T., Dir. E.) | 33 | | | | | | 42 | |

* For the last 66 years.

DECEMBER, 1933.

DIFFERENCES.

The signs + and — mean respectively above and below the MONTHLY average.

| | | | | | |
|-----------------------------------|-----|-----|-----|---|-----------|
| Mean barometric pressure | ... | ... | ... | + | 0.318 in. |
| Monthly range | .. | ... | ... | — | 0.009 in. |
| Mean of highest daily temperature | ... | ... | ... | — | 4.3° |
| Mean of lowest | .. | .. | ... | — | 2.1° |
| Mean daily range | ... | ... | ... | — | 2.2° |
| Adopted mean temperature | ... | ... | ... | — | 3.2° |
| Total rainfall | ... | ... | ... | — | 3.872 in. |

Ground Frost on the 1st, 3rd—6th, 9th—18th, 20th—22nd, 24th, 25th, and 28th—31st. Hoar Frost on the 3rd, 6th, 10th, 16th and 20th. Snow on the 12th and 30th. Hail on the 30th. Fog on the 11th, 16th—23rd, 26th, 29th and 30th. Lunar Halo on the 27th.

EXTREME READINGS FOR DECEMBER,

During 86 Years.

| | | | | |
|--------------------------------------|-------|-------------|-------|------------|
| Highest reading of Barometer | ... | 1905 (12th) | ..... | 30.484 in. |
| Lowest | .. | 1886 (8th) | ..... | 27.350 in. |
| Highest temperature | ..... | 1876 (9th) | ..... | 58.1° |
| Lowest | .. | 1860 (24th) | ..... | 6.7° |
| Highest adopted mean temperature | ..... | 1857 | ..... | 44.6° |
| Lowest | .. | 1878 | ..... | 30.3° |
| Greatest fall of rain | ..... | 1918 | ..... | 10.597 in. |
| Least | .. | 1890 | ..... | 0.550 in. |
| Greatest fall of rain in one day | ... | 1870 (19th) | ..... | 1.962 in. |
| Greatest No. of days on which | | | | |
| .005 in. or more rain fell | ... | 1918 | ..... | 30 |
| Least | .. | †1853 | ..... | 8 |
| *Greatest hourly velocity of wind... | ... | 1894 (22nd) | ..... | 72 mls. |
| *Greatest No. of miles registered | ... | 1929 | ..... | 11493 |
| *Least | .. | 1933 | ..... | 4477 |

* Since 1867 only.

† And in other years.

Summary of Observations, 1933.

| Results of Observations taken during the Year. | Mean for the last 86 Years. | |
|---------------------------------------------------------------------|-----------------------------------|--------|
| <i>Readings of Barometer in inches.</i> | | |
| Mean of the Year | 29·570 | 29·494 |
| Highest Monthly Mean (December) | 29·759 | 29·749 |
| Lowest " " (March) | 29·434 | 29·227 |
| Highest Reading (January 24th) | 30·302 | 30·297 |
| Lowest " (October 28th) | 28·627 | 28·218 |
| Range | 1·675 | 2·079 |
| <i>Thermometer, Fahrenheit.</i> | | |
| Highest Monthly Mean Temperature (July) | 61·2 | 58·6 |
| Lowest " " (December) ... | 35·8 | 35·8 |
| Highest Reading of a Max. Therm. (July 3rd, 7th) | 81·2 | 81·1 |
| Lowest " Min. " (Jan. 23rd, 24th) | 22·0 | 16·8 |
| Range of Thermometer Readings | 59·2 | 64·3 |
| Mean of Highest Daily " | 54·6 | 54·3 |
| Mean of Lowest Daily " | 42·8 | 41·1 |
| Mean Daily Range | 11·8 | 13·2 |
| Deduced Mean Temp. (from Mean of Max. and Min.) | 47·7 | 46·7 |
| Mean Temperature from Dry Bulb..... | 48·8 | 47·2 |
| Adopted Mean Temperature of the Year | 48·3 | 47·0 |
| Mean Temperature of Evaporation | 45·7 | 44·7 |
| Mean Temperature of Dew Point | 42·4 | 42·1 |
| Mean elastic force of Vapour | 0·272 | 0·274 |
| Mean weight of Vapour in a cub. ft. of air...grns. | 3·1 | 3·2 |
| Mean additional weight required for saturation .. | 0·8 | 0·7 |
| Mean degree of Humidity (saturation 100)..... | 77 | 84 |
| Mean weight of a cubic foot of air | 538·5 | 539·0 |
| Mean amount of Cloud (0—10) | 6·7 | 7·3 |
| Total fall of Rain | 32·723 | 47·428 |
| Greatest Monthly Rainfall (October)..... | 5·248 | 7·607 |
| Least " " (December)..... | 0·729 | 1·219 |
| Greatest Rainfall in one day (February 3rd) | 1·291 | 1·668 |
| No. of days per Month on which ·005 inch or more Rain fell | 14·0 | 17·2 |

SUMMARY OF WIND, 1933.

| Prevailing Direction | N | NE | E | SE | S | SW | W | NW |
|---------------------------------------|------|------|-------|------|------|------|-------|------|
| No. of days for each | 52 | 55 | 44 | 8 | 36 | 42 | 109 | 19 |
| Mean Velocity in miles per hour .. | 5.1 | 6.8 | 9.2 | 7.7 | 9.2 | 9.3 | 8.7 | 7.7 |
| Total No. of miles for each Direction | 7405 | 8962 | 10157 | 1483 | 7933 | 9386 | 22826 | 3519 |

| | | Mean for the last 66 years. |
|---------------------------------------------------|-------|-----------------------------|
| Total No. of miles registered | 71671 | 84699 |
| Greatest Monthly Total (February) | 7947 | 9876 |
| Least " " (December)..... | 4477 | 4885 |
| Greatest recorded hourly velocity (January 2) ... | 47 | 50 |
| Prevailing Direction of Wind | W. | W. |

DIFFERENCES, 1933.

The signs + and — mean respectively above and below the
YEARLY average.

| | | |
|-------------------------------------------|---|------------|
| Mean barometric pressure | + | 0.076 in. |
| Yearly range " | — | 0.404 in. |
| Mean of highest daily temperatures | + | 0.3° |
| Mean of lowest " " | + | 1.7° |
| Mean daily range | — | 1.4° |
| Adopted mean temperature | + | 1.3° |
| Total rainfall | — | 14.705 in. |

ABSOLUTE EXTREMES
FOR THE LAST 86 YEARS.

Readings of Barometer, in inches.

| | | |
|------------------------------|-----------------------|--------|
| Highest monthly mean | 1932 (Feb.) | 30·082 |
| Lowest " " | 1868 (Dec.) | 28·984 |
| Highest yearly " | 1921 | 29·615 |
| Lowest " " | 1872 | 29·319 |
| Greatest monthly range | 1886 (Dec.) | 2·795 |
| Least " " | 1852 (July) | 0·505 |
| Highest reading | 1896 (Jan. 9th) | 30·597 |
| Lowest " | 1886 (Dec. 8th) | 27·350 |
| Extreme range..... | | 3·247 |

Thermometer, Fahrenheit.

| | | |
|--------------------------------------|------------------------|------|
| Highest monthly mean temperature ... | 1901 (July) | 63·2 |
| Lowest " " " | 1855 (Feb.) | 28·6 |
| Highest yearly " " | 1921 | 49·4 |
| Lowest " " " | 1879 | 44·1 |
| Highest reading | 1901 (July 20th) | 89·0 |
| Lowest " " | 1881 (Jan. 15th) | 4·6 |

Weight of Vapour in a cubic foot of air (grains).

| | | |
|-----------------------------|----------------------------|-----|
| Greatest monthly mean | 1852 and 1927 (July) | 5·1 |
| Least " " | †1855 (Feb.)..... | 1·4 |

† *And on other dates.*

ABSOLUTE EXTREMES
FOR THE LAST 86 YEARS—Continued.

Rainfall, in inches.

| | | |
|--------------------------------------------|-----------------------|--------|
| Greatest Rainfall in one day | 1866 (Nov. 16) .. | 3·700 |
| Greatest " " month | 1870 (Oct.) | 13·437 |
| Least " " " | 1932 (Feb.) | 0·123 |
| Greatest " " year | 1923 | 63·558 |
| Least " " " | 1887 | 31·250 |
| Days on which ·005 in. or more Rain fell : | | |
| Greatest No. in one month | 1890 (Jan.) | } 30 |
| | and 1918 (Dec.) | |
| Least " " | 1852 (Mar.) | 3 |
| Greatest " year | 1872 | 281 |
| Least " " | 1855 | 135 |

* *Wind.*

| | | |
|---------------------------------------------------|--------------------|--------|
| Greatest hourly velocity, in miles | 1894 (Dec. 22) ... | 72 |
| Greatest No. of miles registered in a month | 1888 (Nov.) | 12813 |
| Least " " | 1917 (Feb.) | 3160 |
| Greatest Mean No. " " | January | 8286 |
| Least " " " | September | 5989 |
| Greatest No. " " year.. | 1868 | 102395 |
| Least " " " " | 1915 | 70623 |

* *Record dates from 1867 only.*

DATES OF OCCASIONAL PHENOMENA.

| 1833 | Frost | Hoar Frost | Snow | Hail | Heavy Rain |
|-----------|------------------------------------|------------------|------------------------|------|------------|
| January | 10-12, 18-31 | 10, 12, 23, 26 | 16, 17, 19, 30 | 5, 6 | 2, 8, 31 |
| February | 3, 11-26 | 11, 13, 14, 20 | 18, 19, 21, 24, 25, 26 | 17 | 3, 9, 25 |
| March | 13, 21, 24-29 | 27, 28 | ... | 30 | ... |
| April | 2, 8, 13, 14, 19-22 | 19 | 19 | 20 | ... |
| May | ... | ... | ... | 14 | ... |
| June | ... | ... | ... | ... | 17, 18 |
| July | ... | ... | ... | ... | 9, 10, 30 |
| August | ... | ... | ... | ... | 31 |
| September | ... | ... | ... | ... | 24 |
| October | 3, 28 | ... | ... | 11 | 9, 10, 11 |
| November | 3, 5, 11-14, 18, 23-28, 30 | 11, 12, 13, 26 | ... | 10 | ... |
| December | 1, 3-6, 9-18, 20-22, 24, 25, 28-31 | 3, 6, 10, 16, 20 | 12, 30 | 30 | ... |

| 1833 | Gales of Wind | Fog | Thunder | Lightning | Lunar Halo | Solar Halo | Aurora Borealis |
|-----------|---------------|--------------------------|---------------|---------------|------------|------------|-----------------|
| January | 2, 3, 4, 5 | 8, 10, 12-14, 18, 19, 20 | ... | ... | ... | 26 | ... |
| February | ... | 6, 7, 8 | ... | ... | ... | 3 | ... |
| March | ... | 3, 4, 13, 27 | ... | 18 | ... | 6 | ... |
| April | ... | ... | 29, 30 | ... | ... | 28 | ... |
| May | ... | 17, 18, 22, 23 | 6, 27 | 6, 22 | ... | 7 | ... |
| June | ... | ... | 8, 20, 21, 22 | 8, 20, 21, 22 | ... | ... | ... |
| July | ... | ... | 7, 11, 19, 27 | 7, 19 | ... | ... | ... |
| August | ... | 4 | 14 | 14 | ... | 5 | ... |
| September | ... | 2, 3 | 20 | 20 | ... | 3 | ... |
| October | ... | 23 | ... | ... | ... | ... | ... |
| November | ... | 4-8, 13, 14, 20, 23 | ... | ... | ... | ... | ... |
| December | ... | 11, 16-23, 26, 29, 30 | ... | ... | 27 | ... | ... |

MONTHLY TOTALS FOR EACH HOUR OF RECORDED SUNSHINE.

| 1933. Local apparent time | 4-5 | 5-6 | 6-7 | 7-8 | 8-9 | 9-10 | 10-11 | 11-12 | 12-1 | 1-2 | 2-3 | 3-4 | 4-5 | 5-6 | 6-7 | 7-8 | 8-9 |
|------------------------------|-----|------|------|------|-------|-------|-------|-------|-------|-------|-------|-------|------|------|------|------|-----|
| January ... | ... | ... | ... | ... | 0.6 | 4.7 | 4.8 | 6.8 | 6.6 | 9.6 | 8.2 | 0.6 | ... | ... | ... | ... | ... |
| February ... | ... | ... | ... | 3.6 | 8.6 | 11.1 | 11.1 | 9.3 | 10.2 | 10.3 | 8.4 | 7.9 | 3.2 | 0.1 | ... | ... | ... |
| March ... | ... | ... | 1.9 | 9.6 | 14.1 | 16.4 | 14.3 | 14.1 | 15.2 | 16.2 | 15.0 | 11.8 | 8.1 | 0.9 | ... | ... | ... |
| April ... | ... | 1.1 | 5.9 | 6.8 | 8.5 | 9.6 | 9.8 | 10.5 | 9.7 | 10.9 | 10.4 | 11.1 | 10.7 | 8.2 | 1.5 | ... | ... |
| May ... | 0.4 | 3.3 | 8.0 | 10.7 | 12.4 | 12.4 | 13.4 | 14.3 | 12.4 | 12.6 | 11.2 | 13.6 | 10.9 | 7.2 | 5.0 | 2.1 | ... |
| June ... | 3.5 | 11.7 | 14.8 | 16.3 | 17.4 | 19.2 | 16.8 | 18.8 | 18.2 | 15.9 | 14.6 | 13.8 | 12.1 | 12.1 | 8.6 | 3.0 | ... |
| July ... | 1.5 | 7.1 | 11.0 | 12.7 | 13.2 | 16.2 | 19.0 | 16.8 | 16.3 | 15.7 | 14.7 | 16.0 | 16.9 | 16.3 | 11.3 | 6.2 | ... |
| August ... | 0.1 | 2.7 | 9.0 | 12.1 | 15.3 | 16.7 | 19.2 | 19.2 | 18.7 | 20.5 | 17.7 | 13.8 | 14.9 | 11.9 | 7.3 | 0.4 | ... |
| September ... | ... | ... | 6.6 | 15.7 | 20.7 | 21.5 | 22.3 | 21.5 | 20.1 | 19.6 | 16.1 | 15.9 | 15.5 | 8.1 | 0.5 | ... | ... |
| October ... | ... | ... | ... | 2.3 | 7.1 | 11.3 | 13.9 | 11.2 | 11.1 | 11.6 | 8.6 | 8.4 | 2.9 | ... | ... | ... | ... |
| November ... | ... | ... | ... | 0.3 | 3.9 | 7.7 | 7.8 | 8.0 | 8.4 | 8.1 | 5.5 | 3.8 | 0.2 | ... | ... | ... | ... |
| December ... | ... | ... | ... | ... | 0.6 | 5.7 | 7.1 | 7.6 | 5.7 | 6.2 | 4.6 | 0.3 | ... | ... | ... | ... | ... |
| Sums ... | 5.5 | 25.9 | 57.2 | 90.1 | 122.4 | 152.5 | 159.5 | 158.1 | 152.6 | 157.2 | 135.0 | 117.0 | 95.4 | 64.8 | 34.2 | 11.7 | ... |

TOTAL AMOUNT OF SUNSHINE RECORDED ON EACH DAY.

| 1933 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 |
|--------------|------|------|------|------|------|------|------|------|------|------|-----|------|------|------|------|------|-----|
| January .. | 1.2 | ... | 4.0 | 1.1 | 2.8 | 2.6 | 0.5 | ... | 6.5 | ... | 2.4 | 3.3 | 0.4 | 0.4 | ... | ... | 1.0 |
| February ... | ... | 7.6 | 0.6 | ... | 1.1 | 0.1 | ... | ... | 1.8 | ... | 3.7 | 1.0 | 8.2 | 5.3 | 6.9 | ... | 7.7 |
| March .. | ... | 2.5 | ... | 0.1 | 1.0 | 6.1 | 1.8 | 0.9 | 0.8 | 3.1 | 9.3 | 8.9 | 8.9 | 5.4 | 1.8 | 0.1 | 0.1 |
| April .. | 6.4 | 1.0 | 0.1 | 1.0 | ... | 6.2 | 5.2 | 1.8 | ... | 5.7 | 5.3 | 9.7 | 10.2 | 11.8 | 0.4 | 4.5 | ... |
| May .. | ... | 3.3 | ... | 0.2 | 2.7 | 3.5 | 2.3 | 5.5 | 3.9 | 6.3 | 0.6 | 9.5 | 2.9 | 11.5 | 5.5 | ... | 2.8 |
| June .. | 8.4 | 0.2 | 10.0 | 13.7 | 13.9 | 12.2 | 12.9 | 9.7 | 3.3 | 2.7 | 4.1 | 14.5 | 5.8 | 7.4 | 11.9 | 2.0 | 5.0 |
| July ... | 2.3 | 12.6 | 14.6 | 14.7 | 14.5 | 7.9 | 6.5 | 5.2 | 5.6 | 5.7 | 3.8 | 1.7 | 0.7 | 1.4 | 1.8 | 10.7 | 6.9 |
| August ... | 12.3 | 0.1 | 3.4 | 6.4 | 2.0 | 7.2 | 9.8 | 9.2 | 8.5 | 13.1 | 0.1 | 8.8 | 10.4 | 6.4 | 0.6 | 11.6 | 2.3 |
| September... | 3.5 | 8.2 | 7.5 | 9.5 | 7.3 | 9.8 | 11.3 | 11.1 | 11.2 | 10.3 | 9.1 | 4.1 | 5.8 | 11.3 | 10.3 | 9.6 | 7.3 |
| October ... | 0.2 | 1.6 | 2.5 | 0.2 | 0.8 | 6.3 | 0.1 | 3.4 | 2.4 | 1.4 | 3.0 | 7.0 | 0.2 | 4.9 | ... | 3.0 | 3.2 |
| November... | 0.2 | 7.8 | 5.5 | 4.0 | ... | 0.4 | 1.0 | ... | 0.1 | 3.7 | 5.0 | 5.8 | ... | 3.6 | ... | 2.6 | 7.0 |
| December... | ... | ... | 3.2 | 6.0 | 2.8 | 5.7 | 1.3 | ... | 0.8 | 0.9 | 0.2 | ... | 0.7 | 5.3 | 0.4 | ... | 1.3 |

TOTAL AMOUNT OF SUNSHINE RECORDED ON EACH DAY—(continued).

| 1933 | 18 | 19 | 20 | 21 | 22 | 23 | 24 | 25 | 26 | 27 | 28 | 29 | 30 | 31 | MONTHLY | |
|--------------|-----|------|------|------|------|------|------|------|------|------|------|-----|-----|-----|---------|----------|
| | | | | | | | | | | | | | | | Total | Percent. |
| January ... | 2.1 | 1.5 | ... | 3.0 | 1.6 | 3.6 | 0.9 | 0.1 | ... | 1.2 | 1.1 | 0.5 | 0.1 | ... | 41.9 | 16.9 |
| February ... | 5.8 | 7.6 | ... | 6.9 | 8.9 | 9.1 | ... | ... | ... | 0.8 | 0.7 | ... | ... | ... | 83.8 | 30.8 |
| March .. | 3.8 | 2.1 | 9.5 | 2.0 | 6.6 | 7.2 | 10.5 | 10.3 | 10.4 | 8.1 | 9.1 | 2.4 | 3.6 | 1.2 | 137.6 | 37.6 |
| April ... | 5.9 | 8.4 | 2.4 | 5.7 | 2.1 | 0.1 | 0.4 | ... | 2.6 | 6.1 | 6.4 | 0.7 | 4.6 | ... | 114.7 | 27.4 |
| May ... | ... | 0.9 | 2.1 | 10.1 | 4.7 | 9.3 | 7.3 | 11.6 | 11.3 | 1.0 | 12.4 | 3.1 | 6.0 | 9.6 | 149.9 | 30.4 |
| June ... | 1.9 | 2.0 | 4.8 | 7.0 | 6.5 | 10.5 | 1.7 | 14.3 | 3.9 | 12.3 | 4.1 | 8.7 | 1.4 | ... | 216.8 | 42.7 |
| July ... | 1.8 | 10.9 | 10.5 | 6.0 | 13.0 | 12.4 | 0.2 | 6.2 | 8.6 | 7.4 | 4.5 | 6.6 | 6.2 | ... | 210.9 | 41.4 |
| August ... | 3.7 | 9.3 | 4.9 | 6.4 | 7.7 | 6.8 | 6.3 | 4.0 | 11.2 | 7.8 | 5.9 | 1.9 | 9.9 | 1.5 | 199.5 | 43.7 |
| September. | 9.2 | 8.8 | 5.7 | 6.9 | 7.8 | 3.8 | ... | 0.3 | 5.6 | 2.1 | 2.0 | 2.4 | 2.3 | ... | 204.1 | 53.9 |
| October ... | 5.3 | 1.2 | 5.2 | 3.0 | 0.4 | ... | 0.5 | 7.6 | 8.0 | 5.1 | 0.4 | 2.8 | 7.7 | 1.0 | 88.4 | 27.1 |
| November... | 0.1 | ... | 1.0 | ... | 0.4 | ... | 0.8 | 3.9 | ... | 0.7 | ... | 0.1 | ... | ... | 53.7 | 21.0 |
| December .. | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 3.0 | ... | 0.2 | 6.0 | 37.8 | 16.4 |

SUMMARY OF SUNSHINE.

| | BRIGHT SUNSHINE RECORDED | | | | | |
|--------------|--------------------------|--------|------------------------------------------|----------------------------|--------|------------------------------------------|
| | 1933 | | | Mean for the last 53 years | | |
| | Number of | | Percentage of Possible Sunshine | Number of | | Percentage of Possible Sunshine |
| | Days | Hours | | Days | Hours | |
| January ... | 23 | 41·9 | 16·9 | 14·8 | 33·6 | 13·6 |
| February ... | 18 | 83·8 | 30·8 | 17·7 | 56·5 | 20·6 |
| March ... | 29 | 137·6 | 37·6 | 24·5 | 104·5 | 28·5 |
| April ... | 26 | 114·7 | 27·4 | 26·5 | 144·4 | 34·5 |
| May ... | 27 | 149·9 | 30·4 | 27·7 | 181·7 | 36·9 |
| June ... | 30 | 216·8 | 42·7 | 28·1 | 186·8 | 36·9 |
| July ... | 30 | 210·9 | 41·4 | 28·5 | 167·5 | 33·0 |
| August ... | 31 | 199·5 | 43·7 | 27·7 | 148·2 | 32·4 |
| September .. | 29 | 204·1 | 53·9 | 25·6 | 125·1 | 32·9 |
| October ... | 29 | 88·4 | 27·1 | 23·8 | 87·3 | 26·8 |
| November .. | 20 | 53·7 | 21·0 | 18·0 | 47·1 | 18·4 |
| December ... | 15 | 37·8 | 16·4 | 14·0 | 27·7 | 12·0 |
| Year ... | 307 | 1539·1 | 34·5 | 276·8 | 1309·3 | 29·4 |

SUMMARY OF SUNSHINE—Continued.
EXTREMES FOR THE LAST 53 YEARS.

| MONTH | Number of Days | | Number of Hours | | | | Percentage of Possible Sunshine | |
|-------|--------------------------------|----------|-----------------|------------|-----------|-----------|---------------------------------|-------|
| | on which Sunshine was recorded | | | | | | Greatest | Least |
| | Greatest | Least | Greatest | Least | Greatest | Least | | |
| Jan. | 23 *1933 | 8 1898 | 64.2 1881 | 12.3 1913 | 25.9 1881 | 5.0 1913 | | |
| Feb. | 24 1895 | 11 1882 | 89.3 1887 | 29.6 1882 | 32.8 1887 | 10.9 1882 | | |
| Mar. | 30 1929 | 17 1904 | 178.9 1929 | 56.8 1912 | 48.9 1929 | 15.5 1912 | | |
| April | 30 *1909 | 22 1920 | 223.7 1893 | 80.7 1920 | 53.4 1893 | 19.3 1920 | | |
| May | 31 1929 | 22 1886 | 266.6 1881 | 79.7 1906 | 54.1 1881 | 16.2 1906 | | |
| June | 30 *1896 | 24 *1888 | 272.5 1887 | 85.2 1912 | 53.6 1887 | 16.8 1912 | | |
| July | 31 *1882 | 24 1920 | 263.4 1911 | 98.0 1888 | 51.7 1911 | 19.3 1888 | | |
| Aug. | 31 *1886 | 23 1894 | 235.2 1899 | 74.1 1912 | 51.5 1899 | 16.2 1912 | | |
| Sept. | 30 1914 | 21 1897 | 204.1 1933 | 62.9 1896 | 53.9 1933 | 16.6 1896 | | |
| Oct. | 29 *1933 | 17 1889 | 134.9 1899 | 50.0 1889 | 41.4 1899 | 15.3 1889 | | |
| Nov. | 24 1925 | 9 1897 | 89.9 1925 | 18.5 1891 | 33.8 1915 | 7.2 1891 | | |
| Dec. | 20 *1917 | 6 1882 | 60.1 1886 | 7.4 1912 | 26.0 1886 | 3.2 1912 | | |
| Year | 307 1933 | 251 1903 | 1613.7 1887 | 927.6 1912 | 36.1 1887 | 20.7 1912 | | |

**And in other years.*

HORIZONTAL MAGNETIC DIRECTION.

Horizontal Magnetic Direction, West of North (from daily measures of the continuous curves).

| 1883. | MEANS OF * | | | | Mean for the month † | Mean daily range ‡ | Highest reading of the month | Lowest reading of the month | Monthly range |
|-----------------------|---------------------|--------------------|---------------------|---------------------|----------------------------------|--------------------------|---------------------------------------|--------------------------------------|------------------|
| | Highest readings | Lowest readings | 4 a. m. readings | 4 p. m. readings | | | | | |
| | 13° + | | | | | | | | |
| January ... | 23.9 | 19.5 | 21.3 | 22.1 | 21.7 | 11.0 | 32.5 | 4.5 | 28.0 |
| February ... | 22.7 | 18.9 | 19.3 | 18.9 | 20.2 | 13.1 | 33.5 | - 3.5 | 37.0 |
| March ... | 23.9 | 16.1 | 18.1 | 20.3 | 19.6 | 14.0 | 31.5 | - 9.5 | 41.0 |
| April ... | 25.9 | 15.5 | 18.1 | 22.5 | 20.5 | 16.7 | 32.5 | 0.5 | 32.0 |
| May ... | 22.7 | 11.5 | 15.5 | 19.9 | 17.4 | 15.0 | 57.5 | - 2.5 | 60.0 |
| June ... | 21.7 | 11.5 | 15.1 | 19.5 | 17.0 | 13.6 | 28.5 | 1.5 | 27.0 |
| July ... | 20.4 | 10.8 | 13.6 | 19.0 | 15.9 | 12.6 | 27.4 | - 0.6 | 28.0 |
| August ... | 20.0 | 10.8 | 13.0 | 16.0 | 15.0 | 15.0 | 39.4 | - 5.6 | 45.0 |
| September ... | 19.0 | 8.2 | 12.8 | 14.8 | 13.7 | 14.8 | 31.4 | -24.6 | 56.0 |
| October ... | 16.8 | 10.4 | 12.2 | 12.2 | 13.7 | 13.1 | 23.4 | - 4.6 | 28.0 |
| November ... | 14.2 | 10.0 | 11.2 | 12.2 | 11.9 | 12.0 | 24.4 | -11.6 | 36.0 |
| December ... | 13.4 | 9.2 | 10.2 | 11.6 | 11.1 | 10.2 | 21.4 | -10.6 | 32.0 |
| Means ... | 20.4 | 12.7 | 15.0 | 17.6 | 16.5 | 13.4 | 32.0 | - 5.5 | 37.5 |
| Mean for the year ... | | | | | 13° 16'.5 W. | | | | |

* For the 5 quietest days.

† Includes all days.

HORIZONTAL MAGNETIC FORCE.

Horizontal Magnetic Force in C. G. S. Units (from daily measures of the continuous curves).

The figures in the columns are entered to the unit 10^{-5} C.G.S.

| 1933 | MEANS OF * | | | | Mean for the month * | Mean daily range † | Highest reading of the month | Lowest reading of the month | Monthly range |
|---------------|------------------|-----------------|-----------------|-----------------|----------------------|--------------------|------------------------------|-----------------------------|---------------|
| | Highest readings | Lowest readings | 4 a.m. readings | 4 p.m. readings | | | | | |
| | 17000 + | | | | | | | | |
| January ... | 185 | 172 | 178 | 179 | 179 | 45.3 | 229 | 119 | 110 |
| February ... | 185 | 166 | 176 | 176 | 176 | 51.9 | 264 | 102 | 162 |
| March ... | 186 | 164 | 173 | 175 | 175 | 58.5 | 229 | 76 | 153 |
| April ... | 185 | 148 | 173 | 178 | 171 | 66.9 | 264 | 94 | 170 |
| May ... | 174 | 133 | 155 | 163 | 156 | 76.1 | 387 | 44 | 343 |
| June ... | 161 | 121 | 146 | 154 | 148 | 58.5 | 176 | 76 | 100 |
| July ... | 189 | 148 | 167 | 173 | 169 | 62.5 | 222 | 87 | 135 |
| August ... | 178 | 142 | 163 | 167 | 163 | 59.4 | 253 | 83 | 170 |
| September ... | 172 | 127 | 154 | 151 | 151 | 73.8 | 258 | -34 | 292 |
| October ... | 185 | 159 | 175 | 175 | 174 | 59.8 | 240 | 87 | 153 |
| November ... | 187 | 170 | 178 | 177 | 178 | 47.2 | 235 | 101 | 184 |
| December ... | 191 | 174 | 182 | 182 | 183 | 36.9 | 213 | 78 | 135 |
| Means... .. | 192 | 152 | 168 | 171 | 169 | 58.1 | 247 | 76 | 171 |

Mean for the year 17169 C. G. S. Units.

* For the 5 quietest days.

† Includes all days.

ABSOLUTE MEASURES—SUMMARY.

| DIRECTION | | | FORCE. | | |
|---------------|-----------------------------|-----------------------|-----------------|-----------|-----------|
| 1933 | Declination Corrected | Inclination | Horizontal | Vertical | Total |
| | ° ' '' | ° ' '' | C. G. S. UNITS. | | |
| | 13 + | 68 + | 0·17000 + | 0·44000 + | 0·47000 + |
| January ... | 21·9 | 49·5 | 146 | 262 | 467 |
| February ... | 20·5 | 46·0 | 164 | 175 | 393 |
| March | 19·9 | 48·2 | 172 | 279 | 491 |
| April | 19·7 | 49·1 | 165 | 295 | 505 |
| May | 16·8 | 48·6 | 172 | 294 | 506 |
| June | 17·3 | 50·4 | 188 | 406 | 617 |
| July | 15·6 | 50·1 | 181 | 376 | 586 |
| August .. | 14·1 | 48·5 | 161 | 263 | 476 |
| September ... | 15·2 | 50·3 | 162 | 334 | 540 |
| October ... | 14·0 | 51·3 | 169 | 333 | 596 |
| November ... | 11·7 | 46·8 | 165 | 208 | 423 |
| December ... | 10·7 | 49·2 | 174 | 323 | 534 |
| Means ... | ° ' '' 13 16·5 W. | ° ' '' 68 49·0 | 0·17167 | 0·44296 | 0·47511 |

DATES OF MAGNETIC DISTURBANCES.

The disturbances are divided generally into three classes, *small*, *moderate*, and *greater*; these are indicated by the initial letters of the classes, and the letter *c* denotes *calm*. Very great disturbances are marked *v.g.* The days are civil days.

| 1933 | Jan. | Feb. | March | April | May | June | July | Aug. | Sept. | Oct. | Nov. | Dec. | 1933 |
|-------|------|------|-------|-------|-----|------|------|------|-------|------|------|------|--------|
| D. | | | | | | | | | | | | | D. |
| 1 | m | s | s | s | g | m | s | s | s | c | s | c | 1 |
| 2 | s | s | s | s | m | s | s | c | s | s | s | s | 2 |
| 3 | c | s | s | s | c | s | c | c | (c) | s | m | m | 3 |
| 4 | c | s | c | s | m | c | c | c | (c) | s | m | m | 4 |
| 5 | c | c | c | c | s | c | c | g | (c) | m | m | m | 5 |
| 6 | m | c | c | s | m | c | s | m | c | s | m | s | 6 |
| 7 | s | s | c | m | s | c | s | c | c | m | g | m | 7 |
| 8 | s | s | c | s | c | m | m | s | s | m | g | c | 8 |
| 9 | c | c | c | s | c | s | m | s | g | m | m | g | 9 |
| 10 | c | c | c | c | c | s | s | c | s | m | m | m | 10 |
| 11 | c | c | m | c | s | c | m | c | c | m | s | c | 11 |
| 12 | c | c | s | c | s | s | s | s | c | m | s | c | 12 |
| 13 | c | c | s | c | s | m | c | m | g | m | s | c | 13 |
| 14 | m | s | c | s | m | m | c | s | m | m | s | c | 14 |
| 15 | m | m | c | m | s | s | c | s | m | s | c | c | 15 |
| 16 | c | c | c | m | s | c | s | c | m | c | c | c | 16 |
| 17 | s | c | (m) | m | s | c | s | s | s | s | c | s | 17 |
| 18 | c | s | m | m | m | c | s | m | m | m | s | m | 18 |
| 19 | m | g | g | m | s | s | c | s | s | s | m | s | 19 |
| 20 | m | g | g | m | c | m | s | m | s | c | m | s | 20 |
| 21 | c | g | g | m | m | c | s | m | s | c | m | s | 21 |
| 22 | m | g | g | m | m | c | s | c | s | c | s | s | 22 |
| 23 | m | g | g | m | m | c | s | m | m | c | s | c | 23 |
| 24 | m | g | g | m | s | s | c | m | c | s | c | c | 24 |
| 25 | m | m | s | s | s | m | s | s | s | m | c | c | 25 |
| 26 | m | m | m | m | c | s | s | s | c | m | c | s | 26 |
| 27 | m | m | m | s | s | m | m | c | c | c | m | s | 27 |
| 28 | m | s | m | s | c | m | s | c | s | c | s | m | 28 |
| 29 | s | | m | c | c | s | s | c | c | c | s | s | 29 |
| 30 | s | | s | m | m | s | c | c | c | c | s | c | 30 |
| 31 | s | | m | m | m | m | c | c | c | c | c | c | 31 |
| TOTAL | (c) | 11 | 9 | 10 | 6 | 11 | 9 | 13 | 13 | 10 | 6 | 12 | TOTALS |
| | s | 7 | 9 | 7 | 12 | 12 | 13 | 10 | 11 | 9 | 12 | 11 | |
| | m | 13 | 4 | 12 | 12 | 7 | 8 | 7 | 4 | 12 | 10 | 7 | |
| | g | — | 6 | 2 | — | 1 | — | — | — | — | 2 | 1 | |
| v.g. | — | — | — | — | — | — | — | — | — | — | — | — | |
| | | | | | | | | | | | | | 121 |
| | | | | | | | | | | | | | 127 |
| | | | | | | | | | | | | | 102 |
| | | | | | | | | | | | | | 15 |

Note :—Character letters in brackets indicate incomplete records.

DATES OF SOLAR OBSERVATIONS

The Unit is $\frac{1}{5000}$ th of the Disc.

NS—No Spots.

n—Incomplete observation at Stonyhurst.

| 1933 | Jan. | Feb. | March | April | May | June |
|------|--------|---------|-------|-------|------|------|
| DAY | | | | | | |
| 1 | NS | 4.70 | 0.53 | 0.65 | NS | NS |
| 2 | NS | 6.35 | 1.04 | 0.25 | NS | 0.07 |
| 3 | 0.35 | 7.83 | 0.99 | NS | NS | 0.05 |
| 4 | 0.81 | n 13.46 | 1.44 | NS | NS | 0.04 |
| 5 | 1.33 | | 1.23 | NS | NS | 0.01 |
| 6 | 2.17 | n 6.90 | 0.92 | NS | NS | 0.03 |
| 7 | 2.50 | 8.54 | 1.31 | NS | NS | 0.08 |
| 8 | | 8.12 | 1.02 | NS | NS | NS |
| 9 | 2.03 | 7.58 | 0.51 | NS | 0.17 | NS |
| 10 | 2.82 | 5.84 | 0.38 | NS | 0.08 | NS |
| 11 | 2.22 | 3.46 | 0.33 | NS | NS | NS |
| 12 | 1.92 | 1.37 | NS | NS | NS | NS |
| 13 | n 2.00 | 0.58 | NS | NS | NS | 0.25 |
| 14 | 1.59 | 0.03 | NS | NS | NS | 1.52 |
| 15 | 0.79 | NS | NS | NS | NS | 1.47 |
| 16 | 0.35 | C NS | NS | NS | NS | 0.55 |
| 17 | 0.07 | NS | NS | 0.11 | NS | 0.60 |
| 18 | NS | NS | NS | 0.44 | n NS | 0.90 |
| 19 | NS | NS | NS | 0.68 | NS | 0.81 |
| 20 | NS | C NS | NS | 0.17 | 0.54 | 0.49 |
| 21 | NS | NS | NS | 0.27 | 0.65 | 0.39 |
| 22 | NS | NS | NS | NS | 0.29 | 0.22 |
| 23 | NS | NS | 1.24 | NS | 0.30 | NS |
| 24 | NS | C NS | 1.82 | NS | 0.33 | NS |
| 25 | NS | C NS | 2.02 | NS | 0.13 | NS |
| 26 | NS | C NS | 3.05 | NS | NS | NS |
| 27 | NS | 0.09 | 2.61 | NS | NS | NS |
| 28 | 0.26 | 0.32 | 2.52 | NS | NS | NS |
| 29 | 0.42 | | 1.45 | NS | NS | NS |
| 30 | | | 1.47 | NS | NS | NS |
| 31 | 1.61 | | 1.18 | | NS | |
| Mean | 0.80 | 2.78 | 0.87 | 0.09 | 0.08 | 0.25 |

AND DISC AREAS OF SPOTS.

Italics indicate Area from copy of Zurich drawing.

C with Italics indicates Catania observation.

| July | August | Sept. | October | Nov. | Dec. | 1933 |
|-------------------|-------------|-------------|-------------|-------------|-----------|------|
| | | | | | | DAY |
| NS | NS | NS | <i>NS</i> | <i>0.29</i> | NS | 1 |
| NS | <i>NS</i> | 0.02 | NS | <u>NS</u> | <i>NS</i> | 2 |
| NS | NS | 0.03 | NS | NS | NS | 3 |
| NS | NS | 0.01 | NS | NS | NS | 4 |
| NS | NS | NS | NS | NS | NS | 5 |
| 0.14 | NS | 0.12 | <u>NS</u> | <i>NS</i> | NS | 6 |
| 0.10 | NS | 1.09 | NS | <i>NS</i> | NS | 7 |
| 0.20 | NS | 0.71 | NS | <i>NS</i> | <i>NS</i> | 8 |
| 0.29 | NS | 0.30 | NS | NS | NS | 9 |
| ⁿ 0.16 | NS | 0.02 | NS | NS | <i>NS</i> | 10 |
| 0.12 | NS | NS | NS | NS | 0.23 | 11 |
| 0.17 | <u>0.05</u> | NS | NS | NS | <i>NS</i> | 12 |
| NS | NS | NS | <i>C NS</i> | <i>C NS</i> | NS | 13 |
| NS | NS | NS | NS | NS | NS | 14 |
| NS | <i>NS</i> | NS | <i>NS</i> | <i>NS</i> | NS | 15 |
| <u>NS</u> | NS | NS | NS | NS | <i>NS</i> | 16 |
| NS | <i>NS</i> | NS | NS | NS | NS | 17 |
| NS | NS | NS | NS | <i>NS</i> | <i>NS</i> | 18 |
| NS | NS | NS | NS | NS | <i>NS</i> | 19 |
| NS | NS | NS | NS | NS | <i>NS</i> | 20 |
| NS | NS | NS | NS | <i>NS</i> | NS | 21 |
| NS | NS | 0.38 | <i>NS</i> | NS | <i>NS</i> | 22 |
| NS | NS | 0.34 | <i>NS</i> | <i>NS</i> | <i>NS</i> | 23 |
| NS | NS | <i>0.11</i> | NS | NS | <i>NS</i> | 24 |
| NS | NS | NS | NS | NS | <i>NS</i> | 25 |
| NS | NS | NS | 0.56 | <i>NS</i> | NS | 26 |
| NS | NS | NS | 1.43 | NS | <i>NS</i> | 27 |
| NS | NS | 0.21 | <i>1.74</i> | <i>NS</i> | NS | 28 |
| NS | NS | 0.17 | 1.48 | <u>NS</u> | <i>NS</i> | 29 |
| NS | NS | 0.05 | 0.91 | <i>C NS</i> | NS | 30 |
| <i>NS</i> | NS | | 0.38 | | NS | 31 |
| 0.04 | 0.00 | 0.12 | 0.22 | 0.01 | 0.01 | Mean |

SUN-SPOT STATISTICS, 1933.

The points for which the co-ordinates were measured are indicated as follows :—s—centre of chief spot, g—centre of group, p—centre of preceding, f—centre of following spot. In the last column is entered the day and decimal thereof on which the centre of the spot or group actually passed the central meridian, or would have done so if on the Solar Surface on the day in question. The "Types" are :—

- I.—One or more small spots.
- II.—A double spot or group of some magnitude.
- III.—A train of spots of some magnitude.
- IV.—A single large spot with or without small companions.
- V.—Irregular group of larger spots.

Groups in *Italics* were not observed at Stonyhurst, but are taken from the Zurich drawings.

| No. of Group | Date | Mean Latitude | Mean Longitude | Ref. Pt. | Max. Area | Mean Type | Central Meridian |
|--------------|----------------|---------------|----------------|----------------|-----------|-----------|------------------|
| | | o | o | | | | |
| 1 | Jan. 3—15 ... | +10.0 | 328.8 | p | 2.82 | II | Jan. 9.1 |
| | | + 9.2 | 315.2 | f | | | " 10.1 |
| 2 | " 12—17 ... | + 1.8 | 274.1 | g | 0.41 | I | " 13.3 |
| 3 | " 13—16 .. | +13.1 | 305.4 | g | 0.49 | I | " 10.9 |
| 4 | " 28—Feb. 6 | + 5.1 | 15.3 | g | 2.43 | IV | Feb. 1.9 |
| | | + 5.6 | 23.8 | s | | | " 1.3 |
| 4' | Feb. 7 | -21.4 | 10.5 | g | 0.12 | <i>I</i> | " 2.3 |
| 5 | Jan. 31—Feb 11 | + 9.4 | 328.7 | s | 0.87 | IV | " 5.5 |
| 6 | Feb. 1—13 .. | +15.0 | 310.1 | s ₁ | 11.85 | V | " 6.9 |
| | | +14.7 | 304.6 | s ₂ | | | " 7.3 |
| | | +11.2 | 297.6 | s ₃ | | | " 7.8 |
| | | +11.4 | 307.0 | s ₄ | | | " 7.1 |
| | | +11.5 | 294.2 | s ₅ | | | " 8.1 |
| 7 | " 14 | - 0.9 | 149.9 | g | 0.03 | I | " 19.0 |
| 8 | " 27 | + 6.6 | 333.8 | s | 0.09 | I | Mar. 4.4 |
| 9 | " 28—Mar.11 | +15.0 | 310.4 | p | 1.44 | II | " 6.2 |
| | | +10.9 | 301.0 | i | | | " 6.9 |
| 10 | Mar. 23—Apl. 2 | + 4.8 | 22.8 | s | 2.27 | IV | " 28.0 |
| 11 | " 26—28 ... | +10.0 | 74.9 | g | 0.78 | I | " 24.1 |
| 12 | Apl. 17—21 ... | + 9.6 | 79.4 | g | 0.47 | I | Apl. 20.0 |
| 13 | " 19 | + 2.2 | 87.5 | g | 0.21 | I | " 19.4 |
| 14 | May 9—10 ... | - 5.7 | 159.4 | g | 0.17 | I | May 11.2 |

SUN-SPOT STATISTICS, 1933—Contd.

| No. of Group | Date. | Mean Latitude | Mean Longitude | Ref. Pt. | Max. Area | Mean Type | Central Meridian |
|--------------|----------------|---------------|----------------|----------|-----------|-----------|------------------|
| | | α | ο | | | | |
| 15 | May 20—22 ... | +10.2 | 68.8 | g | 0.65 | I | May 18.0 |
| 16 | „ 23—25 ... | + 7.9 | 328.4 | g | 0.33 | I | „ 25.6 |
| 17 | June 2—6 ... | — 6.5 | 152.2 | s | 0.07 | I | June 7.9 |
| 18 | „ 6 ... | + 8.1 | 115.3 | s | 0.01 | I | „ 10.7 |
| 19 | „ 7 ... | — 8.8 | 134.5 | g | 0.08 | I | „ 9.3 |
| 20 | „ 13—22 ... | — 6.4 | 37.1 | s | 1.52 | IV | „ 16.6 |
| 21 | July 6—12 ... | + 6.5 | 65.6 | g | 0.25 | I | July 11.7 |
| 22 | „ 8—10 ... | + 6.9 | 43.0 | s | 0.09 | I | „ 13.4 |
| 23 | Aug. 12 ... | —12.4 | 38.2 | s | 0.05 | I | Augt10.0 |
| 24 | Sept. 2—4 ... | + 5.5 | 14.2 | s | 0.03 | I | Sept. 8.0 |
| 25 | „ 6—10 ... | — 9.9 | 47.8 | g | 1.09 | II | „ 5.5 |
| 26 | „ 22—24 ... | +14.5 | 181.4 | s | 0.38 | I | „ 22.6 |
| 27 | „ 28—30 ... | — 1.1 | 123.4 | g | 0.21 | I | „ 27.0 |
| 28 | Oct. 26—Nov. 1 | + 8.5 | 90.7 | g | 1.74 | II | Oct. 26.8 |
| 29 | Nov. 29 ... | —31.7 | 31.4 | g | 0.13 | I | Nov 27.6 |
| 30 | Dec. 11 ... | + 2.5 | 185.7 | g | 0.23 | I | Dec. 13.2 |

