Global Warming – Experimental Results

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The anthropological global warming (AGW) hypothesis would have us believe that global temperatures are rising as a result of increased carbon dioxide levels in Earth's atmosphere and that humans are the primary cause of this increase.

An opposing hypothesis - natural global warming (NGW) - believes the rise in recently observed atmospheric carbon dioxide levels is driven by natural global warming and by volcanic activity and that humans have little effect in altering Earth's climate.

Figure 1 shows the variation in proxy measurements of temperature and atmospheric carbon dioxide concentrations for the past 400,000 years extracted from the air trapped within the ice cores from Antarctica. This period covers several glacial and interglacial periods during the Great Pleistocene Ice Age. The graph shows visually that atmospheric temperature and carbon dioxide levels are related. But this relationship is a natural one that stretches back long before the time of modern man.

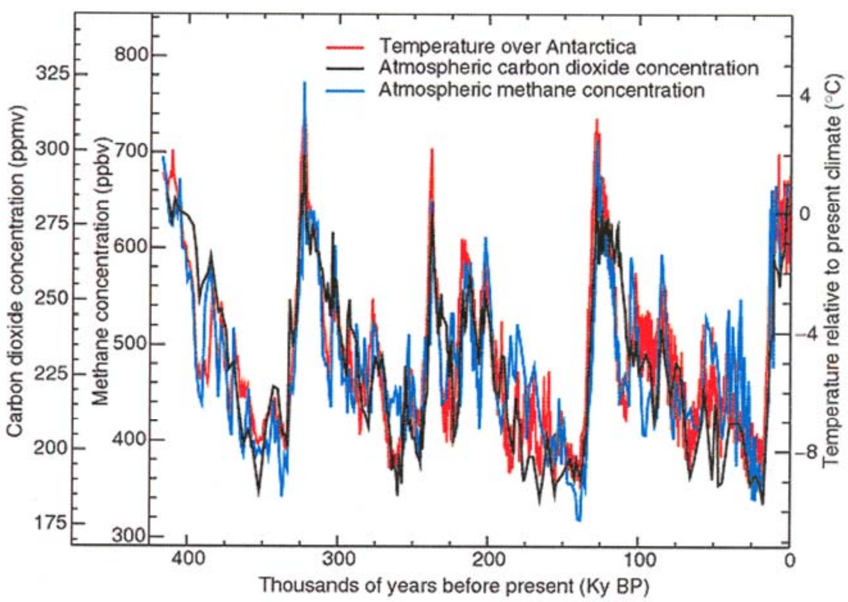


Figure 1. Four hundred thousand years of proxy ice core temperature and carbon dioxide level data. Figure 2.22 of 2001 IPCC report.

Analysis of Antarctic ice cores proxy data also reveals that the rise in carbon dioxide levels lags behind the rise in temperature by hundreds of years. (Refer to http://www.abd.org.uk/co2_cause_or_effect.htm and http://www.co2science.org/scripts/CO2ScienceB2C/articles/V8/N48/EDIT.jsp). This observation can only occur if the rise in temperature is triggering a rise in carbon dioxide levels and not the other way around.

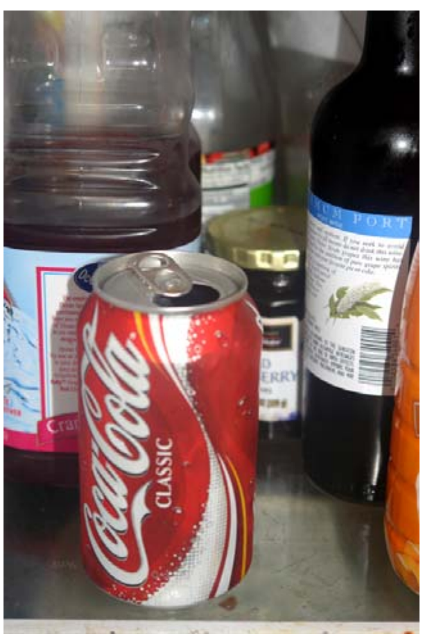
Summarizing these two observations, humans played no role in the global warming/atmospheric carbon dioxide levels over the past glacial/interglacial periods. And natural global warming leads to a rise in atmospheric carbon dioxide levels rather than the converse.

Earth's oceans are a stabilizing force in Earth's climate. Carbon dioxide is a gas that is 1.5 times as dense as air. This heavy gas will gravitationally seek the lowest depths in the atmosphere which is generally the surface of the ocean. Carbon dioxide readily dissolves in water at normal atmospheric pressures. Thus the Earth's oceans have become a vast reservoir of dissolved carbon dioxide. The amount of carbon in the ocean is approximately 50 times greater than the amount found in the atmosphere. But the ability of water to store carbon dioxide is temperature dependent. As the surface of the oceans cool, solubility increases and the oceans are able to absorb greater concentrations of the gas resulting in a reduction of atmospheric CO_2 levels. But as the surface of the oceans warm, solubility drops and the oceans release this stored carbon dioxide back into the atmosphere, elevating atmospheric CO_2 levels. The Earth has experienced many episodes of strong global warming and strong global cooling in the past without any help from man. Earth's climatic system is a well-balanced although chaotic system and humans have very little effect in altering Earth's climate.

The following is a very simple experiment I conducted that showed the effect of natural global warming on the Earth's oceans.

The Earth's oceans are similar to a can of Coke. Both are a primarily a body of water containing dissolved carbon dioxide. Coca-Cola (Coke) is a carbonated beverage. It is produced by injecting carbon dioxide into the drink at a pressure of several atmospheres. Carbon dioxide dissolves readily at normal atmospheric pressures, particularly in cold beverages. In this experiment, the cans of Coke will be used to represent the Earth's oceans. In this experiment, we will accelerate a natural global warming process by using elevated temperatures and by using water with a higher concentration of carbon dioxide. As a result, we can explore the effects of natural global warming on the Earth's oceans in a few hours; a process that normally occurs very slowly over years and decades.

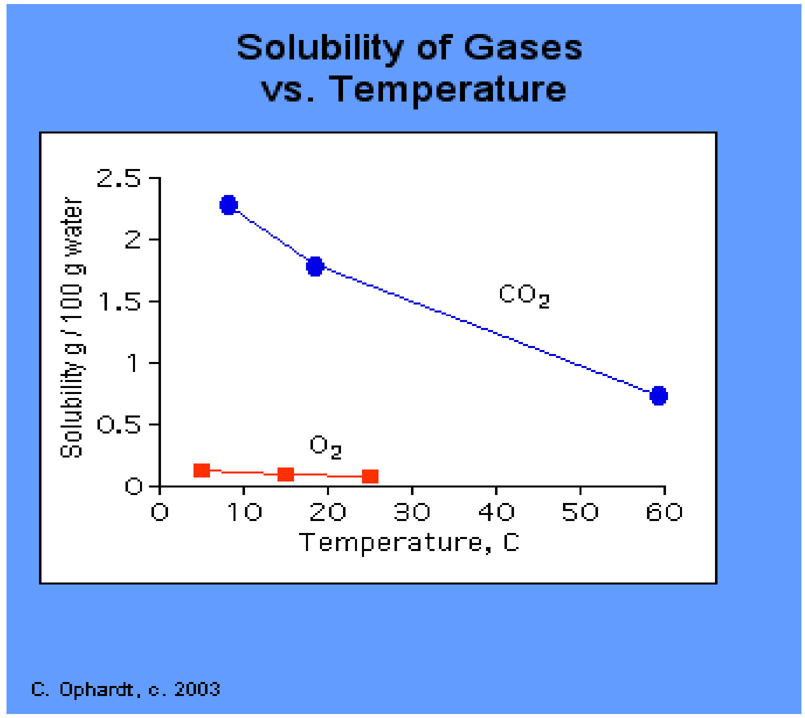
1. I placed two identical cans of Coke in the refrigerator overnight.
2. The next morning, I placed a metal pie pan on the top shelf in a conventional oven and set the oven temperature to 175° F [79° C].
3. After 15 minutes, I removed two cold cans of Coke from the refrigerator and opened each can.
4. I placed one can of Coke back in the refrigerator and closed the door. I placed the other can in the middle of a metal pie pan in the oven and closed the oven door.
5. After 90 minutes, I removed the can of Coke from the oven (it was lukewarm) and the other can from the refrigerator (it was ice cold).
6. I poured the can of Coke removed from the oven into a glass. For a few seconds it bubbled profusely releasing the last of its carbon dioxide into the air. I tasted the lukewarm Coke. It tasted flat. The warm Coke has lost its ability to retain the carbon dioxide, the carbonated fizz.
7. I poured the can of Coke removed from the refrigerator into a glass. It bubbled mildly. I tasted it. It was still carbonated and bubbly.



Coke in Refrigerator

Coke inside Metal Pie Pan in Oven

The can of Coke represents the Earth's ocean. The can placed in the refrigerator was used as the control. The can placed in the oven represents the Earth's ocean subjected to natural global warming. As the can warms, it released dissolved carbon dioxide back into the atmosphere. Carbon dioxide levels in the Earth's oceans are in equilibrium but as the oceans warms, the ocean releases some of the dissolved carbon dioxide back into the atmosphere, thus elevating atmospheric CO_2 levels.



The solubility of carbon dioxide in water as a function of temperature is graphed by Dr. Charles Ophardt (Elmhurst College). Water dramatically loses its ability to retain carbon dioxide as water temperature rises.

Atmospheric carbon dioxide levels have been scientifically measured for over 200 years. Ernst-Georg Beck analyzed more than 90,000 accurate atmospheric carbon dioxide readings covering 150 years beginning in 1812. The results are graphed in Figure 2.

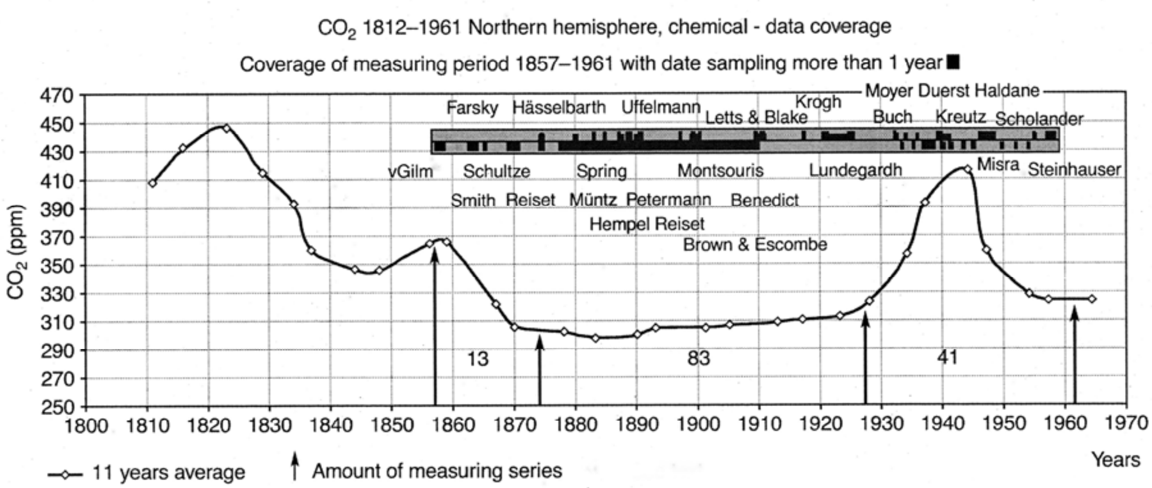


Figure 2. Measured atmospheric carbon dioxide levels for the Northern Hemisphere.
Ernst-Georg Beck, *Energy & Environment*, Vol. 18, No. 2, 2007, pp 259-282.

Current atmospheric CO_2 levels are ~ 380 ppm. This level is neither unusual nor abnormal but fits well within the range of measured levels during the 19th and 20th centuries.