Scientific concepts related to climate change and other musings.

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The definition of climate is “the weather conditions prevailing in an area in general or over a long period”.

One incontrovertible fact is that earth's climate is always changing. For most of history, it has been warmer than today's temperatures (6). In the dinosaur era, the earth was so warm that there were lakes hundreds of feet deep in the 4,000 foot high Salt Lake City valley. Following a cooling period (meteor strike, volcanoes?), these unimaginable amounts of water became trapped in glaciers. Yet 1,500 years ago the earth was again warmer than today, and 10,000 years ago it was so cold that glaciers occupied central park in New York (you can observe the glacier cuts in the exposed rocks). Obviously, there have been no fossil-fuel burning devices during these historic changes in earth's climate.

So the pertinent questions are first, whether anything mankind is doing can or will produce a significant change in the global climate, and second, if we can or should do anything to prevent it?

The first step is to define and understand the problem. In this process, we can't confuse pollution with climate change. Breathing contaminated air damages our lungs, but those health problems are not related to “climate change” as we often hear.

Next, good data and good science is critical. But there are many challenges when attempting to accurately interpret time-based events and other data. One of the most common errors in interpreting scientific data of any kind is to assume that c*orrelation equals causation*. Just because two or more events appear to move together, this does not mean one is causing the other. More often than not, events that occur together are independent. There are many other statistical challenges, such as natural cause and unnatural cause variations.

Causation can often be proven, provided one can establish rigorous controls, assure double-blind analysis, and create an appropriate control group. The gold standard methodology is an accurately randomized, double-blind, controlled, crossover trial. This is obviously difficult or impossible when looking at trends over years before the control was defined and measured. Relying on “observational” data from any past events is notoriously inaccurate when trying to prove cause and effect.

A very common error is whenever “everyone” (such as “99.5% of all scientists”) emphatically believe something is true, a groupthink develops that may well be incorrect. This discourages inquisitive minds, and stifles dissent – often to the point of disdain or punishment of the dissenter. (6, 7, 8).

Yet another issue is accuracy of the study methodology vs accuracy of the results. This often takes the form of studying only one variable without considering the multiple confounders. The classic example here is the consideration of CO2 levels alone related to temperature, without including factors that are exponentially greater such as cloud cover or volcanic activity (a major source of heat and CO2). Patrick Frank is a world-recognized expert who shows that one can't predict future weather with any semblance of accuracy, and that cloud cover is a far greater variable than CO2 levels. (10,11) I'm not sure why we would expect accurate long-term predictions, since meterologists have a hard time predicting weather even a few days into the future or how many hurricanes might occur in the next season.

Examples abound for these scenarios.
Causation vs correlation: Every physician was taught and practiced throughout the 50's into the early 90's that aging females seldom had heart disease until menopause, after their levels of estrogen and progesterone dropped. So the obvious answer was that a lack of female hormones caused heart disease, and the logical treatment was to give hormone replacement after menopause. A long-running "observational" study called the Nurses Health Study, where self-reported data on 50,000 nurses was collected confirmed this "obvious" conclusion. Doctors who chose not to give hormone replacement were chastised, sued for heart attacks, etc. Yet a subsequent, well-designed study called the Women's Health Initiative proved that the conventional wisdom was not only wrong – but dangerous. The original error was that the compare group was not well defined (therefore not randomized), because nurses who took hormones had a "healthy user" bias that was not measured (a typical confounder).

For decades, physicians were also taught that peptic ulcer disease was caused by excess acid, and the best treatment was to use antacids and to cut out acid-producing parts of the stomach. In later years, acid-blocking drugs were developed. However, Drs. Marshall and Warren of Australia proposed in the late 1970s that H pylori bacteria present in ulcerated stomachs might be causative. Oddly, this discovery was made over 100 years ago by Dr. Jaworski in Poland. They were all roundly dismissed and openly criticized, because "no bacteria could possibly live in the acid environment of the stomach". How dare these physicians challenge the conventional wisdom? But these brave dissenters persisted with repetitive, well-designed studies that proved the role of H pylori in ulcer disease and advanced this area of medicine forever.

Groupthink: Pythagoras, in 500 BC, followed by Eratosthenes in 300 BC suggested that the earth was round, but this was not widely accepted in Europe until Thomas Aquinas in 1200 AD. Prior to these times, such dissidents were often imprisoned or executed. Anyone challenging Newton's laws of physics were treated as pariahs – until Einstein developed and proved his general and special relativity theories.

When an idea becomes groupthink, it may take on a religious zeal. Thought that becomes even more rigid despite logic, reason, history, good data, common sense often becomes more like a religion (4). Groupthink is often promulgated using Saul Alinski's "rules for radicals", which include ridiculing any dissenters (1). An example is that climate zealots often result to name-calling against anyone with dissenting opinions with new derogatory terms such as "climate deniers". (6, 7, 8). A healthy scientific environment welcomes challenges and dissents, not stifles them.

The US government, including NASA and NOAA, have been a major source of climate data, which started back in the 70's when I worked at NASA. Over the past 20 years, virtually all weather-related research funding at NASA has been targeted at global warming – climate change – despite dissent from numerous internal experts. For example, in 2012 49 NASA experts sent a letter expressing their concerns, many were subsequently retired or terminated (2). Based on the named studies coming out of NASA and personal conversations with current and recent NASA employees, the current dogma at NASA is that no weather study will be funded unless it supports climate change.

Groupthink and peer pressure can also lead to cognitive dissonance, where one alters reality to fit ideology, or outright falsification of data. Retired geologist and data computation expert Dr. Friedrick Ewert was one of the first to detect manipulation of climate data by individuals who "knew" the data must show global warming trends, even when it did not. (12)

Dissenters.
There is no shortage of experts who range from hesitation regarding the projections, to outright refutation of the current climate models, and in particular the contribution of man to any change in earth's climate. Examples:
Freeman Dyson, PhD, an Einstein contemporary from the Oak Ridge National Laboratory. (3).
Ivar Giaver, PhD. Nobel Laureate in Physics. Great video well worth watching. (4)
State of the Climate Report to the United Nations, 2016. (5).
Dr. Robert Giegengack University of Pennsylvania Geologist 2014), "None of the strategies that have been offered by the U.S. government or by the EPA or by anybody else has the remotest chance of altering climate if in fact climate is controlled by carbon dioxide." (6)
Marc Morano. US Senate Environmental Works Member, Investigative journalist. Presentation at Uintah Energy Summit well worth watching. (7)
Patrick Frank, PhD. Stanford. Article and Utube presentation on the inaccuracy of climate models. The lecture isn't too technical; a must-see. (10, 11)
Alex Epstein. Author who explains why fossil fuels have enormously benefited mankind (attachment)
Dr. Friedrick Ewert, Geologist and computational expert outs data manipulation by NASA. (12)
Christopher Booker, investigative reporting finds falsification of climate data; (13)
300 scientists object to NOAA data (14)
Ido, Carter and Singer NIPCC report: Why Scientists Disagree on Global Warming (15)

The list is virtually endless, and refutes the concept that virtually all scientists agree....

A final question may be who would benefit from climate change regulations, funding and agendas? The dissenters have little to gain, but much to lose in terms of criticism, harassment, threats, and loss of their jobs. Advocates could and have gained by government lobbying or jobs (e.g. EPA, NOAA, NASA, DOE, etc), green-energy projects (e.g. Solyndra, windmill subsidies), and local and global funding for various climate change projects.

Even those who may accept some of the CO2 theories disagree that EPA regulations are the answer, and in fact may be harmful:
Charles McConnell, former Obama Asst DOE secretary: (8).
James Lovelock, Green Guru. Recently reversed his opinions on CO2. (9)

Our economies and health would be unlikely to be altered if the oceans were a few inches higher (we could just ask Holland or Venice for help). However, incurring massive costs and overhead attempting to alter something that arguably may not even exist certainly presents a clear and present danger to our country. Current EPA regulations require that water released from steel plants must be cleaner than municipal water, which is prohibitively expensive. So now we import most of this metal from China. Our coal industry has been decimated, virtually eliminating this component of our path to energy independence.

We know that China, India, Russia and most of the world will never comply with highly restrictive CO2 emissions regulations, and have a fraction of our environmental regulatory overhead – including "carbon credits". So how can we afford to become even less competitive than we are today, or further increase our balance of trade deficit or our $20 trillion national debt? Instead of wasting trillions more chasing these proverbial clouds in the sky, why not spend the money on coastline infrastructure and truly practical energy sources, such as nuclear, clean coal, and energy independence?

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