

RESULTS OF METEOROLOGICAL OBSERVATIONS TAKEN AT JERUSALEM IN THE YEAR 1894.

By JAMES GLAISHER, F.R.S.

THE numbers in column 1 of this table show the highest reading of the barometer in each month; of these the highest, as usual, are in the winter, and the lowest in the summer months; the maximum for the year was 27·607 inches, in October, and the next in order, 27·563 inches, in January. The highest reading in the preceding 33 years, viz., 1861 to 1893 inclusive, was 27·816 inches, in December, 1879.

In column 2 the lowest reading in each month is shown; the minimum for the year was 27·033 inches, in April, and the next in order, 27·060 inches, in February. The lowest in the preceding 33 years was 26·972 inches, both in April, 1863, and February, 1865.

The range of readings in the year was 0·574 inch. The largest range in the preceding 33 years was 0·742 inch, in 1876; and the smallest, 0·491 inch, in 1883.

The numbers in the 3rd column show the extreme range of readings in each month; the smallest was 0·175 inch, in September; and the next in order, 0·178 inch, in June; the largest was 0·507 inch, in March; and the next in order, 0·479 inch, in April. The mean monthly range for the year was 0·281 inch. The mean for the preceding 33 years was 0·309 inch.

The numbers in the 4th column show the mean monthly pressure of the atmosphere; the highest was 27·485 inches, in October, and the next in order, 27·416 inches, in December; the lowest was 27·264 inches, in July, and the next in order, 27·284 inches, in August. The mean yearly pressure was 27·357 inches. The highest mean yearly pressure in the preceding 33 years was 27·443 inches, in 1861, and the lowest, 27·358 inches, in 1892. The mean for the 33 years was 27·390 inches.

The temperature of the air reached 90° on May 23rd. In the preceding 12 years the earliest day in the year the temperature was 90° was March 25th in the year 1888. There were 3 other days in May when the temperature reached or exceeded 90°. In June it reached or exceeded 90° on 9 days; in July, on 9 days; in August, on 8 days; in September, on 4 days; and in October, on 2 days, the 9th and 10th. In the preceding 12 years the latest day in the year this temperature reached 90° was October 23rd in the year 1887. The temperature reached or exceeded 90° on 36 days during the year. In the year 1892 the number of days of this high temperature was 23, and in 1887 was 73; the average of the 12 years was 40. The highest temperature in the year was 108° on June 18th. The highest in the preceding 12 years, 1882 to 1893, was 106°, in July, 1888.

The temperature of the air was as low as 27° on both January 20th

and 21st, and on 7 other nights in this month was at or below 32° , and on one night only it exceeded 40° , viz., the 31st. In February it was at or below 32° on 5 nights, and as low or lower than 40° on 21 other nights; in March at or below 32° on 3 nights, and as low or lower than 40° on 16 other nights; in April it was as low or lower than 40° on 9 nights; in November, on 7 nights; and in December was at or below 32° on 7 nights, and as low or lower than 40° on 15 other nights. Thus the temperature was as low or lower than 40° on 113 nights during the year. In the year 1892 the number of nights of this low temperature was 19, and in 1886 was 97; the average of the 12 years was 54. The lowest temperature in the preceding 12 years was $26^{\circ}\cdot 5$, in January, 1890.

The highest temperature of the air in each month is shown in column 5; in January it was $57^{\circ}\cdot 0$, being $4^{\circ}\cdot 0$ below the mean of the 12 preceding high day temperatures. The high day temperature was above its average in May, June, July, October, and November, and below in all other months. The mean for the year was $85^{\circ}\cdot 0$, being $1^{\circ}\cdot 0$ above the average of 12 years. The highest in the year was 108° , in June.

The lowest temperature of the air in each month is shown in column 6; in January it was $27^{\circ}\cdot 0$, being $5^{\circ}\cdot 0$ below the average of 12 years; in February it was $28^{\circ}\cdot 0$, being $5^{\circ}\cdot 7$ below the average; and was below its average in all other months. The mean for the year was $40^{\circ}\cdot 6$, being $4^{\circ}\cdot 1$ below the average of 12 years.

The range of temperature in each month is shown in column 7; the numbers vary from $30^{\circ}\cdot 0$ in January to $57^{\circ}\cdot 0$ in June. In the months of May, June, and July the ranges were large, owing to the high high day temperature, and the low low night temperature, being $8^{\circ}\cdot 4$, $13^{\circ}\cdot 5$, and $14^{\circ}\cdot 9$ respectively larger than its average. The mean range for the year was $44^{\circ}\cdot 4$, being $5^{\circ}\cdot 1$ larger than the average of 12 years.

The range of temperature in the year was $81^{\circ}\cdot 0$. The largest in the preceding 12 years was $77^{\circ}\cdot 0$, in 1893, and the smallest, $63^{\circ}\cdot 5$, in 1885.

The mean of all the high day temperatures in each month is shown in column 8. The lowest was $50^{\circ}\cdot 5$ in January, being $0^{\circ}\cdot 4$ lower than the average. The highest was $87^{\circ}\cdot 6$, in June, being $2^{\circ}\cdot 7$ above the average, and the next in order $87^{\circ}\cdot 4$, in July. The mean for the year was $71^{\circ}\cdot 8$, being $0^{\circ}\cdot 5$ below the average of 12 years.

The mean of all the low night temperatures in each month is shown in column 9. The lowest was $34^{\circ}\cdot 1$, in January, being $4^{\circ}\cdot 6$ lower than the average. The highest was $60^{\circ}\cdot 1$, in July, being $4^{\circ}\cdot 4$ lower than the average. The mean for the year was $48^{\circ}\cdot 2$, or $4^{\circ}\cdot 4$ below the average of 12 years.

In column 10 the mean daily range of temperature in each month is shown; the smallest was $16^{\circ}\cdot 4$, in January, and the next in order, $17^{\circ}\cdot 2$, in February; the largest was 29° , in October, and the next in order $28^{\circ}\cdot 4$, in June. The mean for the year was $23^{\circ}\cdot 6$, being $4^{\circ}\cdot 0$ above the average. The smallest ranges in the preceding 12 years were $9^{\circ}\cdot 3$, in January, 1883, and $9^{\circ}\cdot 7$, in December, 1890; the largest were $33^{\circ}\cdot 8$,

in August, 1886, and $30^{\circ}1$, in August, 1887. The smallest mean for the year was $17^{\circ}8$ in 1883, and the largest, $24^{\circ}3$, in 1886.

The mean temperature of the air, as found from the maximum and minimum temperatures only, is shown in each month in column 11; the lowest was $42^{\circ}3$, in January; and the next in order $44^{\circ}3$, in February; the highest was $73^{\circ}7$, in July, and the next in order $73^{\circ}4$, in June. The mean for the year was $60^{\circ}0$, being $2^{\circ}5$ below the average of 12 years. The lowest mean temperatures in the preceding 12 years were $39^{\circ}8$, in January, 1890, and $42^{\circ}0$, in December, 1886; the highest were $81^{\circ}2$, in August, 1890, and $81^{\circ}1$, in July, 1888. The highest mean for the year was $63^{\circ}7$, in 1885, and the lowest, $60^{\circ}1$, in 1886.

January was the coldest month of the year; by reference to columns 5 and 6 it will be seen that the temperature was below its average both by day and night; the nights were cold and below the average throughout the year, being particularly so in February, May, July, September, and December.

The numbers in column 12 are the mean readings of a dry-bulb thermometer. If those in column 12 be compared with those in column 11, it will be seen that those in column 12 are higher in every month, the difference of the means for the year being $5^{\circ}8$. The mean difference between the mean temperature and that at 9 a.m. for the 12 years was $3^{\circ}2$.

For a few days in the winter months the dry and wet-bulb thermometers read alike, or nearly so, but in the months from June to September the difference between the readings often exceeded 20° , and was as large as 24° on both July 15th and August 25th.

In column 13 the mean monthly readings of the wet-bulb are shown; the smallest differences between these and those of the dry-bulb were $3^{\circ}4$, in January, and $3^{\circ}6$, in February; the largest were $13^{\circ}8$, in July, and $13^{\circ}7$, in October. The mean for the year was $57^{\circ}5$, and that of the dry was $65^{\circ}8$; the mean difference was $8^{\circ}3$.

The numbers in column 14 are the mean temperature of the dew-point, or that of the temperature at which the air would be saturated by the quantity of vapour mixed with it; the smallest differences between these numbers and those in column 12, were $7^{\circ}2$ in January, and $7^{\circ}6$ in February; and the largest were $23^{\circ}3$ in October, and $23^{\circ}1$ in July. The mean temperature of the dew-point for the year was $50^{\circ}9$; the mean for the 12 years was $50^{\circ}0$.

The numbers in column 15 show the elastic force of vapour, or the length of a column of mercury in inches corresponding to the pressure of the vapour; the smallest was 0.240 inch, in January, and the largest, 0.514 inch, in August. The mean for the year was 0.389 inch; the average of 12 years was 0.373 inch.

In column 16 the weight in grains of the water in a cubic foot of air is shown; it was as small as 2.8 grains in both January and February, and as large as $5\frac{1}{2}$ grains in both May and August. The mean for the year was 4.3 grains; the average of 12 years was 4.1 grains.

In column 17 the additional quantity of water required to saturate a cubic foot of air is shown; it was less than one grain in both January and February, and more than 6 grains in July. The mean for the year was 3.3 grains; the average of 12 years was 3.4 grains.

The numbers in column 18 show the degree of humidity of the air, saturation being represented by 100; the largest numbers appear in January, February, November, and December; and the smallest from March to October; the smallest of all was 45 in both July and October. The mean for the year was 61; that of the 12 years was 59.

The numbers in column 19 show the weight in grains of a cubic foot of air, under its mean atmospheric pressure, temperature, and humidity. The largest number was in January, and from March decreased month by month to the smallest in July, then increasing to December. The mean for the year was 481 grains; that of the 12 years was 482 grains.

The most prevalent wind in January was S.W., and the least prevalent wind was N.; in February the most prevalent were W. and N.W., and the least prevalent was S.; in March the most prevalent was S.W., and the least was N.; in April the most prevalent was S.W., and the least prevalent was N.; in May the most prevalent was N.W., and the least was S.; in June the most prevalent was N.W., and the least were E., S., and S.W.; in July the most prevalent were W. and N.W., and the least were S.E. and S.; in August the most prevalent was N.W., and the least were E., S.E., and S.; in September the most prevalent was N.W., and the least were S.E., S., and S.W.; in October the most prevalent were N.W. and E., and the least were S.E., S., and S.W.; in November the most prevalent were S.W. and E., and the least were N., S., and W.; and in December the most prevalent wind was S.W., and the least prevalent wind was N. The most prevalent wind for the year was N.W., which occurred on 128 times, of which 21 were in August, 17 in June, and 15 in both July and September, and the least prevalent wind was S., which occurred on only 7 times during the year, of these 2 were in each of the months of January, March, and April, and one in December.

The total number of times of each wind are shown in the last line of columns 20 to 27; those winds less in number than the average of the preceding 12 years were—

N.	by	11
S.E.	„	12
S.	„	3
W.	„	14

and those winds greater in number than those of 12 years were—

N.E.	by	7
E.	„	5
S.W.	„	10
N.W.	„	18

The numbers in column 28 show the mean amount of cloud in each month; the month with the smallest amount was July, 0·3, and the largest February, 6·5. Of the cumulus or fine weather cloud there were 3 instances; of the nimbus or rain cloud there were 31 instances, of which 8 were in January, 7 in November, and 5 in both February and March, and only 1 instance from May to October; of the cirrus there were 16 instances; of the stratus 4 instances; of the cumulus stratus 46 instances; of the cirro cumulus 76 instances; of the cirro stratus 19 instances; and 170 instances of cloudless skies, of which 30 were in July, and 25 in both June and October, and only 2 in November.

The largest fall of rain for the month in the year was 8·45 inches, in March, of which 3·03 inches fell on the 30th, 2·19 inches on the 4th, and 1·60 inch on the 31st. The next largest fall for the month was 6·87 inches, in November, of which 1·82 inch fell on the 23rd, 1·70 inch on the 25th, and 1·05 inch on the 24th. No rain fell from May 6th till November 9th, making a period of 186 consecutive days without rain. The total fall of rain for the year was 35·38 inches, being 9·99 inches above the average for 33 years, viz., 1861 to 1893 inclusive. The number of days on which rain fell was 65, being 10 more than the average.

RESULTS OF METEOROLOGICAL OBSERVATIONS TAKEN AT TIBERIAS IN THE YEAR 1894.

By JAMES GLAISHER, F.R.S.

THE numbers in column 1 of this table show the highest reading of the barometer in each month; the highest appear in the winter, and the lowest in the summer months; the maximum for the year was 31·073 inches, in January, and the next in order 30·932 inches, in February.

In column 2 the lowest reading in each month is shown; the minimum for the year was 30·157 inches, in April; and the next in order 30·251 inches, in July.

The range of readings in the year was 0·916 inch. The range in the morning observations was 0·813 inch, being 0·239 inch greater than the range at Jerusalem.

The numbers in the 3rd column show the extreme range of readings in each month; the smallest was 0·256 inch, in June, and the next in order 0·259 inch, in November; the largest was 0·704 inch, in April, and the next in order 0·628 inch, in March.

The numbers in columns 4 and 5 show the mean monthly reading of the barometer at 8 a.m. and 4 p.m.; and those in column 6 the lower reading at 4 p.m. than at 8 a.m.; the smallest difference between these two readings was 0·064 inch, in December, and the next in order 0·067 inch, in January; the largest was 0·133 inch, in October, and the next in order 0·100 inch, in September. In England in January the reading