

METEOROLOGY FOR JUNE, 1864.

PRIVATE OBSERVATORY, HOBART TOWN.

Year.	Barometer reduced to standard temperature, 32 degrees.	Mean Temperature of the Air.	Maxima Thermometer Readings.	Minima Thermometer Readings.	Mean daily range of temperature.	Degree of humidity, 100 complete saturation.	Extent of cloudy sky 10 for sky covered.	Mean amount of ozone 10 for maxima.	Total amount of Rain.
	In.	°	°	°	°				In.
1841	29.913	46.21	62.0	33.6	13.6	.85	5	—	1.23
1842	29.659	45.12	59.0	34.7	10.5	.81	5	—	4.41
1843	29.816	47.62	62.5	37.0	12.0	.86	5½	—	1.91
1844	29.790	43.89	63.2	33.2	13.3	.85	4½	—	2.74
1845	29.799	45.04	63.6	32.3	16.5	.85	4	—	4.27
1846	29.954	45.69	60.8	33.2	12.7	.87	6½	—	2.29
1847	29.644	43.09	59.0	31.5	14.9	.90	5½	—	0.56
1848	29.950	45.81	59.0	37.7	12.3	.85	6	—	1.12
1849	29.866	44.73	56.8	29.4	13.4	.87	5¾	—	2.46
1850	29.903	45.56	61.8	30.7	13.9	.86	6½	—	0.70
1851	29.794	47.01	59.0	34.8	10.9	.85	5½	—	2.35
1852	29.919	45.37	63.5	32.7	11.9	.86	5½	—	0.22
1853	29.917	44.03	57.6	29.8	11.6	.89	5¾	—	0.35
1854	30.031	44.85	54.1	34.0	9.6	.90	7½	—	0.33
1855	29.857	50.00	72.0	31.0	13.14	.83	4.50	—	1.29
1856	29.657	48.80	71.0	33.0	20.46	.80	6.33	—	1.15
1857	29.822	49.30	67.0	33.0	20.20	.83	5.90	4.80	3.42
1858	30.057	49.26	70.0	33.0	20.96	.77	4.50	6.38	1.12
1859	30.005	49.23	66.0	35.0	17.26	.81	5.67	6.22	3.80
1860	29.885	47.33	67.0	33.0	15.46	.83	6.00	6.25	1.30
1861	29.751	50.92	69.0	35.0	18.93	.79	5.16	6.50	1.58
1862	29.961	45.97	66.0	29.0	18.56	.81	4.92	6.68	1.23
1863	30.062	48.01	68.0	32.0	16.63	.82	5.42	6.59	0.89
1864	30.031	47.42	65.0	32.0	15.13	.82	6.17	6.90	3.71

The means in all cases are taken from the sums of each column, and not from the maximum and minimum.

Time of leafing, flowering, fruiting, &c., of a few standard plants in the Royal Society's Gardens during June, 1864.

- 1st. Leaves of *Maclaura aurantiaca* falling.
- 3rd. First flower of early *Narcissus* open.
- 14th. Leaves of Common Privet shedding.
- 20th. Flowers of Snow Flake commencing to open.
- 29th. Black Mulberry bare of leaves.

F. ABBOTT.



ANALYSIS OF THE OBSERVATORY RECORDS FOR JUNE, 1864;
IN CONJUNCTION WITH THOSE OF BIRTHS, DEATHS, &c. By
E. SWARBRECK HALL.

June commenced with such a genial fall of rain, that excited hopes that the mortuary record of the month would fall below the average; but the subsequent weather was so abnormal in many respects, that again, for now the fourth month in succession, the deaths are considerably above the average of the previous seven years' Junes.

Atmospheric pressure had a mean, 30·031, which has only been exceeded twice in the previous 23 years:—1863, 30·062; 1858, 30·057. 1854 had exactly the same mean, and every other year, except 1859, had a mean below 30 inches. The present month is + 00·164 above the 20 years' adopted standard mean, but + 00·77 higher than the average of the first 14 years of the series. The extreme range of the month was, 1·094 inches, and happened within three days, the minimum, 29·291, having occurred at the evening record of the 7th; and the maximum, 30·385, on the morning record of the 10th. The fluctuations of pressure were both numerous and high, the highest being a fall of —·715 of an inch on the 24th. On the 4th there was a fall of —·234 of an inch, and next day a further fall of —·437 of an inch, making a total fall of —·671 in the 48 hours. The greatest rise on any day was +·690 of an inch, on the 9th. But the most remarkable condition of the barometer was observed between the evening of the 24th and the close of the month, during which the mercury continuously rose; on the 26th as much as +·542, and for the six days altogether +·912 of an inch. At the same time the temperature was the highest for any similar period of the month. The ozone the same, and yet the wind vane marked, mostly, northerly winds and of considerable force. The last seven days of the month had the greatest number of deaths, 20. The previous seven had only 13, though one day, the 21st, had seven of that number. That day had a high, and rising atmospheric pressure, without wind, low temperature, cloudy, electricity almost absent, and ozone much below the month's mean.

Wind force total was, 28·60 lbs, only the Junes of 1857 and 1861 having more the former being, 37·28 lbs., the latter, 29·04 lbs. The present month's force exceeded the average of the seven previous years, by + 3·83 lbs.; yet the calms, 46, were + 3 above the average; thus showing that the winds were of unusually great force, when there were any. S.W., W., and N.W. were all above the average both in frequency and force. The latter was recorded 43 times out of the 90 observations, and as having 10·92 lbs. out of the total force. But as I have often before remarked, the coast, &c. stations, at the same time recorded west or south-west winds, there being no doubt that the course of the valley of the Derwent, with the position of Mount Wellington, frequently causes a north-westerly deflection of what are really winds from the west and south-west points of the compass. North winds were considerably below the average frequency, though nearly one pound above the mean in strength. N.E. winds were nearly as much above the average in frequency, as north were below, but were a few decimals below the mean in force. From all the other three points of the compass, the winds were below the average, both in number and strength. The greatest force of any wind during the month was 2·60 lbs.—twice noted from the south, with the rain on the 1st. Once N.W. on the evening of the 5th, the same from the north at noon of the 6th, and from the west on the evening of the 24th and noon of the 25th.

Temperature mean by the three daily observations was, 47·43 degrees, being + 00·30 above the 20 years' mean. The *Wet-bulb-thermometer* approximated unusually near to the foregoing, being 44·86 degrees. The present month's mean, however, is + 2·15 degrees above the 14 years' mean of the observations at the Royal Observatory Ross Bank, in the Queen's Park. The maxima and minima thermometers give a mean of 48·66 degrees. The highest record of the former was 65 degrees, on the 29th, the three previous days were all 60, and the one succeeding was 63. No other day of the month reached 60, except the 3rd, which attained 61. The mean of all the maxima is only 56·23 degrees, so that the warmth of the last five days of the month was peculiarly great. The minimum record was 32 degrees on the 10th and 13th, and the mean of all the minima of the month, 41·10 degrees. 1863 had the same minimum, 1862 had 29, 1855 had 31, all the rest of the nine years had higher minima, than the present, and the whole nine higher

maxima. The extreme range of the month, was 33 degrees, being below that of any of the preceding nine years' Junes, except 1859, which had only 31 degrees.

The *daily range* mean, 15·13 degrees, is — 17 below the 20 years' mean, had less than all the previous years, since 1855, which had only a daily range of 13·14 degrees, 1863 had 16·13. The extreme range on any day of the month only amounted to 22 degrees, and was recorded on the 10th. No year since 1854, had so small an extreme. The least range on any day was 6 degrees on the 19th.

The *solar temperature* mean was, 72·46 degrees, being — 2·29 degrees below the mean of the previous eight years, but + 1·46 degrees higher than June 1863 had. The highest temperature noted by this thermometer, was on the 29th, and 89 degrees; the lowest was 52 degrees on the 14th. The number of cloudy days, accounts for the small total of mean solar temperature, and at the same time shows, that the sun's rays, on the sunny days, were really hotter than is usual in this month.

Terrestrial radiation mean was, 37·80 degrees, being + 1·20 above the mean of the previous 8 years, and + 00·31 above 1863. The minimum record was 28·5 degrees on the night of the 13th, and that is — 2·5 below the minimum of 1863. The maximum temperature of this thermometer was, 47·5 degrees on the 20th.

Rain-fall total was, 3·71 inches, which is + 1·82 above the 20 years' mean. Though January, February, March, and May, had all a rainfall below the average, the half year's total is actually + 00·12 more than the 20 years' average of the first six months of the year. 2·70 inches of the present month's fall, was precipitated on the first two days of the month, with fresh southerly winds. Rain was recorded on all the first nine days of the month, except the 4th, and amounted altogether to 3·54 inches. In this period the fewest number of deaths took place. From the 10th to the 18th inclusive, there was not a sprinkle of rain, and only 17 of an inch fell during the last twelve days of the month, distributed through five of them. The last 12 days of the month had 32 out of the 54 deaths in the month.

Snow was permanent on Mount Wellington throughout the month, but underwent frequent mutations of increase and decrease.

While *spontaneous evaporation* exceeded the deposit of rain in May, in this month it was far below it, being only 1·42 inches.

Elastic force of vapor mean, 273, was so near the 20 years' June mean, that it was only—1 less.

Humidity mean, 82, was—1½ below the 20 years' mean.

Cloud mean was 6·17, being + 0·68 above the 20 years' mean.

Ozone mean, 6·90, was the highest recorded for any year of the previous seven, and + 70 above the mean of the whole. To the high atmospheric pressure, combined with this abundance of ozone, may be attributed the great prevalence of catarrh this month—Dr. Dongan Bird in his recent interesting and valuable little book, "On Australian Climates" confirms the opinions long since published by me, that "excess of ozone, particularly if the air is dry, causes irritation of the mucous membranes, particularly those of the pulmonary and gastric tract, &c. It has, in fact, upon the animal and vegetable organism, an action similar to that of oxygen, in an exaggerated form; it stimulates the rapid performance of all the vital functions, and their associated operations—respiration, circulation, excretion, secretion, assimilation—the circle of successive repair and destruction in which life consists, and whose coincidence and equality constitute health. It is nature's atmospheric stimulus, which, in an overdose, becomes, like alcohol, a poison." Many persons confound catarrh with influenza. In the latter, however, as was signally exemplified in the destructive epidemic that prevailed at this season in 1860, ozone was at a minimum or altogether absent.

Electricity.—There were only three positive indications recorded, with a maximum tension of five. Negative was noted 41 times, but with only a maximum tension of 4·5. There were 16 nil records. On the evening of the 8th and 9th the aurora australis was seen, and on the first night exhibited a most beautiful and unusual appearance, a broad arch of tremulous white light, extending across the sky from nearly east to west, and enduring for some time.

The *deaths* were 54 this month, being $\times 7$ six-sevenths above the average of the previous seven years, and more than any one of them, except 1861, which had 59; measles at that time prevailing epidemically, as catarrh has

been during the present month. The table following contrasts the ages at death of the present month, with the seven preceding Junes, and with the previous month of May :—

June, 1864.	Ages.	Junes.								Avg. 7 yrs Junes 1857-1863.
		May, 1864.	1863	1862	Max. 1861	1860	1859	1858	Min. 1857	
14	Under 1	9	6	10	9	12	11	7	9	9 1-7
10	1 to 5	6	6	3	20	5	5	8	8	7 6-7
4	5 to 20	2	3	5	4	0	4	3	2	3
7	20 to 45	11	9	14	14	11	14	15	8	12 1-7
9	45 to 60	12	10	11	5	3	9	9	2	7
10	60 and above	8	14	10	7	5	5	5	3	7
54		48*	48	53	59	36	48	47	32	46 1-7

* One more death registered since the May report was drawn up.

The greatest proportion of the mortality this month has fallen upon those under 20 years old, and those above 60. The deaths between 20 and 60 years of age (16) are less than in any of the Junes in the table, except 1860 (14), and 1853 (10). The maximum year of mortality, 1861, had more deaths at 1 to 5 years of age, and 20 to 45; an equal number at 5 to 20; but less in all the other groups of ages. It must not, however, be forgotten, that the relative proportion of the living population in each group of ages, is annually varying, and with a general tendency to an increase of those under 14 years of age, and those above 60. By exhibiting the number dying in each year in the five great classes of disease, as in the following table, it will be seen what type of sickness has been most induced by the meteorological character of the month :—

June, 1864.	Classes of Disease.	Junes.								Avg. 7 yrs Junes 1857-1863.
		May, 1864.	1863	1862	Max. 1861	1860	1859	1858	Min. 1857	
5	1 Zymotic	7	4	9	23	2	11	8	9	9 3-7
6	2 Constitutional	12	5	8	7	9	10	10	3	7 3-7
33	3 Local	24	29	26	25	20	21	17	14	21 5-7
6	4 Developmental	4	8	4	3	4	6	7	4	5 1-7
4	5 Violent	1	2	6	1	1	0	5	2	2 3-7
54		48	48	53	59	36	48	47	32	46 1-7

Zymotic deaths are little more than one half the seven years' average, and only two out of the seven had fewer. This is a true test of the general atmospheric purity of the present month. One of the deaths, however, in all probability, was due to habitual breathing of a locally poisoned atmosphere.

Constitutional deaths are also less than the seven years' average. Of the six recorded, four were cases of *Consumption*. One of the number being a native born youth. The deaths in the *local class* are greatly beyond the seven years' average, and more than any June of the seven. This augmentation arose from the comparatively large amount of deaths from *convulsions*, and *diseases of the organs of circulation and respiration*, the latter having the unusually large number of 14 deaths, (the previous month had only 4.) These were all from the prevailing *catarrh*, and its inflammatory sequences, *bronchitis*, *pleuritis*, and *pneumonia*, the causes for which have been indicated in the meteorological analysis. The *developmental class* had somewhat more deaths than the 7 years' average. Four out of the six deaths were from old age, respectively aged 62, 72, 85, 92, the last being an invalid at the Brickfield's Asylum. The fifth class, *violent* and accidental deaths, had considerably more than the seven years' average. Of the four deaths, one was a child, killed by a cart running over him; another was a girl, accidentally burnt by her clothes igniting from a bonfire; the third was a sailor, found drowned; and the fourth died from lock-jaw (*traumatic tetanus*) from a slight wound, but in a constitution probably pre-disposed from occupation and habits.

Inquests took place on three cases dying within this month. June, 1863, had five. In the hospital nine deaths occurred. Junes, 1863 and 1862, had respectively 13 and 12. Two of the cases this month were from country districts. Of the 54 deaths of the month, five died in the Glenorchy district, three in the Queenborough, and the rest in the city. 32 were males, 22 females. On the 6th, 7th, 11th, 18th, 20th, 23rd, 26th, not a single death occurred. In the first week of the month, seven died; in the second, 10; in the third, 16; in the fourth, 14; in the last two days, 7. The last seven days of the month, had 20 deaths; the previous seven, only 13; though one day—the 21st—had seven of that number. The next seven days in retrogressive order had only 10; the fourth, 9; and the first two days, 2. For any two consecutive days, the greatest number of deaths was eight, on the 21st, 22nd, and 27th 28th.

The registered *births* were 71, being five less than June, 1863, had.
