Crowborough Observatory, Sussex.

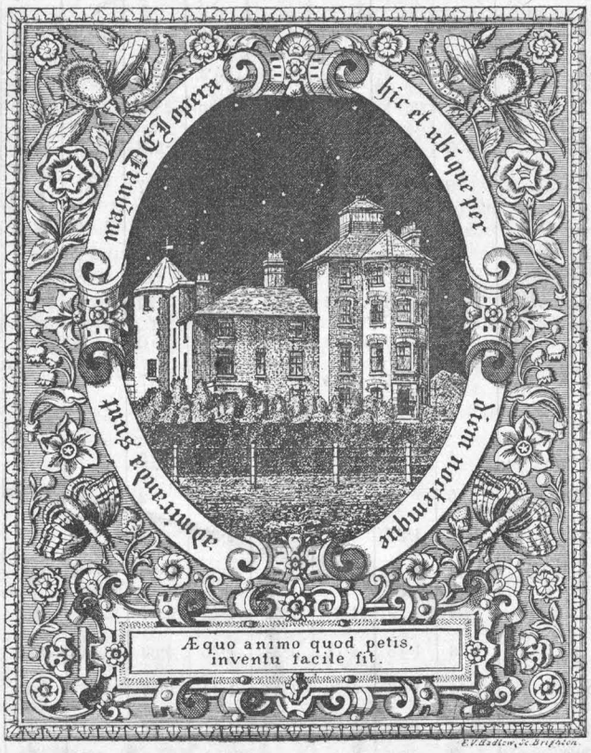
THE SUMMARY

OF A

METEOROLOGICAL JOURNAL,

KEPT BY

C. LEESON PRINCE, F.R.A.S., F.R.MET.S.,



AT HIS OBSERVATORY,

CROWBOROUGH, SUSSEX.

1888.

1888.		Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.	Year.
Barometer, mean 9 a.m., sea level		30·261	29·954	29·630	29·897	30·077	29·943	29·792	30·028	30·160	30·090	29·827	30·083	29·978
Temperature by exposed Thermometers 4 feet above the soil.	Absolute maximum	58°·4	52°·0	54°·8	68°·8	76°·4	87°·0	76°·0	83°·0	81°·0	68°·6	59°·4	52°·6	87°·0
	„ minimum	18·3	15·2	19·2	24·0	31·2	40·3	36·2	42·2	39·5	25·5	27·7	24·4	15·2
	Mean maximum	42·8	39·5	44·6	53·9	64·8	69·3	68·7	70·7	68·2	57·3	51·2	45·2	56·3
	„ minimum	30·5	27·5	29·8	33·3	40·0	47·1	49·2	49·3	47·9	37·5	40·4	34·9	38·9
	„ temperature	36·6	33·5	37·2	43·6	52·4	58·2	58·9	60·0	58·0	47·4	45·8	40·0	47·6
	„ daily range	12·3	12·0	14·8	20·6	24·8	22·2	19·5	21·4	20·3	19·8	10·8	10·3	17·4
	Solar radiation (in Vacuo), maximum	63·2	59·0	65·0	81·2	87·8	97·0	89·1	92·8	91·1	73·6	69·0	59·0	97·0
	„ „ „ mean	46·5	46·1	51·3	64·1	76·4	79·6	78·8	80·4	76·5	64·9	52·6	49·3	63·8
Terrestrial radiation—minimum		16·2	11·5	15·8	22·4	27·3	37·2	35·0	39·8	37·6	25·5	26·4	22·1	11·5
„ „ mean minimum		28·4	26·5	29·0	32·1	37·4	45·4	48·2	47·4	45·2	33·9	38·4	31·0	36·9
Mean amount of cloud, 9 a.m.		7·0	9·0	8·5	8·3	6·5	8·1	9·5	7·1	5·8	5·4	9·1	6·1	7·5
Temperature in the shade (Stevenson's Stand) 4 feet above the soil.	Absolute maximum	58·4	47·5	50·4	61·0	70·8	80·0	68·8	78·0	74·9	64·2	55·0	51·0	80°·0
	„ minimum	21·0	18·2	21·8	26·2	33·4	41·9	37·0	43·8	41·2	28·0	28·0	25·8	18·2
	Mean maximum	41·2	36·4	41·0	48·7	59·4	63·6	62·9	64·9	62·9	53·1	48·3	44·0	52·2
	„ minimum	32·1	29·2	31·0	34·7	41·6	48·3	49·9	50·4	49·2	39·5	41·2	36·2	40·2
	„ temperature	36·6	32·8	36·0	41·7	50·5	55·9	56·4	57·6	56·0	46·3	44·7	40·1	46·2
	„ daily range	9·1	7·2	10·0	14·0	17·8	15·3	13·0	14·5	13·7	13·6	7·1	7·8	12·0
	Temperature, 9 a.m.	37·0	33·4	36·5	43·1	53·4	58·2	57·0	59·2	57·4	47·7	45·7	40·4	47·4
	„ of dew point, 9 a.m.	34·6	30·1	32·8	36·8	43·6	51·2	52·1	52·5	51·5	42·9	43·8	38·7	42·6
	Elastic force of vapour, 9 a.m.	·200	·168	·187	·218	·284	·376	·389	·396	·381	·276	·286	·235	·283
	Relative humidity, 9 a.m.	90	88	86	78	69	77	83	78	80	83	93	93	83
Direction of the Wind at 9 a.m.	N.	4	2	3	0	3	2	6	2	2	7	1	2	34
	N.E.	7	17	9	13	8	9	1	7	14	3	2	5	95
	E.	2	0	1	1	1	2	2	1	2	4	5	2	23
	S.E.	3	0	1	1	4	0	2	0	0	3	5	5	24
	S.	1	1	3	1	3	7	2	5	2	1	3	11	40
	S.W.	5	2	7	8	8	3	11	10	5	5	5	2	71
	W.	4	4	5	5	4	5	5	5	5	6	9	4	61
	N.W.	5	3	2	1	0	2	2	1	0	2	0	0	18
Rainfall in Inches.	Crowborough	1·14	1·87	4·58	1·84	1·66	4·31	6·76	3·11	1·20	2·49	5·35	2·93	37·24
	a. Eridge Castle	0·95	1·33	4·96	1·86	1·36	3·10	5·01	3·66	0·83	1·45	5·07	2·87	32·45
	b. Mayfield Vicarage	1·04	1·79	4·04	1·65	1·42	3·17	5·30	2·19	1·49	2·89	4·78	2·48	32·24
	c. Forest Lodge, Maresfield	1·06	1·48	4·14	1·58	1·36	4·02	6.44	2·28	1·02	2·34	4·52	2·40	32·64
	d. Waldron, Heatherden House	1·24	1·89	4·93	1·50	1·44	3·67	5·07	1·90	1·25	2·66	5·41	2·16	33·12
	e. Uckfield	1·04	1·44	3·59	1·27	1·61	3·26	4·19	3·49	0·84	2·51	4·73	2·13	30·10
	f. Waldron, Bryckden	1·17	2·01	4·22	1·45	1·60	4·21	5·66	2·15	1·33	2·61	5·37	2·32	34·10
	g. Warbleton	1·18	1·97	4·30	1·49	1·42	3·47	5·22	1·45	1·02	2·64	4·56	2·00	30·72
	h. Fletching	1·05	1·73	3·67	1·49	1·50	4·20	4·65	2·26	0·95	2·10	4·37	2·21	30·18
	i. Newick	0·93	1·56	4·03	1·36	1·89	3·95	4·86	2·76	0·97	2·28	5·44	2·38	32·41
	j. The Coneyboroughs House	1·11	1·64	5.22	1·43	1·91	5·60	5·35	3·42	1·08	2·67	6·43	2·86	38·72
	k. Lewes	1·11	1·70	4·05	1·31	1·44	3·47	4·84	1·67	0·89	2·90	4·21	2·05	29·64

The Observatory is situated 825 feet above the level of the sea, in Latitude 51° 3′ 14″ North, and in Longitude 0° 9′ 30″ East.

a. From the Register kept by Mr. RUST, Eridge Castle Gardens.
b. „ „ „ The Rev. H. T. M. KIRBY.
c. „ „ „ Capt. WM. NOBLE, F.R.A.S.
d. „ „ „ J. G. BOUCHER, Esq.
e. „ „ „ Miss LAURA DAY.
f. „ „ „ Dr. GRAHAM.
g. From the Register kept by The Rev. R. G. PENNY.
h. „ „ „ Dr. TREUTLER, F.R.Met.S.
i. „ „ „ T. ST. LEGER BLAAUW, Esq.
j. „ „ „ Lord MONK-BRETTON.
k. „ „ „ J. G. BRADEN, Esq.

GENERAL REMARKS.

JANUARY.—The year commenced with a continuance of the severe frost which had prevailed during the latter part of December, but a considerable rise in temperature occurred during the night of the first, with a change of wind from E. to S.E.; and several succeeding days were mild and showery. The weather continued mild to the 12th, when cold weather returned and continued, for the most part, to the end of the month. The high temperature on the 10th and 11th was very remarkable and exceeded any instance which I had previously recorded for January. On the former day the highest temperature in the shade was 58°·4, and on the latter 57°·2. The sky was absolutely cloudless on these two days, the atmosphere perfectly calm, while the sun's rays felt so warm, for the time of year, that for the sake of testing them I placed my black-bulb thermometer (in vacuo) by the side of my usual instruments, and found that it registered a temperature of 89°·6! At mid-day some hundreds of bees left a neighbour's hive and settled on an adjoining cottage, for some time, before they discovered that they had made a premature exit from their home. At this time nearly the whole county was enveloped in dense fog, the upper surface of which presented a remarkable appearance from The Observatory. Before sunrise on the 10th and after sunset on the 11th, some beautifully coloured tints were visible in the aqueous vapour lying above the distant horizon. In the clear atmosphere of these mornings the planet Venus, although so many weeks past the theoretical period of greatest brilliancy, shone with such intensity as to cast a shadow. On the 12th the fog came up the hill and caused such a decrease in temperature that the highest temperature for the day was 20° lower than that on the 11th. During the night of the 25th a continuous gale occurred from the S.W.; the mean temperature of the month was rather below the average, and after the 4th the readings of the barometer were high, the maximum, 30·714 inches, was recorded on the morning of the 10th. The rainfall was considerably below the average, so that the deeper springs were lower than is usual, or desirable, at this season. The Eclipse of the Moon on the 28th was invisible here during the period of totality.

FEBRUARY.—The frost which prevailed during the latter part of January continued during the first three days of this month, after which the weather was comparatively mild for the time of year until the 15th, when the wind backed to the N.E. and the frost returned, and continued, for the most part, to the close of the month. On several occasions this cold wind blew with almost the force of a gale, particularly during the nights and early mornings, so that the temperature felt much colder than the thermometer indicated; the greatest cold was recorded on the mornings of the 2nd, 20th and 25th, viz., 21°·0, 22°·3 and 18°·2 respectively. Although the mean temperature in the shade was nearly five degrees below the average, yet it was still lower in the years 1873 and 1886, while its intensity was trifling as compared with the corresponding month in the year 1855. The amount of precipitation was 1·87 inches and consisted chiefly of snow, which fell more or less on nine days and remained on the ground during the last fortnight. In some exposed places it had drifted to the depth of three feet or more. The sky was much covered by cloud, which frequently assumed a dull and leaden appearance.

MARCH.—The mean temperature of this month was rather more than four degrees below the average, while its general character was cold, wintry and unusually sunless, with an excess of N.E. wind. Notwithstanding these conditions, it was the wettest March since the year 1864; both the total rainfall and the number of days on which it fell were nearly double the average. The amount of rainfall at Uckfield for the first three months of the current year was 6·07 inches, the average of the last 45 years for the same period being 6·66 inches, so that notwithstanding this large rainfall in March, more than half-an-inch of rain was still due thus far in the year. Snow fell, more or less, on six consecutive days, which is a very unusual circumstance in a spring month; the mean reading of the barometer had not been so low in March since the year 1876. The lowest reading at 9 a.m. was on the 28th, 28·827 inches. The average night temperature was one degree below the freezing point, as shewn by a thermometer protected from radiation, while frost occurred to a greater or lesser extent on twenty occasions; the lowest temperature was observed on the first, viz., 21°·8. A heavy gale passed over on the morning of the 11th and stormy weather prevailed on the 17th, 18th and 24th. Snow fell much more heavily in various parts of the kingdom, much impeding railway traffic and causing a great loss of cattle in the Scottish Highlands. An unusual darkness prevailed here during the afternoon of the 31st.

APRIL.—It may be safely affirmed that this was the coldest April which had been experienced in the South of England during the last half-century. Its mean temperature was five degrees below the average of 45 years. The weather was bitterly cold during the first ten days, with an almost constant prevalence of N.E. wind, frequent slight falls of snow and nightly frosts, together with a remarkable deficiency of sunshine. The lowest temperature, 26°·2 was recorded on the morning of the 6th. The daily highest temperature was very low for the time of year and only reached 60° and upwards on three occasions, viz., on 16th, 28th and 30th. Rainy weather prevailed from 15th to 23rd; nevertheless the total rainfall for the month was more than half-an-inch below the average. The 15th was a comparatively warm day. A solar halo, slightly prismatic, was visible for a time about 11 a.m.; and I saw, for the first time this season, three butterflies on the wing, viz., G. Rhamni, V. Urticæ, and V. Io; this latter being a remarkably fine specimen. The 24th had been fine and pleasant during the morning, but during the afternoon a cold N.E. wind set in with such a great decrease of temperature, that the highest temperature recorded for the 25th was only 44°·7. The last frost of the season occurred on the morning of the 27th. The cuckoo was not heard in this immediate district before the 28th.

MAY.—The mean temperature of this month was somewhat below the average, but the departure therefrom was much less than in the two previous months. The readings of the barometer were high with no great fluctuation. The rainfall was again below the average of many years and fell only on eight days. The wind was much more equally distributed than for some time past; the Polar and Equatorial currents having been equal. There was a decided increase in temperature on the 8th, so that so late as 8 p.m. it remained for some time at 60°! The morning of the 19th was hot and almost sultry, and between 3 and 4 p.m. thunder was heard to the S.E. About 7 p.m. a thick fog came up from the sea with a great decrease of temperature; for at 3 p.m. the thermometer stood at 68°, but at 7 p.m. only 46°; showing a decrease of 22° in four hours! Thunder storms were prevalent in this district on the 21st during the afternoon and evening. The remainder of the month was fine, for the most part, and a shower fell during the night of the 29th. Sawerthal's comet was very well seen here on the night of the 12th, with its small bright nucleus and narrow tail.

JUNE.—This month was cold and wet for the first month of summer. The 25th was the hottest day, when the temperature in the shade rose to 80°, for the only time during the entire summer. The mean temperature was nearly two degrees and a half below, while the rainfall, which occurred on fifteen days, was considerably above the average. On the 2nd and 3rd there was a remarkable display of the Cirrus cloud over the South of England. Just [illegible] on the latter day, a thick fog advancing from the sea was beautifully illuminated, of a dark pink colour,

by the rays of the setting sun. The weather on the 8th was very showery, which, in former days, would have been considered an augury of a wet harvest according to the old distich,

"If on the eight of June it rain,
It foretells a wet harvest men sain."

A heavier rain occurred on the 9th, which was most acceptable to the growing crops. On the 12th there was another great display of the Cirrus cloud, as well as on the 13th. The 16th was a very cold, damp day, and in many instances fires were considered requisite. The 21st was densely overcast and the air saturated with moisture, presenting a remarkable contrast to the Jubilee Day of 1887. A very heavy shower fell during the afternoon of the 28th, when nearly half-an-inch of rain fell in about fifteen minutes. At the close of the month vegetation generally was in a very backward and sad condition from the previous wet and sunless weather. On the night of the 10th I took another observation of Sawerthal's comet, and found its brightness very much diminished since May 12th; its tail, too, instead of being long and narrow, was shorter and become somewhat fan-shaped.

JULY.—With the exception of the very cold month of July, 1879, the mean temperature of this month was lower than I have recorded for any July since the year 1841. If, however, I refer to the mean daily maximum temperature for July, 1888, I find that it was even *lower* than that in July, 1879. The highest temperature in the shade was not more than 68°·8, which was two degrees and eleven degrees colder respectively than the warmest day in May and June. The rainfall at Crowborough and Forest Lodge was very heavy, while that at Uckfield was less than at any station from which I received a report. The actual amount which fell there was 4·19 inches, which has been only three times exceeded during the last 45 years, viz., in 1865, 1867 and 1882. At Crowborough it was the largest amount which I have ever registered, for this month, during the last eighteen years. This sunless month may be described as having had only one cloudless morning (13th), while the average daily amount of cloud, at 9 a.m., was as much as 9·5 (an overcast sky being represented by 10·0). On the 2nd, a heavy gale, with almost continuous rain for some hours, came up from the S.W. On the 6th, a thunder storm passed away to the eastward, and some rain and hail fell here. Early in the morning of the 11th, a very heavy hailstorm occurred about two miles to the northward; some snow fell here and the temperature fell to a lower point than I ever remember to have recorded in July. In the shade it was only 5°, and on the grass only 3° above the freezing point. A considerable quantity of hail or snow must have fallen on the hill to the north of Beachy Head, as I noticed its whitened appearance so late as 8 a.m.; the sky being densely overcast. Snow was reported to have fallen this morning at Brighton, East Bourne and Hastings. An unusual darkness prevailed on the 15th; a dense cloud rested on the hill and I observed frequent faint flashes of lightning, but no thunder in consequence of immediate earth contact. I have previously observed this phenomenon on more than one occasion. On the 17th, this district was again visited by a thunder storm, and there was considerable electrical disturbance on the two following days. On 22nd, about 10.45 p.m., a rather severe thunder storm occurred, and with such heavy rain that more than one inch fell in about 45 minutes. In consequence of this heavy rain the hay crop over many acres was completely washed away for some miles. A house at Lewes was struck by lightning.

AUGUST.—This, the last month of summer, proved more seasonable than either June or July, and the temperature, during the day and night, was warmer than any other month; nevertheless the mean was two degrees and a half below the average of many years. The sky was somewhat more free from cloud which was distinctly indicated by the solar radiation thermometer. The fluctuations of the barometer, though frequent, were very trifling. The rainfall at Crowborough was about equal to the average of the last eighteen years, but at Uckfield it was one inch in excess. The average of the former and the excess at the latter station was entirely due to the very heavy rain on the 1st, which was exactly one inch at Crowborough, but nearly an inch and three-quarters at Uckfield. This heavy rain coming so immediately after the large total for July, caused very serious floods, both in London and the South-Eastern counties generally. It was the result of a heavy thunder storm. Near the village of Rotherfield a valuable team of horses was struck by the electric fluid. One horse was killed instantaneously and the others were thrown down and injured. The temperature fluctuated very much, and chiefly in consequence of the frequent variations in the direction of the wind; the S.W. was the most prevalent. There was not much electrical disturbance after the 1st, but thunder was heard on the 15th and a slight thunder storm occurred on the 30th. The greater portion of the hay crop was secured during the first fortnight, but a very considerable quantity would be in very bad condition and absolutely useless for fodder.

GENERAL REMARKS UPON THE SUMMER.

Upon a review of the Meteorological character of the Summer of 1888, I find that with the exception of the Summers of 1860 and 1879, it was certainly the coldest and most ungenial during the last half century, and, perhaps, since the year 1816. It is also a remarkable fact, which I believe to be quite unprecedented within living memory, that during a whole year, *i.e.*, from September 1st, 1887, to August 31st, 1888, the mean temperature of *every* month was below the average, consequently all vegetation suffered severely from the absence of that due amount of sunshine, without which it is impossible it can proceed to full maturity. With the exception of June 25th, when the temperature in the shade reached 80°, it cannot be said that there was a really hot summer's day during the three months, while on several occasions fires were more agreeable than the usual light summer clothing. For the six months ending April 30th, the average amount of cloud was as much as 8·1; a completely overcast sky being represented by 10·0.

By way of comparison, the following table gives particulars of the temperature of several cold summers during the last 46 years, and I should state that in order to render my observations at Crowborough comparable with those formerly taken by me at Uckfield, + 1°·4, has been applied to the former as a correction for the difference of elevation above sea level between the two stations.

Months.	1845	1860	1862	1867	1879	1882	1888
June	60°·6	56°·1	57°·1	57·4	56·3	56·6	57·3
July	60·0	59·0	59·3	58·3	57·7	59·7	57·8
August	57·1	58·9	59·6	60·6	60·1	59·8	59·0
Mean temperature of the Summer	59·2	58·0	58·7	58·7	58·0	58·7	58·0

With respect to the rainfall, a larger quantity was recorded at Crowborough than for any other Summer during the last eighteen years, 1879 excepted. It appears from Miss L. Day's report that a small quantity was registered by her at Uckfield compared with many other stations in the county. The following table gives some particulars of the rainfall during wet Summers, from the Uckfield register of 46 years and the Crowborough register of 18 years.

Months.	Uckfield Rainfall in Inches.					Crowborough	
	1848	1852	1860	1879	1888	1879	1888
June	3·91	7·04	4·80	3·29	3·26	3·87	4·31
July	3·01	0·50	3·00	3·53	4·19	4·71	6·76
August	6·05	6·01	5·84	4·80	3·49	6·56	3·11
Total for the Summer	12·97	13·55	13·64	11·62	10·94	15·14	14·18

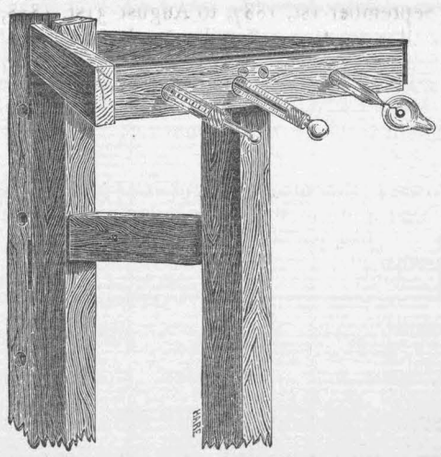
The large amount recorded at Crowborough and Forest Lodge, Maresfield, for July, respectively, resulted from local thunder storms.

SEPTEMBER.—The mean temperature of this month was, within a fraction of a degree, equal to the average of many years, although still warmer weather would have been very desirable for the harvest; yet the general condition of the air was an agreeable change after the very humid weather of the previous three months, notwithstanding the frequent prevalence of N.E. winds, particularly at the period of the Equinox. The mean daily readings of the barometer were high, with but little fluctuation, and there was an entire absence of the gales in this locality which are supposed to be usual at this season of the year. It was by far the driest month of the year, as the rainfall was scarcely equal to one-third of the average. Vivid lightning was visible to the eastward during the evening of the 9th, which was followed by rain during the night, and a cold shower of rain and hail on the 10th. From the 10th to the 28th, the air was very dry and no precipitation occurred. On the 24th distant thunder was heard in the N.W., and about 4 p.m. on the 27th a very fine prismatic solar halo was visible for some time. Its diameter was 35 degrees.

OCTOBER.—This month was unseasonably cold, and the mean temperature nearly 4 degrees below the average. On the 4th some showers of rain and hail fell, causing a considerable decrease of temperature and such a severe frost during the night that many half hardy plants were much injured and in some instances killed. Slight frost occurred again on the 7th. The wind was very changeable and nearly equally distributed. Although the weather was cold, yet there were several cloudless days. The rainfall was an inch and a half below the average, and the greater part fell during the last four days, accompanied by an unusually high temperature both day and night. The month passed without any gale or even stormy weather.

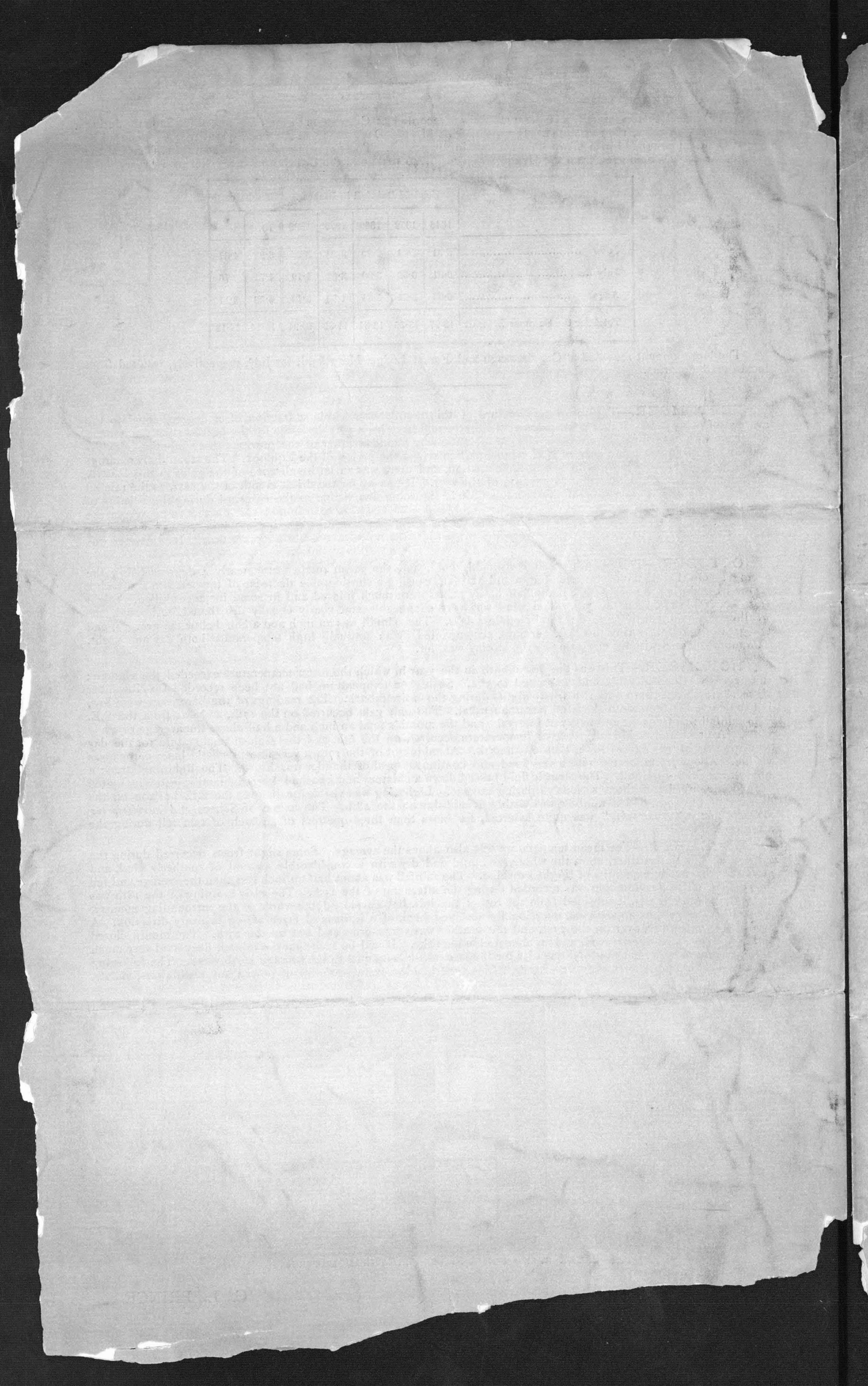
NOVEMBER.—This was the first month in the year in which the mean temperature exceeded the average; the excess was considerable and amounted to 3°·4. So high a temperature had not been recorded for November since 1881. There were only two frosty nights during the entire month. The readings of the barometer were low, but the curve for the month deviated less than usual. The only gale occurred on the 27th, and was from the S.E. The rainfall was frequent and heavy at intervals, and the month's total an inch and a half above the average of many years. A great and sudden decrease of temperature occurred on the 6th, and the highest temperature for the day was upwards of 18 degrees lower than on the 5th. At midnight of the 17th a very fine prismatic lunar corona was visible. About 7 p.m. of the 26th a very loud and continuous peal of thunder was heard. The lightning struck a house near Cross-in-Hand. The electric fluid passed down a chimney and knocked down the family, who were seated around the fire, but without seriously injuring anyone. Lightning was visible again over the S.E. horizon on the evening of the 27th, and a rainbow was visible at mid-day on the 28th. The axiom of Seneca, "*A meridie ortus magnam vim aquarum vehit*" was quite asserted, for more than three-quarters of an inch of rain fell during the afternoon.

DECEMBER.—The mean temperature was also above the average. Some slight frosts occurred during the third week, but the weather, upon the whole, was mild and dry with a considerable amount of southerly wind, and more than the average quantity of bright sunshine. The rainfall was about half an inch less than the average and fell on 15 days. The heaviest rain was recorded during the afternoon of the 25th. The early morning of the 18th was foggy, but before 9 a.m. it subsided from the top of the hill, but enveloped the whole of the surrounding country, presenting the curious appearance, occasionally observed here, of a horizontal layer of fog in every direction. A moderate gale passed over on the 21st, and the weather was very stormy and wet on the 27th. The month closed with a fine day, a northerly wind, and an almost cloudless sky. It will be seen that the rainfall fluctuated very much in the several months, but the total quantity for the year was about equal to the average of 46 years. The following flowers were in bloom on the 25th:—Roses, African marigolds, several varieties of polyanthus, wallflowers, violets, and some scarlet geraniums in a sheltered situation.



THE STAND FOR THE EXPOSED THERMOMETERS.

C. L. PRINCE.



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C. LEESON PRINCE, F.R.A.S., F.R.MET.S.,

AT HIS OBSERVATORY,

CROWBOROUGH, SUSSEX.

1889.

1889.		Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.	Year.
Barometer, mean 9 a.m., sea level		30·203	29·923	30·007	29·756	29·843	30·029	29·955	29·912	30·115	29·707	30·239	30·219	29·992
Temperature by exposed Thermometers 4 feet above the soil.	Absolute maximum	54°·2	61°·8	60°·3	68°·4	85°·0	89°·0	83°·8	85°·0	83°·5	63°·7	60°·0	50°·9	89°·0
	„ minimum	21·2	16·2	19·3	28·3	37·0	44·0	44·4	43·0	34·8	36·0	23·3	21·0	16·2
	Mean maximum	41·8	42·6	48·9	55·4	68·6	74·5	73·6	72·8	68·3	57·7	48·7	39·9	57·7
	„ minimum	30·4	28·5	30·5	36·0	46·4	50·3	50·4	50·0	46·6	40·9	37·5	30·7	39·8
	„ temperature	36·1	35·5	39·7	45·7	57·5	62·4	62·0	61·4	57·4	49·3	43·1	35·3	48·7
	„ daily range	11·4	14·1	18·4	19·4	22·2	24·2	23·2	22·8	21·7	16·8	11·2	9·2	17·9
	Solar radiation (in Vacuo), maximum	62·0	69·1	69·0	77·0	96·0	99·0	94·0	93·6	90·3	75·0	66·2	57·0	99·0
	„ „ „ mean	45·2	49·1	57·5	65·0	78·1	82·8	83·2	83·0	76·2	65·4	51·6	43·2	65·0
Terrestrial radiation—minimum		18·7	15·6	15·3	27·5	34·5	42·2	40·1	39·2	31·0	32·2	22·2	17·0	15·3
„ „ mean		27·8	26·8	28·0	34·1	43·3	48·9	48·6	47·4	44·1	38·2	35·3	28·6	37·6
Mean amount of cloud, 9 a.m. (0.10)		7·1	8·3	7·8	8·2	7·8	5·2	6·6	5·9	5·2	6·8	7·1	6·9	6·9
No. of Fine Nights for Astronomical Observations, including Moonlight Nights		4	9	8	8	9	13	12	13	15	10	12	8	121
Temperature in the shade (Stevenson's Stand) 4 feet above the soil.	Absolute maximum	50·8	57·1	56·5	65·0	79·2	80·6	78·0	79·3	77·1	58·5	57·0	49·4	80·6
	„ minimum	23·7	18·2	21·8	31·0	36·8	45·8	47·6	44·5	37·5	36·0	25·2	23·0	18·2
	Mean maximum	40·2	40·0	45·5	51·1	63·4	68·8	67·3	66·9	63·3	54·4	47·0	40·1	54·0
	„ minimum	31·6	30·4	32·2	37·2	47·4	51·2	51·6	50·9	48·2	41·4	38·8	32·2	41·0
	„ temperature	35·9	35·2	38·8	44·1	55·4	60·0	59·4	58·9	55·7	47·9	42·9	36·1	47·5
	„ daily range	8·6	9·6	13·3	13·9	16·0	17·6	15·7	16·0	15·1	13·0	8·2	7·9	13·0
	Temperature, 9 a.m.	36·3	35·1	39·6	44·5	56·8	62·1	60·5	60·5	56·2	48·3	43·6	36·8	48·3
	„ of dew point, 9 a.m.	33·3	32·3	35·7	39·9	50·9	53·8	53·4	53·4	50·3	45·6	41·7	35·8	43·8
	Elastic force of vapour	·190	·182	·209	·246	·373	·414	·406	·406	·365	·306	·264	·210	·297
	Relative humidity, 9 a.m.	88	88	86	83	80	74	77	77	80	90	92	96	84
Direction of the Wind at 9 a.m.	N.	4	10	5	7	2	1	5	2	3	2	5	8	54
	N.E.	13	4	9	5	7	19	6	0	11	7	2	5	88
	E.	0	1	1	4	1	0	2	0	0	1	6	4	20
	S.E.	1	0	0	3	3	4	1	3	2	1	1	1	20
	S.	5	0	3	3	7	2	2	2	4	7	5	4	44
	S.W.	4	4	5	7	5	0	9	14	1	8	1	7	65
	W.	1	7	5	1	6	4	5	7	2	4	9	2	53
	N.W.	3	2	3	0	0	0	1	3	7	1	1	0	21
Rainfall in Inches.	Crowborough	1·34	3·23	2·44	3·27	1·72	0·57	4·30	4·00	1·38	8·09	1·84	2·70	34·88
	a. Eridge Castle	0·97	2·69	3·08	2·96	1·82	0·61	3·23	3·20	1·12	7·90	2·08	2·48	32·14
	b. Mayfield Vicarage	1·40	2·25	1·95	2·76	1·62	0·35	3·71	2·82	1·25	8·50	1·56	2·30	30·47
	c. Forest Lodge, Maresfield	1·34	3·07	2·23	3·11	1·47	0·26	3.25	3·25	1·20	6·92	1·49	2·21	29·80
	d. Waldron, Heatherden	1·26	2·65	1·89	2·74	1·42	0·37	3·19	2·85	1·32	8·74	1·50	2·00	29·93
	e. „ Bryckden	1·16	2·61	1·90	2·56	1·56	0·38	3·74	2·91	1·23	8·31	1·60	2·13	30·09
	f. Uckfield	1·01	2·34	1·83	2·14	1·37	0·31	3·75	3·57	1·04	7·15	1·27	1·75	27·53
	g. Warbleton Rectory	1·10	2·24	1·66	2·60	1·20	0·33	2·76	2·56	1·20	9·37	1·44	2·05	28·51
	h. Fletching	1·20	2·53	2·19	2·76	1·53	0·18	3·40	2·84	1·32	6·98	1·33	1·89	28·15
	k. Newick	1·06	2·68	2·30	2·59	1·73	0·22	3·59	2·95	1·02	7·24	1·58	1·98	28·94

The Observatory is situated 825 feet above the level of the sea. Latitude, 51° 3′ 14″ North. Longitude, 0° 9′ 30″ East.

a. From the Register kept by Mr. RUST, Eridge Castle Gardens.
b. „ „ „ The Rev. H. T. M. KIRBY.
c. „ „ „ Capt. WM. NOBLE, F.R.A.S.
d. „ „ „ J. G. BOUCHER, Esq., J.P.
e. „ „ „ Dr. GRAHAM.
f. From the Register kept by Miss LAURA DAY.
g. „ „ „ The Rev. R. G. PENNY.
h. „ „ „ Dr. TREUTLER, F.R.Met.S.
k. „ „ „ T. ST. LEGER BLAAUW, Esq.

GENERAL REMARKS.

JANUARY.—The mean temperature of this month was about one degree below the average, although the frost was not at any time severe. The lowest temperature in the shade was recorded on the morning of the 6th, and that of terrestrial radiation on the 5th, which was followed by a brilliant day and night. Thick rime accumulated on the trees and shrubs. The 10th was a remarkably dark day and artificial light was required at 3 p.m. A faint lunar halo was observed on the night of the 19th, and during the following week the weather became colder with frequent but not severe frost at night. The last day of the month was particularly mild and pleasant for the time of year. The prevailing wind was the N.E. The readings of the barometer were high during the first week and last fortnight, and the rainfall was not much above a third of the average.

FEBRUARY.—Was colder than January, and its mean temperature fully 2° below the average. On the morning of the 12th the temperature in the shade fell to 18°·2 which proved to be the most severe frost during the winter. Frosty nights were frequent and very clear on several occasions. Northerly winds were the most frequent. Rainfall was somewhat above the average and snow fell in trifling amounts on eleven days. A rather heavy gale from S.E. passed over on the afternoon of the 13th, and a prismatic lunar corona was observed at 9 p.m. on the 14th. The readings of the barometer were low with sudden fluctuations.

MARCH.—Began with very cold weather and sharp frosts occurred very frequently to the 17th, when the weather became much milder, with occasional showers, to the end. The total rainfall was about equal to the average and was recorded on 14 days. Northerly winds were the most prevalent. The weather was rather stormy on the 19th, but otherwise the air was very calm and the equinox passed without any gale in this locality. A brilliant prismatic lunar corona was observed on the night of the 16th, which was followed by mild weather and variable winds. The reading of the barometer was low on the morning of the 20th, viz., 29·039 inches at sea level. The nights of the 11th and 22nd were remarkably favourable for astronomical observations.

APRIL.—Although the mean temperature of this month was considerably below the average, yet it was warmer than the corresponding month of last year. The weather was, upon the whole, very sunless and ungenial and, as a consequence, vegetation was very backward for the time of year. Rain fell more or less on twenty days, a number largely in excess of the average, but the total quantity registered was not so great as might have been expected. The readings of the barometer were lower than I have ever recorded in April (1879 excepted). The prevailing wind current was N. or N.E. on twelve days, which much conduced to a low mid-day temperature. Several thunderstorms occurred along the borders of Sussex and Kent, while that on the 9th was very severe. The lightning struck Cowden Church as well as several oak trees in that neighbourhood. I noticed that many flashes were of the globular form. The rain was very trifling here, but we had a continuous hail shower for upwards of an hour, which caused such diminution of temperature that the maximum on the 10th was only 44°·7. A rather severe gale came on from the S.W. on the 23rd and a slight thunderstorm with rain and hail showers occurred on the 25th.

MAY.—Was a warm and very genial spring month, while both the day and night temperature was considerably above the average. Rain fell in rather small quantities on twelve days. I observed a lunar halo at 9 p.m. on the 8th. The most prevalent winds were from S. and S.W. Lightning was visible to the westward on the 24th and 25th. On several days a dense haze pervaded the landscape. The night of the 22nd was a very brilliant one for astronomical observation, with that exquisite telescopic definition which frequently obtains here during the spring months. The details of the rings of the planet Saturn were seen to great advantage, and I came to the conclusion that Terry's white spot was, after all, a mere optical delusion.

JUNE.—Little need be said of this month but that it was upon the whole exceedingly dry, warm and pleasant. The temperature was high both day and night. The readings of the barometer were above the average and their fluctuation very trifling, as their entire range was only ·770 of an inch. There was an extraordinary prevalence of a north-easterly current of wind on 19 days, 13 of which were consecutive, viz., from 16th to 28th, both inclusive. Frequent thunder was heard in the S.W. during the afternoon of the 6th. On the 7th, during the greater part of the afternoon, I observed some magnificent masses of cumulo-stratus cloud, highly electrified, extending in a continuous line along nearly the entire length of the contiguous borders of Kent, Sussex and Surrey, from which very heavy peals of thunder rolled almost incessantly for nearly two hours, while here the sun shone brilliantly all the afternoon. The rain and hail of this storm was very heavy at Tunbridge Wells and its vicinity, while the damage occasioned thereby was greater than on any instance on record in that neighbourhood. I was credibly informed that many of the hail-stones were the size of pigeons' eggs, and that Mr. Young, of Barden Mill, picked one up which weighed nearly or quite half-a-pound! On this same day many severe thunderstorms occurred in various parts of England, and in the majority of instances very heavy hail-stones were precipitated. The effect of this ice storm was so great that the highest temperature of the 8th was just twenty degrees lower than on the 7th. At the close of the month the drought had become rather serious in some districts, and there were no indications of approaching rain. As is usual in seasons of drought, a very dense haze pervaded the landscape so that distant objects were quite invisible for many days together. It is worthy of record that the S.W. wind, which is generally so prevalent over the S.E. of England, was entirely absent throughout the month, a fact, I think, without precedent during the last half-century, and perhaps much longer. The average amount of cloud was only 5·2; an overcast sky being represented by 10·0.

JULY.—The fine weather of June continued to the 6th of this month, when a rather sudden decrease of atmospheric pressure indicated the approaching change which arrived on the following day, and rain fell daily (13th and 19th excepted) during the succeeding twenty-two days to the amount of 4·30 inches. This quantity exceeded the average of 47 years by nearly 1·50 inches. Although this heavy rainfall was very beneficial to vegetation generally, yet it interfered very much with that portion of the hay harvest which had not been completed during the latter part of June. The first and last weeks were fine and pleasant; notwithstanding which the mean temperature of the month was about two degrees below the average. Some electrical disturbance occurred in this district on the 14th, 17th, 23rd and 26th, but this immediate locality was not visited by any severe thunderstorm. On the 23rd the lightning was very vivid and frequent on the S.E. horizon, and on one occasion I noticed three separate flashes pass down towards the sea, simultaneously, and apparently about a quarter of a mile apart. On the 27th 0·32 inch of rain fell between 7.40 and 7.50 p.m. A great variety of the Cirrus cloud was seen here on the 11th and 31st.

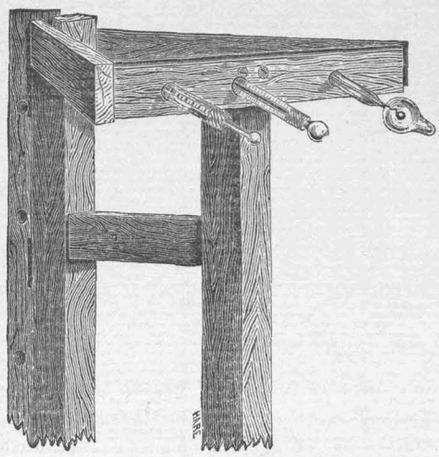
AUGUST.—The mean temperature was about one degree below the average and a large quantity of rain fell during the first three weeks, which very much delayed the ingathering of the harvest. The total was nearly one inch above the average of many years. There was an entire absence of thunderstorms. The highest temperature in the shade was only 79° on the 1st and 79°·3 on the 30th and 31st. The S.W. wind was more prevalent than had been observed for many months. The evening of the 7th was very favourable for the observation of the occultation of Jupiter by the Moon. In consequence of first contact happening in bright sunlight, I could not be certain of the exact time but disappearance took place at 16h. 12m. 18s., L.S.T. The planet, when in contact with the moon, assumed a peculiar green colour, but its limb was quite bright to the moment of disappearance. Re-appearance occurred at 17h. 5m. 56s., L.S.T., and last contact at 17h. 7m. 58s., L.S.T., the planet was then of a somewhat greener colour than at disappearance; this greenish colour continued for upwards of an hour. The limb of the moon was very sharp and black as it passed over the disc of the planet. The belts were dark on emersion, but perfectly distinct close up to the moon's limb. The evening of the 28th was also very favourable for an observation of Davidson's Comet, which I then saw for the first time; its appearance was that of a bright, somewhat oval nebulosity, with a nearly central condensation.

SEPTEMBER.—Although this was a very fine, dry, and pleasant month, yet the mean temperature was scarcely equal to the average, but this may have been due in part to the great prevalence of N.E. wind during a full third of the month. The readings of the barometer were very uniform, above the average, and exceeded 30 inches on 20 days at sea level. The total rainfall was little more than a third of the average of many years. Severe thunderstorms occurred in various parts of the Kingdom on 2nd, and the places more especially visited in the counties of Sussex and Kent were the neighbourhoods of Seal, Southend, Tunbridge, Sevenoaks, Edenbridge and Rye. Considerable damage was done there by the lightning and torrents of rain. The lightning, as seen from my Observatory, was magnificent, and it exhibited for the most part a tint close resembling that of the ordinary electric light; only a slight shower fell here about 9 p.m. This month was particularly favourable for astronomical observations, as no less than 15 nights were remarkably clear. The equinox passed without any gale.

OCTOBER.—The mean temperature was rather more than one degree below the average; a condition caused by a low mid-day temperature for the nights were much warmer than usual and the month passed away without any frost even on the surface of short grass. In a long series of years the average rainfall in October is the largest for the year, and in the present instance it fully maintained its character, for there were only seven dry days and the total quantity was nearly double the average of many years. At Uckfield, the amount was 7·15 inches, which had been exceeded there only four times during the last 47 years, viz., 8·70 inches in 1852, 7·25 in 1853, 11·23 in 1865, and 7·78 inches in 1882. At Crowborough, the amount was 8·09 inches which has been only once exceeded during the last 19 years, viz., 8·30 inches in 1882. The mean reading of the barometer had not been so low since 1865. The temperature of the Dew Point was only 2°·7 below that of the air at 9.0 a.m. A rainbow was observed at noon on the 4th and again at the same hour on the 9th, which is a certain sign of an approaching wet season. During the night of the 19th a heavy gale prevailed from the S.W. and another on the 26th from the N.E.

NOVEMBER.—The heavy rains of October continued to the 3rd of this month on which day nearly an inch of rain was registered, but for three weeks from this date, no more rain was registered although during that time the weather was frequently gloomy and damp, notwithstanding the long continuance of an anticyclone. The mean temperature was above the average both day and night and no trace of frost was observable until the 26th. On the 27th a gale came on from the Northward with a slight fall of snow, and this was only the fifth time during the month that any precipitation was recorded.

DECEMBER.—In consequence of some rather severe frosts during the first and last weeks, the mean temperature was much below the average. Some snow fell on the 5th, 6th, 7th and 29th, but the quantity in each instance was very trifling. Frequent rain occurred from the 12th to the 24th, but the total quantity for the month, including the melted snow, was nearly an inch below the average of many years. An unusual amount of fog and a generally misty condition of the atmosphere prevailed during a great part of the month and, as a consequence, the temperature of the Dew Point at 9.0 a.m. was only one degree below that of the air. An Aurora was visible early in the evening of the 10th, but the sky soon became overcast and not much was seen of it. The month ended with sharp frost and a cold wind from the Southward.



THE STAND FOR THE EXPOSED THERMOMETERS.

Some Remarks upon the great prevalence of N.E. Wind during the last five years.

The great preponderance of N.E. wind over all other wind currents, and more particularly over that from the S.W., which has obtained during the last five years has induced me to look through my journal since 1858 in order to ascertain whether I had a record of any similar condition of the principal wind currents of the S.E. of England. For the thirty-one years, ending with 1889, I find only two instances in which the N.E. has been in excess, viz., in the years 1864 and 1870.

The following table gives the average annual frequency of the N.E. and S.W. winds respectively in each year from 1859 to 1883, both inclusive.

Year.	N.E.	S.W.	Year.	N.E.	S.W.	Year.	N.E.	S.W.
1859	48	109	1869	81	110	1879	51	69
1860	68	132	1870	107	88	1880	84	90
1861	69	138	1871	78	88	1881	69	78
1862	64	128	1872	36	116	1882	43	79
1863	43	138	1873	62	119	1883	62	78
1864	104	89	1874	65	87			
1865	84	94	1875	65	90	Average	63	99
1866	54	122	1876	36	64			
1867	67	101	1877	30	87			
1868	84	120	1878	33	67			

In the year 1884 the N.E. and S.W. winds were nearly balanced, viz., N.E. 75, S.W. 72; but during the last five years there has been a reversal of their respective frequency and to the considerable amount shewn in the following table, which will include also the average annual frequency of the several winds from the eight principal points of the compass during the last 47 years, viz., from 1843 to 1889, both inclusive.

Year.	N.	N.E.	E.	S.E.	S.	S.W.	W.	N.W.
1885	40	98	30	20	46	74	41	16
1886	28	102	19	37	32	83	50	14
1887	51	128	15	12	27	67	46	19
1888	34	95	23	24	40	71	61	18
1889	54	88	20	20	44	65	53	21
Average frequency ...	41	102	21	22	38	72	50	17
Average of 47 years...	33	63	29	27	28	91	59	35

It seems difficult to assign any physical cause for this sudden and great change in the direction of our two most prevalent winds, but it may be interesting to draw attention to the fact in the event of some comparative observations being elicited.

That the S.W. wind has been for many years the most prevalent current in the S.E. of England has been long established, both by record and tradition, as well as by observation of the growth of trees in exposed situations, *i.e.*, how their principal branches lean to the northward. The change cannot be due to the greater elevation of my present Observatory, above the sea level, over my former position at Uckfield, because the preponderance of the S.W. was maintained *here* from 1873 to 1883 as it had been *there* during the previous 30 years.

C. L. PRINCE.

THE OBSERVATORY,
CROWBOROUGH, SUSSEX,
January 31st, 1890.