

Climate Change: The Role of Carbon Dioxide

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The phrase “Climate Change” has been hijacked.

Climate change occurs continuously, as eg shown in the well-known and carefully analysed ice-core data (fig 1) gathered at the Antarctic Vostok base at 78°S. The temperature and CO₂ levels are strongly correlated, although an exception occurs during the past few thousand years - the period of human civilisation, fortunately - when the CO₂ level rose rapidly but the temperature only oscillated, up to $\pm 2^\circ\text{C}$.

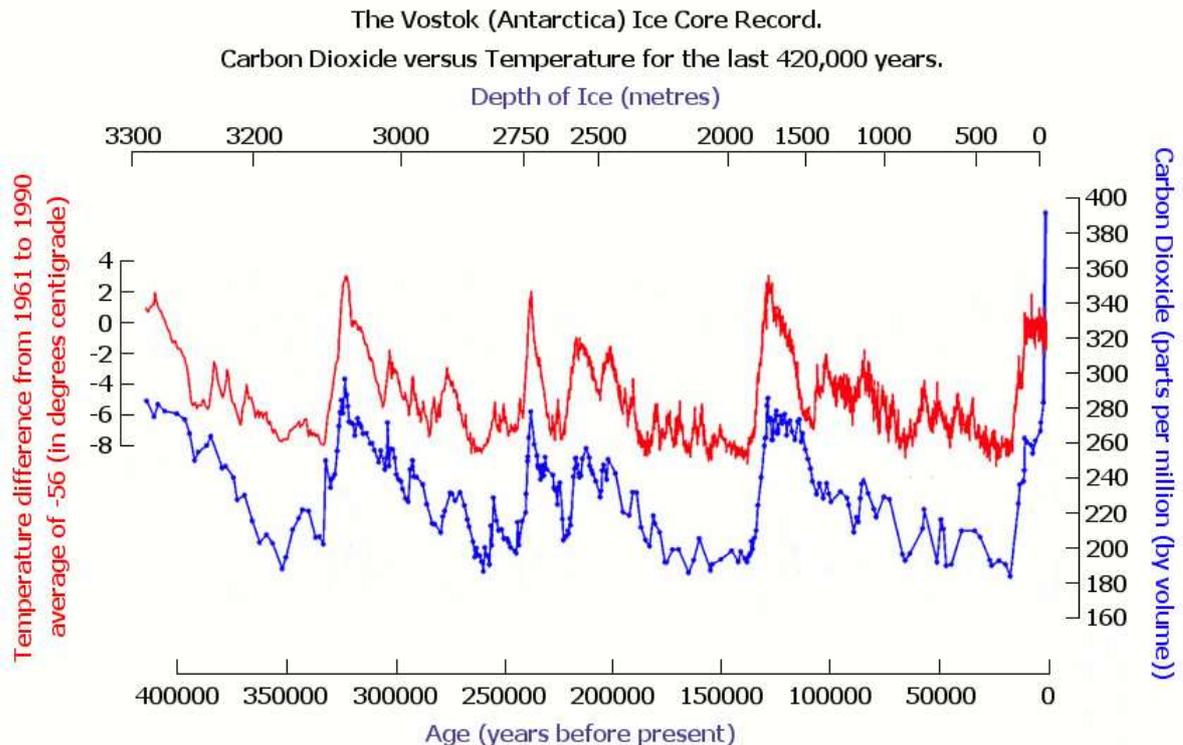


Fig 1: Vostok ice-cores (Petit et al 1999)

“**Climate Change**” speculates that climate change, ie global temperature rise since about 1950 (fig 2) is caused by mankind burning coal and oil, producing high levels of the greenhouse gas CO₂. Annoyingly, every time there is an extreme weather event, it is unthinkingly taken as support for the hijacked “Climate Change”, now taken to mean Anthropogenic (Greek for man-made) Global Warming, **AGW**.

The AGW premise is that higher CO₂ levels lead to higher temperatures because more and more greenhouse gas will trap more and more of Earth’s radiant heat. IT entrepreneur - and Nobel Prize recipient! - Al Gore, in his movie “An Inconvenient Truth” presented this IPCC dogma. He dramatically lifted himself in a forklift in front of the large screen to wildly extrapolate figure 2 to project catastrophic temperature rise with the increase in atmospheric CO₂. The extrapolation is completely wrong of course, as he - as do many others - implicitly assumes that increasing greenhouse gas will continue to produce extra, alarming warming with no end in sight.

This supposition is false.

The attraction to the idea of carbon dioxide's causation of the current warming arises from the similar shapes of *that part of figure 2 (WMO) since 1950* to that of figure 3 (NOAA) – particularly if one chooses the two different scales “judiciously”, as here. **This curve similarity is the entire basis for AGW!**

This curve matching neglects the fact that a faster temperature rise (Chylek 2006) occurred in the period 1905-1940, when CO₂ were lower than those post-1950, and according to this supposition, that rate of rise should be lower than now. That's the first inconsistency.

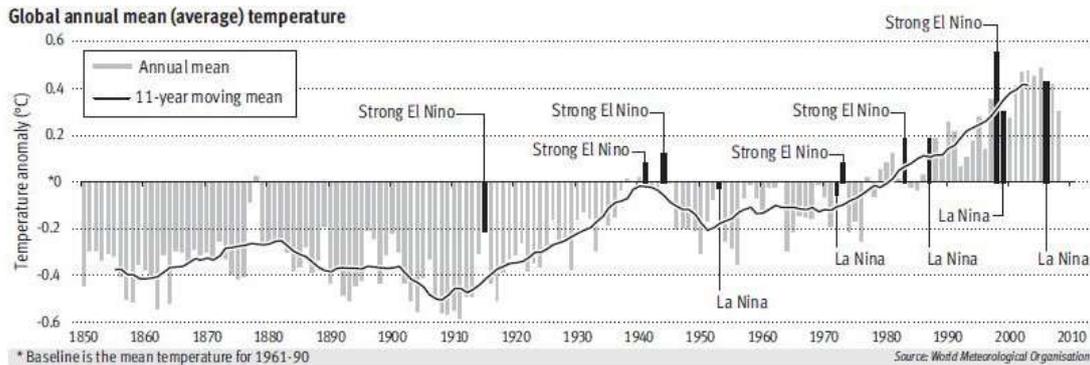


Fig 2: Global Average Temperatures 1850-2008 [Vastly smaller time scale than Fig 1]

Another inconsistency can be seen from Fig 1, but this time it's fatal. Previous temperature peaks occurred at levels of about 280 to 290 ppm, much less than the current 400 ppm. Yet those peaks were up to 3°C higher than today's! *How does that work?* Clearly, higher CO₂ levels above 290ppm, do NOT cause higher temperatures. Therefore, ice-core data imply that the maximum amount of heat, ie infrared aka IR, which CO₂ can absorb occurs at *less than 290ppm*.

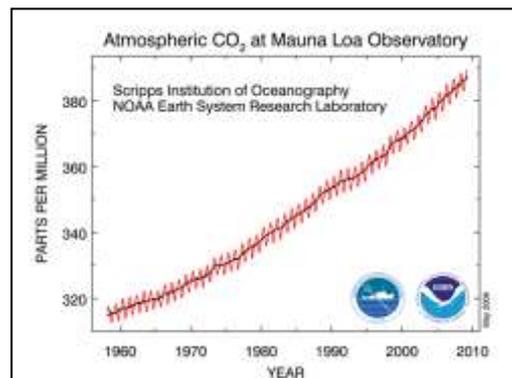


Fig 3: CO2 levels measured at Hawaii

The well-established Beer-Lambert Law, shown generically in figure 4, gives the **definitive scientific explanation:** *The proportion of radiation, in this case heat, being transmitted through an absorbing fluid, eg the atmosphere, diminishes with increasing concentration of the absorbent, eg CO₂, within the fluid.*

Al Gore's extrapolation is completely contrary to this physical law.

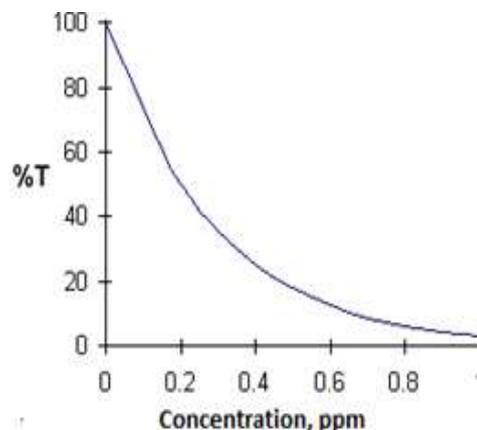


Figure 4: Beer-Lambert Law

[The %Transmission never quite reaches zero but becomes vanishingly small at high concentrations, as seen at CO₂'s wavelengths, figure 5.]

Despite Beer-Lambert and the Vostok record, Gore, IPCC, etc, still use the argument that increasing CO₂ levels → extra heating → more CO₂ being released from the oceans → more heating etc. This is the bogey-man thermal runaway. This has not happened in the past, is not happening now, and will not happen in future.

The measured ice-core CO₂/temperature levels are consistent with IR spectroscopic (Lord 1992) measurements (fig 5) from Gemini Observatory, located atop Hawaii's Mauna Kea, showing the amount of IR energy radiated from Earth's surface into space. Even at this altitude, the limit has been reached; complete absorption at CO₂'s IR bands centred at 4.2 and 15 micron, ie ALL Earth's radiated heat at CO₂'s wavelengths is absorbed. (This proves that CO₂ is a greenhouse gas - if that is indeed needed). Gebbie's 1951 (horizontal, sea-level) IR measurements were less extensive, 1 to 14 micron, but also showed both CO₂'s wavebands were absorbed even then. **Further increases in CO₂ are unable to absorb more heat as there's none at its wavelengths left to absorb.**

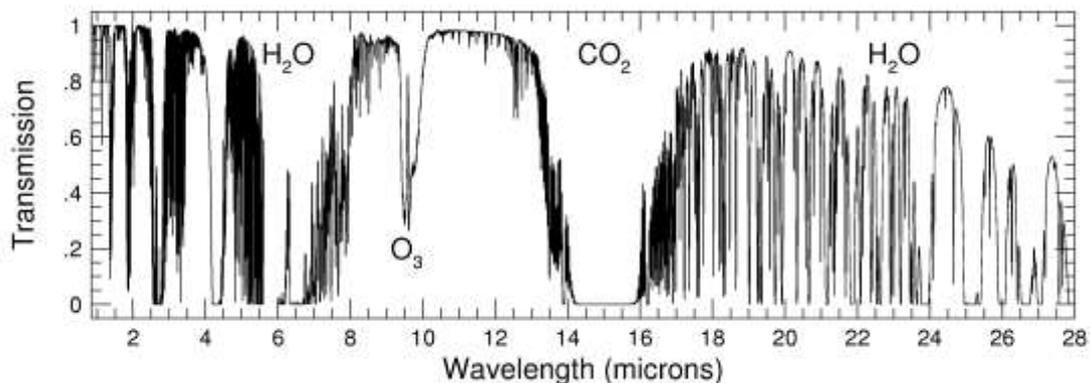


Figure 5: Infrared transmission at Mauna Kea, measured vertically. (After S.Lord 1992) [Maximum absorption *may have occurred earlier than in 1992*, ie at less than 355ppm (fig 3), but once maximum absorption has been reached, more CO₂ causes no change to its absorption spectrum.]

Further, Gemini Observatory's elevated position in the thin atmosphere 4200m above sea level is above 40% of the mass of the earth's atmosphere. An observatory at sea-level, where Global Temperatures are measured, would therefore show complete absorption by CO₂ with a level of only **215 ppm** (using the barometric formula). A concentration that low has seldom existed on Earth over the past 420,000 years, most recently about 10,000 years ago. Even then, CO₂'s heat absorption was near its upper limit, and consequently its effect was **almost unvarying** through maybe all Earth's history, but contributing a near *constant* several degrees to Earth's overall greenhouse warming.

Therefore, *changing* CO₂ levels have made only insignificant *Changes* to Climate.

References:

Petr Chylek, M. K. Dubey, and G. Lesins, "Greenland warming of 1920–1930 and 1995–2005" Geophysical Res Lett, Vol 33, L11707, (2006).

Gebbie, H.A., Harding, W.R., Hilsum, C.A., Pryce, A.W., and Roberts, V. Atmospheric transmission in the 1 to 14μ region." *Proc Roy Soc A* 206, 87 (1951).

Lord, S.D. NASA Tech Mem 103957 (1992). These are standard astronomical data, and are more extensive but consistent with the sea level horizontal measurements of Gebbie. Conveniently, figure 5 was compiled from Lord's data by R.Pogge in [<http://www.astronomy.ohio-state.edu/~pogge/Ast161/Unit5/atmos.html>].

NOAA. Mauna Loa measurements. <http://www.esrl.noaa.gov/gmd/ccgg/trends/>

Petit, J.R. et al. "Climate and atmospheric history of the past 420,000 years from the Vostok ice core, Antarctica". *Nature* **399**, 436 (1999).
(This image from <http://www.preearth.net/phpBB3/viewtopic.php?f=16&t=23>.)

World Meteorological Organisation. This figure 2 was reproduced from "Sceptics skip the long view" by Mike Steketee in "The Weekend Australian" newspaper, 03 Jan 2009.