CO2, Temperatures and ice ages...

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It is general accepted that CO2 is lagging temperature in Antarctic graphs. To dig further into this subject therefore might seem a waste of time. But reality is, that these graphs are still widely used as an argument for the global warming hypothesis. But can the CO2-hypothesis be supported in any way using the data of Antarctic ice cores?

At first glance, the CO2 lagging temperature would mean that it's the temperature that controls CO2 and not vice versa.

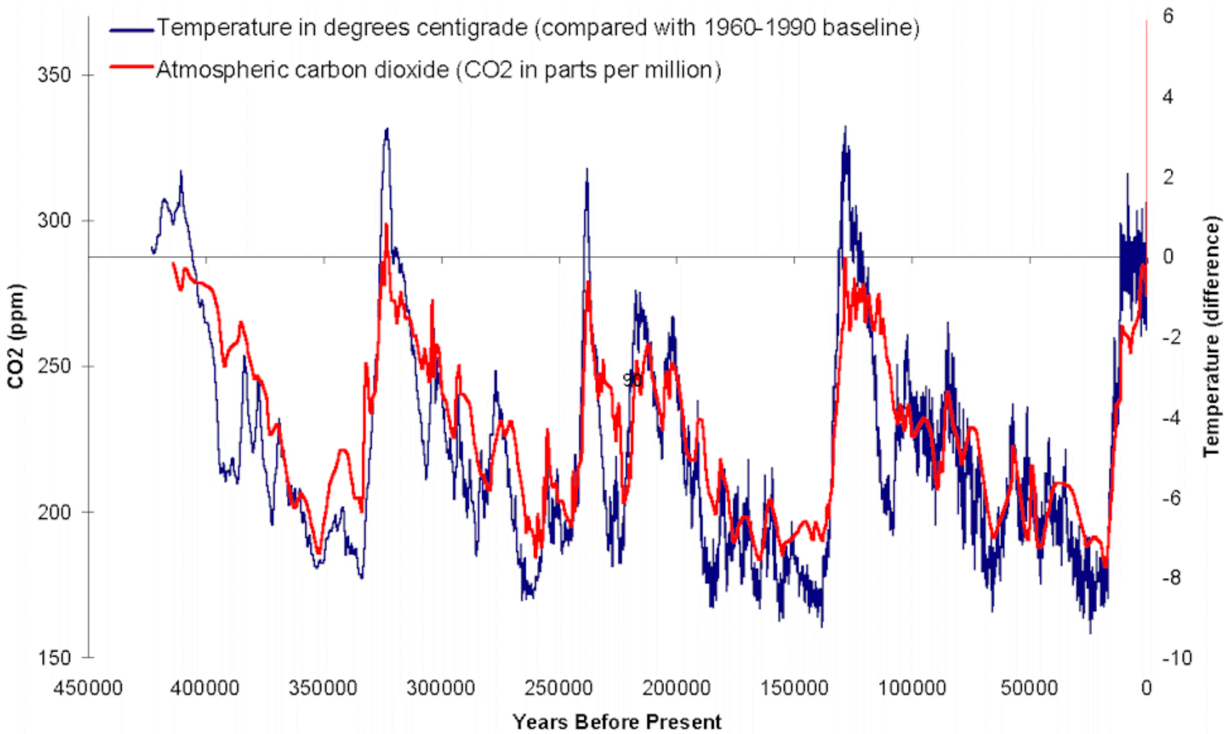

Fig 1. Source: http://www.brighton73.freeserve.co.uk/gw/paleo/400000yrfig.htm

But this is the climate debate, so massive rescue missions have been launched to save the CO2-hypothesis. So explanation for the unfortunate CO2 data is as follows:

First a solar or orbital change induces some minor warming/cooling and then CO2 raises/drops. After this, it's the CO2 that drives the temperature up/down. Hansen has argued that: ***The big differences in temperature between ice ages and warm periods is not possible to explain without a CO2 driver.***

Very unlike solar theory and all other theories, when it comes to CO2-theory one has to PROVE that it is wrong. So let's do some digging. The 4-5 major temperature peaks seen on Fig 1. have common properties: First a big rapid temperature increase, and then an almost just as big, but a less rapid temperature fall. To avoid too much noise in data, I summed up all these major temperature peaks into one graph:

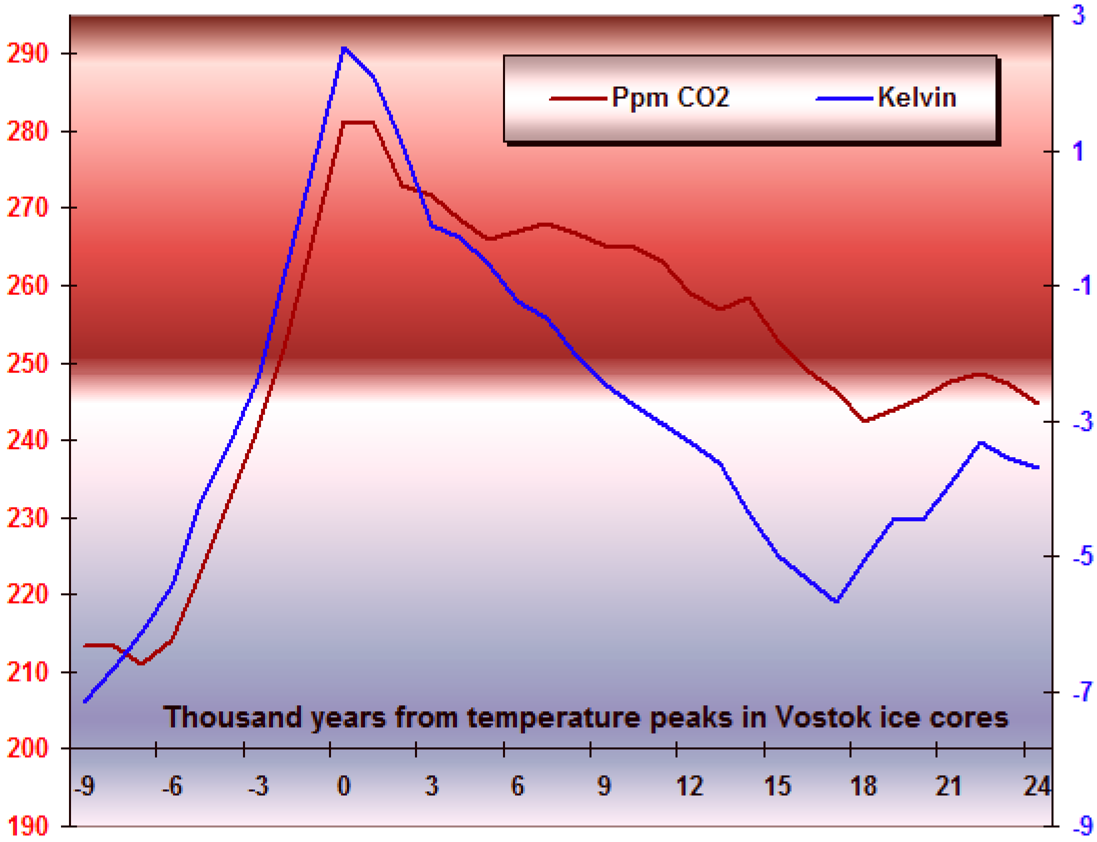

Fig 2. This graph of **actual data** from all major temperature peaks of the Antarctic vostok data confirms the pattern we saw in fig 1, and now we have a very clear signal as random noise is reduced.
The well known Temperature-CO2 relation with temperature as a driver of CO2 is easily shown:

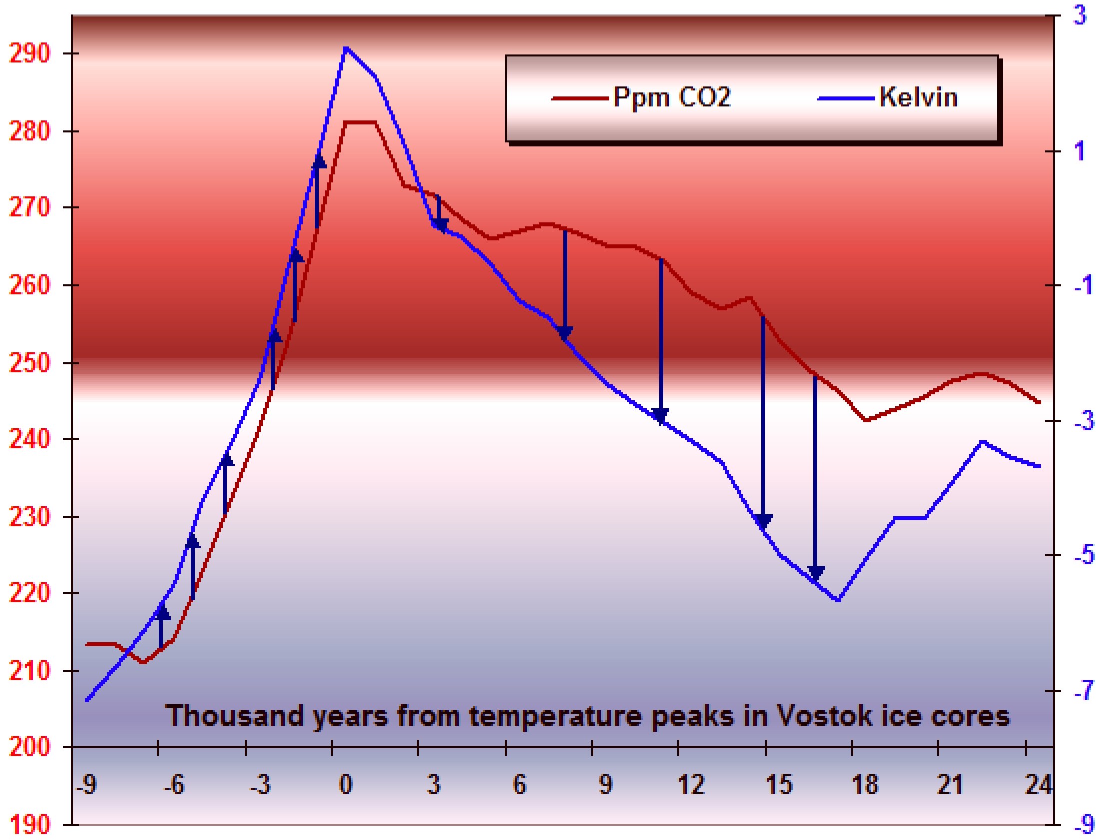

Fig 3.

Below is a graph where I aim to illustrate CO2 as the driver of temperature:

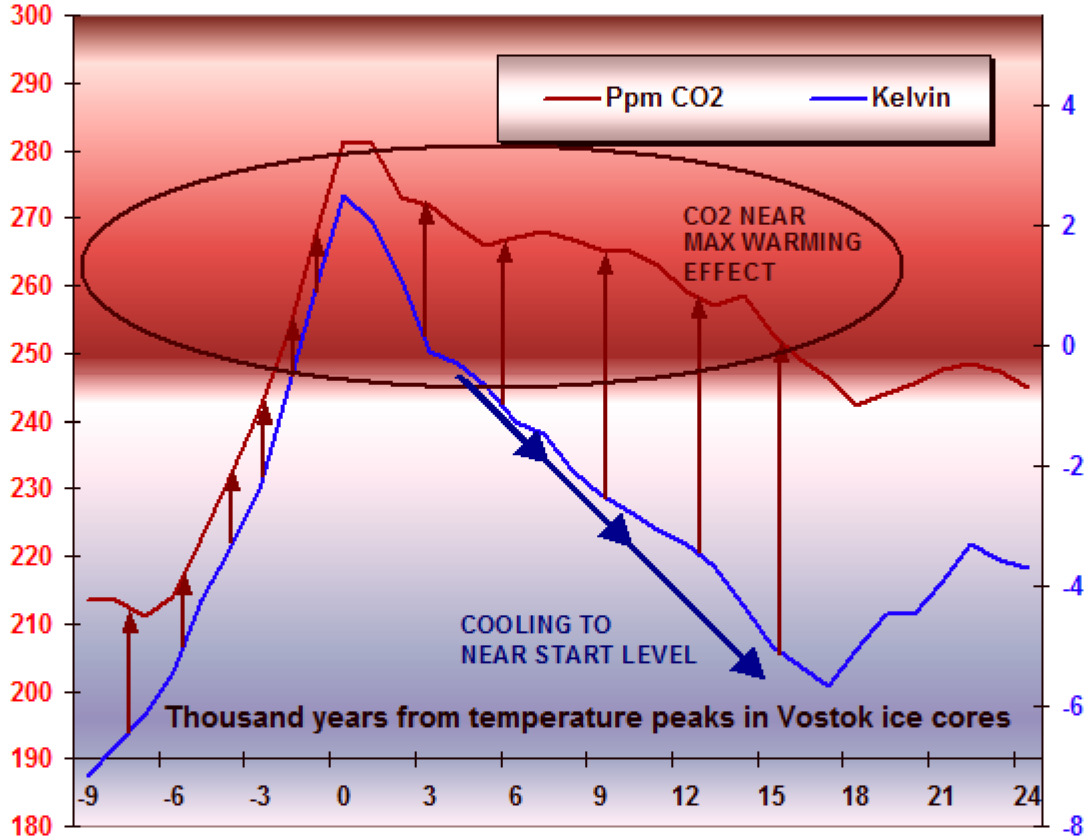

Fig 4. Except for the well known fact that temperature changes precede CO2 changes, the supposed CO2-driven raise of temperatures works ok before temperature reaches max peak. No, the real problems for the CO2-rescue hypothesis appears when temperature drops again. During almost the entire temperature fall, CO2 only drops slightly. In fact, CO2 stays in the area of maximum CO2 warming effect. So we have temperatures falling all the way down even though CO2 concentrations in these concentrations where supposed to be a very strong upwards driver of temperature.

I write "the area of maximum CO2 warming effect "…
The whole point with CO2 as the important main temperature driver was, that already at small levels of CO2 rise, this should efficiently force temperatures up, see for example around -6 thousand years before present. Already at 215-230 ppm, the CO2 should cause the warming. If no such CO2 effect already at 215-230 ppm, the CO2 cannot be considered the cause of these temperature rises.
So when CO2 concentration is in the area of 250-280 ppm, this should certainly be considered "the area of maximum CO2 warming effect".

The problems can also be illustrated by comparing situations of equal CO2 concentrations:

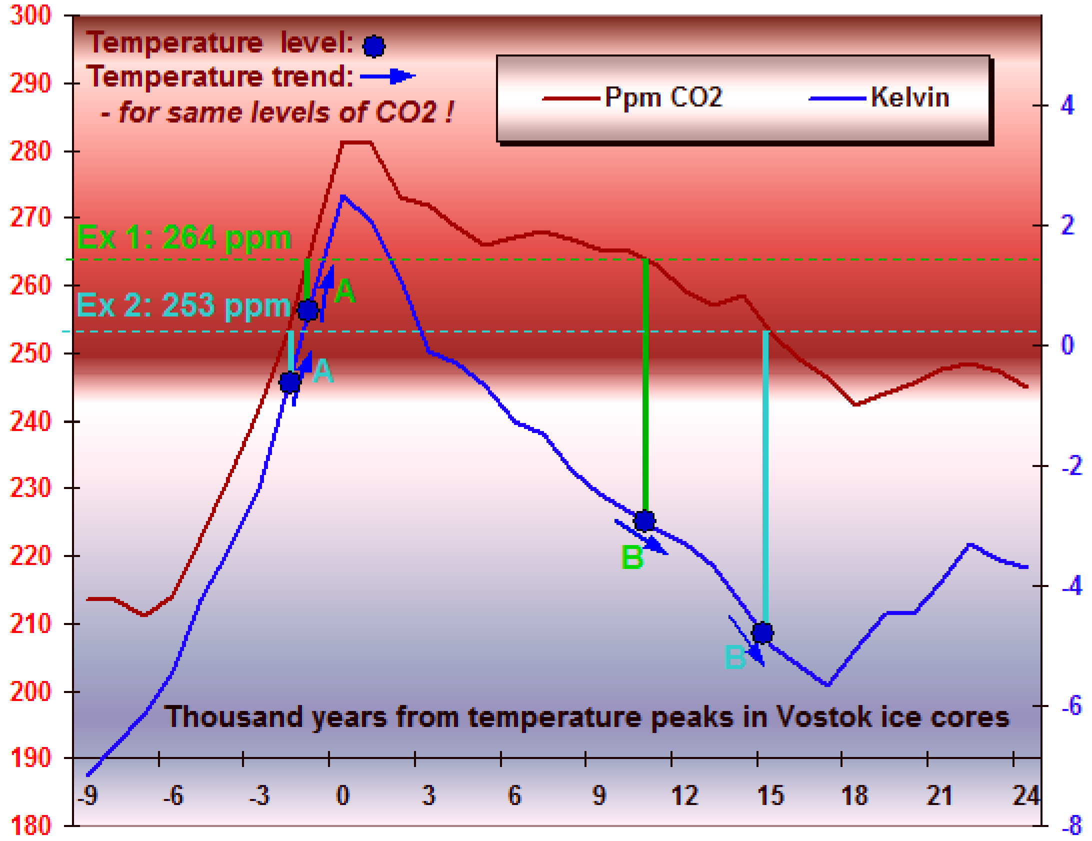

Fig 5.

So, for the exact same levels of CO2, it seems we have very different level and trend of temperatures:

Ex 1: CO2 concentration = 264 ppm			Ex 2: CO2 concentration = 253 ppm		
	Temperature, K	Trend, K/1000 years		Temperature, K	Trend, K/1000 years
A	+ 0.7	+ 1,56	A	- 0.7	+ 1.56
B	- 2.9	- 0.38	B	- 4.7	- 0.55

Fig 6.
How come a CO2 level of 253 ppm in the B-situation does not lead to rise in temperatures? Even from very low levels? When 253 ppm in the A situation manages to raise temperatures very fast even from a much higher level?

One thing is for sure:
"Other factors than CO2 easily overrules any forcing from CO2. Only this way can the B-situations with high CO2 lead to falling temperatures."

This is essential, because, the whole idea of placing CO2 in a central role for driving temperatures was:
"We cannot explain the big changes in temperature with anything else than CO2".

But simple fact is: ***"No matter what rules temperature, CO2 is easily overruled by other effects, and this CO2-argument falls".*** So we are left with graphs showing that CO2 follows temperatures, and no arguments that CO2 even so could be the main driver of temperatures.

- Another thing: When examining the graph fig 1, I have not found a single situation where a significant raise of CO2 is accompanied by significant temperature rise– *WHEN NOT PRECEDED BY TEMPERATURE RISE*. If the CO2 had any effect, I should certainly also work without a preceding temperature rise?! (To check out the graph on fig 1. it is very helpful to magnify)

Does this prove that CO2 does not have any temperature effect at all?

No. For some reason the temperature falls are not as fast as the temperature rises. So although CO2 certainly does not dominate temperature trends then: Could it be that the higher CO2 concentrations actually is lowering the pace of the temperature falls?

This is of course rather hypothetical as many factors have not been considered.

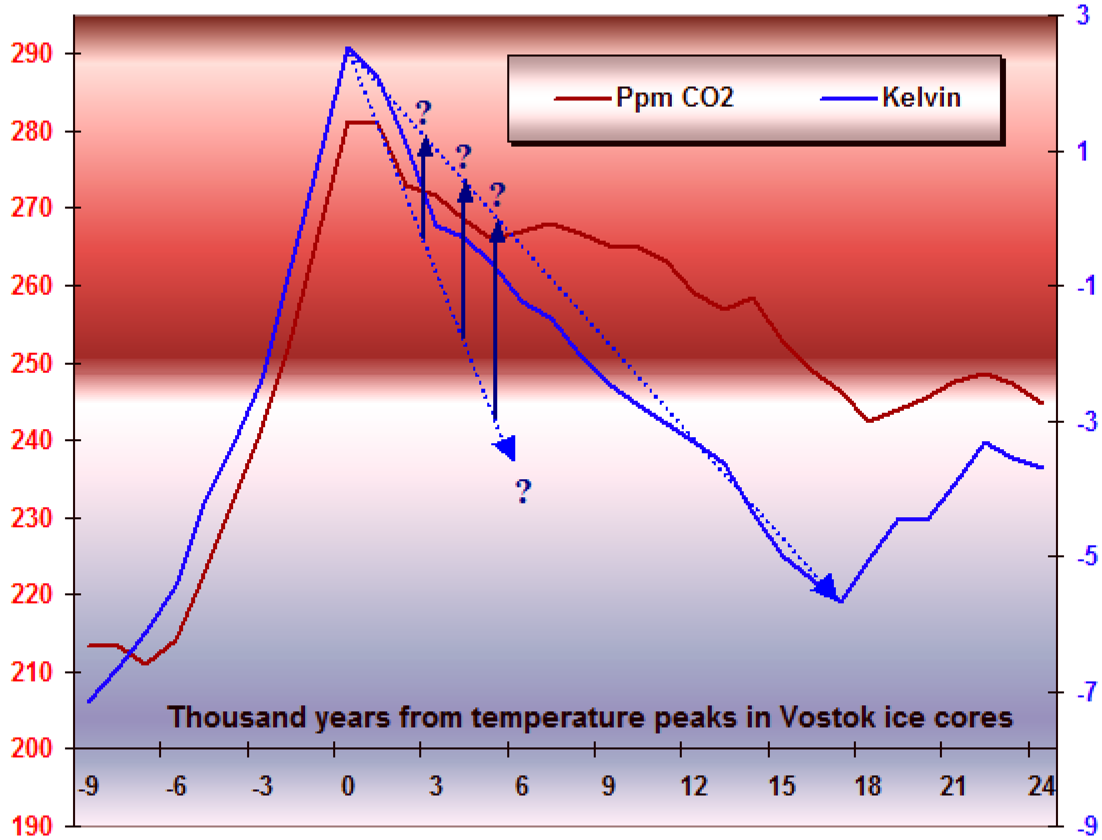

Fig 7.
Well, if CO2 should be reason to such “temperature-fall-slowing-effect”, how big could this effect be? The temperatures falls **1 K / 1000** years slower than they rise**.**

However, this CO2 explanation of slow falling temperature seems is not supported by the differences in cooling periods, see fig 8.

When CO2 does not cause these big temperature changes, then what is then the reason for the big temperature changes seen in Vostok data? Or: “What is the mechanism behind ice ages???”

This is a question many alarmists asks, and if you can’t answer, then CO2 is the main temperature driver. End of discussion. There are obviously many factors not yet known, so ***I will just illustrate one hypothetical solution to the mechanism of ice ages among many:***

First of all: ***When a few decades of low sunspot number is accompanied by Dalton minimum and 50 years of missing sunspots is accompanied by the Maunder minimum, what can for example thousands of years of missing sunspots accomplish? We don’t know.***

What we saw in the Maunder minimum is NOT all that missing solar activity can achieve, even though some might think so. In a few decades of solar cooling, only the upper layers of the oceans will be affected. But if the cooling goes on for thousands of years, then the whole oceans will become colder and colder. It takes around 1000-1500 years to “mix” and cool the oceans. So for each 1000-1500 years the cooling will take place from a generally colder ocean. Therefore, what we saw in a few decades of maunder minimum is in no way representing the possible extend of ten thousands of years of solar low activity.

It seems that a longer warming period of the earth would result in a slower cooling period afterward due to accumulated heat in ocean and more:

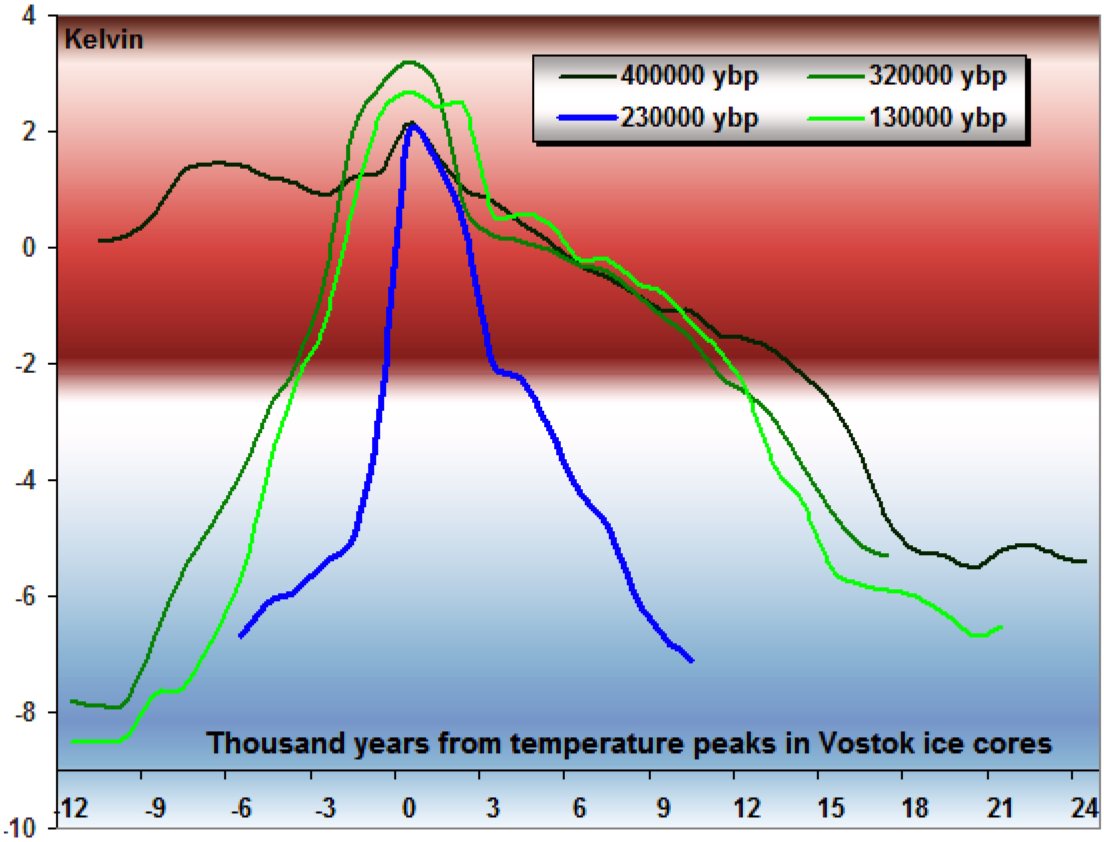

Fig 8.
Again, this fits very well with Vostok data: Longer periods of warmth seems to be accompanied by longer time needed for cooling of earth. The differences in cooling periods does not support that it is CO_2 that slows cooling phases. The dive after 230.000 ybp peak shows, that cooling CAN be rapid, and the overall picture is that the cooling rates are governed by the accumulated heat in oceans and more.

Note: In this writing i have used Vostok data as valid data. I believe that Vostok data can be used for qualitative studies of CO_2 rising and falling. However, **the levels and variability of CO_2 in the Vostok data I find to be faulty** as explained here:
http://wattsupwiththat.com/2008/12/17/the-co2-temperature-link/