Why The Climate Change Sceptics/Deniers are Wrong.

1. Science not Politics.

The first point to make with respect to those who are sceptical of or deny that Global Warming poses a threat, is that the decision concerning the reality of the problem is a scientific decision not a political decision. The difference between these is that scientific decisions concern what actually is – or is not. It makes no difference whether one or 1 million people believe something, there is a reality that is independent of opinion. Global Warming either is happening or is not happening. The only way to make scientific judgements is to base them on evidence;- experiments and observations, and on the theory which supports that evidence.

Scientific theories and explanations are not absolute truths. Science essentially involves a sceptical way of looking at the world. The true scientist should always have in the back (or front) of his mind that the current view might not be correct. Scientific judgements concerning anything always contain an element of uncertainty. They are always of the form that:- "in the present state of knowledge this is the most probable explanation and understanding". So the scientific statements are always in the form of probability. For some statements such as "that the Sun will rise tomorrow" (within the conventional meaning of that phrase) or that "the Earth is not flat" have an exceedingly high probability of being true. Others are less secure.

Global Warming is a complex subject, but has received a huge amount of attention over the last 20 years. A huge amount of evidence in the form of observations and measurements has been collected and a huge amount of theoretical development towards understanding what is happening has been going on. It is this evidence and understanding that has to be evaluated in order to make a judgement as to what is the most probable explanation of what is happening and what is most likely to happen. This is the only valid way to make the judgement. It cannot be based on how many people believe in or do not believe in the phenomenon. In turn this means that everybody's opinions are not equally valid. Only those who have a real understanding of the theory and a real knowledge of the evidence are in a sensible position to come to a judgement.

In turn this means that for most of us the only way we can come to our own conclusion is by looking to see what evidence is presented and what theoretical explanations are advanced and ourselves evaluating the reliability of the people putting forward the case. It does not matter about the charisma or vehemence of the exponent, only whether they have the weight of evidence on their side to back up a view that is sensible.

2. The Tactics of the Global Warming Sceptics/Deniers.

The techniques of those who wish to discredit Global Warming do not adopt this rational scientific evaluation. Instead they resort to at least the following six tactics:-

1) Vehement direct denial – entirely unsupported by any evidence.
2) Creating a huge and entirely unconvincing conspiracy theory again supported by no substantial evidence.
3) Smearing, abuse and invective directed against those who produce the scientifically based judgements.

4) The putting forward of plausible alternative explanations, but ones that are not supported by evidence and for which they give zero or paltry evidence.
5) Picking on every anomaly or hint of error in the scientific evidence and declaring that this undermines the whole case.
6) The Appeal to History.
7) The appeal to common sense, we all know the weather is sometimes hot and sometimes cold. So there isn't anything to worry about.

3. The Arguments of the Deniers.

3.1 Direct Denial.

There are few substantial individuals who still support this view, though internet web-sites are still full of statements made years ago. Statements of the sort:- Global Warming is not happening – the temperature is not rising – the extent of summer arctic sea-ice is not declining – polar bears are not threatened – glaciers are not melting – etc. These statements are not supported by any substantial evidence. They may be supported by limited and not very reliable evidence like:- it was colder on my holiday this year than last year.
In the main the direct deniers have retired from this position overwhelmed by the evidence of temperature rise and have moved on to a position in which they argue that while the temperature may be rising it is not caused by human emissions.

3.2 There is a Huge Conspiracy.

This ludicrous argument suggests that there is a massive conspiracy among climate scientists which involves the fraudulent production of data to make the case for Global Warming. This conspiracy is postulated either to be perpetrated by climate scientists eager to secure funding for their research and perpetrated on all of us including sucker governments who have been led to believe what they are being told. Alternatively the conspiracy is even wider and involves both governments and climate scientists and is perpetrated in order to enable governments to raise taxes and restrict freedom.
The argument ignores all the obvious anecdotal evidence that, as any gardener, wild life observer, traveller or skier, will tell you:- the seasons are shifting – plants and animals are thriving in places previously too cold for them - glaciers and mountain snow cover is receding - etc.
In so far as it suggests that governments want to create the myth of Global Warming this is directly contrary to the reality that governments have tried for years to minimise and ignore the threat of global warming because they do not want to have to act. Governments signed up to the treaty to prevent Global Warming nearly 20 years ago and in the intervening period have done absolutely nothing to curb emissions. Only now when it is almost too late are they beginning very tentatively to take actions to lessen the threat, but not actions which go nearly far enough.

3.3 Invective.

A recent front page headline article used the phrases:-

"hot-air underpinned by fraud",
"treating the public like fools",
"the climate comrades are trying to keep the gravy train going",
"the average person has been talked down to. He has been treated like a fool".

This was typical of much of the denier rhetoric. It is designed to produce an emotional response of anger against those who try to explain how serious the problem of global warming really is.

3.4 Alternative Explanations.

The sceptics agree that Global Warming is happening but claim that it is not because of human emissions. Instead it is because:- the Sun is getting hotter – there is a wobble in the Earth's orbit – carbon dioxide is being belched out of volcanoes – etc. All these explanations have the merit that there is some truth in them. These things can cause the Earth to be warmer. But all these things have been investigated during the last 20 years of research and all have been found individually and cumulatively to be inadequate to explain the temperature rises that have been observed. The people who advance them do not advance evidence or theory to support their contentions they simply state that these are the cause.

3.5 Appeal to History. "It's been Warmer in the Past."

And its mate "The CO_2 level has been much higher in the past." So its OK isn't it?
These are real nonsenses. How do people know that it has been warmer in the past or that the atmospheric mix has been different? They were not there and nor were any instruments to measure these parameters. The answer of course is that scientists have collected evidence and worked out theories, which enabled them to make these deductions. But it is the same scientists and the same science, which has led to the conclusion that what is happening now is very likely to upset the climate in a way that will be very dangerous to our survival. Yet those advancing these arguments take one part of the scientists message and ignore the bit they do not like.
Further the fact that it has been warmer, or cooler in the past, or that the GHGs in the atmosphere may have been higher or lower in no way invalidates the statement that the change threatens to be catastrophic now. There have been lots of drastic catastrophes throughout the Earth's history and the fact that life subsequently recovered in no way lessens the fact that they were catastrophes. Further still – planets can die. It is highly probable that in the past Mars had much more abundant life than is present today.

3.6 Picking on Anomalies and Challenges.

All genuine scientific research will occasionally throw up anomalous results - maybe an experiment goes wrong, maybe an instrument misreads, maybe freak conditions apply, etc. Similarly the essence of science is to challenge accepted ideas and put forward alternative suggestions. These things are an inevitable and essential part of the scientific process. With direct experiments other scientists will attempt to repeat the experiment. With observations it may not be possible to repeat the observations in the same conditions, since the time will be different, but similar observations will be made. With theoretical explanations lots of scientists will make their own judgements and advance their own explanations.
Overall a consensus develops as to what the situation is. The fact that there are some anomalous results and different ideas does not undermine the overall probable conclusion. It is also true that many of the views and results that have been out forward in the past have subsequently been corrected and modified. However climate change deniers often continue to advance these retracted evidenc.

3.7 The Appeal to Common Sense.

Another favourite argument of those arguing against Global Warming is the appeal to common sense. The weather oscillates up and down in temperature by 25 or 30 ^{0}C between summer and winter, by more than this between one place and another even by many degrees between 1 day and the next or one time and another. So how can a change of a few fractions of a degree matter. Its just common sense that there is nothing to worry about.

Common sense is a remarkably unreliable source. It is only common sense that if you put a man in a chair at 300 m above the ground and gave him an amount of flimsy cloth you could pack in a good sized rucksack and a few strings he would fall to the ground. In fact anyone who has watched a hang glider soaring for hours until they land by choice knows that common sense does not always come up with correct answers.

The truth of the matter is that the whole weather system is driven by the temperature differences between one place (like the Equator) and others (like the poles) and by the difference between day and night and so on. Despite the big local and timescale variations overall the climate system is remarkably stable and variation occurs slowly on an annual cycle. In fact the small variations in the global average caused by Global Warming do have a significant effect on the overall climate.

4. Is There Any Merit in Scepticism?

In the first section of this article we pointed out that the truly scientific attitude is one of scepticism. One should accept that we do not know for certain what is going to happen. The scientific predictions therefore take the form of statements about the probabilities of possible outcomes. It is right to be constantly questioning these statements. However it is just as likely that the outcomes will be worse rather than less serious. Indeed all the recent history of research and the development of understanding has moved in the direction that things are more threatening than was believed previously.

We should not use the admission that there are elements of uncertainty in the predictions as an excuse to delay action. The present predictions are that it is very likely that, if we do not act very rapidly and drastically, the present disruption of the climate (which we are already seeing) will get enormously much worse. Further, there is a considerable possibility of it leading to an environmental catastrophe of overwhelming proportions. These are not in the distant future but will probably occur within the lifetimes of today's children.

5. "Climategate".

So called climategate, the "scandal" of the East Anglian e-mails.

It is necessary to comment on this media storm.

Firstly one should note that this particular event is a very sophisticated operation that has been timed to do maximum damage to the Copenhagen conference. It has been reported (by the Daily Mail, no friend to the those who want to see robust action on climate change) that the operation may well have been mounted from Russia possibly with the help of the Russian security services. They report that the story broke on a Russian web-site based in Tomsk, though as soon as it had been picked up by other web-sites it was removed from that web-site.

Second something like 13 years of private internal correspondence e-mails was stolen and then trawled for damaging statements. In those circumstances it is remarkable how little could be found.

Thirdly what has been found. A few statements that suggest that members of the Unit did not want some of the papers which they regarded as of very dubious scientific value getting to the IPCC, others that suggested that they did not want their data subjected to scrutiny which was liable to be biased and time-wasting, and others that have been interpreted as suggesting that some of their data had been manipulated.

With respect to the first allegations - in 13 years of communication between colleagues it is not surprising that there are some suggestions of a desire to have dubious negative papers brushed aside. With respect to the data manipulation this has been vigorously denied. An investigation is to be mounted. There is a considerably possibility that the investigation will reveal that little or nothing was amiss. But in the meantime the allegations and their release timing have been chosen to cause maximum confusion at the Copenhagen Conference.

One should see these allegations in this light.

It is time we saw the case put by the sceptics/deniers as misguided and often pernicious.

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