

# **A BRIEF REVIEW OF GLOBAL TEMPERATURE VARIABILITY**

© JWR Whitfield 2019  
Fraser Technology Building  
24 Grange Road, Livingston, EH54 5DE  
email: whitfield\_mdc@yahoo.co.uk Tel: 07973 717021

# A BRIEF REVIEW OF GLOBAL TEMPERATURE VARIABILITY

## Preface

In order that this short essay may be read to optimal effect, it is important, in advance, to emphasise the following points.

(a) Defining the Global climate dynamic variables and their inter-relationships is one of the greatest challenges ever faced by the science community.

The Earth's surface is dominated by oceans which exhibit thermodynamic characteristics very different from the remaining landmass fraction.

(b) This essay makes no attempt to discuss the important quasi-cyclical thermal energy exchanges between the Global oceans and the landmass fraction. These may be anticipated to have a significant effect on Global Temperature variability - primarily over Decadal and possibly Century time scales.

For example - El Nino & Atlantic Multidecadal Oscillation.

(c) In the 21<sup>st</sup> century, a multiplicity of Earth orbiting satellites and deep space missions have facilitated a huge enhancement in data gathering capacity relative to the scenario existing at the end of the 20<sup>th</sup> century - when data resources were sparse and inaccurate - or simply not available.

**(d) It is vital to bear in mind that the interpretation of data accumulated over a 'short' time scale (Decades and Centuries) is likely to prove highly misleading - unless viewed and understood in the broader context of additional much longer term data resources spanning Thousands and Hundreds of Thousands of years.**

(See Fig.2 on Page.2)

(e) In retrospect, it is perhaps unfortunate that at the end of the 20<sup>th</sup> century, the prevailing insufficiency of data and knowledge did not inhibit a number of scientists & subsequently the IPCC<sup>[1]</sup> from proclaiming, as a matter of near certainty, that the Global temperature was rising primarily as a result of the increasing atmospheric carbon dioxide volume brought about by human activity.

JWR Whitfield

16/01/19

# A BRIEF REVIEW OF GLOBAL TEMPERATURE VARIABILITY

## Introduction

Prior to 1990, it had been recognised that the global temperature had undergone frequent variations over time scales ranging from decades to millions of years.

A number of hypotheses had been proposed to account for this.

### Over Decadal, Multi-century and Millennial Time Scales

(i) Variations in Solar activity and the strength of Solar radiation heating the Earth were suggested.

**(Solar Variability).**

(ii) Alterations in the composition of the Earth's atmosphere & in particular of the volumes of the gasses Water Vapour and Carbon Dioxide - which had been shown to reduce the loss of global heat radiated to space and thus to maintain a higher global temperature than would otherwise be the case.

**(The Greenhouse Effect)**

(iii) Variability in Particulate matter (Dust, Aerosols) suspended in the atmosphere, which facilitate the formation of clouds and thus obstruct the Solar radiation heating the Earth.

**(The Albedo Effect)**

### Over Time Scales of Hundreds of Thousands Years.

Alterations in the Earth's orbit and distance from the Sun and a consequential variation in the Solar radiation warming the Earth were proposed. (Professor M. Milankovitch<sup>[2]</sup>)

---

## Discussion

By 1995, with regard to Decadal and Century time scales, global temperature change due to an enhancement of the Greenhouse Effect caused by an increasing volume of atmospheric carbon dioxide resulting from human activity had become a dominant hypothesis.

This proposal was strengthened by the simultaneous escalation in global temperature and atmospheric carbon dioxide volume recorded, primarily during the late 20<sup>th</sup> Century - and it was concluded that these two effects were correlated.

(See Fig.1, Page.2)

---

This was the situation when, in 1998 American climate scientists Dr. Michael Mann<sup>[3]</sup> et al. published their paper "Observed Climate Variability & Change", subsequently incorporated within the Nobel Prize winning IPCC Report of 2001.

Because of the sparsity of quality data available at that time, they were able to draw upon only limited and poor quality resources which required the utilisation of innovative techniques to extract the desired information from 'Noisy' and difficult to interpret source material;

Dr. Mann was a pioneer in this work.

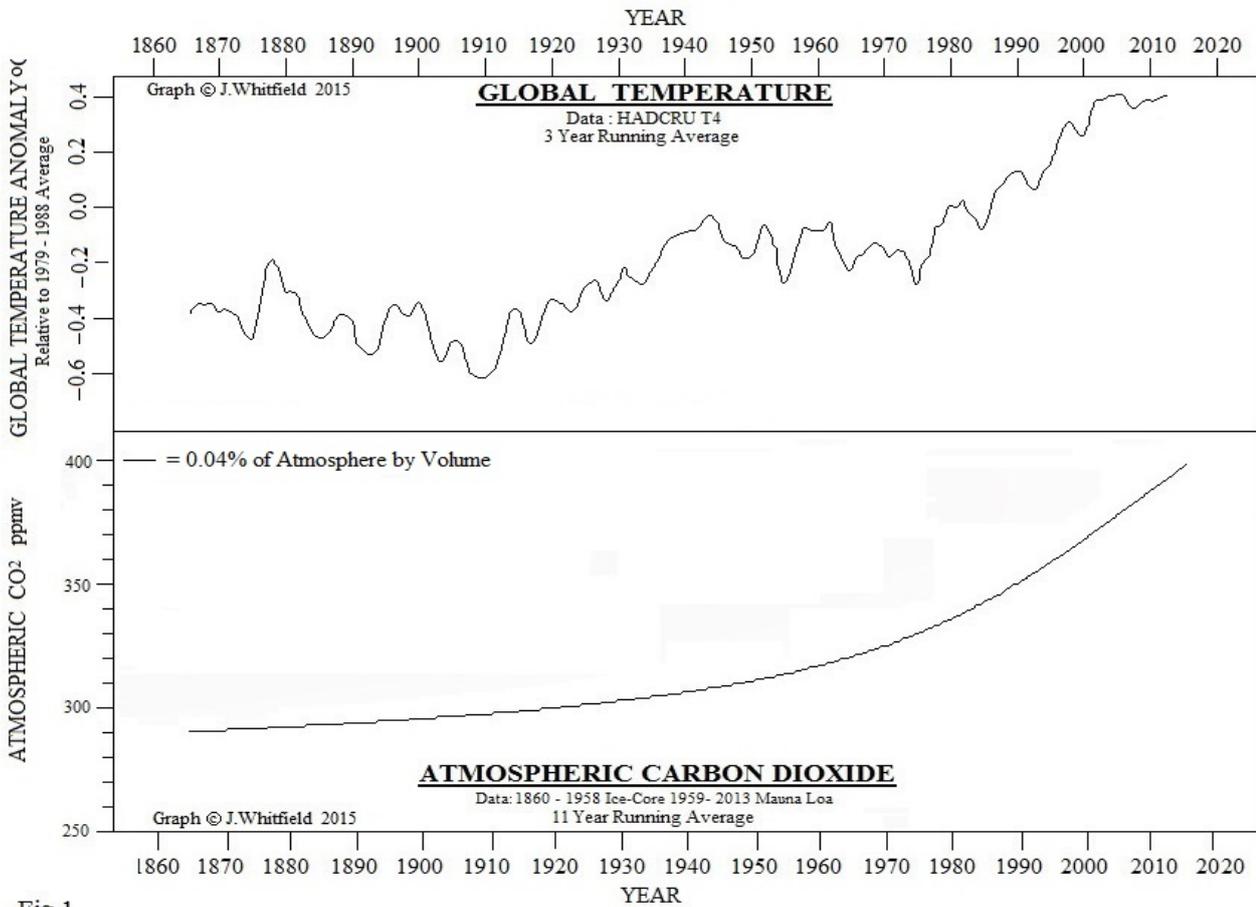


Fig.1

Subsequent to the publication of Dr. Mann’s 1998 paper, a profusion of Earth orbiting satellites and deep space missions have transformed our knowledge of both global climate dynamics - and of the Solar and Cosmic ray interactions which were previously unsuspected.

Furthermore, a breakthrough in our knowledge of global climate variability over longer time scales (> 400,000 years) has been enabled by a number of deep ice-core studies in Greenland and Antarctica which very clearly demonstrate that the present day ‘Interglacial’ warm period (the Holocene) is significantly cooler, not warmer, than the previous three.

(See Fig.2 below)

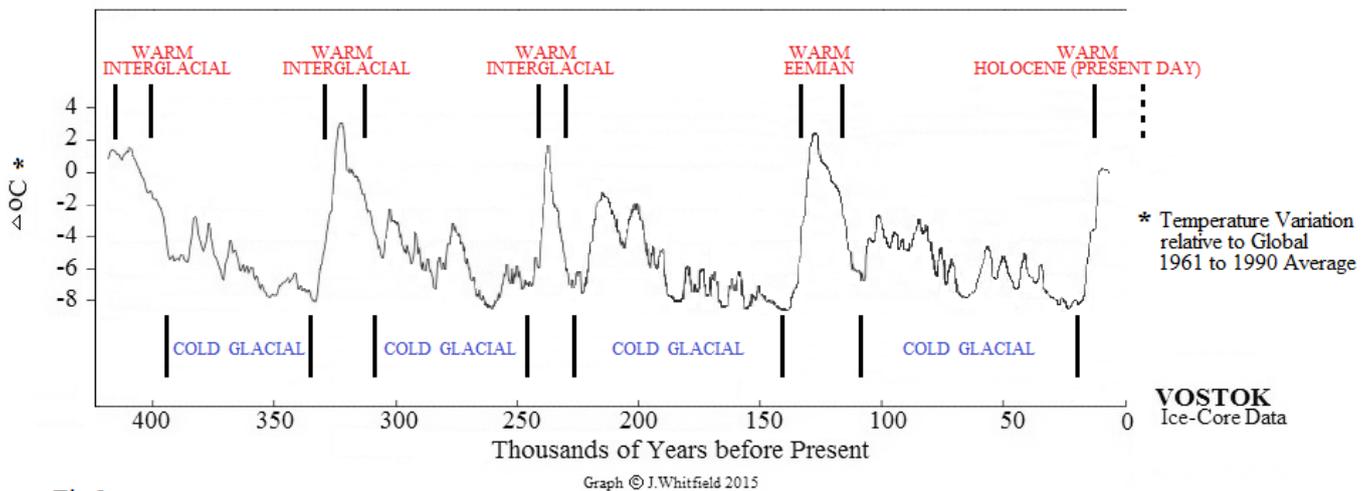


Fig.2

## Problems with the Carbon Dioxide Hypothesis of Global Warming

The following pages demonstrate a number of fundamental objections which diminish the credibility of Dr. Mann's anthropogenic carbon dioxide hypothesis of global warming and consequently undermine the currently stated IPCC position on climate change.

Unsurprisingly, since it is easy to be 'wise after the event', some of these objections are enabled and justified because of 21<sup>st</sup> Century access to high quality data resources which were not available in 1998.

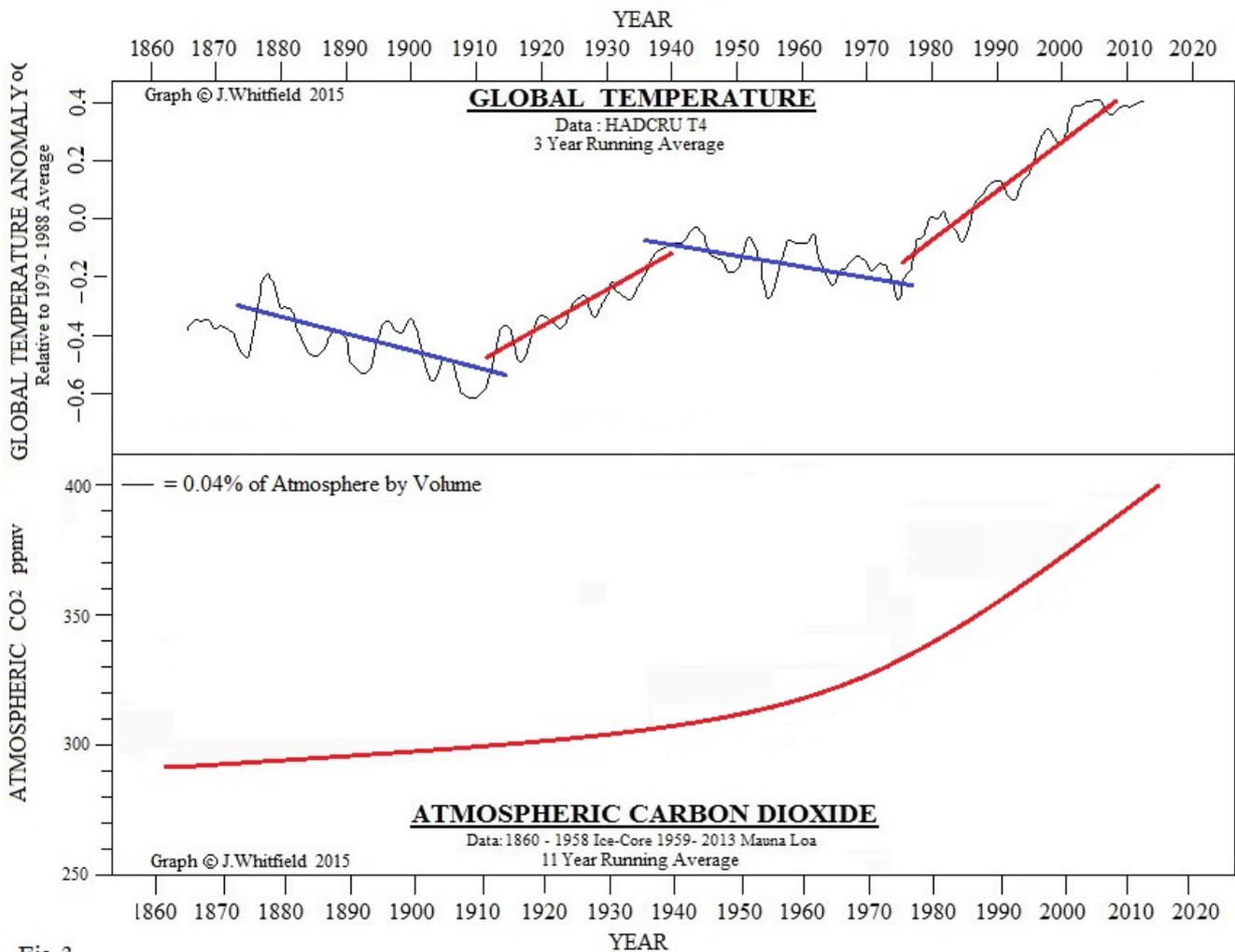


Fig.3

Figure.3 above is the same graph as Fig.1 but has been re-drawn to demonstrate the hard to reconcile relationship between global temperature and the increasing atmospheric carbon dioxide volume - Stated in Dr. Mann's paper to be the primary temperature controlling agent.

It is obvious that for almost half the period depicted (1860 to 2013), global temperatures have **Decreased** at a time of **Rising** atmospheric carbon dioxide volume.

Clearly, there are global temperature modulating forces in play of a strength sufficient to override any postulated effect of increasing atmospheric carbon dioxide volume.

There are two additional and significant areas of uncertainty incorporated within the carbon dioxide hypothesis of global warming.

### (1) **Positive Feedback & Water Vapour**

It has always been accepted by the advocates of this hypothesis that the observed increase in atmospheric carbon dioxide volume could not, **on its own**, account for a significant escalation in global temperature and it was asserted that the involvement of the dominant Greenhouse Gas, Water Vapour, was necessary to **amplify** the process. This effect is known as Positive Feedback.

However, to date it has proven impossible to quantify with any accuracy or confidence just what this amplification factor might be.

The wide range of Positive Feedback effects proposed has resulted in a high degree of uncertainty and a huge spread of global temperature increase predictions spanning from -

“**An increase of less than 0.5oC**” (Trivial)  
to  
“**An increase of more than 5.0oC**” (Very Significant)

(These predictions are based on what it is believed will result if the atmospheric carbon dioxide volume continues to increase from the present level of 0.04%, to 0.06%)

Additionally, there are significant indications from work conducted by Christopher Monckton et al. [4] and reported in their paper - ‘On an Error in Defining Temperature Feedback’ - that climate science’s misunderstanding & incorrect application of Positive Feedback Theory, has led to a gross overestimation of forecast global temperature increase by the IPCC.

### (2) **Atmospheric Aerosols & Cloud Formation**

On average, clouds cover about 60% of the entire Earth’s surface and by reducing Solar heating have a net cooling effect on the global temperature.

In 2016, the mechanisms which are responsible for the formation of Low Level Clouds (altitude less than 10,500 Feet) were stated by a majority of climatologists to be amongst the greatest uncertainties in climate science.

Cloud condensing nuclei (CCN) - the starting point for cloud formation - may be provided by tiny particles such as dust and smoke suspended in the atmosphere.

Additionally the presence of sulphuric acid and other chemicals in the atmosphere, are known under certain conditions to encourage CCN production and resilience.

This resulted in the insecure conclusion that the modern era (20<sup>th</sup> and 21<sup>st</sup> Centuries) with increased pollution levels is significantly cloudier than the Pre-industrial Era ..... and so should be cooler ..... \*\*

“**Were it not for the effect of the global warming caused by carbon dioxide**”

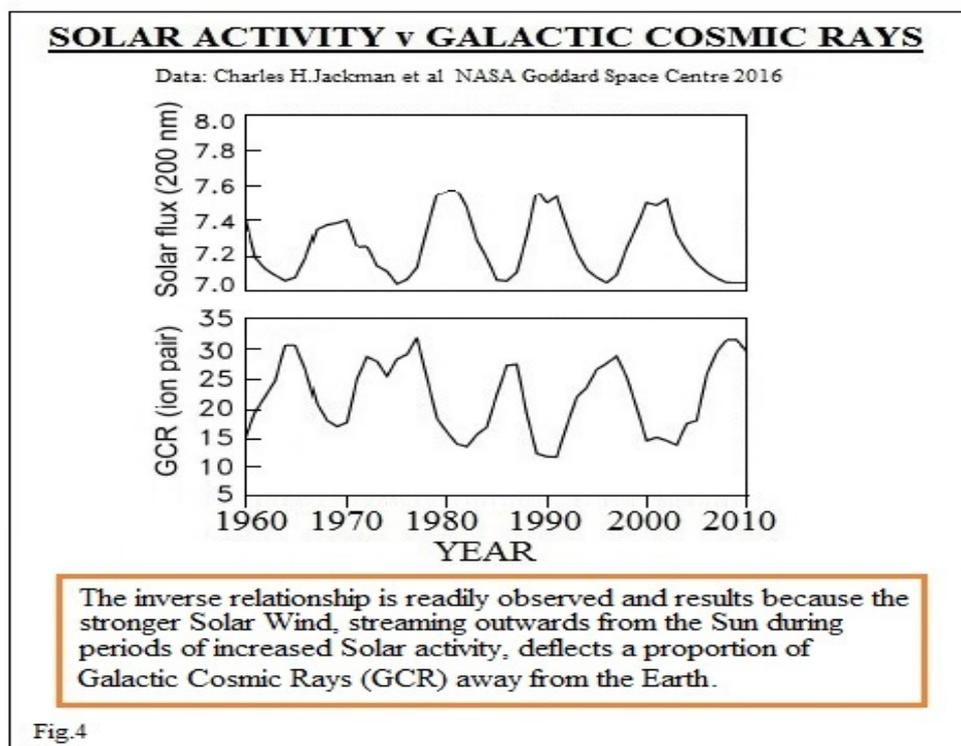
And so this was factored in, with the result that any warming effect attributed to an increasing volume of atmospheric carbon dioxide was significantly overstated.

\*\* Now refuted by the CERN Cloud Experiment results - (See Page.6)

## The Influence of the Sun & Cosmic Rays on the Earth's Climate

In 1998, at about the same time as Dr. Mann published his carbon dioxide hypothesis, a Danish physicist, Professor Henrik Svensmark [5] and his team published their paper - "Influence of Cosmic Rays on the Earth's Climate" - which proposed that changes in the numbers of cosmic rays striking the Earth's atmosphere may influence the formation of clouds **And may thus indirectly modify the Global temperature.**

Fig.4 below demonstrates the now well established inverse relationship between Solar Activity and the number of Galactic Cosmic Rays which strike the Earth's atmosphere - **More Active Sun / Fewer Cosmic Rays**



Professor Svensmark developed his hypothesis by proposing that when Cosmic rays strike gas molecules within the Earth's atmosphere they create showers of charged particles (Ions) and these ions assist in the formation of CCN (Cloud Condensing Nuclei).

Thus, there is a potential inter-relationship between the intensity of the cosmic rays striking the Earth's atmosphere and the formation of clouds. (More cosmic rays > More clouds)

Professor Svensmark's hypothesis may be more fully stated -

**More Active Sun > Stronger Solar Wind > Fewer Cosmic Rays > Fewer Clouds > Increased global Temperature.**

Up until 2016, the above hypothesis, while interesting, had been rejected by the majority of climate scientists as being both unsupported by sufficiently robust experimental data and at odds with their computer predictive climate models - which made no provision for, nor took account of, any such effects.

**And then the results of the CERN "CLOUD" Experiment were published**  
(See Page.6)

## The “CLOUD” Experiment at CERN

When, in 2016, the **CERN “CLOUD” Experiment** [6] results were published in Nature journal, they clearly demonstrated two crucial and previously largely unsuspected effects.

(1) That biogenic vapours (produced by trees & plants) can progress to CCN (Cloud Condensing Nuclei) dimensions and thus seed clouds in unpolluted atmospheres -

**Without the presence of dust, smoke or sulphuric acid.**

(eg. Pre-industrial conditions)

(2) That the rate of production of CCNs from biogenic vapours is increased -

**Between Ten & one Hundred times in the presence of ionising radiation**

(eg. Resulting from Cosmic Rays striking the Earth’s atmosphere)

Furthermore, it is noteworthy that additional experiments conducted at the Swiss Jungfrauoch research station (@11,400 Feet) utilising ‘CLOUD’ Experiment apparatus have confirmed that the mechanisms (1) & (2) above, demonstrated at the CERN laboratory, are also present and effectual in the natural world.

These results, provided by a highly respected institution and published in the prestigious and fastidious journal Nature, in fully supporting the Svensmark hypothesis should result in a fundamental re-alignment in the understanding of factors which control the global climate.

---

Fig.5 below is displayed in order to facilitate the simultaneous comparison of the variability in the primary elements discussed above.

- (a) Solar Activity
- (b) Central England Temperature
- (c) Global Temperature
- (d) Atmospheric Carbon Dioxide Volume

### Note

The reason why the Central England temperature record, which commences in 1700 has been included is because the Global temperature record extends back in time only to 1860 and is thus of restricted value.

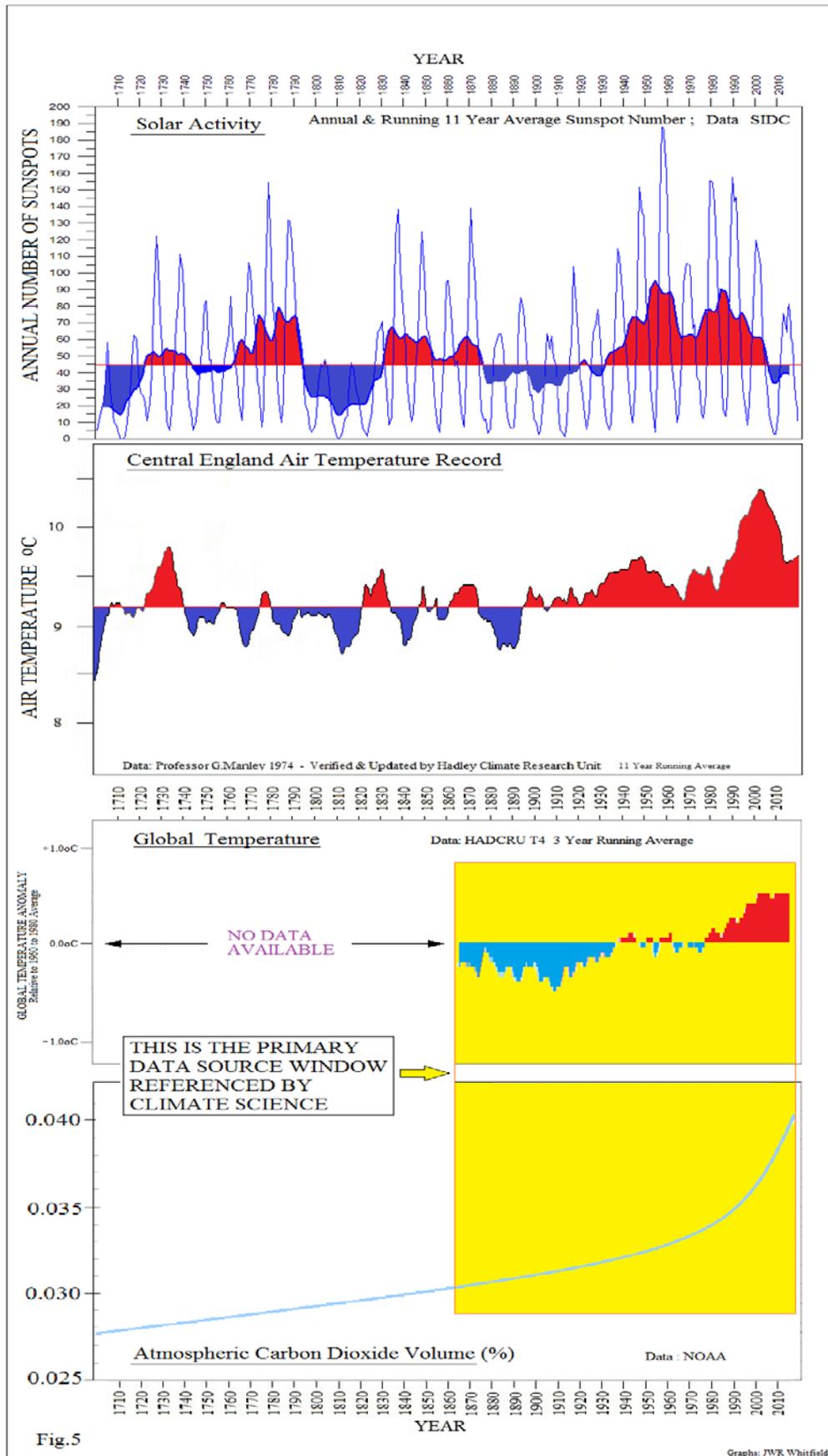


Fig.5

Graphs: JWR Whitfield

## **In Conclusion**

The purpose of this essay has been to provide a readily accessible, easily assimilated, record of the principal factors currently under consideration by climate science.

(i) For the reasons presented, it is the opinion of the author that the carbon dioxide hypothesis of global warming is likely to lose its currently predominant position.

(ii) Furthermore, it is very possible that the Svensmark theory -

**Greater Solar Activity > Fewer Cosmic Rays > Fewer Clouds > Greater Global Temperature -**

together with the published results of the CERN “CLOUD” experiment, confirmed by the work undertaken at the Jungfraujoch research station, will become incorporated within future mainstream climate science, thus enabling an urgently required improvement in the IPCC Global temperature forecasting accuracy.

In closing, it is important to highlight that, with the mechanisms described in the Svensmark theory now proving to be significant, and with the Sun entering a cyclical period of low (possibly very low) activity, and the measured intensity of Cosmic Rays striking the Earth’s atmosphere now steadily rising -

**The IPCC must take account of and make provision for the real possibility that from about the year 2020, the global temperature may enter a declining phase, conceivably extending over a number of decades.**

---

## **References**

- [1] IPCC - Intergovernmental Panel on Climate Change - A geopolitical organisation
- [2] Professor M. Milankovitch - Serbian climatologist, mathematician, astronomer, polymath
- [3] Professor M. Mann - American climatologist
- [4] 'On an Error in Defining Temperature Feedback' - Christopher Monckton et al
- [5] Professor Henrik Svensmark - Solar System Physics Division, Danish National Space Institute.
- [6] CERN 'CLOUD' experiment - Dr.Jasper Kirkby et al. -  
'Ion-induced nucleation of pure biogenic particles' - Published in Nature journal