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**WEATHER
AND
PHENOLOGICAL
OBSERVATIONS
AT
HURSTPIERPOINT
1859 TO 1862**

by Hugh Thomas

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ROYAL METEOROLOGICAL SOCIETY
104 OXFORD ROAD – READING – RG1 7LL – UNITED KINGDOM
Telephone: +44 (0)118 956 8500 Fax: +44 (0)118 956 8571
E-mail: chief.exec@royalmeteosoc.org
Web: <http://www.royalmeteosoc.org>
Registered charity number 208222

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SUMMARY

This article is based on meteorological, phenological and some astronomical observations made by the Rev J Gorham at Hurstpierpoint College in West Sussex from February 1859 to March 1862. The observations are generally taken as they were written in the School Magazine, known as *The Hurst Johnian*.

Investigation of these records was prompted by Dr Howard Oliver of the Royal Meteorological Society's History Group, who obtained a letter written by James Glaisher, the Secretary of the British Meteorological Society, to the Rev Gorham in February 1860. The letter is shown in the appendix.

After each month, season and year, some comparisons are made with readings taken concurrently at Greenwich Observatory. By the early 1950s, a weather station was again operating at Hurstpierpoint College. Comparisons are also made between the 1859 to 1862 records and those of the post 1950s, often referring to the 1971/2000 average.

In reviewing these comparisons, the impact of the warming trend since 1988 is evident. Between 1950 and 1987, the range of the annual mean temperature fits quite closely with the 19th century data. In the warm years of 1859 and 1959, for example, the annual means were 10.6°C and 10.8°C respectively. Since 1987, however, there has been a notable increase in the number of years with an annual mean temperature above 10.8°C. Only in 1996 and 2010 has it been significantly lower.

The record of rainfall totals published in *The Hurst Johnian* is less complete than the record of temperature, but it is reasonable to assume that annual rainfall totals, and their variation, at Hurst would have been similar to those of the post-1950s (excluding 2000). For example, 1860 had around 1100mm, while Hurst in 1960 had 1173.5mm (third wettest since 1951). At Greenwich, 1860 was the third wettest between 1841 and 1880. Similarity between the driest years is also apparent.

There is some suggestion that wetter years are occurring more frequently today but because of the limited data that point is not pursued.

WEATHER AND PHENOLOGICAL OBSERVATIONS AT HURSTPIERPOINT, 1859 TO 1862

by Hugh Thomas
Hurstpierpoint, West Sussex

INTRODUCTION

The Rev John Gorham ran a weather station at Hurstpierpoint College in Sussex and his observations were published in the school's magazine, *The Hurst Johnian*.

Hurstpierpoint College was founded in 1849 by Canon Nathaniel Woodard. It began as St John's Middle Grammar School at Shoreham on the Sussex coast. The school moved to the village of Hurstpierpoint in 1850. Woodard had bought some land to the north of the village and the College moved to its present site in 1853.

In 1858, the Rev John Gorham joined the staff. In his book on the history of the College, Peter King writes, *"He taught mathematics, helped as the sub-bursar, and encouraged the boys in a range of interests including geology and meteorology."*

He started observations in February 1859 with *"a thermometer 25 feet from the ground with a NE aspect"*.

The College was at a height of 31m, 3.5km from the crest of the South Downs and 13.5km from the south coast at Brighton (see Fig.1).

The Hurst Johnian of February 1860 records, *"We have much pleasure in mentioning that the Rev John Gorham has been engaged during the Christmas holidays in arranging with Glaisher*, the well-known scientific observer, for the purchase of a complete set of instruments for recording atmospheric observations. The collection of such facts is becoming of increasing interest and importance. These will at some future day, perhaps less distant than is supposed, lead to a wonderful insight into the fixed laws, which doubtless govern even the caprices of the weather and the inconstancy of the winds."*

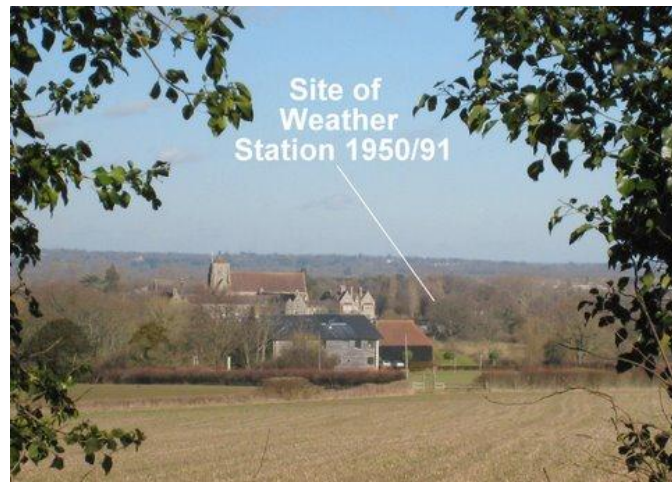
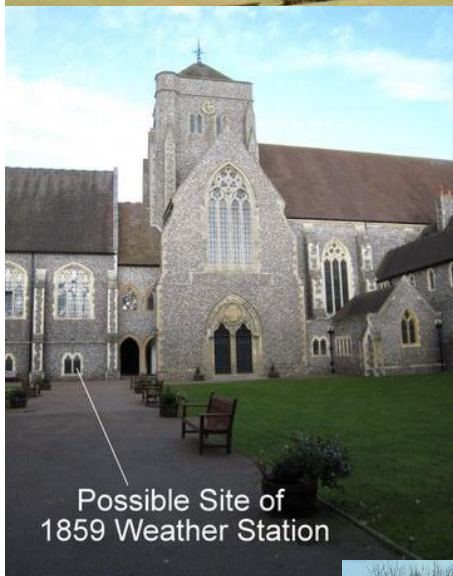
To give some elaborations on Gorham's readings, Tables (i) and (iii) to (v) have been taken from figures for Greenwich in J H Brazell's book, *London Weather*.

At the request of the then Southern Water, a weather station was set up at the College in the early 1950s on a fairly open site on the SE side of the College (see Fig.1). The station was moved 1 km to the south at a height of 51m in September 1991, and the daily rainfall readings continue to be sent to the Environment Agency and the Met Office.

Table (ii) shows the 1971/2000 averages and comparisons between the past and the present are made in the article.

* James Glaisher, Secretary of the British Meteorological Society.

FIG.1: HURSTPIERPOINT COLLEGE WEATHER STATIONS



1950-1991 site (now wild)



1859

February 1859

The observations did not begin until February 1859. No rainfall measurements were taken but there are references to the number of Rain Days.

“February 1859 has been remarkably mild. On only four occasions sank to 32°F [0°C] and never below 31.5°F [-0.3°C].

The wind was between S and W on 25 days; between N and W on 11 days; between E and S on 2 days; between E and N, not once during the month.

There were gales from the SW on 10 days of the month while rain, in more or less quantities, fell on 15 days.

There was hail on the 1st and 26th; snow not once during the month.

The mean maximum [max] was 48.5°F [9.2°C]; the mean minimum [min] was 38.7°F [3.7°C] and the mean was 43.6°F [6.4°C].

The highest max was 53°F [11.7°C] on the 16th and 17th; the lowest min was 31.5°F [-0.3°C] on the 25th.

On the 11th, ladybirds were seen flying about in the sunshine. On the 21st, yellow butterflies were observed in the middle of the day. S Walker maintained his bird-nesting reputation by taking two song-thrush eggs, the first of the season.”

At Hurst, the mean temperature for February 1859 of 6.4°C would today have equalled the tenth warmest since 1950.

Taken from James Glaisher's records, the mean temperature for the winter of 1858/59 was 41.5°F (5.3°C), which was 3.8°F(2.1°C) above the average of the previous 88 years.

Today, at Hurst, a winter mean of 5.3°C would only be 0.5°C above average.

At Hurst in 1859, it was scarcely a decade since the end of the Little Ice Age and cold winters had been quite common. After 1988, the present warming phase became noticeable and the 1971/2000 average is reflecting this. For example, the mean temperature for February had risen by 0.4°C between the 1961/1990 averages and the 1971/2000 averages.

March 1859

“March 1859, has been chiefly remarkable for the total absence of easterly winds: although mild, the mean temperature of the month was only 3.5°F above that of February.

The wind was SW on 23 days and NW on 17 days.

There were strong gales on the 8th and almost continuously from the 11th to 18th and on the 29th. The storm on the night of the 14th was especially violent.

No hail fell during the month, but on the 30th snow fell, mixed with rain, accompanying a shift of wind from SW to NW and the Downs were white on the morning of the 31st. There was a heavy fall of snow in the north of England, and even in London at this time.

Rain fell on 12 days of the month.

The mean max was 52°F [11.1°C]; the mean min was 42°F [5.6°C] and the mean was 47°F [8.3°C]. The highest max was 60°F [15.6°C] on the 4th; the lowest min was 31°F [-0.5°C] on the 10th. There were slight frosts on five mornings. The coldest day [in terms of the daily mean] was the 31st with a mean of 35.5°F [1.9°C].

On the 1st, quickset hedges in sunny situations showed green leaves, and white violets were gathered. On the 7th, probably much earlier, wall-fruit trees were in full bloom. On the 17th, blackthorn blossoms and young elm leaves were observed.”

Gusts around 70mph have been recorded three times in March since 1950: on 27th in 1966 and 1987 and on the 10th in 2008, and a similar figure could have occurred on the 14th in 1859.

Today, March 1859 would have been the eighth warmest since 1950.

April 1859

“April 1859 well deserved the epithets of variable and inconstant, by its sudden and extreme changes of wind, weather and temperature.

The morning of the 1st brought a sharper frost than had been exceeded during the four preceding winter months, the thermometer falling to 26°F [-3.3C]. In less than a week, we were enjoying soft southerly winds, bright sunshine, and the temperature of July, with summer lightning at night: the thermometer rose, on the 7th, to 70°F [21.1°C] in the shade, and thus in one week we had the highest and lowest readings for this, and indeed for five months. About the middle of the month we were chilled again with N and NE winds, which came and went with showery weather until the close of the month.

On the 21st, between 8 and 9 pm, a strong rose-coloured Aurora appeared, extending from NE to W, with an altitude of about 60. The night was clear and frosty.

The wind was between S and W on 18 days; between N and W on 8 days; between N and E on 8 days and between S and E on 5 days.

There were gales from the SW on the 2nd and 15th but they were not violent.

There was rain on 16 days; every day from the 8th to 16th.

(Following Glaisher’s letter (see Appendix), references to barometer readings now appear).

The mean height of the barometer was 29.77 inches [1008mb]; 30.30 inches [1026.5mb] the maximum on the 1st; 29.07 inches [985mb] the minimum on the 14th.

The mean max was 55°F [12.8°C]; the mean min was 41°F [5.0°C] and the mean was 48°F [8.9°C]. There were frosts on 9 mornings.

The coldest day was the 1st with a daily mean of 36°F [2.2°C] and the 7th was the warmest with a daily mean of 58°F [14.4°C].

The nightingale was reported on the 3rd, but it was silent afterwards for a long interval. Swallows were seen by several boys on the morning of the 7th, and were heard of in other parts of the county about the same time; they did not appear again till the 19th, and were then but few. Young oak leaves were out on the 11th, before the ash, apple blossoms about the same time. The cuckoo, due on the 12th, was not heard until the 21st, but white-thorn blossoms, “May”, were forward in the bud on the 9th, and came out, in spite of the cold NE wind, by the early 22nd, very unusually early.”

Today, since 1950, the mean of 8.9°C (48°F) has been exceeded nineteen times, fifteen of them being since 1987.

May 1859

“Northerly and easterly winds prevailed during the whole month, which was, nevertheless, warm towards its close.

There were no frosts and no gales, but thunderstorms on the 19th, 20th, 30th and 31st.

Rain fell every day from the 15th to 20th and on 11 days in all.

The mean height of the barometer was 29.94 inches [1013mb]; 30.25 inches [1026mb] the maximum on the 9th; 29.72 inches [1006mb] the minimum on the 30th.

The mean max was 60.25°F [15.7°C]; the mean minimum was 45°F [7.2°C] and the mean was 53°F [11.7°C], which was 5°F warmer than in April.

The highest max was 76°F [24.4°C] on the 30th; the lowest min was 35°F [1.7°C] on the 6th. The mean for the coldest day was 45°F [7.2°C] on the 1st and for the warmest day, 62.5°F [16.9°C] on the 29th, 30th and 31st.

The turtle dove was first heard on the 25th.”

The warmest day in April being warmer than the warmest in May is not unusual. Since 1950, it has occurred six times, the most recent being in 2007.

The mean of 11.7°C has been exceeded on many occasions. Since 1996, every May has had a mean temp above 11.7°C.

The mean temperature of the spring at Hurst in 1859 was 49.6°F (9.8°C); while at Greenwich it was 48.7°F (9.3°C), 2.3°F (1.3°C) above average.

Today, at Hurst, a spring mean of 9.8°C would be 0.8°C above average.

June and July 1859

(The two months were taken together).

“June and July have been two remarkably fine and warm summer months [The summer of 1859 was one of the hottest in the 19th century]. Thunderstorms, which occurred at intervals, passed away without unsettling the weather, or apparently reducing the temperature, while the heavy showers that accompanied them were sufficient to keep the country from being parched by heat.

Winds were variable and never violent, except in an occasional thunder squall.

In the first week of June, there were thunderstorms nearly every afternoon and the thermometer rose to nearly 80°F [26.7°C] in the shade. There were thunderstorms again on the 26th; the 28th was the only thoroughly wet day in two months; the heavy rain in July mostly fell at night. On the 2nd and 3rd of July there were violent thunderstorms in southern counties. The lightning was incessant, the rain very heavy; and a violent whirlwind from the SW, which snapped large trees asunder, preceded the storm in some places.

From the 4th to 18th, the weather was almost tropical, regular land and sea breezes prevailed on the coast, the mean temperature of London rose to 71°F [21.7°C]; at Chichester on the 13th and 14th the maximum was 88°F [31.1°C], but we heard from more than one quarter of it rising to 92°F [33.3°C]. (On the 18th, the max was 93°F at Greenwich).

From the 19th to 23rd inclusive, thunderstorms were violent and frequent throughout England, and much damage was done in the north by hailstones, which the papers reported to have been, in places, as large as hens' eggs.

From the 23rd to the end of the month was fine with a slight shower occasionally.

Harvest began in this neighbourhood on the 11th July and a wheatrick was built in this parish on the 18th.

The mean temperature of June at Chichester was 64°F [17.8°C], of July 70°F [21.1°C]. The lowest minimum in June was 46°F [7.8°C] on the 21st, the lowest minimum in July 52°F [11.1°C] on the 26th.

(No other temperature or barometer readings were given).

N.B.- the early thunderstorms in May and June came from the N and E, those in July from the S and W.

On Saturday, June 4th, about 10.15 pm, a splendid meteor was observed by S B Gould (Sabine Baring Gould, writer of 'Onward Christian Soldiers'). Looking eastward it appeared to pass from right to left, its greatest apparent altitude about 30 degrees, it had a brilliant green light, and burst into a cloud of crimson stars before reaching the horizon. Its apparent diameter was estimated at 20 degrees."

(There is no reference to rainfall but at Greenwich June was rather dry, while July was wet. Given the thunderstorms, it was probably wet at Hurst).

Unfortunately, the temperatures for Hurst in July 1859 are not given. Undoubtedly, it was an outstanding month. In *London Weather*, at Greenwich from 1841 to 1880 and at Kew from 1881 to 1964, it was the warmest July with a mean max of 27.7°C and a mean temperature of 20.8°C.

At Hurst, only July 2006 was comparable, with a mean max of 26.9°C and a mean temperature of 20.9°C. As in July 1859 there were thunderstorms, especially on the 21st and 22nd, when 25.5mm of rain fell in two separate storms.

August 1859

"A fine and warm summer month, although the temperatures were considerably below that of July. The 23rd, 24th and 25th were very hot days followed by a thunderstorm, after which the weather was cool, and even cold on the 30th and 31st.

The mean temperature was 65°F [18.3°C]; the highest max was 81°F [27.2°C] on the 25th; the lowest min was 49°F [9.4°C] on the 22nd and 31st.

The mean height of the barometer was 30.05 inches [1017mb]; 30.39 inches [1029mb] was the highest on the 22nd with a N wind; 29.70 inches [1005.5mb] was the lowest on the 31st with a SW wind.

Rain fell on 14 days but, except for the 10th and 26th, only in slight showers.

There were no gales but strong SW breezes on five days and lightning on the 26th and 30th.

The wind was between S and W on 21 days; N and W on 9 days; N and E on 9 days; S and E on 3 days.

On the evening of the 22nd five wild geese flew over from the north.

On the night of Sunday, the 28th, a brilliant Aurora Borealis was observed: this was visible in Rome and over a great part of Europe. It appeared for several hours in the north and west, and was sometimes white, sometimes rose coloured.

The wheat harvest was generally finished by the 11th; a good crop being secured in excellent conditions."

Since 1950, the mean temp of 18.3°C has been exceeded six times from 1975.

The summer of 1859, along with 1868, were the two great summers of the 19th century. The mean temperature at Greenwich was 18.9°C. This compares with 17.9°C in 1976, 18.3°C in 1995 and 18.1°C in 2006 at Hurst.

The higher figure at Greenwich is mostly accounted for by the minimum temperature, which over the three months was 0.9°C higher at Greenwich. The Hurst site is in a semi-rural location, while Greenwich is close to a large conurbation.

The mean max at Greenwich in 1859 was 25.2°C. In the summer of 1976, the mean max at Hurst was 24.4°C; at Hurst, in both 1995 (24.3°C) and 2006 (23.9°C), the mean max was lower than 25.2°C.

Another factor, which has to be remembered, when comparing these figures with recent ones, is the location of the instruments. The Stevenson Screen had not been invented by 1859. It was invented in 1864, and the Greenwich 1859 readings might have been a little lower if the thermometers had been in a Stevenson Screen.

September 1859

“The early part of the month was cold and unsettled, but the weather became warmer towards the close, and at Michaelmas, the heat and moisture brought out laburnum and apple blossoms on trees whose bloom had been cut off by the late frosts in the spring.

On the 24th, about 9.0 pm, a considerable body of white light appeared in the NNW, between a low fog bank and a band of clouds: the height was from 15 to 20 degrees, and streamers of white, and occasionally of pale rose light preceded from it.

An Aurora appeared also on the 29th, in the N and NW

The highest max was 72°C [22.2°C] on the 24th; the lowest min was 43°F [6.1°C] on the 20th. The warmest day was on the 24th with a daily mean of 65.5°F [18.6°C]; the coldest day was on the 14th with a daily mean of 52°F [11.1°C].

The mean max was 65.3°F [18.5°C]; the mean min 51.3°F [10.7°C] and the mean temperature was 58.3°F [14.6°C] nearly 7°F [3.9°C] below that of August.

The barometer maximum was 30.38 inches [1028mb] on the 11th; the minimum was 29.47 inches [998mb] on the 21st and the mean for the month was 29.92 inches [1013mb].

Rain fell, though not often in large quantities, on 22 days and hail only once, on the 14th. There were no thunderstorms and no gales, but there were strong breezes from the SW on three days and from the N on the 17th.

The wind was between S and W on 21 days; between W and N on 10 days; between N and E on 4 days and between E and S on 2 days.”

At Hurst, the mean temperature was just above the 1971/2000 average. At Greenwich, with rainfall 197% of average, it was a wet month. Probably more rain fell at Hurst than the Rev Gorham realised.

October 1859

“October 1859 will long be remembered by meteorologists for its violent and eccentric phenomena.

The summer temperature, which prevailed through more than half the month, and kept wasps and hornets alive till the 9th, was suddenly exchanged for the severity of winter, there being on the 24th, a harder frost than had been known in October for many a year, and a heavy fall of snow, lasting nearly through the day, accompanied with thunder.

But the event of the month was the furious gale which followed closely upon this frost, on the night of the 25th and morning of the 26th (This was the famous ‘Royal Charter’ gale). The gale did much damage to the coast and caused heavy losses of life and property at sea. There was ample warning of its approach; the barometer had been low for many days and fell to 29.14 inches [987mb] immediately before the gale came on, and the wind shifted suddenly and ominously from the SW to SE, against the sun.

It appears to have been a cyclone, i.e., a storm which travels like a wheel, its centre progressing in one direction and its circumference revolving round that centre.

The channel fleet were in the comparatively tranquil centre of this storm about three o’clock on Tuesday afternoon, and shortly afterwards encountered its fury from the NW, about the time that it was commencing with us from the SE, the SE gale having met them in the morning.

From this it would appear that the direction of the storm was up the channel or from SW to NE – that the centre of it passed to the north of this place – that it travelled from the start point to us in seven or eight hours or at about 25 miles an hour, that its diameter was at least the distance from the start point to Beachy Head; and that it revolved from E, through N to W, or in the opposite direction to the sun.

Many such data concerning this storm are under discussion, at this time, and the results are, we understand, to be published.

There were brilliant Auroras on the 2nd and 12th.

On the 2nd the light was principally white; the northern sky was illuminated by rays from the WNW making a small angle with the horizon; a faint pink light was noticed in the NE.

On the 12th the light was of a beautiful rose colour reaching from the western horizon to the zenith; the strong moonlight made it difficult to trace any white rays.

The swallows congregated in hundreds on the 4th, on the sunny side of the Hall roof and were not seen in any numbers afterwards, though stragglers lingered on till the 22nd, after one or two white frosts.

There were thirteen days in the month that might be called fine, though rain fell more or less on twenty days; some say there are always twenty-one fine days in October.

The highest max was 72°F [22°C] on the 4th; the lowest min was 28°F [-2°C] on the 24th.

The mean maximum, for the first seventeen days was 64.5°F [18.1°C]; for the last thirteen days, 49°F [9.4°C]; for the month 57.5°F [14.2°C].

The mean minimum for the first seventeen days was 53.5°F [11.9°C]; for the last thirteen days 35.5°F [1.9°C]; for the month 40°F [4.4°C].

The 4th was the warmest day with a daily mean temperature of 65°F [18.3°C]; the 24th, the coldest, with a daily mean temperature of 32°F [0°C].

The mean temperature for the month was 52°F [11.1°C] or 6°F below that of September.

The wind was between S and W on eighteen days; N and W on eight days; N and E on twelve days; S and E on six days.

There was thunder and lightning on the 11th, 17th, 23rd and 24th; hail on the 17th.

The barometer maximum was 30.28 inches [1026mb] on the 3^d; lowest 28.96 inches [981mb] on the 31st, in a southerly gale; mean for the month 29.69 inches [1006mb].”

It was a remarkable month with the warmth of the 4th contrasting with the cold of the 24th, with its snowfall, and the great gale of the 25/26th.

Since 1950, there have been comparable warm periods in early October such as on the 3rd in 1959 when the max was 26.9°C. The great gale of October 1987 may have exceeded the Royal Charter gale in Sussex but there has been no snowfall in October to compare with the snow on 24th October in 1859. In fact, since 1950, snow has not been recorded in October at Hurst, not even in 2008.

November 1859

“November, 1859, commenced in thunder, lightning and in rain. The first eight days were wet and stormy; from the 10th to 20th fair and frosty, with light N and NE breezes; the last four days showery with variable winds.

Fourteen days were rainy, five days were foggy, seven mornings frosty; a little snow on the 30th.

The wind was between S and W on seventeen days; N and W on nine days; S and E on seven days.

There were SW gales on the 1st, 2nd, and again on the 5th, 6th and 7th; in both instances accompanied by thunder and lightning.

The mean max was 47°F [8.3°C], the mean min was 37°F [2.8°C] and the mean temperature was 42°F [5.6°C].

The highest max was 57°F [14°C] on the 6th and the lowest min 25.5°F [-3.6°C] on the 14th.

The 6th was the warmest day with a daily mean of 52.5°F [11.4°C]; the 14th was the coldest day with a mean of 33.5°F [0.8°C].

The barometer max was 30.72 inches [1040.5mb] on the 10th; the lowest 28.96 inches [981.5mb] on the 1st. The mean for the month was 30.00 inches [1016mb].

Swallows were flying about on the 2nd and 3^d. A cockchafer was caught on the 23^d. The Bathing Pond had its first coat of ice on the 14th; the River Neva, we read was frozen over on the 17th; Fieldfares arrived in flocks on the 18th.

A Shoreham correspondent observed a brilliant meteor about 9.00 pm on the 13th. It left a streak of bluish light behind it and exploded without noise, giving off a white ball and vanishing.

Messrs. Gould, Bond and Sanwith heard a strange rumbling in the earth near Danny, on the 6th. About this time the papers reported the shock of an earthquake in Cornwall.”

At Hurst, since 1950 there have been six Novembers with a mean temperature below 5.6°C. The last time was in 1993, when the mean was 4.6°C

At Hurst in 1859, the mean temperature of the autumn was 50.7°F (10.4°C), while at Greenwich the mean was 50.9°F (10.5°C), some 1.9°F (1.1°C) below average.

Today, at Hurst in the autumn, a mean of 10.4°C would be 0.4°C below average. In 2008, the mean was just below average but the last really cold autumn was in 1993, with a mean of 8.9°C.

December 1859

“Observations on the severe frost, from the 14th to the 20th inclusive. – Northerly winds struggled with the south-westers from the middle of November. On the 3rd of December, a large flight of wild fowl were seen on their way to the SW. On the 6th, hail followed the previous southerly storm, and from that time the barometer rose till on the 10th it attained the maximum of the year [30.80 inches or 1043mb]. Light winds sprung up from the NE: the white upper clouds, which produced large haloes round the moon and sun, gradually changed their direction from S to W, and on the 10th, to N, when it at once grew frosty, and the Aurora became very rose-fingered indeed.

From the 10th the barometer continued to fall as steadily as it had risen, the hard frost came with a strong breeze from the N, increasing to a gale, succeeded on the third day by a light NE breeze lasting for three days more. Then the vapours, which had occasionally struggled up from the W and formed hoar-frost which lay like oaten grains upon the ice, were succeeded by clouds, and the lower current changed to SE, but still the frost held, the SE wind became a southerly gale, but still it froze till the half-year when the frost broke up.

We shall remember the six good days skating at Hurst; the ponds bearing on the second day of the frost; even great Pondlie on the fourth; the ice, if anything, too good; we shall not soon forget the cold dormitories in the early mornings when, for three days and nights it froze in-doors and out.

A heavy fall of snow on the morning of the 19th was the precursor of the thaw in the SW, but it did not reach beyond Worthing. There was no drifting, but the trains were stopped for some hours on the South Coast; the average depth was six inches, and this fell in three or four hours at most.

The severe cold made itself felt through the whole of France, even to Marseilles; the temperature at Hurst was nearly the same as that of London and Paris, but in many parts of England the frost was far more intense; e.g., at Malvern the thermometer fell to 10°F [-12°C], at Liverpool to 6°F [-14.4°C], at Norwich to 1°F [-17°C], the lowest.

Over the last eleven days of the month, warm, wet, and stormy weather prevailed, with S and SW winds; the thermometer rose to about 50°F [10°C] and the barometer fell to 28.64 inches [971mb], the lowest reading of the year.

The mean maximum was 38.7°F [3.7°C], the mean minimum 28.6°F [-1.9°C] and the mean temperature was 33.7°F [0.9°C].

The highest maximum was 53°F [11.7°C] on the 5th; the lowest minimum 18°F [-7.8°C] on the 17th.

The mean temperature for the 14th to 20th inclusive was 26.5°F [-3.1°C].

The 17th and 18th were the coldest days with a mean daily temperature of 24°F [-4.4°C]. (The warmest not given.)

The wind was between S and W on five days; N and W on five days; N and E on nine days; S and E on five days.

There were gales on four days; rain on seven days; snow on four days and hail on the 6th.”

At Hurst, since 1950, only the mean temperature of 0.7°C in December 2010 has been lower. This was the lowest in Mid Sussex since 1890, when the mean at Hurst would have been around -2.3°C.

GREENWICH 1859

Table (i)

Month	TEMPERATURE										RAINFALL	
	Mean	Diff from ave	Mean max	Diff from ave	Mean min	Diff from ave	High max date	High max temp	Lowest min date	Lowest min temp	Total	% of average
	°F	DegF	°F	DegF	°F	DegF		°F		°F	in	
Jan	40.5	+0.7	45.5	+1.2	35.5	+0.1	18th	53.0	8th	28.5	0.80	39
Feb	43.3	+3.0	50.4	+4.9	36.3	+1.4	16th	59.0	5th	30.5	0.86	54
Mar	47.3	+3.6	54.2	+3.2	40.5	+4.0	5th	63.5	31st	28.9	1.35	88
Apl	48.0	-0.1	56.9	+0.7	39.1	-1.0	6th	79.0	1st	25.3	2.17	114
May	54.4	+0.5	64.9	+2.0	43.9	-0.9	30th	77.0	6th	33.1	2.35	128
June	63.5	+3.6	73.9	+4.8	53.0	+2.4	26th	81.3	25th	43.5	1.40	84
July	69.5	+5.8	81.8	+8.9	57.2	+2.6	18th	93.0	25th	46.5	3.30	141
Aug	65.3	+2.3	76.1	+4.0	54.4	+0.4	25th	91.3	31st	46.5	1.13	50
Sept	58.1	-0.5	67.1	+0.4	49.0	-1.5	24th	76.0	12,20th	41.5	3.80	197
Oct	52.0	+0.4	59.0	+0.9	45.0	+0.7	4th	81.0	24th	26.5	3.60	161
Nov	42.5	-1.8	49.4	+0.0	35.5	-3.7	6th	60.4	14th	25.5	2.90	115
Dec	36.7	-3.7	41.5	-3.2	31.8	-4.3	31st	56.5	19th	14.0	2.17	104
							July		Dec			
Year	51.7	+1.1	60.1	+2.4	43.4	+0.0	18th	93.0	19th	14.0	25.83	108

Annual Summary for 1859:

It was a warm but rather wet year.

Because of gaps in the records, one had to make some estimates but the annual mean for 1859 came out at approximately 51.4°F (10.8°C).

At Greenwich the annual mean was 51.7°F [10.9°C], which was close to that at Hurst.

This makes 1859 a warm year. At Greenwich between 1841 and 1880, there were only three warmer years in 1846, 1868 and 1857.

Since 1950, an annual mean higher than the 10.8°C at Hurst in 1859 has occurred in fifteen years, all since 1988, with 2006 being the warmest year.

Between 1950 and 1987, the warmest year was 1959 with a mean temperature of 10.5°C.

At Greenwich with 25.83 inches (655.8mm), rainfall was 108% of average, and it was probably also a rather wet year at Hurst.

HURSTPIERPOINT 1971 - 2000 AVERAGES

Table [ii]

Month	Mean max (°C)	Mean min (°C)	Mean temp (°C)	Average monthly precipitation (mm)
Jan	7.4	2.0	4.7	93.4
Feb	7.9	1.6	4.8	56.7
March	10.7	3.1	6.9	62.0
April	13.2	4.2	8.7	54.9
May	17.0	7.1	12.1	50.8
June	19.7	9.9	14.8	58.6
July	22.2	12.1	17.2	46.5
Aug	22.3	11.9	17.1	55.2
Sept	19.2	9.6	14.4	80.1
Oct	15.2	7.0	11.1	107.9
Nov	10.8	4.0	7.4	91.2
Dec	8.3	2.9	5.6	97.1
Year	14.5	6.3	10.4	854.3

1860

January 1860

“January 1860 was very mild, wet and stormy; thunder frequently accompanying the southerly and SW gales.

The moon was full on the 8th, and new on the 23rd.

We observe that both in November and December the weather became fair and frosty with the full moon, and it inclined that way in January, the first eight days being wet with strong SW winds, the next six slightly frosty and fine, except for fogs. S and SW gales then prevailed with heavy rains till the last week, when the wind wavered between SW and NW, and there were considerable falls of snow in the North.

The greatest amount of frost, at Chichester, was but 3°F [-16°C] on the 26th. The highest temperature 53°F [11.7°C], on the 1st and 3rd.”
(No other temperature details were given.)

“The Barometer was highest on the 8th at 30.28 inches [1026mb]; lowest 28.73 inches [972.5mb], on the 24th, in a SW gale accompanied with hail and thunder. Mean for the month, 29.6 inches [1002.5mb].

A report has reached us that Blackbirds’ eggs were taken in this neighbourhood before the end of the month.”

In this month the correlation with Greenwich is not good. Hurst is described as ~~v~~ery mildq which suggests a mean of around 42°F, and as being ~~w~~et and stormyq but rainfall at Greenwich was 87% of average.

The present-day warming trend can be seen in the Greenwich mean of 4.4°C. From 1950 to 1988, 24 Januarys at Hurst had a mean lower than 4.4°C; since 1989 only the Januarys of 1992, 1997, 2001, 2006, 2009 and 2010 have had a mean lower than 4.4°C

February 1860

“February was snowy and blowy.

The highest max was 49°F [9.4°C] on the 8th and 28th; the lowest min was 23°F [-5.0°C] on the 14th.

The mean max was 40.2°F [4.6°C]; the mean min was 31.2°F [-0.4°C]; the mean monthly temperature, 35.7°F [2.1°C].

The coldest days on the 13th and 14th had a daily mean temperature of 29°F [-1.7°C]. Warmest day on the 8th with mean of 46°F [7.8°C].

Snow fell on nine days, and remained on the Downs and the north side of the hedges from the 11th to 25th; hail on two days, rain on eight days.

Winds: N on ten days, with gales on the 2nd, 3rd, 9th and 16th; NE on six days, with gales on the 13th and 17th; E on two days; SE on two days; S on two days; SW seven days, with a gale on the 7th; W on seven days; NW on four days; gales from W and NW on the 6th, 19th, 27th and 28th – on these last two days it blew violently. [Eleven days altogether].

On the barometer the highest reading was 30.40 inches [1029mb] on the 14th; lowest 29.0 inches [982mb] on the 27th and the mean for the month was 29.9 inches [1013mb].

N.B.- By comparison with a standard barometer it appears that our previous readings have been 0.2 of an inch too high.

An Aurora was seen on the 5th, in the ENE, between 9 and 10 pm: eight white streamers proceeded from a low arch, there was a body of white light in the WNW, with occasional traces of red light in the North. The rays were apparently connected with high streaky clouds.

On the 21st another Aurora was observed in the NNW; white streamers and bright rose light.

The Honeysuckle showed some leaves at the beginning of the month, but they were all cut off. Willow Palms were out on the 21st.

A Peacock Butterfly was caught in-doors, on the 7th, and two other butterflies in the field on the 29th.

The Feast of the Purification was a bright day with a strong north wind; the proverb runs: "If the sun shine on Candlemas Day [2nd February] the winter is not half over."

"Si sol splendescat Maria purificante

Major erit glacies post festum quam fuit ante."

We may infer by this that it has been observed that if the weather be fair at the beginning of February a cold period may be expected."

At Hurst since 1950, there have been seven Februarys with a mean lower than 2.1°C, with the last time being in 1991. The last time snow was recorded on nine days in February was in 1986.

In the winter of 1859/60, December and February were very cold at both Hurst and Greenwich. At Greenwich, the January mean was close to average, while at Hurst (where no figures were given) January was described as, ~~v~~ery mild which may have been an exaggeration. Assuming that it was mild at Hurst, the mean for the winter at Hurst could have been around 37°F (2.8°C), and at Greenwich the mean was 37.6°F (3.1°C), which was 2.5°F (1.4°C) below average.

Today, at Hurst, a mean temperature for the winter of 2.8°C would be 2.0°C below average. Since 1950, only the winters of 1962/63, 1978/79, 1984/85 and 2009/10 have had a mean temperature below 3.0°C.

March 1860

"The month was inclement, the season backward.

The highest max was 55°F [12.8°C] on the 18th; the lowest min was 24°F [-4.4°C] on the 10th. The mean max was 46.5°F [8.1°C]; the mean min was 36.4°F [2.4°C] and the mean for the month 41.4°F [5.2°C]. The 10th was the coldest day, mean temperature, 30°F [-1.1°C]; the 18th and 29th the warmest, mean temperature, 50°F [10°C].

The highest barometer reading 30.4 inches [1029mb], on the 6th; lowest 28.75 inches [974mb] on the 31st; mean for the month 29.75 inches [1008mb].

The Wind: NE on four days; SE one day; S one day; SW on 19 days; NW 13 days.

There were gales on 11 days none of which were violent.

Rain fell on eighteen days; snow on six days; hail on two days; frosts on ten mornings.

Gooseberries began to come into leaf about the 4th; blue violets were gathered on the 13th, and white on the 16th; on the 17th, two song thrush eggs, the first of the season, were brought into school; on the 18th the white-thorn showed its young leaves."

At Hurst since 1988, the March mean temperature has only been below 5.2°C in 1996, but before that, since 1950, thirteen Marches had a lower mean temp than 5.2°C, while seventeen were lower than 5.6°C.

The last March to record snow on six days was 1975.

April 1860

“April 1860 began with SW winds and seasonable showers; Good Friday, the 6th, was a remarkably fine spring day, the 7th and 8th were also fine and mild. On the 9th the SW wind suddenly became cold with hail showers, the Aurora Borealis was seen at night, the wind changed to NW and hail, frost and snow followed till the end of the month, with strong N and NE winds.

From the 19th to 22nd inclusive, there was snow more or less every day, on the 24th there was heavy driving snow, for at least six hours, which lay thickly on the N slopes of the Downs.”

Very little further information is given and there is no statement of the mean max, mean min and mean temp for the month.

“The highest temperature was about 65°F [18.3°C] on the 30th, the lowest temperature was 29.5°F [-1.4°C] on the 22nd.

The barometer stood at 30.26 inches (1025mb) on the 28th, the highest reading for the month.+

For the first time, however, there is a figure for rainfall: *“the depth of rain was about 2.5 inches [63.5mm].”*

No information is given as to the site of the rain gauge or whether it had been obtained with the help of James Glaisher.

“The nightingale was heard at Lancing on the 12th, swallows were seen at Hurst on the 18th, the cuckoo on the 27th; the blackthorn came into blossom at this time: at the end of the month the trees and hedges showed scarcely a sign of leaf.”

At Hurst since 1955, the last April to have a mean lower than the 7.1°C at Greenwich in 1860 was in 1986; altogether only three other Aprils have had a mean temperature below 7.1°C, those in 1954, 1970 and 1978.

Since 1989, 1994 was on average and all the other Aprils have been above average.

Snow fell on five days in April 1860 and this has been matched once at Hurst, in 1975, but the mean temp in that April was 8.1°C.

May 1860

“NE winds and clear dry weather, with occasional white frosts, prevailed till the 7th, when the clouds rose in the SW; from this date to the end of the month the wind was mostly in the SW. From the 26th to the 29th there were strong SW and NW gales, with thunder and lightning: many trees were uprooted on the 28th, and great damage and loss of life occurred in the North Sea. The weather was fine from the 18th to 25th, but the month as a whole, was cold and showery: 2.96 inches [75.2mm] of rain fell, and the mean temperature was about 56°F [13.3°C].”
No other details or barometer readings are given.

“Apple blossom first shewed about the 10th; lilac and laburnum from the 15th to the 17th, hawthorn and horse-chestnut on the 17th, beans on the 17th: oak leaves came out on the 10th.

The Aurora Borealis was seen on the 13th.”

The comment, *“but the month as a whole was cold...”* does not match the statement above that, *“the mean temperature was about 56°F (13.3°C)”*.

Today, a mean temperature of 13.3°C would be 1.2°C above average; the mean at Greenwich of 12.8°C would be 0.7°C above average.

75.2mm of rain has often been exceeded since 1951, but 99.0mm has been exceeded only five times, with the highest in 2002 of 125.3mm.

In the records from 1955, those for strongest gusts are incomplete, but gusts of 50mph or more have been recorded on seven occasions. The gale on the 28th May was probably comparable to the great May gale on the 17th May 1955, when a gust of 60mph was recorded. A gust of 62mph was also recorded on the 6th May in 1955.

In the spring of 1860, at Greenwich, March and April were cold, while May was warm. With no figures for April and only an estimate for May, it is difficult to be sure of the mean temperature of the spring at Hurst in 1860. Guided by the figures for Greenwich, the mean was probably around 47°F (8.3°C). At Greenwich, the mean was 47.3°F (8.5°C), which was some 3.8°F (2.1°C) below average.

Today, at Hurst, a spring mean of 8.3°C would be 0.7°C below average. The last spring to have a mean below 8.3°C was in 1996, with a mean of 7.9°C.

June 1860

“On the 2nd the South Coast was visited with a more violent storm that has been experienced for many a year at the same season; trees were blown down or stripped of their foliage, and the shore strewn with wrecks.

The wind in the morning backed to the E, blowing fresh with clouds and rain; the barometer falling rapidly, about noon the weather cleared and the wind shifted to the south, rising rapidly to a gale, which soon came on violently with rain from the SSW and SW, continuing till the following morning.

S and SW winds prevailed till the end of the month, bringing with them frequent and drenching rains, and heavier than winter floods in this neighbourhood. Thunder and lightning were frequent, and the weather seemed to right itself in heavy electrical storms, the wind veering to the N, and the 30th proving fine”.

Unfortunately, no figures for temperature, rainfall or the barometer were given.

“The hawthorn was not fairly out till this month came in, and continued to bloom throughout it.”

At Hurst since 1950, ten Junes have had a mean temperature below 13.7°C, with the lowest in 1972 when the mean was 11.9°C. The last cool June was in 1991 with a mean of 12.7°C. At Greenwich between 1841 and 1880, it was the wettest June.

On the England and Wales Rainfall Series since 1766, June 1860 was the wettest with 157.2mm (6.19 inches).

The Met Office now ignores this series (and all the records in *British Rainfall*, the numerous records from the 19th century and early years of the 20th century) and concentrates on their new aerial rainfall and temperature series starting from 1914. This enables them to put out headline catching statements, which are seized upon by the media, such as saying that 2007 was ~~the~~ the wettest summer on record when on the 1766 series, it was the eighth wettest, with 1912 the wettest. At Kew, however, June 1903 had 183.2mm (7.21 inches) of rain.

At Hurst, since 1951, the wettest June was in 1997 with 174.3mm (6.87 inches). It is possible that at Hurst the total in June 1903 was higher than in 1997 and, given the reference to serious flooding, also in 1860.

In Sussex, in the recent past, there have been two great gales in early June. The famous D-Day gale of the 4th/5th June in 1944 and on the 23rd in 2004, when the top gust at Hurst was 59mph. A large number of trees and power lines were brought down and the Mid Sussex Times reported widespread power cuts, along with much structural damage. The gale of 2nd June 1860 must have been much the same.

July 1860

“The first fortnight was fine and warm but cloudy; regular land and sea breezes set in on the coast, the clouds, for the most part, coming from the NW, N and NE.

From the 14th to the end of the month SW winds prevailed, with showery unsettled weather, frequent heavy rains and thunder.

The thermometer was only observed from the 16th to the end.

The max observed was 73°F [23°F] on the 17th; the min was 42.5°F [5.8°C] on the 23rd.

We heard several persons say there was white frost on the grass once, earlier in the month, probably on the 9th.

The depth of rain that fell from the 20th June to the end of July was 3.1 inches [76.5mm], though, probably, something should be allowed for evaporation, as the gauge was not examined for a month.

“The white-thorn was still in blossom at the beginning of this month. Wheat remained in flower till nearly the end: it came into ear about the longest day.”

Based on the Greenwich figures, July 1860 was probably similar to the cool, wet, dull Julys that occurred at times before 1989. At Hurst, the last July to have a mean temperature below 15.4°C was in 1988 with a mean of 15.3°C and, between 1950 and 1989, nine Julys had a mean below 15.4°C. The coldest July in recent times was in 1954 with a mean temperature 14.6°C.

A ground frost has been recorded in July in 1962, 1963 and 1971.

August 1860

“A remarkably wet and windy month. There were but six days on which it did not rain, more or less; and there were gales from the SW on the 24th, 28th, 29th and 30th; indeed, it blew on average, what sailors would call half a gale of wind for the whole month. The wind blew from the SE 1 day, S 4, SW 18, W 3, and NW 6 days.

The highest max was 74°F [23.3°C] on the 4th; lowest min 46°F [8°C] on the 7th and 10th. The mean temperature for the month was 59°F [15°C].

The barometer max was 29.91 inches [1013mb] on the 1st; min, 29.24 inches [991mb] on the 30th; mean for the month 29.59 inches [1003mb]. [These figures are very low for August.] Fall of rain, 4.60 inches [116.8mm].”

At Hurst, the last Augusts to have a mean of 15.0°C were in 1985 and 1986. Four Augusts in the 1960s had a mean temperature below 15.0°C, with the mean down to 14.2°C in 1956.

Between 1951 and 1985, there were six Augusts with more than 116.8mm of rain, with the most in 1951, when 150.8mm of rain fell.

The summer pattern of the weather is familiar. 1959 an excellent summer, 1960 a very poor one; 1976 an outstanding summer, 1977 very poor; and here we have 1859 an excellent summer, 1860 very poor.

With no details for June and July, it is not possible to state a mean temperature for the summer of 1860 at Hurst but it was obviously a cool, wet and probably dull one.

At Greenwich, the mean temperature was 58.6°F (14.8°C). On the 23rd of May, the max of 76.5°F (24.7°C) was higher than on any day in the summer. At Hurst, since 1950, May has had the warmest day in 1954, 1965 and 1978.

Today at Hurst, a mean of 14.8°C would be 1.3°C below average. Since 1950, the summers of 1962, 1954, 1972, 1956 and 1965 have had a lower mean than 14.8°C.

The rainfall total at Greenwich was 12.28 inches (312.0mm), which was an exceptionally high figure. It is not possible to state a definite total for Hurst. The only total given was from 20th June to 31st July, which was 7.61 inches (193.3mm), and 4.60 inches (116.8mm) for August. It is probable that the first three weeks of June were wet and that the Hurst total for the summer was, at least, around 300mm.

Since 1951, the wettest summer was in 1960 with 303.6mm.

Broadly speaking the summers of 1954, 1956 and 1960 were comparable with 1860.

September 1860

No observations for September 1860 were printed.

Based on Greenwich, it would have been a very cold and wet month. See Table [ii].

At Greenwich the mean temperature was 54.6°F (12.6°C), 4.0°F (2.2°C) below average.

Since 1950, only 1952, 1965, 1972 and 1986 had a lower mean temperature than 12.6°C.

The Greenwich rainfall total of 3.10 inches (78.8mm) was 161% of average, and at Hurst the rainfall total could have been over 100mm.

October 1860

There was no general description of the month but, in general, temperatures were close to average, with an Indian Summer at the end of the month, and it was a rather dry month.

"The highest max was 69.5°F [20.8°C] on the 31st and this was also the warmest day with a daily mean of 59.3°F [15.2°C]; the 13th was the coldest with a daily mean of 40.0°F [4.4°C].

The only night with the thermometer below the freezing point was on the 12th with a min of 30.1°F [-1.1°C].

The mean max was 58.7°F [14.8°C], the mean min was 45.0°F [7.2°C] and the mean temperature was 51.9°F [11.1°C].

On the barometer the highest reading was 30.3 inches [1026mb] on the 4th; lowest 29.3 [992.5mb] on the 11th and the mean for the month was 29.9 [1012.5mb].

The only bad weather was from the 10th to the 19th. There were 18 days on which no rain fell and 21 which may fairly be reported as fine. The rainfall total was 2.31 inches [58.6mm].

The wind blew from the E and NE on six days; from S to SW on 25. There were gales from the S.W. on the 15th and 18th.

A great body of swallows left about the 9th; but many remained until the 28th. Primroses were gathered on the 20th. Nuts in plenty through the whole month."

The high rainfall figure for October in Table [ii] is reflecting the number of very wet Octobers between 1971 and 2000, notably 289.8mm in 1987 and 330.5mm in 2000.

The Indian summer at the end of the month was a notable one. The max at Greenwich on the 28th of 68.5°F (20.3°C) and at Hurst of 69.5°F (20.8°C) on the 31st has, since 1950, only been matched by a max of 20.5°C on the 28th in 2005.

It is interesting that the Hurst mean of 11.1°C in 1860, which may have been just above average then, is the same as in the 1971/2000 averages.

November 1860

“The highest max was 55°F [12.8°C] on the 1st and 2nd; the lowest min was 28°F [-2.2°C] on the 3rd, the mean temperature for the month was 42°F [5.6°C].

On the Barometer the highest reading was 30.4 inches [1029mb] on the 7th, the lowest 29.1 inches [985.5mb] on the 17th and the mean for the month was 29.7 inches [1006mb].

The wind was NE on 16 days, E 5, SE 1, S 3, SW 3, and NW 2.

There was little gloomy weather and fogs only on the 2nd and 13th.

Snow fell on the 17th accompanied by a sudden shift of wind from SE to NE.

The rainfall total was 2.56 inches [65mm].

A large flock of Pigeon Fieldfares on the 5th. Ice first formed on the bathing pond on the 8th. Hazel nuts and Primroses were to be found in the woods in considerable quantities through the whole month.”

There is a close correlation between Hurst and Greenwich on the highest and lowest temperatures, but the mean temperature at Greenwich (5.0°C) was rather lower than at Hurst (5.6°C). Even so, this would make it a cold month about 1.5°C below average but, apart from the reference to ice forming on the bathing pond, there is little or no reference to cold weather, other than snow falling on the 17th.

The wind direction shows that the month was dominated by easterly winds, which would suggest a cold month.

At Hurst, since 1950, only four Novembers have been colder, those in 1952, 1965, 1980 and 1993.

The rainfall total of 65mm would have been 71% of the 1971/2000 averages.

With the mean temperature of both September and November well below average, the autumn of 1860 was cold.

At Greenwich, the mean temperature of 9.4°C was 1.5°C below average. At Hurst, because no figures were given for September, it is not possible to be certain. Guided by the figures for Greenwich, a September mean of 11.8°C would make the autumn's mean 9.5°C at Hurst, which is 1.3°C below the 1971/2000 averages. Since 1950, only the autumns of 1952, 1965, 1974 and 1993 have had a lower mean temperature.

At Greenwich, the rainfall total was 183mm, which, because of the wet September, made the autumn rainfall above average. At Hurst, there were no figures given for September but we can assume that it would have been wet. To offset the rather dry October and November, there would have to have been around 155mm of rain in September for the autumn rainfall to be on average. This is not impossible. Since 1951, eight Septembers have had more than 155mm of rain.

December 1860

“The first nine days were gloomy, wet, and stormy, with a prevalence of S winds, blowing a gale on the 6th and 7th. Great floods prevailed in the NW and Midland counties.

The barometer fell on the 8th to 28.7 inches [972mb], the lowest in this neighbourhood for 40 years, we were informed; the weather immediately improved and the winds set in.

A very severe frost began on the night of the 17th, and continued till the night of the 30th. Snow fell on the 17th, heavily on the 19th, and again with a strong E wind and drifting on the 26th and 27th; the estimated depth, 7 inches; in the western part of the county 9.5 inches fell on the 19th. The snow mostly came from the ESE and SE, and was the result of conflicting currents, three of which from NE, NW, and SSE, were observed at one time.

On the morning of St. John’s Day, the chapel altar was beautifully covered in snow to an inch in depth.

The thermometer fell to 9°F [-12.8°C], 3°F [-16.2°C], and 5°F [-15.0°C], on the mornings of the 24th, 25th and 29th. Christmas Eve was everywhere the coldest day in England, 15°F [-9.4°C] being registered: a dense fog prevailed.

The winds during the frost were mostly from the north, but occasionally light and variable; the difference between the day and night temperature was extreme, as for instance on the 22nd, when the range was from 18°F [-7.8°C] to 46°F [7.8°C].

The thaw came with a strong SE wind and heavy rain at the end of the month; the snow, with the exception of the deepest drifts, all went with the old year, which departed characteristically with a flood.

The rainfall total for the month was 3.4 inches [86.4mm].

Primroses were gathered till the frost set in; a quart of good nuts on the 17th, and others after Christmas Day.”

At Hurst since 1950, there have been no minima to compare with the figures above in December. The nearest was -11.5°C on the 9th in 1967.

January, however, has seen -16.2°C on the 23rd and -16.0°C on the 13th in 1963 and -13.4°C on the 8th in 1985. February: -14.6°C on the 10th in 1986. It would appear that it was a ~~White~~ White Christmas at Hurst in 1860.

Since 1950, the lowest max recorded at Hurst was . 5.7°C on 12th January 1987. The figure for Christmas Eve of 15°F (-9.4°C) was probably a daily mean and not a maximum reading. The nearest to this in December was a daily mean of -6.8°C on the 9th in 1967 and -6.1°C on the 28th in 1961. The daily mean, however, on the 13th. January 1963 was -10.0°C (14°F).

Based on Greenwich, from the very low minimum temperatures quoted and the heavy snowfall, it must have been a cold month. At Hurst no monthly means were quoted. It is likely that the mean was similar to that in 1981, when it was 2.0°C.

The Greenwich mean temperature of 36.3°F (2.4°C) was 4.1°F (2.3°C) below average. Since 1950, only 1950, 1962, 1963, 1976 and 1981 have had a mean temperature below 2.4°C.

In 1860, snow fell on at least five days during the cold spell and was heavy at times.

Since 1950 at Hurst, snow has fallen on five or more days in December in 1950 (at least 10) 1962 (6) 1967 (5) 1970 (6) 1981 (5) and 1975 (5).

GREENWICH 1860

Table (iii)

Month	TEMPERATURE										RAINFALL	
	Mean	Diff from ave	Mean max	Diff from ave	Mean min	Diff from ave	High max date	High max temp	Lowest min date	Lowest min temp	Total	% of average
	°F	DegF	°F	DegF	°F	DegF		°F		°F	in	
Jan	39.9	+0.1	45.0	+0.7	34.8	-0.6	3rd	55.5	28th	27.5	1.81	87
Feb	36.3	-4.0	42.5	-3.0	30.1	-4.8	28th	53.5	11th	23.2	1.10	69
Mar	42.1	-1.6	49.2	-1.8	35.0	-1.5	28th	59.5	10th	23.5	1.86	121
Apl	44.7	-3.4	53.7	-2.5	35.6	-4.5	30th	65.0	11th	28.2	1.00	53
May	55.1	+1.2	65.5	+2.6	44.6	-0.2	23rd	76.5	7th	32.5	3.90	213
June	56.7	-3.2	65.0	-4.1	48.5	-2.1	24th	74.0	6th	43.5	5.80	349
July	59.7	-4.0	69.2	-3.7	50.2	-4.4	17th	75.0	5th	41.6	2.80	120
Aug	59.5	-3.5	67.2	-4.9	51.8	-2.2	4,16	70.8	7th	45.5	3.68	161
Sept	54.6	-4.0	63.4	-3.3	45.8	-4.7	7,8	69.7	12th	35.7	3.10	161
Oct	51.5	+0.2	58.6	+0.5	44.5	+0.2	28th	68.5	12th	32.4	1.60	71
Nov	41.0	-3.3	46.7	-2.7	35.3	-3.9	1st	55.3	3rd	28.5	2.50	99
Dec	36.3	-4.1	40.6	-4.1	32.0	-4.1	6th	54.0	25th	8.0	2.75	132
							May		Dec			
Year	48.1	-2.5	55.5	-2.2	40.7	-2.7	23rd	76.5	25th	8.0	31.90	133

Annual Summary for 1860:

It was a cold and wet year.

At Greenwich, 1860 was the third coldest year between 1841 and 1880 after 1879 and 1855. The annual mean temperature of 8.9C was 1.4C below average.

At Hurst, full temperature figures were given for only six of the months, so it is not easy to estimate the annual mean temperature. Taking 1859 and 1860 together, full figures were given for 15 months. On six occasions, the mean at Hurst was higher than at Greenwich, on seven lower and on two the same.

After making various estimates, the most likely figure for the annual mean temperature is in the range of 8.7°C to 8.9°C. Since 1950, only three years have had an annual mean temperature below 9.0°C: 1962 (8.6°C) 1963 (8.4°C) and 1979 (8.9°C).

At Greenwich, with the heavy spring and summer rainfall, the total of 31.90 inches (861mm) was 133% above average. Between 1841 and 1880, this made it the second wettest year after 1852.

At Hurst, the annual rainfall total is about 240mm higher than at Greenwich. Rainfall figures were given for only six of the months. The spring and summer at Hurst were probably very wet, and it is quite possible that the rainfall total was around 1,100mm, which would have also been about 133% of average.

Since 1951, there have been seven years with an annual total of over 1,000mm, with the three wettest being 2000 (1382.0mm) 1951 (1177.3mm) and 1960 (1173.5).

1861

January 1861

“The year commenced with a SW gale and a high temperature, 49°F [9.4°C], which fell after 9 am, the wind shifting in the afternoon to the NW; on the morning of the 2nd the frost had returned with a clear cold NE wind.

A hard frost then lasted until the 16th, but it has not been so intense as the first in December, and has hitherto been without any considerable fall of snow; the weather has been fair, the wind light and variable, mostly from the east.

The thermometer fell to 15°F [-9.4°C] on the 11th but has mostly ranged from 18°F [-7.8°C] or 17°F [-8.3°C] at night to 36°F [2.2°C] by day.

Slight thaw set in on the 12th, accompanying a fall of half an inch on the barometer, but on the night of the 13th the frost returned with an E wind, which at first had to struggle with a southerly upper current, and came on with a fog, but cleared during the day with a strong breeze from the NE. The mean temperature for the first 15 days, 30.0°F [-1.1°C].

Observation: - When northerly and NE winds follow a low barometer, expect them to prevail for sometime.

A thaw set in unexpectedly on the night of the 16th; some warm counter current met the fierce NE wind in the upper air and disarmed it, when apparently at its full strength. The temperature rose slowly and steadily to the end of the month, SW winds and fogs prevailing, the warm wind condensing against the cold earth.

The ice remained firm enough for skating till the 24th, and even until the 29th in places, fairly outlasting the holidays; but every trace of frost and snow, in this neighbourhood, had disappeared before the end of the month, and the roads, not so cut up before since 1814 we heard, became tolerably firm again.

The frost penetrated the level garden ground to the depth of 9 inches.

The 11th was the coldest day, mean daily temperature, 23.5°F [-4.7°C]; but more ice formed on the 16th, with a mean temperature of 28°F [-2.2°C], and a strong wind. The 26th, the warmest day, mean daily temperature 47°F [8.3°C].

The moon was new on the 11th, and full on the 26th. The thaw set in, as the frost had done, about the middle of the first quarter.

Thermometer: max 53°F [11.7°C] on the 30th; min 15°F on the 11th [see above]. Mean max 40°F [4.4°C], mean min 29.7°F [-1.3°C]; mean temperature of the month 35°F [1.7°C].

Greatest daily range, 21°F [11.7°C] on the 10th from 17°F to 38°F; least 4°F on the 5th from 29°F to 33°F.

Barometer, high this month and steady, rising with the thaw. Highest 30.39 inches [1033mb] on the 21st; lowest 29.1 inches [986mb], after a SW gale.

Gales from the NE on the 15th, from the SW on the 25th, neither of them violent.

Snow fell on three days in slight quantities, and rain on 3 days, with a total of 0.34 of an inch [8.6mm].”

The very cold first half and milder second half of January have some similarities with January 1997 (mean: 2.0°C)

At Hurst since 1950, there have been colder Januarys only in 1963, 1979, 1985, 1997 and 2010.

January 1861 was a very dry month. At Greenwich between 1841 and 1880, only 1880 with 0.26 of an inch (6.5mm) was drier.

At Hurst, since 1951, the only comparable Januarys were 1963 with 11.7mm (0.46 of an inch) and 1987 with 17.1mm (0.67 of an inch).

February 1861

No general description of the month was given.

“Though Candlemas Day was bright no considerable frost followed.

Thermometer: the max 55°F [12.8°C] on the 18th and 27th; min. 21.5°F [-5.8°C] on the 12th; the mean temperature 42.8°F [6.0°C]. The 18th was the warmest day, mean temperature 50°F [10°C]; 12th the coldest day, mean temperature 29°F [-1.7°C]. The greatest daily range, 21.5°F on the 27th; least 2°F on the 5th.

Barometer: highest 30.6 inches [1036mb] on 2nd, wind shifting to NW but speedily returning to SW; lowest 29.3 inches [993mb]; mean for the month 29.7 inches [1005.5mb].

The winds were SW 9 days, S 8 days, SE 4 days, N 3 days, NE 2 days, NW 2 days.

Gales from the SW on the 18th, 20th and 21st; the latter was very violent and brought down the spire of Chichester Cathedral.

There were 19 fine days; frosts on 7 mornings; snow on the 11th, and 1.25 inches of rain [31.8mm] during the month.

Willow palms were out on the 18th, and gooseberry leaves towards the end of the month; honeysuckle much earlier.”

The temperature figures at Hurst in 1861 and Greenwich are similar but at Hurst it was drier. Today, 31.8mm would be 56% of average.

There have been many comparable Februarys both in the past and the present. The figures for Hurst in 1861 are virtually the same as those of 1992, 2004 and several other Februarys.

The winter of 1860/61 was cold and dry. The very cold December and January were partly offset by the mild February, and the probable mean of 3.2°C was similar to that at Greenwich.

Today, at Hurst, a mean of 3.2C would be 1.6C below average.

Today, since 1950, only the winters of 1955/56, 1962/63, 1978/79, 1984/85 and 2009/10 were definitely colder than that of 1860/61.

After a wet December, January and February were dry. The total of 4.99 inches (126.7mm) meant that overall it was a dry winter. In terms of 1971/2000 average, rainfall was 51% of average and, since 1951, there have only been seven drier winters.

March 1861

No general description of the month's weather was given.

"Thermometer: the highest max was 61°F [16°C] on the 24th and the lowest min 28°F [-2.0°C] on the 14th; the mean temperature was 46.5°F [8.1°C].

On 15 days no rain fell. The month's total was 2.15 inches [54.6mm].

Snow fell on the 21st.

The wind N on 1 day, NE 1, S 2, SW 12, W 10, NW 4, Calm 1. The wind was strong on the 19th.

The barometer max 30.32 inches [1026.5mb] on the 9th, the min 28.9 inches [979mb] on the 19th and the mean 29.66 inches [1005mb]."

It was a mild month dominated by westerly winds. At Hurst, from 1950 to 1988, the mean of 8.1°C was exceeded only in 1957 and 1981, but nine times after 1981.

Both Hurst and Greenwich had the same rainfall total, which made it a wet month at Greenwich (140% of average) but rather dry at Hurst (88% of 1971/2000 average).

April 1861

"The month began with west winds and showery weather, the rain falling mostly at night. On the 5th, the wind shifted to NW, and the weather became fine. N and NE winds prevailed from the 6th to the end of the month, which was remarkably dry, with continued fine weather, very acceptable, we believe, to the farmer as well as to the cricketer. Depth of rain 35 inches, and snow fell heavily on the 27th."

(One may assume that this is a misprint and that the total was 0.35 of an inch [9.0mm]).

"The barometer has been high and steady. The difference between the night and day temperature has occasionally been excessive, amounting to 39°F on the 12th, the thermometer ranging from 25.5°F [-3.6°C] in the early morning to 64.5°F [18°C] in the heat of the day.

The 17th has been the warmest day as yet, with the max 69.5°F [20.8°C]. The mean max was 57.4°F [14.1°C], the mean min 36.6°F [2.6°C]. There were severe frosts on the 10th, 11th, 21st and 30th, and the mean temperature of the month was 47.2°F [8.4°C], while the mean daily range was 20.8°F [11.6°C], which is excessive.

The barometer max 30.42 inches [1030mb] on the 10th, the min 29.57 [1002mb] inches on the 2nd and the mean 30.02 inches [1016.5mb].

The first leaves of the elm and horse-chestnut showed at the beginning of the month; pear and peach blossoms also. The black-thorn was in flower on the 11th. On that day the nightingale was heard: and a swallow is reported on the 3rd. The honeysuckle, on the SW wall of the College was in bloom on the 13th. Oak leaves showed on the 21st, long before the ash; the cuckoo was heard on the 22nd."

At Hurst, there were obviously considerable variations of temperature both during the month, with the max close to 70°F on the 17th and snow on the 27th, and also diurnally. These changes probably occurred at Greenwich also.

At Greenwich, this led to a cold month with the mean temperature 1.4°C below average. At Hurst, the mean min of 2.6°C was close to that of Greenwich (2.2°C). The mean max of 14.1°C was rather higher than that of Greenwich (13.0°C). With northerly winds prevailing, the max at Greenwich was likely to have been lower, and this could account for the difference.

Greenwich had 0.83 of an inch of rain (21.0mm). Since 1951, the Aprils of 1955, 1957, 1984, 1997 and 2007 have had less than 9mm, with the driest being those of 1984 (3.3mm) and 2007 (3.6mm).

Only a brief report is given for the next four months.

May 1861

“Hot sun and cold winds, dry weather and great difference between the temperature of the day and night.

The highest max was 81.5°F [27.5°C] and the lowest min was 32.5°C [0.3°C], with a mean of 53.8°F [12.1°C]. The daily range of temperature varied between 42°F and 6°F.

Rain fell on 9 days with a total of 1.24 inches [31.5mm].

Thunder on 4 days.

Prevailing winds NE 16 days, W and SW 14. The barometer max was 30.28 inches [1026.5mb], min 29.41 inches [996mb], and the mean 29.93 inches [1013mb].”

At Hurst in May 1861, temperatures were around average, while rainfall was 62% of the 1971/2000 averages.

The spring of 1861 was dry with the mean temperature perhaps around average.

Temperatures appear to have been rather higher at Hurst than at Greenwich, with a mean temperature of 9.5°C. Thus, the mean temperature at Hurst could have been a little above average, while at Greenwich it was a rather cold spring, with a mean temperature of 8.8°C.

Today, at Hurst, a mean of 9.5°C would be 0.5°C above average.

At Hurst, it was a dry spring with a rainfall total of 4.04 inches (102.5mm). In terms of the 1971/2000 average, this was 61% of average, but at Greenwich rainfall was around 80% of average.

June 1861

“Great differences still between the day and night temperature. Latter part of the month was mild and showery.

The highest max was 84.5°F [29.2°C] and the lowest min 40.5°F [4.7°C], with a mean of 61.1°F [16.1°C]. The daily range varied between 34°F and 6.5°F.

Thunder on 7 days, winds NE 17 days, SW 11 days. The barometer max was 30.05 inches [1017mb], min 29.75 inches [1008mb], and the mean 29.8inches [1009mb].

Wheat in ear by the 18th.”

It seems that June 1861 was a very warm month. A mean of 16.1°C has been exceeded only three times between 1950 and 1991 (in 1950, 1970 and 1976) although six times since 1992.

With thunder on 7 days and the mean pressure down to 1009mb, it was probably a very wet month at Hurst but, unfortunately, separate totals are not given for June and July.

July 1861

“The highest max was 74°F [23.3°F] and the lowest min 47°F [8.3°C], with a mean of 61.3°F [16.2°C]. The daily range varied from 24°F to 9°F.

Wind SW on 28 days. Thunder on the 7th and 8th, and a gale on the 18th.

The barometer max was 29.99 inches [1016mb], min 28.97 inches [982mb], and the mean 29.57 inches [1002.5mb].

Rain fell in June and July on 32 days to a total of 7.57 inches [192.2mm].

The wheat and barley harvest began at the end of July.”

With SW winds on 28 days, July 1861 at Hurst was rather cool and unsettled, with the highest max being 23.3°C. Since 1950, the max in July was lower than this in 1954, 1960, 1965 and 1988. In 1988 it was only 22.1°C.

The barometer readings are very low for July. The low of 982mb was probably on the 18th, the day of the gale. On the day of the great gale on 29th July 1956 (top gust here of 66mph), the barometer was down to 976.6mb at Yeovilton in Somerset.

The barometer mean of 1002.5mb seems exceptionally low. July 1960 was a cooler and probably wetter month than in 1861, with a barometer mean of around 1010mb.

In 1861, July with around 80 to 90mm was probably not quite as wet as June.

At Hurst, since 1951, there have been four very wet June/Julys: 1954 (216.0mm), 1980 (223.9mm), 1991 (36.2mm) and 2007 (208.7mm).

AUGUST 1861

“The highest max was 83.5°F [28.6°C] on the 28th; lowest min 45°F [7.2°C] on the 7th and 31st, with a mean temperature of 63°F [17.2°C]. The daily range varied from 34.5°F on the 28th to 4°F on the 17th.

Winds, S. 2 days; SW 24; W 2; NW 2; calm 1.

The barometer max was 30.24 inches [1025mb] on 31st, min 29.57 inches [1002mb] on 8th; mean 29.9 inches [1012.5mb].

Rain on 8 days, with a total of 0.84 inches [21.4mm]. Thunder and lightning on 7th, 16th and 20th.”

Again, there is a contrast in the mean temperature between Greenwich 18.2°C and 17.2°C at Hurst. The dominance of SW winds during the month could account for this difference.

At both stations it was a dry month. At Hurst, since 1951, there have been five Augusts with less than 21mm of rain.

The summer of 1861 was changeable, with a warm, wet June, a rather cool, wet July and a rather warm, dry August. At Hurst in 1861, the mean temperature for the summer was just above the 1971/2000 average, while Greenwich was probably somewhat warmer.

At Hurst, because of the very wet June and July it was a wet summer with the rainfall total of 213.6mm (8.41 inches) 133% of the 1971/2000 average. By contrast, Greenwich was not so wet in June and July, and the total of 118.5mm (4.67 inches) was about 10% below average.

September 1861

“The highest max was 77.5°F [25.3°C] on the 1st and 2nd, lowest min 38°F [3.3°C] on the 27th, with a mean temperature of 58°F [14.4°C]. The daily range varied from 34.5°F on the 12th to 6.5°F on the 26th.

Winds N 2 days; NE 1; SE 1; S 6; SW 15; W 2; NW 2; calm 1. SW gale on the 23rd.

The barometer max was 30.07 inches [1019mb] on the 18th; min 29.15 inches [988mb] on the 25th; mean 29.77 inches [1009mb].

Rain on 15 days, with a total of 3.65 inches [92.6mm].

The weather was bad from the 21st to 25th. Thunder, lightning and heavy rain on the 24th and 25th.

August and September were both beautiful harvest months, and the last ten days of August and first nineteen of September, were especially fine: and Hurst and many other parishes had good cause for their day of thanksgivings and festivity.”

September was probably warm and generally dry until the 19th, then much cooler and wetter. The mean temperature was close to average. The heavy rain at the end of the month brought the rainfall total above average. As in the summer, there was a similar contrast between the drier Greenwich and the wetter Hurst.

October 1861

Most of the usual details are missing, and any figures seem to refer only to the first half of the month.

“The month has been remarkably fine and warm, with six foggy mornings. The thermometer reached summer heat three times and twice exceeded it.

Thunder or lightning, or both, on five different days. Fall of rain 0.78 of an inch [19.8mm].

*Honeysuckle was in blossom on the 9th. An aurora was observed on the 10th. A brilliant meteor in the north on the 8th. The swallows congregated on the hall roof on the 14th but some still remained on the morning of the 17th. The larch trees are putting out spring shoots, and a *pirus [sic] japonica* is in full bloom.”*

From the comments, and the figures for Greenwich, it would have been a very warm, dry month. At Hurst, since 1950, the mean of 13.3°C at Greenwich, has been exceeded only in 2001, 2005, 2006 and 1995.

It is probable that it would have been a dry month.

November 1861

“The month was remarkable for frequent gales, floods and severe frosts.

The highest max was 56°F [13.3°C] on the 1st, lowest min 19°F [-7.2°C] on the 19th, with mean temperature 41°F [5.0°C]. The daily range varied from 28°F on the 25th to 1.5°F on the 22nd.

Prevailing winds, N 2 days; NE 1; S 1; SW 11; W 5; NW 4; 6 days calm.

Gales from the SW on the 5th, 10th, 21st, 25th, 29th, that on the 10th being very violent.

The barometer max was 30.3 inches [1023mb] on the 19th. Min. 28.81 inches [976mb] on the 13th. Mean 20.57 inches [1002.5mb].

Lightning on the 1st, 6th, 10th, 23rd and 30th. Snow on the 2nd. Hail on the 6th and 10th. Rain on 15 days, with rainfall total of 7.09 inches [180.2mm].”

It must have been an extremely unpleasant month with the unusual combination of being stormy, very wet and very cold. At Hurst no such combination has occurred since 1950.

Perhaps the nearest was in 1965 with a mean temperature of 4.9°C (1.9°C below average), 122.7mm of rain, and strong winds on eight days with a gust of 57mph on the 1st.

1963 had 192.5mm of rain, with very strong winds on five days, gusting to 70mph on the 18th, but it was a mild month.

Since 1950, in November, a mean temperature lower than 5.0°C has occurred only in 1952, 1965, 1985 and 1993 while, since 1951, only seven Novembers have been wetter.

The autumn of 1861, like the summer, was changeable varying between mild and cold, very dry and very wet weather. The cold November offset the warm October. At Hurst in 1861, the autumn's mean temperature was 10.9°C, which was 0.1°C above the 1971/2000 averages. As in the summer, Greenwich was drier than Hurst where, today, a rainfall total of 292.6mm would be 5% above average.

December 1861

No general description of the month's weather was given.

“The highest max was 54°F [12.2°C] on the 1st, 10th, 14th, the lowest min 26.5°F [-3.1°C] on the 26th, with a mean temperature of 41.8°F [5.4°C]. The daily range varied from 22°F on the 6th to 2°F on the 20th.

Prevailing winds, N 1 day; NE 10; E 4; SE 1; S 5; SW 3; W 4; NW 2; calm 1.

Gale from the S. on the 13th.

The barometer max was 30.71 inches [1040mb] on 27th. Min 29.15 inches [988mb] on the 7th and mean 30.01 inches [1017mb].

Lightning on the 8th. Rainfall 1.65 inches [42mm].”

It was probably a mild month with some cold weather at the end, and it was a dry month. Today, at Hurst, a mean of 5.4°C would be 0.2°C below average. Since 1951, there have been nine drier Decembers.

GREENWICH 1861

Table (iv)

Month	TEMPERATURE										RAINFALL	
	Mean	Diff from ave	Mean max	Diff from ave	Mean min	Diff from ave	High max date	High max temp	Lowest min date	Lowest min temp	Total	% of average
	°F	DegF	°F	DegF	°F	DegF		°F		°F	in	
Jan	34.2	-5.6	39.7	-4.6	28.7	-6.7	27,29	55.0	8th	16.0	0.55	27
Feb	42.5	+2.2	48.2	+2.7	36.9	+2.0	17th	56.0	12th	24.4	1.80	113
Mar	44.9	+1.2	52.7	+1.7	37.1	+0.6	24th	61.8	4th	22.5	2.15	140
Apl	45.5	-2.6	55.0	-1.2	36.0	-4.1	12th	63.5	21st	26.8	0.83	44
May	53.3	-0.6	63.5	+0.6	43.0	-1.8	23rd	80.2	9th	33.4	1.79	98
June	61.1	+1.2	70.8	+1.7	51.3	+0.7	19th	81.8	9th	42.9	1.90	114
July	62.9	-0.8	72.3	-0.6	53.4	-1.2	1, 8	76.3	11th	48.4	2.20	94
Aug	64.7	+1.7	75.6	+3.5	53.8	-0.2	12th	89.3	31st	46.2	0.57	25
Sept	58.3	-0.3	68.3	+1.6	48.2	-2.3	1st	81.1	27th	37.7	1.46	76
Oct	55.9	+4.6	64.1	+6.0	47.7	+3.4	8th	75.6	29th	39.6	0.88	39
Nov	40.7	-3.6	47.3	-2.1	34.1	-5.1	26th	57.8	19th	23.2	5.07	200
Dec	40.9	+0.5	45.9	+1.2	36.0	-0.1	9th	54.0	27,30	23.5	1.25	60
							Aug		Jan			
Year	50.4	-0.2	58.6	+0.9	42.2	-1.2	12th	89.3	8th	16.0	20.45	85

Annual Summary for 1861:

A dry year, with the mean temperature close to average.

The mean temperature varied as warm and cold months alternated through the year. January was a notably cold month (3.1°C below the 1971/2000 average) while October was warm (2.1°C above average).

At Hurst, the mean temperature of 10.3°C was close to the Greenwich mean of 10.2°C. At Greenwich that was 0.1°C below average. Today at Hurst, a mean of 10.3°C would be 0.1°C below average.

While rainfall was below average in seven of the months, June, July and November were very wet. Overall, it was a dry year with 713.2mm (28.08 inches), which was 84% of the 1971/2000 average. Since 1951, there have been seven drier years, with the three driest being 1973 (589.1mm), 1989 (647.1mm) and 1953 (651.4mm).

Greenwich was drier with 519.3mm (20.45 inches) and that was 85% of average.

1862

January 1862

The only reference to January was, *“The winter to this date, Jan. 22nd, has been mild and fine. Snow has only fallen on the 2nd of November and 21st of January, disappearing almost immediately.”*

At Greenwich, overall, it was a rather cold, dry month, with at least one spell of very cold weather around the 19th. Hurst must also have been very cold around the 19th to 21st. In fact, the February report below says the mean of 42.3°F (5.7°C) was 4°F warmer than January. That would put the January mean around 38.3°F (3.5°C), which would imply that it was a cold January, 1.2°C below the 1971/2000 average.

February 1862

No general description of the month's weather was given.

“The highest max was 55.5°F [13.1°C] on the 6th and 23rd, the lowest min, 21°F [-6.1C] on the 9th, with a mean temperature of 42.3°F [5.7°C], 4°F warmer than January. The daily range varied from 17°F on the 10th to 1°F on the 24th.

The 1st and 20th were the warmest days, mean daily temperature 51°F [10.6°C]; the 8th and 9th the coldest, mean daily temperature, 29.5°F [-1.4°C].

Winds: N 3 days; NE 8; E 3; SE 2; S 3; SW 5, W 2; NW 1; calm 1.

The barometer max was 30.41 inches [1029.5mb], min. 29.12 inches [985.5mb]; mean, 29.89 inches [1013mb].

There were no gales of wind. Month remarkably dry.” (But no figure was given in the report).

It would have been a rather warm and very dry month. Through the 1850s to 1862, February had been a dry month, with rainfall only a little above average in 1858 and 1861. To describe the month as, *remarkably dry* suggests that at Hurst the rainfall total may have been lower than the 0.46 of an inch (11.7mm) recorded at Greenwich.

At Hurst, since 1951, the Februarys of 1956, 1959, 1965, 1993 and 1998 have had less than 11.0mm of rain, with 2.0mm in 1959 being the driest.

The winter of 1861/1862 would have been a dry one with the mean temperature perhaps a little above average. The estimated rainfall total of 122mm was 49% of the 1971/2000 averages. At Hurst, since 1951, there have been six drier winters.

March 1862

“Thermometer: max. not registered but was above 60°F [15.6°C]; min. 21°F [-6.1C] on the 5th, mean 43.3°F [6.3°C], or 1°F warmer than February. The daily range had a mean of 11.5°F [6°C]; the 27th was the warmest day and the 3rd the coldest with a mean of 30.5°F [-0.8°C].

Winds, N 2 days; NE 6; E 2; SE 1; SW 10; NW 4; calm 3.

Gales from S and SW on the 5th and 9th.

Rain 3.46 inches [88.0mm] on 15 wet days. The month was wet, and more so than the depth of rain would show from the constantly clouded and misty weather and little evaporation. Snow fell on the 3rd and a few flakes in the rain on the 21st. Remarkably vivid lightning on the 8th.

Vegetation forward. The horse chestnut, in leaf on the 24th, when butterflies were seen. Four house sparrows eggs were taken on the 1st, most unusually early.”

There would have been cold weather on the 3rd/4th and 21st but much of the month was probably mild. The mean at Hurst of 6.3°C was a little below the 1971/2000 average. Between 1950 and 1987, a min lower than -6.1°C was recorded in nine Marches. Since 1987, no min has been as low.

It was a wet month and, at Greenwich, it was the second wettest March since 1841. In terms of the total, it was not outstandingly wet at Hurst. Since 1951, eleven March rainfalls have exceeded a total of 80.0mm.

GREENWICH 1862

Table (v)

Month	TEMPERATURE										RAINFALL	
	Mean	Diff from ave	Mean max	Diff from ave	Mean min	Diff from ave	High max date	High max temp	Lowest min date	Lowest min temp	Total	% of average
	°F	DegF	°F	DegF	°F	DegF		°F		°F	in	
Jan	39.1	-0.7	43.9	-0.4	34.3	+1.1	31 st	55.0	19th	20.4	1.79	86
Feb	41.6	+1.3	46.5	+1.0	36.7	+1.8	20th	56.3	8th	24.4	0.46	29
Mar	44.2	+0.5	50.0	+1.0	38.4	+1.9	24th	63.6	4th	22.5	3.54	230
Apr	49.6	+1.5	57.5	+1.3	41.7	+1.6	25th	75.0	13th	26.7	2.82	148
May	57.1	+3.2	66.4	+3.5	47.9	+3.1	6th	81.5	3rd	37.8	2.84	155
June	58.2	-1.7	67.1	-2.0	49.3	-1.3	2nd	73.5	10th	43.4	1.93	116
July	60.8	-2.9	70.8	-2.1	50.8	-3.8	26th	79.0	22nd	44.6	1.66	71
Aug	61.2	-1.8	71.0	-1.1	51.4	-2.6	1st	79.9	24th	44.7	3.01	132
Sept	58.9	+0.3	67.6	+0.9	50.1	-0.4	15th	73.8	23rd	39.2	1.61	83
Oct	53.1	+1.8	60.5	+2.4	45.6	+1.3	3rd	71.7	30th	28.5	4.07	182
Nov	40.1	-4.2	45.8	-3.6	34.3	-4.9	3,4th	57.0	23rd	24.8	1.00	39
Dec	43.3	+2.9	48.0	+3.3	38.5	+2.4	7th	57.1	22nd	33.4	1.59	76
							May		Jan			
Year	50.6	0.0	57.9	0.2	43.3	-0.1	6th	81.5	19th	20.4	26.32	110

CONCLUSION

After March 1862, there are no further reports.

There are still references to the Rev J Gorham. One is very sad. On 23rd February 1863, he was presumably supervising a party of boys rolling the cricket square, when one of the boys slipped. They could not stop the roller going over him and he died two minutes after getting him back into the College.

The other was a happier occasion: *"A new sun-dial of novel construction and of great beauty of idea, has been presented to the College by the Rev J Gorham, who has already done much for the promotion of scientific observation. The dial, which is placed at the western end of the terrace, and stands on a handsome base of Portland stone, from a design of S B Gould, Esq., is formed by a solid and substantial brass cross, set at an inclination parallel to the plane of the earth, looking due south. The sun in its course casts a shadow from one part of the cross upon another, and indicates by figures engraved upon the cross every five minutes the progress of time. The motto, Via Crucis Via Lucis adds the grace of holy association to the beauty of scientific arrangements."*

In King's history of the College, there is a reference to the sundial, *"A terrace was made fronting South Field, with a sundial carved by Baring-Gould, and a Stevenson Screen manned by John Gorham"* (see Fig.2). This suggests that, the Rev Gorham, perhaps helped by James Glaisher, may have been one of the first to obtain the new Stevenson Screen in 1864.

It is quite possible that the original weather station had to be moved as the new Chapel was being built from the late Spring of 1862 and a new station set up by the South Terrace but, for some reason, the observations were no longer published in *The Hurst Johnian*.

In the history of the College, after referring to John Gorham's prowess as a sportsman, King says, *"This made his swift death in April 1866 all the more tragic when a chill turned to fever."*



APPENDIX

Further to the letter from the Rev J Gorham asking for assistance in the setting up of a weather station, below is the reply from James Glaisher.

LETTER FROM JAMES GLAISHER TO REV J GORHAM

The stimulus for the re-discovery and subsequent analysis of the data set described in this paper was an original letter from James Glaisher obtained by Howard Oliver. He then traced the Rev Gorham as having been located at Hurstpierpoint College at the time of the letter (17 February, 1860). Subsequent contact with the present College then led to Hugh Thomas taking on the location and analysis of the relevant magazine issues which were thankfully still available at the college.

A transcript of the whole letter, together with images of the first and last pages [copyright H R Oliver] are provided.

JAMES GLAISHER LETTER

Blackheath
1860 Feb 17

Dear Sir

I was in hopes that I could have visited you before now.

Do not send your Bar^f. up to town again but proceed as follows:-

Drive the adjusting screw till the ivory point is well covered by the mercury or till you meet with resistance, then incline the Barometer Cistern upwards, and the open part of the mercury at the other end also upwards, then you may see the bubble of air pass upwards . then gently tap, to draw it to the top . raise the Bar, vertical, cistern upwards . withdraw the screw a little . then **drive** the screw till a **slight** resistance is felt . Invert the instrument . withdraw the screw a very little . & incline the Instrument & see if the top be sharp . if so . drive the screw again . put the Instrument up . plumbing it in both directions . when precise, withdraw the screw, and in observation the surface of the mercury must always be brought to just touch the ivory point, (which is one end of the scale) or the reflexion of the point & the point itself must appear touching each other.

The maximum thermometer has an obstruction at the bend, to prevent the mercury from returning on the temp. falling, and requires shaking to reset.

I shall be pleased to run down to you on some early day, and send all the instruments to you & explain anything you may wish

I am dear Sir

Faithfully yours

James Glaisher

APPENDIX

Fig.3: Glaisher letter: page 1

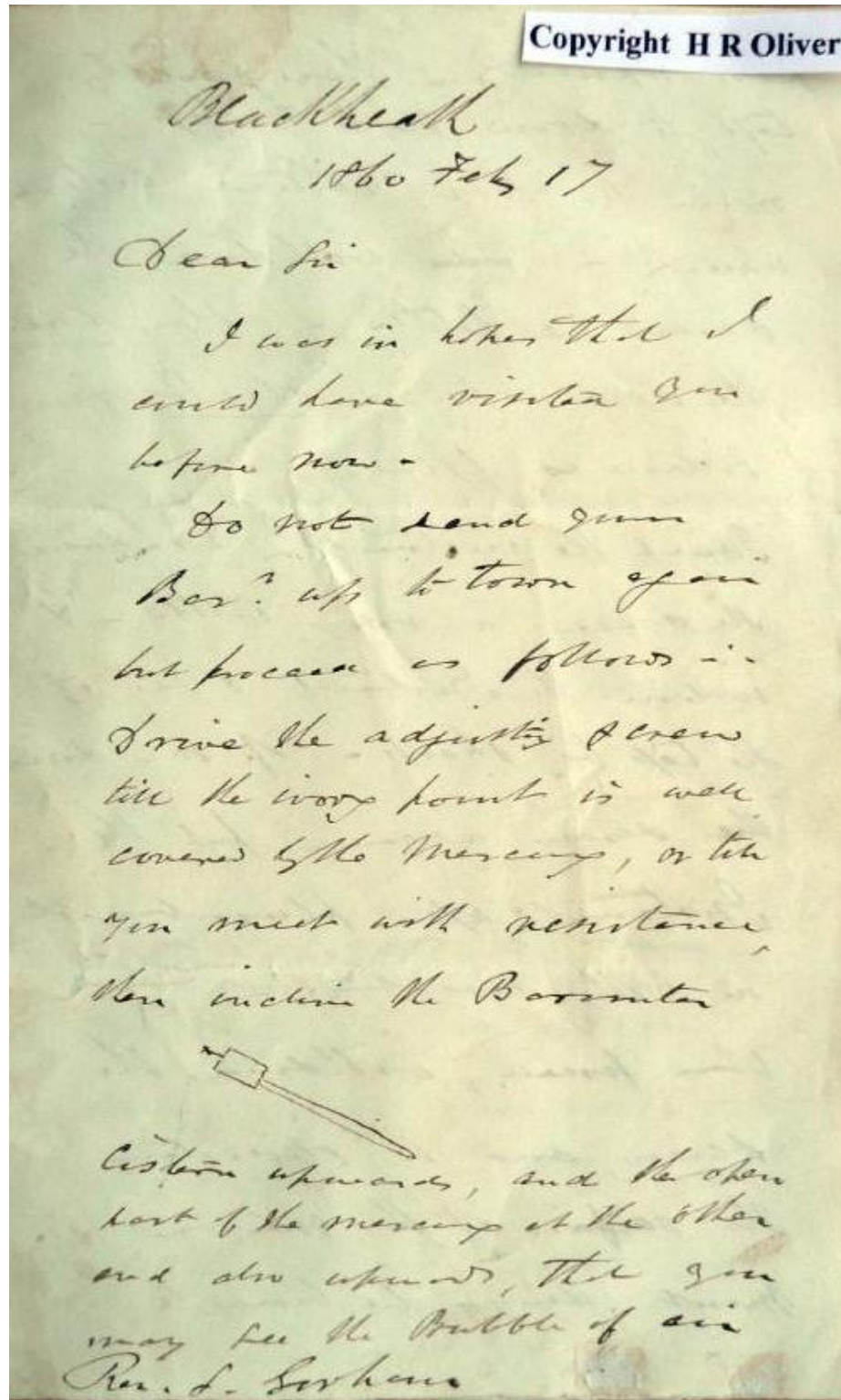


Fig.3: Glaisher letter: page 2

less upwards - then partly
top, to draw it to the top -
raise the Bar, vertice, Centre
upward, - ~~not~~ withdraw the
screw a little - then drive
the screw to a slight in-
crease is felt -
Insert the instrument - withdraw
the screw a very little - &
incline the Instrument & see if
the top be sharp - if so - drive
the screw again - put the
Instrument up - plumb it
in both directions -
When done, withdraw the
screw, and in observation
the surface of the mercury
must always be brought to

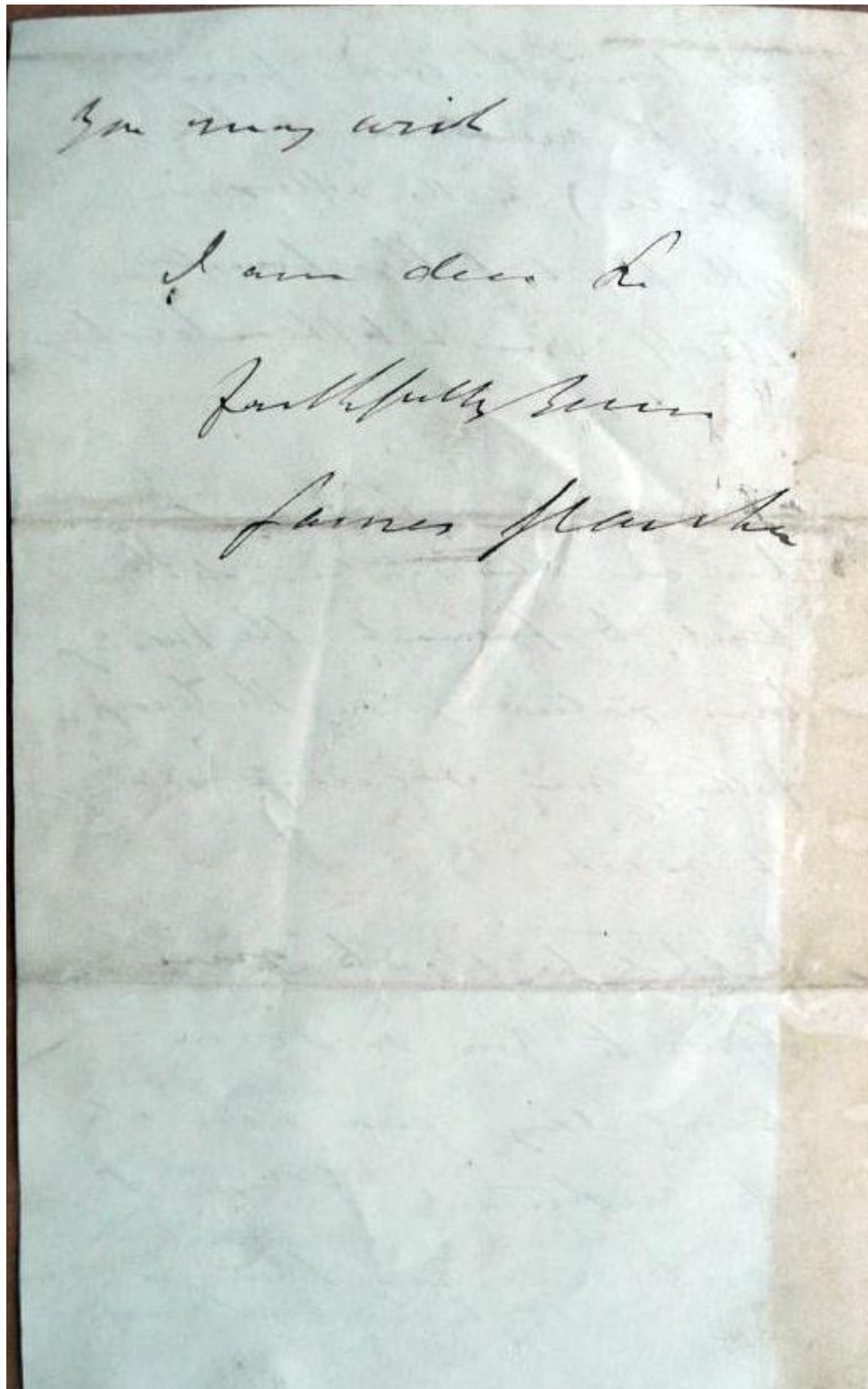
Fig.3: Glaisher letter: page 3

just touch the wrong point,
(which is one end of the
scale) or the reflexion
of the point & the fountain
itself must often touch
each other.

The Muscine thermometer
has an obstruction at the
point, to prevent the Mercury
from returning on the temp.
falling, and requires shaking
to reset.

I shall be glad to run
down to you on some
day, and need not
the instruments if you'd
explain anything.

Fig.3: Glaisher letter: page 4



You may wish
I am dear Sir
Faithfully yours
James Glaisher

ACKNOWLEDGMENTS

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Correspondence to: Hugh Thomas, 26 College Lane, Hurstpierpoint, West Sussex, BN6 9AQ.