

THE SKY IS FALLING
OR
ON REVISING THE NINE TIMES RULE

PART II OF V

WILLIAM F. McCLENNEY, P.G. R.E.A.

In Part 1, we examined the remarkably regular Pleistocene climate clock. We learned that sixteen times in the last 1.6 million years we would drop into 100k year long deep freezes and nearly instantaneously come out of them, working up 400 foot sea level rises, only to start another long slow slide into the next one, with the interim being just a few tens of thousands of years, if that. With the detailed Vostok ice core data, we saw that the entry into an ice age is a long slippery slope, but quite a bumpy ride, with warm spells that can be tens of thousands of years long on that slide in. Like Ziggy, we are left scratching our heads on just what could be left alive after one of those 100k year long deep freezes that suddenly generated enough greenhouse gases (GHGs) to spectacularly end each ice age with a near instantaneous, geologically speaking, 400 foot rise in sea level. And ominously, we saw that THE TRUTH is that earth temperature change and CO2 are tied. But THE WHOLE TRUTH is that temperature goes up and CO2 follows sometime later. In Part II we will come to understand why that is..

THE THIRD HERESY

Ever notice that, on average, days tend to be warmer than nights? Ever wonder what causes this? Well, it's the sun! Receipt of solar radiation is called insolation. Ever notice that the sun tends to be higher in the sky and stick around longer during summer days than on winter days? Ever wonder what causes the seasons? This one will be a little more complicated, but the earth's rotational axis is presently tilted 23.5 degrees from the plane of our orbit around the sun. Think of this like a spinning top that is wobbling. The surface the top is spinning on is probably flat, somewhat like our orbital plane around the sun can be considered more or less flat. But the top, as it spins down, will get wobbly on its axis, just like the earth is. Like I said, at present we are tilted 23.5 degrees to our orbit, so taking the northern hemisphere as an example, at noon on the summer solstice, the northern end of our tilt axis is tilted towards the sun, 23.5 degrees and the sun is as high as it will get to the north in the sky during the year. The summer solstice is also the longest day of the year. So on that day, you get more sun falling on the place you are at in the northern hemisphere than on any other day. More insolation. More energy from the sun. Not really mind shattering, is it?

As we wind our way around the sun to the winter solstice, the axis shifts through zero (equinox) to 23.5 degrees tilted away from the sun at noon on the winter solstice, a 47 degree difference from the summer solstice. The sun will now be riding as low in the sky as you will ever see it at noon of any day of every year. This is also the shortest day of the year, meaning you will receive the least amount of insolation of any day that year.

This happens every year of your life. But there is one more thing to consider. Place your hand near a lamp and feel the heat. Now move your hand a little further away from the lamp. Which

position is warmer? Closer to or further away from the lamp? Factoring in the 47 degree tilt change on a planet 8000 miles in diameter, and the fact that due to the 47 degree shift, you are now a few thousand or so miles further away from the sun and you now have your mind wrapped around the two and only two factors that make the difference between summer and winter. Every single year.

Now, the earth's orbit is not a circle around the sun. And we are not the only thing orbiting the sun. In fact, some of the other planets have worlds orbiting them that are even bigger than the earth, all possess gravity, just like we do. And they exert that gravity not only on their satellites, but every one of the sun's satellites, including us. And they all orbit the sun at speeds commensurate with their distance from the sun. We presently orbit the sun at 93 million miles, we call that distance one astronomical unit. But we are not always 93 million miles from the sun. Those pesky neighbors of ours push us around to the tune of 2%, making our orbit not a circle but an ellipse. That 2% difference is called eccentricity, and it occurs to us on three cycles, 91k years, 125k years, and 400k years. Is 2% enough to make much of a difference in terms of receipt of solar insolation? According to present estimates, it will only make a 23% difference (about 1/4). Is that enough to push us into an ice age? With lots of change left over It is presently observed that the difference in insolation varies about 7% between summer and winter, so there is your answer if you didn't figure it out for yourselves. All of Sol's children push each other around, all have slightly elliptical orbits, and all have different length years. Even a cave man would get this.

Forty seven degrees of axial shift and a few thousand miles of earth diameter shift making the difference between summer and winter, each and every year. Simple enough. What would happen if we make that a few million miles instead of a few thousand miles without changing the axial tilt at all? You get an ice age. Oh, and by the way, the axial tilt also changes, just to complicate the picture a little.

And once again, since few seem able to get their minds wrapped around this important point, try to imagine what life on spaceship earth would have been like at the bottom of one of the 100k year deep freezes. Miles thick ice sheets, lots of species having succumbed to the cold and passed into the fossil record. Meaning not much around to generate CO2/GHGs.

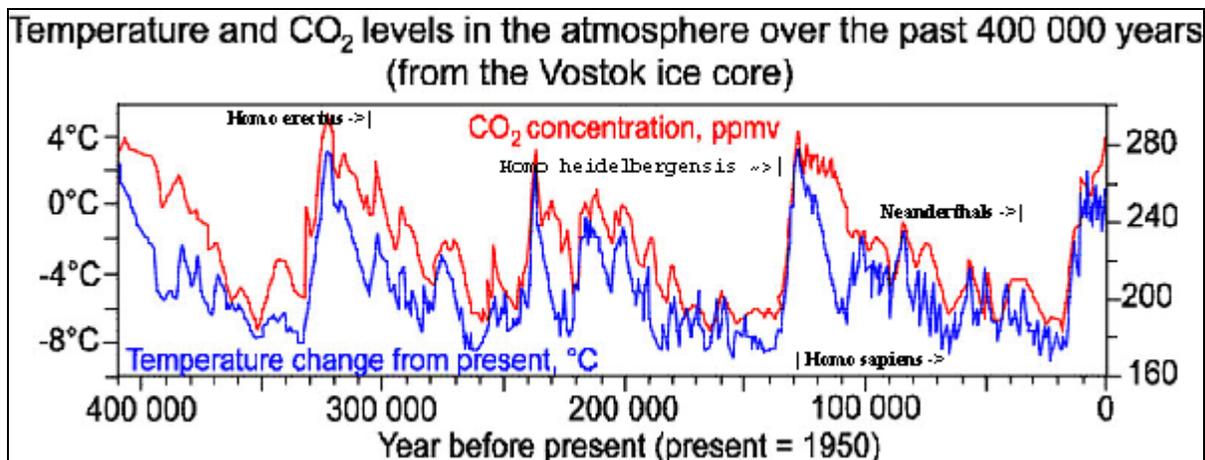


Figure 1. Vostok Ice Core, Temperature and CO₂ concentration. (Note which occurs first.)

So Houston, the problem is actually of astronomical proportions. Figure 2 shows the three things which we experience in our billions of turns around the sun. Precession of that tilt on our axis, which happens on a 19k, 22k, and 24k year cycle. Obliquity of that eccentricity, which happens on a 41k year cycle, like the ice age period in the Pliocene, and eccentricity, which cycles were discussed above.

All of this makes perfect sense, meaning there is only an 11.1% chance anybody will actually recognize it as the truth since we are always so pre-occupied with rumor.

Figure 2 makes this so easy a cave man would get it.

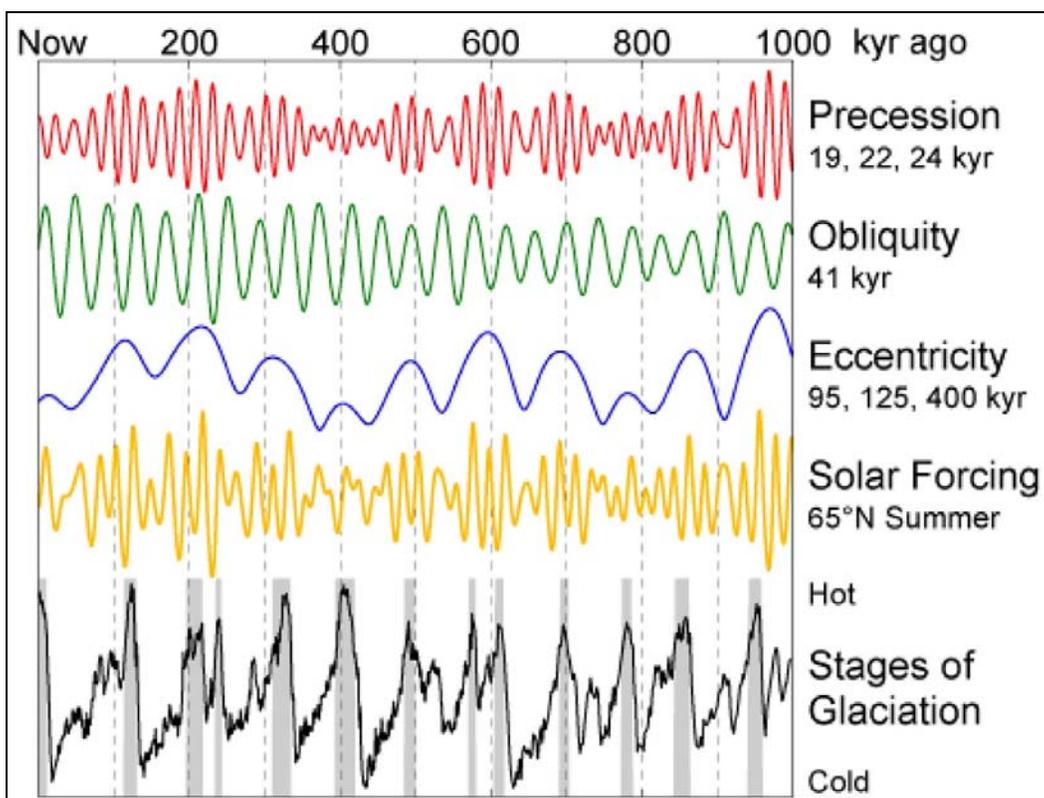


Figure 2. Differential Astronomical (Milankovitch) Cycles and Earth's Climate.

After working that out, it was only natural to cast the old evil eye on the GHG theory and see if it would “hold water”. I downloaded all the Vostok ice core data <http://www.ncdc.noaa.gov/paleo/icecore/antarctica/vostok/vostok.html> and loaded it into Excel. Here I did some careful analysis and was able to verify things I had found on the internet. On average, temperature rises and CO2 follows in about 400-3,000 years. Meaning, of course, that CO2 is a spectator during these climate change events. But that 400-3,000 year timing was intriguing. It takes about that long for the deep oceans to turn over and come into thermal equilibrium with the atmosphere. Could it be that CO2 changes were reflecting temperature driven equilibrium concentrations between ocean and atmosphere?

So I concocted a little test. I took two of my favorite carbonated beverages, beer, and placed one in the refrigerator, and the other on the kitchen counter last summer. I turned the fridge down very low, like deep-sea bottom of 100k year deep freeze grade cold, and let the brew and fridge cool down for a few days. I then opened the warm brew and put it back on the kitchen counter, and opened the nicely near frozen one and put it back. I waited two days. I then took both outside and shook them up with my thumb over the opening. Upon releasing my thumb, what do you think I found? The one in the freezer had far more CO2 left than the warm beer did.

Depending upon just how permeable you are to facts, the oceanic concentration of CO2 is between 60-90 *times* the atmospheric concentration. That was *times*, in case that did not register appropriately. If you wish to ignore *every single one* of the 800 pound gorillas in the room, then you must remember that the Nine Times Rule predicates that this is what is expected of the vast majority. The two questions that should be niggling at the back of your consciousness are (a) do you want to be part of that majority and (b) do you actually have a choice in the matter?

An easy going person by nature, I will have no mercy if you intentionally pull the wool over my eyes. So for some time now I have been searching out the truth, the whole truth and nothing but the truth on CO2. And the results (Part 3) were startling!

About the Author:

Mr. McClenney is a California Licensed Professional Geologist and Registered Environmental Assessor. He was also appointed the first Certified Environmental Auditor in Victoria, Australia in 1991, empowered to sign-off on contaminated site cleanups. He has been investigating and cleaning up hazardous waste sites for 22 years.