The Sun and Trends in the Central England Temperature (CET) since 1659

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The Bruges Group

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PART 1

The Sun – our Nearest Variable Star?

By Roderick Taylor, BSc (Eng., Hons.), CEng, FIChemE

This paper summarises the author's research over the past ten years or so into the factors governing the Earth's surface warming. The work is based mainly on data from Arctic and Antarctic ice core analyses published in *The Royal Commission on Environmental Pollution's 22nd Report 'Energy – the Changing Climate'*[1]; BAA *Journal* reports of its Variable Star Section[2]; texts on radiation thermodynamics[3]; information on the physical, chemical and other properties of matter[4]; properties of the Earth and its atmosphere[5]; nuclear reactor theory[6,7,8]; astronomical text books and other sources of data[9,10,11,12]; Canadian spectroscopic work[13]; NASA planetary data[14]; the 4th Report of the Intergovernmental Panel on Climate Change (IPCC)[15]; and BBC climate information[16], as well as other listed references[17-21].

Note: All references for the green superscript numbers in the text are listed under 'References' on page 18.

Introduction

My research on this subject began with the publication in June 2,000, of the 22nd Report of The Royal Commission on Environmental Pollution entitled '*Energy – the Changing Climate*', which indicted the *greenhouse effect* of atmospheric carbon dioxide as the major factor governing the world's climate. From straightforward engineering thermodynamics, using a simple radiation model, I produced a paper [17] showing that this was not so. My argument hinges on the fact that solar radiation accounts for about 99% of the Earth's total heat input from all known sources. This includes tidal friction in its crust, geothermal activity, the burning of fossil fuels and the generation of nuclear power.

The only other significant heat source is the secondary input of the atmosphere's greenhouse effect, which is dominated by atmospheric water in all its phases. This effect results from the absorption within the atmosphere of part of the infra-red radiation generated by heat from the Earth's surface and its re-emission isotropically to its surroundings. This *resonance* is exhibited mainly by gas molecules of heteropolar composition, such as water vapour, carbon dioxide, carbon monoxide, hydrocarbons, sulphur dioxide, ammonia, hydrogen chloride and alcohols. Of these, only water vapour and carbon dioxide – the Earth's two principal *greenhouse gases* – were considered, since the smaller contributions of other less abundant greenhouse gases are not relevant to my analysis. Many of them are, in any case, strictly controlled as pollutants in the western world.

In simple terms, the Earth glows invisibly with infra-red radiation from its Sun-warmed surface. This radiation is boosted by that emitted from the atmosphere's *greenhouse blanket* which enshrouds the entire globe. The *blanket* partly absorbs the Earth's infra-red radiation and isotropically (i.e. evenly in all directions) re-emits it as a series of *twinkles* far too rapid for the human eye to discern. Thus a little under half of the energy of these precursor *infra-red photons* returns to Earth at each *twinkle* to add to the total. The result is that with a *blanket* having an overall *thermal emissivity* ϵ_b, the total effective solar radiation impinging on the Earth is boosted by a factor $(1+\epsilon_b)$ – as detailed in reference [18]. This *boosting ratio*

I term the *greenhouse gain factor*, γ, which can never exceed a numerical value of **two**, since – by definition – ϵ_b can never exceed **unity**, i.e., that of a **perfect black body radiator**.

Since water vapour exists at a much higher concentration on average throughout the atmosphere (around 12,500 parts per million by volume – ppmv) compared with carbon dioxide (at about 400 ppmv), and also has a much greater emissivity, the present-day value of ϵ_b is about 0.778 , making γ_b = 1.778 and boosting the Sun's global mean impact without the greenhouse effect by roughly 78%.

Starting Point

Fig.1 (*Fig.2-V* of reference[1]), shows where this all started. The red line indicates the mean temperature of the Earth's surface at the western Antarctic's Vostok Ice Sheet location, at latitude approximately 78˚S. The superimposed black line shows the corresponding atmospheric levels of carbon dioxide, which are fairly uniform throughout the world because of atmospheric turbulence. Because of the scales adopted, both lines seem to be almost identical in shape and size, pointing strongly towards some close form of correlation.

The 22nd *RCEP Report's* authors, while acknowledging that the indicated temperature changes could have caused some of the carbon dioxide variations, made lengthy discourse about the possibility that this could have been the other way round, i.e., the gas concentration changes were the cause of inducing the temperature changes. In this they relied on the advice given to them by the Hadley Centre of the U.K's Meteorological Office. No quantified proof of this relationship was presented, however. Furthermore, no mechanism was postulated by which the Earth could generate such regular 99,000-year cyclical pulses of atmospheric carbon dioxide.

Fig. 1 Vostok Ice Core Analysis

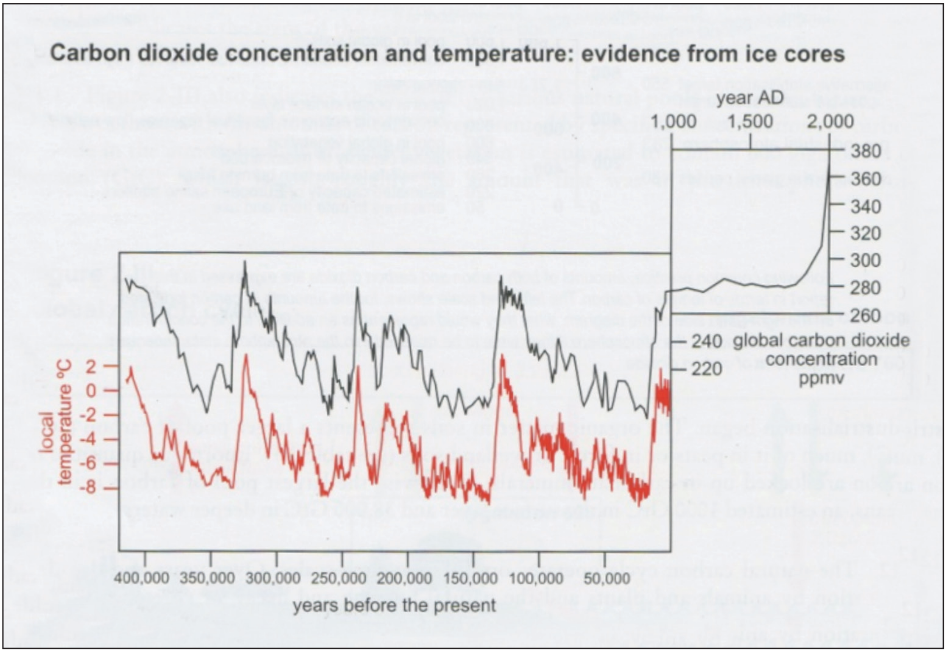


Fig. 2 Light curve of AW Sagittae

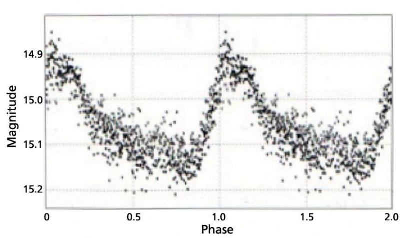
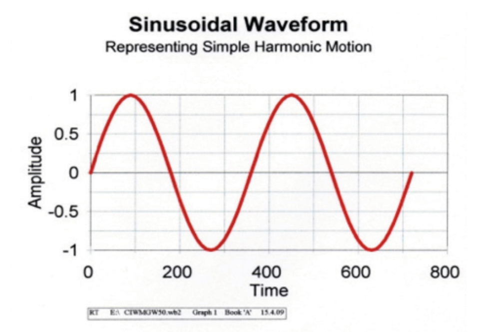


Figure 9. Phase diagram of the time-series data from runs 1 to 6.

Fig. 3 Sinusoidal orbital effects



Subsequent more refined analysis of the Vostok Ice Core data [20] indicated that, during the last three deglaciations, the carbon dioxide increases lagged between 600+/-400 years behind the corresponding temperature increases. This seems to me to be prime evidence that these oscillations in carbon dioxide concentration were almost entirely due to its changing solubility in the world's varying surface water temperature, and not spontaneous.

However, the authors of the 22nd Report appeared not to be aware of this factor. They continued to highlight atmospheric carbon dioxide as the principal cause of global climate change. In this they were tacitly accepting information emanating from the reports of the Intergovernmental Panel on Climate Change (IPCC).

Unquantified reference was made *en passant* in the report to the influence of solar activity on the Earth's climate. This included the Maunder minimum of the 17th and early 18th centuries, the 40,000-year Milankovitch orbital cycles, the 22,000-year gyroscopic precession of the equinoxes and variations in the Earth's axial tilt. If these were the dominant forces governing the Earth's surface temperature, however, their effects would be of basically symmetrical form with respect to time, and of fundamentally sinusoidal shape – as shown in **Fig.3** – in order to be repeatable. This contrasts sharply with the observed strongly-asymmetrical form of the thermal and gas concentration traces of **Fig.1**.

No-one involved with the report seems to have considered the possibility that the Sun is a long-term variable star. The 13˚C range of surface temperature over the 420,000-year span of the ice core analyses at the Vostok site is roughly equivalent to a global mean surface temperature change of nearly half this amount – say up to 6˚C. This would require a reduction in the Sun's peak energy output of about 13% [21], taking into account the combined effects of reduced cloud cover and reduced transfer of tropical heat to the poles. Similar changes could be expected during earlier glaciation cycles in this range (**Fig.1**), and there is no reason to think that future glaciations and warm periods would not continue for a considerable time to come.

Unfortunately, the whole question of intrinsic changes in the Sun's output was glossed over in favour of indicting carbon dioxide as the primary cause. Whatever *greenhouse effects* such pre-biblical CO_2 changes may have exerted, they were obviously insufficient to overcome the overwhelming effects of the Sun's varying energy output.

Carbon Dioxide – the Scapegoat

The changes in atmospheric carbon dioxide concentration shown in **Fig.1** can, of course, be explained by a combination of basic physical and biochemical phenomena. For one thing, the solubility of carbon dioxide is much less in warm water than in cold water and since around 71% of the Earth's surface is water-covered, surface temperature swings of around 13˚C in Antarctica will – other factors being equal – involve significant swings in atmospheric CO_2 levels.

For another, considerable changes in the Earth's vegetative cover occur when polar regions expand during ice ages. This redues the total rates of vegetative growth and subsequent decay, decreasing the atmospheric CO_2 concentration because of the strongly biased forward reaction rate of photosynthesis, which tends to scavenge the air of this gas.

Corresponding changes in the extent of animal life and associated respiration rates would have compounded these atmospheric carbon dioxide changes.

'Runaway Global Warming'

Needless to say, the widely-held view that *runaway global warming* can occur as the result of carbon dioxide's increasing *greenhouse effect* is utter nonsense, as the IPCC itself admits. As shown above, the effect can never more than **double** the impact of direct solar radiation, no matter how powerful or abundant the *greenhouse gas*. For constant solar radiation at its present level, this places an absolute upper limit to the global mean surface temperature of not more than about 290˚K, or 2˚C more than now, as can be inferred by extrapolating **Fig.4**. In fact, because the absorptivity and emissivity of carbon dioxide are much lower than those of water vapour, the *greenhouse gain factor*, γ (see **Equation 1** on page 10), reaches a peak and then declines when carbon dioxide becomes the major component of the atmosphere compared with water.

However, in order for the *greenhouse effect* to generate sufficient power to raise the Earth's mean surface temperature anywhere near this level, the whole atmosphere would need to be contaminated with poisonous gases referred to in the **Introduction**. Such a state of affairs would never be tolerated in a sane world.

The accompanying temperature increase caused by a shrinkage of the Earth's ice caps – which presently account for absorbing a maximum of about 4% of its total solar energy intake –would also be partly countered by a reduction in solar irradiation due to an increase in cloud extent, acting as an automatic Venetian blind against the Sun's rays.

Analysis

Contrary to the alarming and highly questionable predictions of the IPCC in its 4th Report[15], it proved relatively easy to construct a simple thermodynamic model of the Earth's energy balance, with a corresponding input from the Earth's *greenhouse effect*. This was done using empirically established radiation thermodynamics[3] for the mutually-interfering absorptivities and emissivities of atmospheric water vapour and carbon dioxide. These had to be extrapolated to the much larger physical dimensions of the greenhouse blanket using the logarithmic progression inherent in the data. Information on other physical, chemical and thermodynamic properties was derived from standard textbook sources[3,4,5]. The resulting heat balance, using the simplifying assumption that 100% of the Earth's thermal energy comes from the Sun, yields **Equation 1** below:

$T_g = [\phi_s.\gamma.(1- \psi)/(4.\sigma)]^{1/4}$ ˚K .... (**1**),

where T_g = the Earth's global mean surface temperature;

ϕ_s = the solar 'constant' (now c.1.39 kW/m^2);

γ = the *greenhouse gain* factor;

ψ = the atmosphere's *obscuration factor*; and,

σ = the Stefan-Boltzmann constant

= 5.67×10^{-11} kW/m^2 $(˚K)^4$

The graphical correlation between T_g and the atmospheric carbon dioxide concentration in parts per million by volume (ppmv) is shown in **Fig.4** on page 12 as the difference, ΔT_g, between T_g and its present-day value of about 288.2˚K (c.15˚C).

It should be noted that, by substituting the values of $\gamma = 1.0$ and $\psi = 0.31$ (the Earth's albedo[19]) in **Equation 1**, we derive the value $T_{g0} = 255.01$˚K, where T_{g0} would be the global mean surface temperature **in the absence of the greenhouse effect**. In this case, dense cloud cover simply screens the fraction ψ the Earth's surface beneath it totally from solar radiation, reflecting all the sunlight impinging above it back into space.

This is approximately 33˚C below the actual present value, indicating that the whole of the Earth's surface would be -18˚C, the normal temperature of a domestic freezer.

This calculation agrees with that of the IPCC.

It can clearly be seen that the temperature changes shown in **Fig.4** are far less than those predicted by the IPCC in its 4th Report, shown in **Fig.5** (see page 12).

The IPCC is often quoted as predicting alarm were the global mean surface temperature to rise more than 2˚C above its present level of about 15˚C. This they associate with an increase in the atmospheric greenhouse gas stabilisation level of carbon dioxide from the pre-Industrial Age maximum concentration of 280 ppmv to 450 ppmv, as shown by the median curve of **Fig.5**.

The disparity between this set of curves and my own thermodynamic analysis in **Fig.4** is startling, to say the least. Somewhere along the line, I think that the IPCC has missed out a significant factor.

Putting into **Equation 1** the present-day values I have derived for $\gamma = 1.778$ and $\psi = 0.366$ gives $T_g = 288.3$˚K, or 15.1˚C, within a gnat's whisker of its reported, measured value.

It should also be noted that my graph, **Fig.4**, is very much flatter than any of the three IPCC curves shown in **Fig.5**. This means that even the largest conceivable increases in carbon dioxide levels caused by the continued burning of fossil fuels would not appear to be a threat to the global climate. **Fig.4** shows that even a doubling of the present-day carbon dioxide level from 400 ppmv to 800 ppmv (by a colossal – almost inconceivable – acceleration of present-day fossil fuel consumption) would raise the global mean surface temperature by only about 0.5˚C. Furthermore, any programmes intended to reduce such emissions

Fig. 4 Predicted Variation in the Earth's Global Mean Surface Temperature at Constant Solar Irradiation (ϕ_s = 1.39 kW/m²)

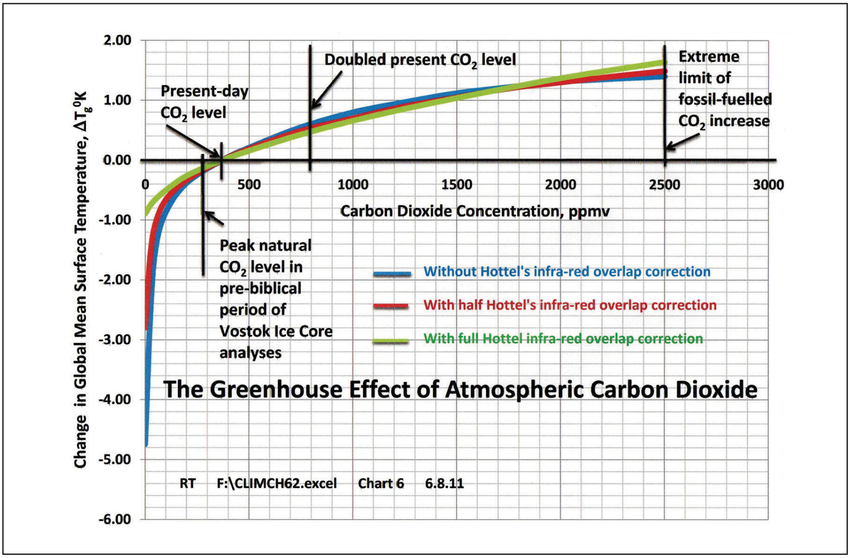
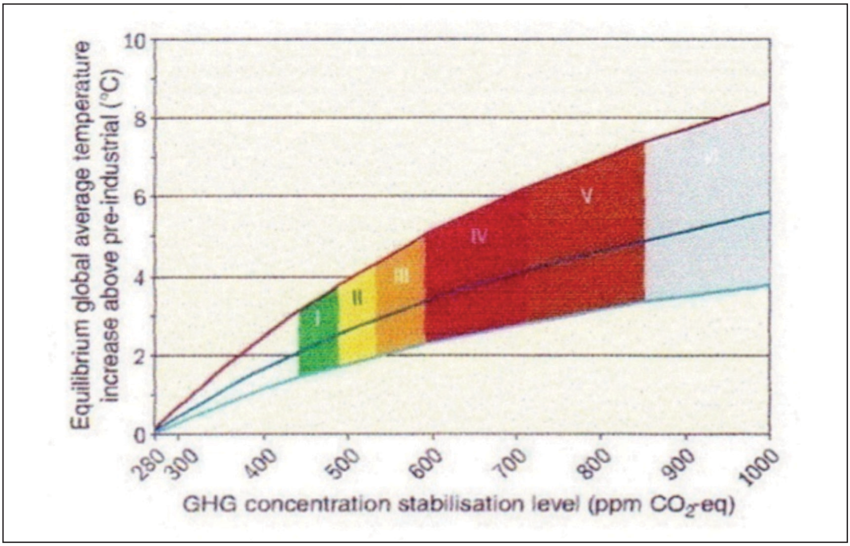


Fig. 5 IPCC Correlation



are doomed to failure by their feeble effect. A reduction – were it possible – from the present-day 400 ppmv to the pre-industrial maximum of 280 ppmv (indicated by the left-hand bar line of the graph) would drop the global mean surface temperature by only ¼˚C, by my calculations. Big Deal!

It must not be forgotten that the Earth has four principal lines of defence to any changes resulting from increases or decreases in the *greenhouse effect*. First of all is the absolute limit of 2 for the gain factor, γ, referred to above. Secondly is the fact that *greenhouse gases* and *agents* have to compete with each other for the capture of the Earth's infra-red photons which provide the only means of dissipating its cumulative gain of solar and other sources of heat out to space. Thirdly is the fact that the overall emissivity of the Earth's *greenhouse blanket* can – by definition – never exceed unity. Fourthly and most importantly is the fact that cloud, fog and ice caps reflect much of the Sun's incident energy: overall cloud cover increases and decreases in sympathy with the global mean surface temperature, to act as a natural Venetian blind which regulates the changes in solar energy input to the Earth.

Somewhere along the line the IPCC has clearly missed out in its reckonings – hence its repeated failure to predict the course of the world's unfolding climate history.

Fossil Fuel Burning

As part of my thermodynamic analysis, I included the case in which all the carbon dioxide produced by the hypothetical flash burning of all the world's known fossil fuel reserves was discharged to atmosphere, without its associated direct heating effect or change in the equilibrium solubility in the world's oceans and other surface water. This would theoretically have the initial effect of boosting the global mean atmospheric CO_2 level to about 2,500 ppmv, with a corresponding greenhouse increase in ΔT_g of only 1.6˚C. Looking at this in another way, a sudden surge in average world carbon dioxide concentration to this extent would have the same effect.

Since the Earth has clearly, according to **Fig.1**, withstood (but admittedly not without change) several cycles of surface temperature of between three and four times this amount, the panic propagated by the IPCC's prognostications is fundamentally flawed. The warnings of global catastrophe they predict also ignore some of the benefits which a moderate degree of global warming engender, such as a lengthening of the agricultural growing season and the stimulation of plant growth by the increase in atmospheric carbon dioxide concentration, a phenomenon well known to, and regularly used by, horticulturists such as tomato growers.

Revelation

Stellar evolution is governed by two opposing forces: those of gravitation and of radiation pressure. In simple terms, stars burst into life when a critical mass of hydrogen – together with its associated natural isotope deuterium – collects to form a dynamically-compressed dense core of plasma hot enough (at around 15 million˚C) to initiate and sustain thermonuclear fusion.

The balance between the compressive force of gravitation and the temperature-sensitive expansive force of radiation pressure is a delicate one which may, in the Sun's case, permit it to continue accreting interstellar hydrogen in a regular cyclical manner. This hydrogen/deuterium mixture probably accumulates in the form of rings or spherical shells around the Sun which are rhythmically sucked into its photosphere, diffuse through its mantle and eventually into its core.

The inequality of the 'spring rates' of these two opposing forces – the first proportional to mass and inversely proportional to the square of the distance, and the second proportional to the fourth power of the plasma temperature – is thus capable of producing the strongly asymmetrical form of the Earth's surface temperature oscillations shown in **Fig.1**. The frequency and intensity of these surges would clearly depend upon the density of the interstellar hydrogen and the Sun's constitution and mass.

Calculations I have made indicate that there is enough interstellar hydrogen within our galaxy to provide this slow, pulsating accretion of hydrogen/deuterium to the Sun's core to continue to give it the 99,000 year cyclical variation of output indicated by **Fig.1** for aeons to come. A similar phenomenon manifests itself in the numerous Roche lobe overflow accreting white dwarf binary variable stars which have been the subject of astronomical study in recent years. The double star AW Sagittae is one of them, and its light curve is illustrated in **Fig.2**.

The enormous difference between the periodicity of this star's light curve (0.0745 days) and the 99,000 years of the Sun's variability indicated by **Fig.1** can almost certainly be explained by the huge difference between the densities of the accreted hydrogen and deuterium in these two instances, and to the fact that – to reach the Sun's core – this material has to diffuse through some 300,000 miles or so of its mantle. In contrast, the exposed core of AW Sagittae's white dwarf companion has almost instant access to the very much denser hydrogen sucked in from its companion star.

The Penny Drops

From the foregoing arguments, the Earth's local surface temperature deduced from analyses of ice cores drilled at the Vostok site (**Fig.1**) may be assumed to indicate – as a surrogate – the pattern of the Earth's solar irradiation. The striking similarity it shows with the highly-asymmetrical form of the light curve of AW Sagittae (**Fig.2**) indicates that the Sun may also be an accretion-variable star, with an energy ranging from its minimum to a maximum of probably 15% greater, according to the Stefan-Boltzmann law of black body radiation. This value includes the opposing effects of cloud cover variation and ice cap changes, with a minimum solar irradiation amounting to 87% of its maximum[21].

Nevertheless, the argument that solar radiation is the dominant cause of climate change still holds true whether or not the Sun's energy variations are caused by hydrogen accretion or simply by resonant oscillations within it due to the turbulence engendered by the violence of hydrogen fusion in its core.

This, to me, seems the simplest logical explanation of the phenomena revealed by the Vostok Ice Core analyses.

Conclusions

This paper aims to show that:-

a) atmospheric carbon dioxide is not the dominant force which changes the Earth's climate, as claimed by adherents of the IPCC philosophy;
b) changes in the Earth's axial tilt and orbit exert only secondary effects which are not easily distinguishable from the evidence of **Fig.1**;
c) the Sun is a variable star with a 99,000-year cycle ranging from its current maximum energy output to a minimum roughly 13% less during Ice Age cycles such as those shown in **Fig.1**; whether this is mainly due to the gravitational accretion of interstellar hydrogen and its natural isotope deuterium, or simply to rhythmical oscillations induced by the widely-different forces of gravitation and thermo-nuclear fusion in its core are not relevant to the argument presented here, namely **that the variations in the greenhouse effect of atmospheric carbon dioxide due to fossil fuel burning are of negligible consequence in their effects on the Earth's climate**;
d) because of the thermodynamic limitations indicated in the above analysis, attempts to reduce the emissions of carbon dioxide to the atmosphere such as the so-called but misnamed 'carbon' capture and storage (CCS) are pointless. A relatively small amount of the atmosphere's oxygen content (around 0.2 percentage points from 21% to 20.8% by volume) would thus be removed needlessly by unsafe methods not guaranteed to be permanent, such as underground storage as a pressurised gas in depleted oil, natural gas and oil-shale reservoirs.
e) a corollary of such capture and removal is that the potential benefits of stimulating plant growth and possibly extending the agricultural growing season due to increased atmospheric carbon dioxide concentrations would be missed, to the detriment of the world's food supplies for an expanding population.

Deductions

From these conclusions, several questions arise:-

a) since the last peak of the solar output apparently occurred about 5,000 years ago, how close are we to another series of impending ice ages, assuming that the indicated trend persists?;
b) will human and other forms of life be able to survive these changes as they appear to have done before?;
c) how many other stars are there in the universe with similar variability?; and, finally,
d) what effects would this have on our theories of cosmology and estimates of the age of the universe?

Acknowledgements

These must inevitably go to the authors of works I have cited in the attached reference list, as well as to my wife in her rôle as proof reader.

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18. Since the sum to an infinite number of terms of the series

    $\gamma = 1 + \epsilon_b\ (1/2 + 1/4 + 1/8 + 1/16 \ldots + (1/2)^n) = 1 + \epsilon_b$, when n -> infinity.
19. 'Albedo' is a measure of the total fraction of incident solar energy which is reflected from the Earth and therefore reduces the Sun's heating effect.
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21. i.e., 100x(1-1/1.15)%

PART 2

Trends in the Central England Temperature (CET) since 1659

By John Pendlebury MA (Cantab), PhD, CEng, FIET, FCMA

September 1st 2014

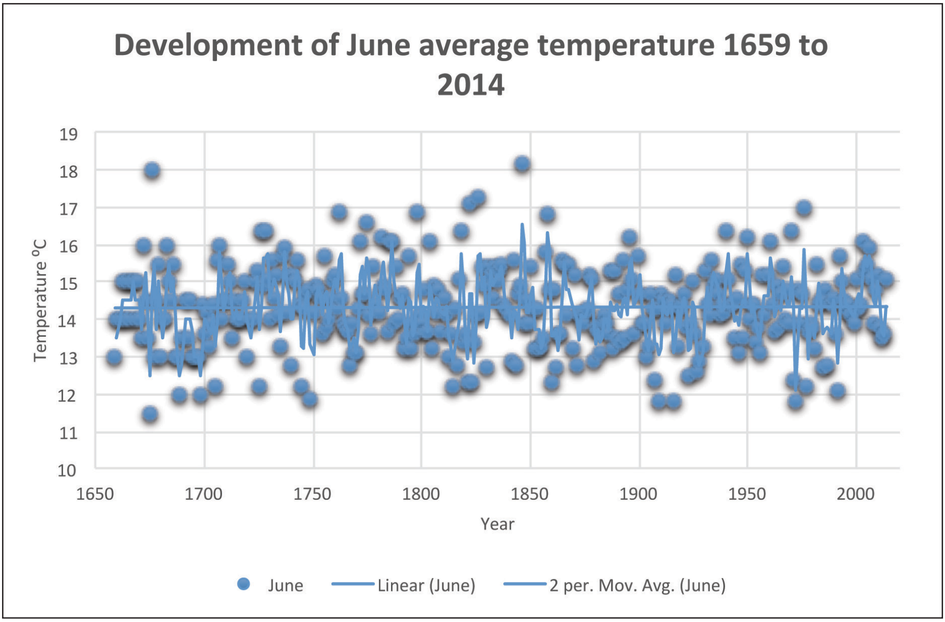
The following analysis is derived from the Central England Temperature (CET) data made freely-available by downloading from the Hadley Wood Centre of the UK Meteorological Office. The analysis is the author's alone although the data clearly belongs to the Met Office. The reference used to denote the data is attached as a footnote[1].

[1] Monthly Mean Central England Temperature (˚C) 1659-1973 Manley (Q.J.R.Meteorol.Soc., 1974) 1974 On Parker et al. (Int.J.Clim., 1992) Parker and Horton (Int.J.Clim., 2005)

The CET monthly average temperature data has been collected continuously since 1659, and is probably the longest-running series of its kind in the world. Great care has apparently been taken to maintain its consistency as land usage has changed and population has expanded.

Fig.1 below is a sample of the kind of data easily obtainable using the data set. Trend lines, generated using Excel, are also shown on the chart. The linear trend line reflects an almost non-existent level of warming of 0.0000975 degrees per year, or 0.0346 degrees over the 355 years of data collection.

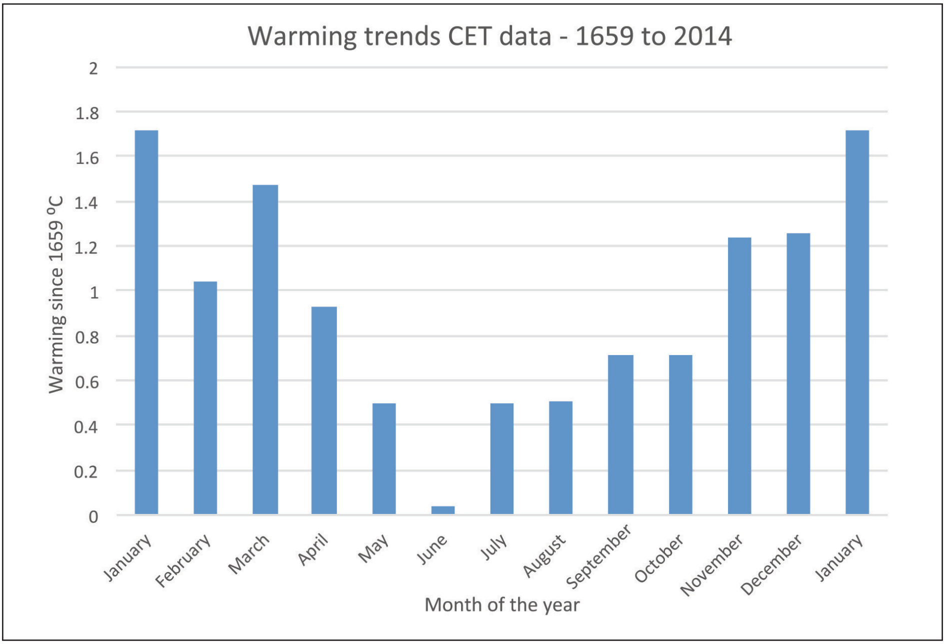
Fig.1 The evolution of average English June temperatures since 1659



June is the only month in the data with such a low figure. In any event the statistical error inherent in estimating the slope in the data is larger than its actual value so that in June there is no evidence of any warming at all.

If we carry out the same exercise for all the other months we obtain the data shown in **Fig.2** (see page 21).

Fig.2 Warming trends derived for all months of the years 1659 to 2013/4



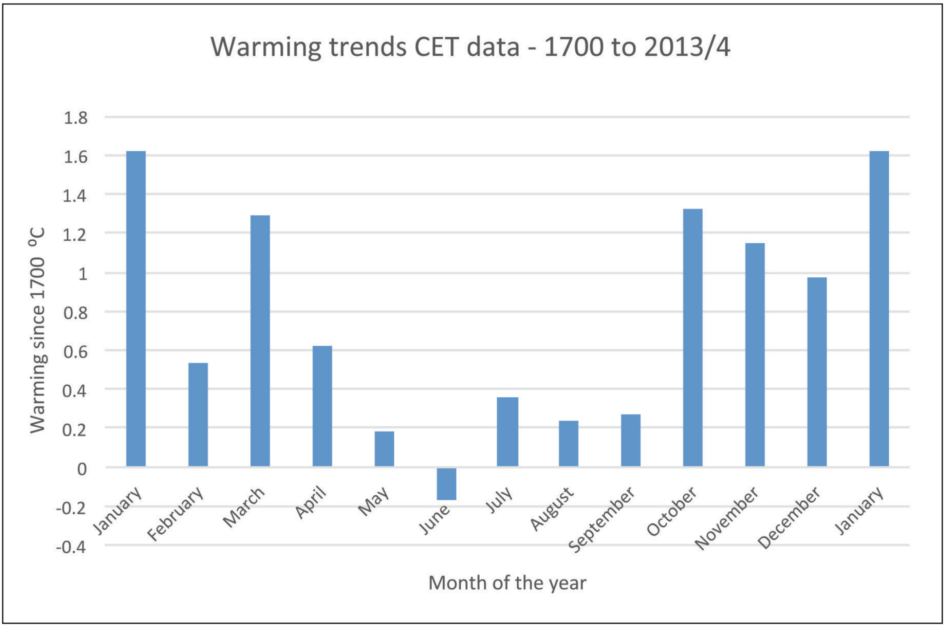
With this chart we see the true nature of the warming that has taken place since 1659. It is mainly a winter phenomenon.

However, rather than undertake more analysis on this chart, the author prefers to utilise a similar chart using the data series starting in 1700. The reason for this is that there was a particularly cold period starting in around 1650 known as the Little Ice Age (LIA). The following extract from Wikipedia sums up the situation.

> **NASA** defines the term as a cold period between AD 1550 and 1850 and notes three particularly cold intervals: one beginning about 1650, another about 1770, and the last in 1850, each separated by intervals of slight warming.

The average annual temperature in the period 1659 to 1699 was as a result 0.62 degrees lower than in the following fifty years. Using 1700 as a start-point corrects for the problem and results in the chart shown in **Fig.3** (see page 22).

Fig.3 Warming trends derived for all months of the years 1700 to 2013/4



This chart is most interesting since it shows that in 2014 there is no significant evidence of warming in England in the late spring, summer and early Autumn since 1700. The trends derived in all of these months are small, much smaller than the standard deviation of the estimates and not statistically significant when analysed using the Fisher F statistic. However, for the months of January, March, October, November and December, meaningful warming has taken place.

Despite the 300 plus years of the dataset, the standard deviations of the warming estimates are relatively large. **Table 1** on page 23 provides details. Comparison of the warming estimate with its standard deviation shows the extent to which the figure is significant.

Table 1: Standard error in the estimation of warming (˚C)

Month	Warming ˚C	Standard error	Significant warming
January	1.62	0.37	Yes
February	0.54	0.35	Maybe
March	1.29	0.28	Yes
April	0.63	0.24	Yes
May	0.18	0.22	No
June	-0.17	0.21	No
July	0.36	0.23	No
August	0.24	0.21	No
September	0.27	0.21	No
October	1.33	0.24	Yes
November	1.15	0.27	Yes
December	0.97	0.33	Yes

Attempt to obtain greater precision in the estimates

If we postulate that there is definitely no warming in any of the summer months the trend for these months *taken as a whole* can be investigated. In this way we have a data set of 1254 elements. However in fitting to the data we must also derive two Fourier coefficients to derive a sinusoid to adjust for the differences in average temperature from month to month. By doing so the following results are obtained for the data series May through September, 1700 to 2014.

	˚C
Average warming in summer period	-0.015
Standard error	0.027

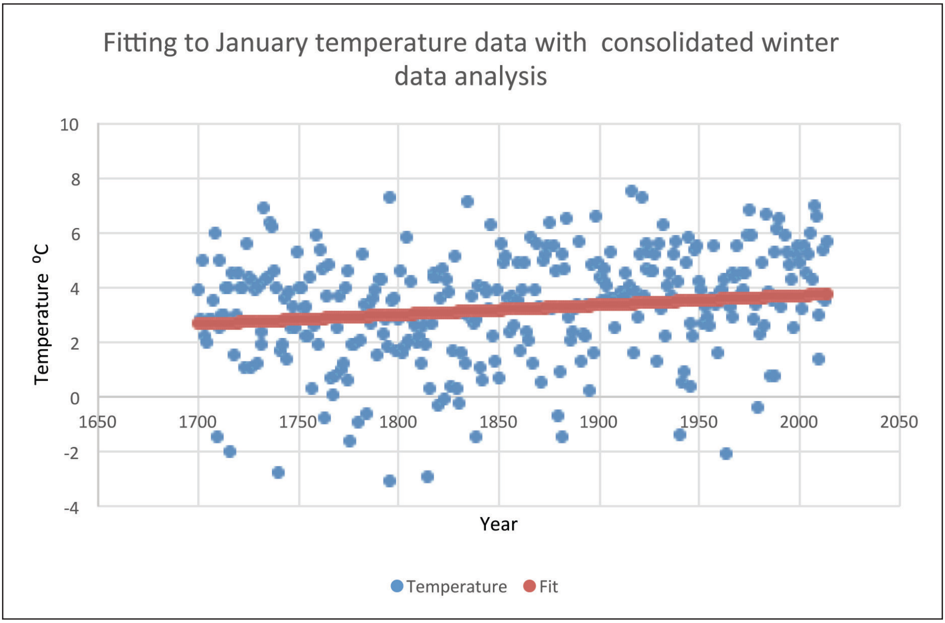
This is a major narrowing of the standard error compared with the data derived from the months taken individually. It provides solid proof that there has been no significant warming in the English summer since 1700.

Similarly, if we combine the months of October, November, December, January, February and March, estimating trends and two Fourier coefficients, we obtain the following combined estimate for the winter warming in the period.

	˚C
Average warming in winter period	1.098
Standard error	0.133

April has been ignored in the analysis as it is probably a transition time between the two different conditions with warming probable but not to the same extent.

Fig.4 Trend-line fitted to January data 1700 to 2014



Conclusions on warming in England

Warming is present, but there has not been any change in temperature in the summer months over the 314-year period since 1700. If analyses are carried out over shorter, later periods, the results can show more warming, but they are not the longer term trends which have been focussed on here. For example over the last fourteen years, there has been a sharp decline in temperatures, averaging a little less than 1˚C (-0.82) over the period. Between 1980 and 2000, there was a rise 1 degree, which if extrapolated would suggest 5 degrees per 100 years, nonsense of course as the last fourteen years have demonstrated. The essential point is that estimating trends over anything other than very long periods is subject to a high degree of standard error. Only by taking data over the full length of the series produces anything of much value.

Seasonality

The absence of any warming in summer and the higher statistically significant levels in winter points us away from carbon dioxide as a possible source and perhaps towards another conclusion.

In 1659 the English population was around 5 million. Today it is over 10 times greater. With it have come the following effects:

- Deforestation
- Changed land use
- Growth of cities and infrastructure
- Universal use of central heating
- Cheap energy until the last 15 years

In daily weather forecasts, the forecasters regularly explain that temperatures in winter in the great conurbations will exceed those in the surrounding countryside by as much as two degrees or more. Further, in the great conurbations in winter, large amounts of water vapour are entering the atmosphere through the combustion processes. Cloudiness and rain are more prevalent, acting as a blanket at night helping to retain the heat generated throughout the day from the sun and from heating output at night. There was once a famous Dutch skating race on the canals there. It has become rare because of climate change in winter.

What is good for UK plc

The greater warmth in winter quite literally saves UK plc billions of pounds annually in reduced heating requirements. The warming also brings on spring conditions two to three weeks earlier and prolongs the summer and early autumn by a week or two. The result has to have been a useful rise in agricultural productivity. Increases in CO_2, which are certainly taking place, promote plant growth by aiding photosynthesis.

So why should we be spending billions on global warming counter-measures as a result of climate specialists telling us huge problems are in store for us. These doom-mongers have no clothes. Their limitations continue to be exposed.

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