

METEOROLOGY FOR JULY, 1866.

PRIVATE OBSERVATORY, HOBART TOWN.

Day of month.	Bar. 37 feet abv. sea level, cor. & reduced		Self - register- ing Thermo- meters.				Wind.		Rain in inches.
	Highest.	Lowest.	Highest in shade.		Lowest in shade.		Direction from three daily registers.	Force in lbs. per square foot.	
			°	°	°	°			
1	30.233	30.194	61	46	92.0	44.5	W E S W	.52	
2	30.270	30.205	68	41	91.0	37.0	NW	.26	
3	30.055	29.934	65	38	87.5	41.0	NW N	.52	
4	29.841	29.795	57	41	73.0	38.0	NW W N W	3.38	0.02
5	29.542	29.415	60	41	86.5	39.0	NW N E N W	.52	
6	29.535	29.456	62	40	85.5	34.5	N N W	.26	0.02
7	29.781	29.769	52	35	55.0	33.5	NW W N W	.26	0.03
8	30.030	29.972	53	36	75.0	32.0	W N W S W	.52	
9	30.341	30.277	58	34	79.0	30.5	NW S W	.26	0.04
10	30.432	30.419	51	31	77.0	31.0	NW	.78	
11	30.460	30.437	53	28	76.5	28.5	NW W	.78	
12	30.421	30.410	51	27	76.0	28.0	NW W	.52	
13	30.319	30.200	56	31	76.0	29.5	NW N N W	.26	
14	29.996	29.942	53	39	69.0	37.5	NW S E	.26	
15	30.123	30.043	52	42	53.5	42.5	S	1.04	0.24
16	30.227	30.205	53	35	81.0	33.0	NW S	.52	0.10
17	30.235	30.196	53	31	76.0	29.0	W N W W	.52	
18	30.231	30.146	52	29	72.5	28.0	NW W	.52	
19	30.188	30.118	49	30	63.0	27.5	NW	.78	
20	30.182	30.143	52	32	79.0	29.0	NW W S	.52	0.04
21	30.069	29.991	48	37	63.0	34.0	S W S E	0.	0.07
22	30.024	29.934	52	33	70.5	32.0	NW E S E	0.	0.10
23	29.955	29.850	53	31	75.5	28.0	W N E	0.	
24	29.912	29.892	57	32	82.0	28.5	W S W	.52	
25	29.930	29.790	57	30	84.0	29.0	NW S	1.04	
26	29.816	29.794	51	39	58.0	36.5	NW S W S	.52	0.06
27	29.911	29.885	55	41	84.5	39.0	NW S E W	.26	0.16
28	29.521	29.354	51	35	72.5	32.5	NW N S W	.78	0.02
29	29.676	29.520	48	39	52.0	38.0	S S W	5.99	0.89
30	29.956	29.869	49	35	75.0	34.0	S W S	1.04	0.53
31	30.153	30.090	56	35	83.0	33.0	NW N N W	.26	0.20
Monthly									
mean 30.100 46.23 75.00 33.50 Total force 23.67 2.52									

The mean in all cases is taken from the sums of the three daily registers, and not from the maximum and minimum.

The direction of the wind is registered from currents moving at a height of 192 feet, and the force according to Lind's Wind Gauge. The supposition, however, of an uniform velocity during the month is a very arbitrary one, and the results can be considered only approximately correct.

The relations of the quantities of rain which fell under the different winds are registered each evening at sundown.

The twenty years' standard tables are used for obtaining the difference from the average.

*Leafing, Flowering, and Fruiting of a Few Standard Plants
in the Royal Society's Gardens during the Month :—*

- 1st. Arbutus unedo, commencing to flower.
- 2nd. Garrya elliptica, ditto.
- 7th. Almond, ditto.
- 10th. Leaf buds of Morus alba commencing to break.
- 28th. Crocus commencing to flower.
- 30th. White hyacinth ditto.

Barometer mean, 30·100in., being 0·242in. above the average.
 Temperature mean, 45·23°, being 0·59° below the ditto.
 Solar intensity mean, 75°, being 1° below the ditto.
 Dew point mean, 38·5°, being 1·33° below the ditto.
 Humidity of air mean, ·83, being $\frac{1}{2}$ per cent. below the ditto.
 Elastic force of vapor mean, ·255, being ·004 per cent. below ditto.
 Total amount of rain, 2·52in., being 0·79 above the ditto.
 Increase of rainfall on spontaneous evaporation 1·10in.
 Mean amount of ozone, 7·00, being ·57 on chromatic scale above ditto.
 A paucity in electricity all through the month.
 Snow never absent from Mount Wellington during the month.

FRANCIS ABBOTT.

ANALYSIS OF THE OBSERVATORY RECORDS FOR JULY, 1866, IN CONJUNCTION WITH THOSE OF BIRTHS, DEATHS, &c. BY E. SWARBRECK HALL.

The meteorological phenomena of this July have been so nicely balanced in their effects on life, that the deaths were only one below the average of the nine previous Julys. In 1865,—the healthiest July on record,—the mortality was one-third lower; nevertheless, it is remarkable, that the present month had a smaller number of deaths under 45 years of age, than any one of the preceding nine years, the death-rate being raised, altogether, by very infirm and old people. The weather, still, was quite abnormal, as the following analysis will show:—

Atmospheric-pressure mean, 30·100, was +·242 above the 20 years' adopted standard for July. Only two years out of the previous 25, had higher means,—1860 and 1850. Last year was less by —·053. The month's range was 1·106 inches. The maximum, 30·460, having occurred on the 11th, and the minimum, 29·354, on the 28th. This range is about that of the mean of the previous eleven years, though +·270 more than 1865 had. The greatest movement of the barometer in any twenty-four hours, from 1 p.m. to 1 p.m., was a fall of —·476 of an inch on the 28th. Last year's maximum was some what more. The next highest was a fall of —·380 on the 5th, and the largest rise was +·327 on the 30th, and another of +·324 on the 9th. Altogether there were eleven days on which the movement exceeded one-fifth of an inch. From the 6th to the 11th inclusive, the barometer rose daily until the maximum of the month was attained, and the deaths on these six days were more numerous (14) than on any other consecutive six days in the month, 8 of the number were from 60 to 71 years old, 4 from 28 to 53, and only 2 below 5 years old. From the 18th to the 23rd, there were only 2 deaths, aged 52 and 76 respectively, and this period was marked by the smallest daily barometrical movements, of any six days in the month. Old and hopelessly diseased people succumb to variations of atmospheric pressure in this climate, much more readily than to variations of temperature, or the lowest cold we are subject to. Out of the six days of smallest mortality, there were four on which the minimum temperature was at or below freezing point, and the two others had minima of 33 and 37 only.

Wind-force was —15·87 lbs. below the July average of the previous nine years, being only 23·67 lbs. 1860 and 1861, however, had both a much smaller amount, while last year had considerably more than double the aggregate force. Nevertheless, a minute comparison of the frequency and force of the winds from the eight points of the compass, gives the more favorable aspect to the present month. North, north-east, east, and south-east were all below the average, both in frequency and force; south, south-west, west, and north-west were all above the average in frequency, but south and west alone were above in force. Frequent and gentle breezes from these two points gave a pleasant and healthy character to this month. The greatest wind pressure recorded was 5·21 lbs. to the square foot, with a south wind at 7 a.m. on the 29th. On the 30th last year there was a storm from the south-west, which added 15·62 lbs. to the month's force, and there were three other days on which 5·21 lbs. pressure was registered. The present month, moreover, had only one entry of 2·60 lbs., while last July had 7. The *Calms*, too, present a remarkable contrast, for while last year had 55, the present year had only 36, being —3·82 less than the average of the previous eight years. Almost constant but gentle aërial movement, therefore, characterised this month in this city; while storms, causing numerous shipwrecks, prevailed on the seaboard of the southern and eastern colonies of the Australian Continent.

Temperature mean, 45·23 degrees, is the coldest on record since July 1854, and is —·59 of a degree below the 20 years' average. 1865 had a mean +1·86 degrees milder, and 1864 was four degrees warmer than the present July. The self-registering maxima and minima thermometers gave only the mean of 44·87 degrees. Thus for two months consecutively these thermometers have given lower means than the observed ones. It is very rarely that any month does this, but that two in succession should do so is without parallel. Last year's self-registered mean was + 4·28 degrees more than the present month's. The extremes of temperature were 68 degrees on the 2nd, and 27 on the 12th. The last is the lowest temperature noted in the 26 years, during which regular records have been kept. 29·4 degrees, in June 1849, was previously the

lowest. The extreme range, 41 degrees, is the greatest ever registered in the 26 years. The mean of all the maxima, or high-day temperatures, was only 54.45 degrees, while last year's was + 4.10 more. The mean of all the minima, or low-night temperatures, was only 35.30 degrees, being -4.45 less than July 1865 had. On eleven nights in the month, the minimum thermometer descended to and below freezing point, *i.e.*, from the 10th to the 13th; the 17th to the 20th; the 23rd to 25th. Ice on ponds four feet deep, attained more than an inch of thickness, and bore walking over. Neither in intensity, nor duration, was ever so much frost before recorded in this city and neighborhood. It is probable, however, that in the winter of 1836 there was more. At that time the Great Lake was so hermetically sealed by ice, that the fish perished for want of fresh air, and loaded bullock carts were driven across the lake to save the ordinary detours by the route on its margins. No minute and accurate data, unfortunately, exist, for the meteorological phenomena at that period, therefore, no reliably minute comparison can be made, I only write from memory on this point. In the very cold period of 16 days from the 10th to the 23rd inclusive, 22 deaths only occurred, while in the other 15 days, 32 deaths took place; so that the influence of cold, merely, on mortality, is not here marked as it is said to be in England and elsewhere.

Daily Range of Temperature had the mean of 19.16 degrees, being + 3.81 degrees above the 20 years' average, but only -35 of a degree less than 1865 had. The greatest range on any day was 27 degrees on the 2nd and 3rd, and 25th. The two first days had a heavier mortality (10) than any other two consecutive days in the month, the next highest having only 6. The smallest range on any day was 9 degrees on the 29th, and on this day 4 deaths took place.

The *Solar Thermometer* gave a mean for the month of 75.00 degrees, being 2 less than 1865 had, and also -51 of a degree below the average of the previous ten years. The maximum record was 92 degrees on the first; the minimum, 52 on the 29th. The corresponding records last year were 92 and 50.

The *Terrestrial Radiation thermometer* had a mean of 35.50 degrees, which is -3.26 below that of 1865, and -2.05 less than the average of the previous ten years. The extremes were, 44.5 on the 1st, 27.5 on the 19th. On the 12th, when the self-registering minima air thermometer, elevated four feet above the ground and under cover, fell to the lowest minimum ever recorded, 27; Terrestrial-radiation thermometer, on the grass and exposed to the sky, was one degree higher.

The aggregate *Rain-fall* of the month was, 2.52 inches, being + .79 of an inch above the 20 years mean, and + .92 of an inch more than July 1865 had. It fell on 15 days, which is + 1.27 more than the average of the previous eleven years. In the first fourteen days of the month, there were only 4 days on which rain fell, and the total amount was only .11 of an inch, barely sufficient to moisten the surface of the ground. On the 15th, there was gauged .24 of an inch, and there was a moderate run in the surface channels. On the 20th, 21st, 22nd, there was rain in small quantities. The last six days of the month were all wet, and 1.86 of an inch was gauged. The greater part of this fell on the 29th and 30th, and surface channels, sewers, and rivulets, were thoroughly flushed. *Snow* was never absent from Mt. Wellington during the whole month, and received several copious additional deposits.

Humidity had a mean of 83, which is only - .05 less than the 20 years' mean, but + 4 above last year's. It ranged from minimum of 147 at 7 a.m. on the 19th, to maximum of 372 at 1 p.m. on the 2nd. The corresponding records for 1865 were, 174 and 318.

Spontaneous-Evaporation amounted to only 1.42 inches, being, as might be expected from the low temperature, little sunshine, and moderate wind-force of the month, much below rain-fall. Last year spontaneous evaporation exceeded rain-fall in amount.

Cloud mean was 5.49, being + .22 more than the 20 years' average for July, though .41 less than 1865 had, notwithstanding the greater number of rainy days and rain-fall in the present month.

Ozone mean, 7.00, is .09 less than the average of the previous nine years, and -1.55 less than 1865 had, showing how much aerial movement increases the purity of the air, above what mere washing of it by rain effects. In the present month the point of saturation (10), was never obtained, 9 being the maximum, though frequently recorded. The lowest register was 5, and very frequently entered, *i.e.*, 15 times out of the 62 records.

Electricity had only 2 positive records with tension of 4, registered on the 6th. In 1865 there were 21, with maximum tension of 6. There were 46 negatives, with maximum tension of 4, and minimum of 0.5. Last year had only 34, though with maximum tension of 7. "Nil" was registered 14 times this year, to 7 last. On the last six days of the month nil was noted 9 times out of the 12 observations. The contrast of the electrical conditions of the atmosphere, this year and last, accounts to some extent, for the difference in the ozone mean, and the relative amount of mortality at the same time, of course the latter was largely influenced by the state of atmospheric pressure.

Fifty-four deaths for July 1866 is just one less than the average for this month of the preceding nine years, though one-third more than July last year had (36), that having, with 1862, the smallest number for any of the nine Julys compared. Three years of the nine had a greater number of deaths than the present month, but the other six all had less.

July, 1866.	Ages.	Julys.										Avg. 9 yrs. Julys. 1857-1865.
		June, 1866										
			'65Min	1864	1863	'62Min	1861	'60Max	1859	1858	1857	
4	Under 1	5	7	16	6	3	10	8	7	7	16	8 8-9
4	1 to 5	1	2	4	5	8	13	9	9	9	6	7 2-9
1	5 to 20	1	3	7	3	2	10	4	2	10	1	3 5-9
4	20 to 45	10	6	13	10	9	13	22	8	11	20	12 4-9
13	45 to 60	7	7	18	14	11	3	22	5	8	4	10 2-9
28	60 and above	24	11	12	10	3	10	49	8	6	5	12 6-9
54		48	36	70	48	36	59	114	39	41	52	55

"Under one year of age" the deaths were not quite half the nine years' average, and only 1863 had fewer.

At "1 to 5 years of age" the mortality was slightly more than half of the average. 1865 had only half the number, however, and 1864 had an equality with the present year.

At "5 to 20" the deaths were little more than one-fourth of the average, and only one-third of what 1865 had. Nevertheless 1858 had even less than the present year, that is, none.

At "20 to 45" the average of the nine years was more than three times the number that died this month. At all ages under 45, therefore, the total deaths were but 13, while the nine years' average for all these groups amounts to 31 1-9, or nearly three times as many. Moreover no single year of the nine had less than 18, and that was last year. The other year of minimum total mortality, 1862, had 22.

At "45 to 60" the deaths were somewhat above the average, and only three years out of the nine had more.

At "60 and all ages above" the mortality was more than double the average, and only the fatal influenza-year, 1860, had more. Last year had much less than half. The previous month of June this year, too, had nearly as many.

July, 1866.	Classes of Disease	Julys.										Avg. of 9 yrs. Julys '57-'65.
		June, 1866.										
			'65Min.	1864	1863	'62Min.	1861	'60Max	1859	1858	1857	
6	1. Zymotic	1	3	0	3	8	19	38	4	6	6	9 6-9
6	2. Constitutional	7	9	13	7	7	6	10	8	7	9	8 4-9
27	3. Local	33	17	42	29	16	21	44	20	24	26	26 5-9
12	4. Developmental	6	4	11	9	1	5	11	3	2	5	5 6-9
3	5. Violent &c.	1	3	4	0	4	8	11	4	2	6	4 6-9
54		48	36	70	48	36	59	114	39	41	52	55

The 1st, or *Zymotic class of diseases*, had 6 deaths, which is more than one-third less than the nine years' average, but twice as many as 1865 had. Nevertheless the present month had three deaths included in this class which did not arise from climatic causes, while 1865 had not any in the same "orders." The "miasmatic order" in both years had the like number of deaths. Last year one of these deaths occurred in the Queen's Asylum. So far, in the seven months of 1866, there has not been a single death in that Institution. The 2nd or *Constitutional class of diseases* had 6 deaths, being little more than two-thirds of the nine years' average. None of the nine had less, but 1861 had the same number. Three of the present month's deaths were from *Consumption*, at the ages respectively of 28, 41, and 68; none of them were born in Tasmania. Last year also had 3, and none of them natives of the island. The 3rd, or *Local class of diseases*, had a fraction more than the average of deaths, 1864, 1863, 1860, had all more; 1865, however, had not so many by 10. The previous month of June had 6 more. In the 1st order of this class,—*The Brain and Nervous system*,—the deaths were 7, two from *apoplexy*, four from *paralysis*, and one from *convulsions*; 1865 had one less. In the 2nd order,—*The Heart and circulatory system*,—there were 5 deaths, last year had only 2. In the 3rd order, *Lungs and respiratory system*, the deaths were 9, all but a child of 6 months old, being from 46 to 72 years old. Last year had one third less in number. June of the present year had 15 deaths in this group. In the fourth order, *The Organs of Digestion*, the deaths were 3, last year had 2. In the 5th order *The Urinary System*, 3 deaths took place, there was only 1 in 1865.

The 4th, or *Developmental class* of diseases, had 12 deaths, or more than double the nine years' average, and the highest of any year of the nine; one was an infant only four weeks old, from *Atrophy and Joint disease*; all the others, from old age, i.e. :—62, 67, 71, 73, 76, 77, 78, 80, 80, 82, 92. Last year had only 4 deaths in this class, and but 2 of them were old people, i.e. :—72, 88, the other two were children aged one hour, and two years respectively.

The 5th, or *Violent and Accidental class* of diseases, had 3 deaths, being considerably less than the average. One a child 2 months old, was *suffocated* by being overlaid; the second was a child, 2 years old, accidentally *burnt*. The third was a woman of 55, found drowned. Last year had the same number of deaths, i.e. :—2 overlaid, 1 burnt.

Inquests were alike 5 this year and last. The deaths in *Hospital* were 15, one admitted from a country district. In 1865 there were only 9, and four of those from country districts. At the *Male Invalid Asylum* there were 9 deaths the youngest being 51, and the oldest 92 years old. Last year there were only 4. In June and July of this year, therefore, there have been altogether the enormous number of 19 deaths. No person conversant with modern requirements for such like institutions, would say that the Brickfields Asylum has all the provisions necessary to smoothen the passage to eternity, for such a number of persons, lingering, many of them, for months in hopeless agony. They should either have the comforts the General Hospital provides for the sick and dying, or be removed to die in that institution. In London it is proposed to establish six large hospitals with all modern improvements, for the sick and dying poor of the parish poor-houses. The revelations lately made as to the miserable treatment of the sick and hopelessly-diseased poor in these poor-houses has roused benevolent men of all denominations to urge the government to take prompt steps to remove such a scandal to humanity, and our common christianity. God speed their labors, and grant that we may go and do likewise. Of the 54 deaths 2 died in the Glenorchy, one in the Queenborough, and the rest in the city divisions of this registration district, 36 were males, 18 females. Last year males and females were alike, 18 in number.

In the first week there died 15; in the second, 13; in the third, 9; in the fourth, 11; in the last three days, 6. There were seven days in the month on which no deaths took place; but only three of them consecutive, i.e., 20th, 21st, 22nd. The most fatal days of the month were the 2nd, 3rd, 17th, 29th, on which there took place 4, 6, 4, 4, deaths respectively. The most fatal periods of the month were, from the 7th to 11th inclusive, and 25th to 29th, when each five days had 13 deaths.

The *births* registered were 51, being 22 less than July, 1865, had.