

Climate Change: The Role of Flawed Science

An analysis by Peter Laut – November 2009

“My findings do not by any means rule out the existence of important links between solar activity and terrestrial climate. Such links have over the years been demonstrated by many authors. The sole objective of the present analysis is to draw attention to the fact that some of the widely publicized, apparent correlations do not properly reflect the underlying physical data.”

From my article in Journal of Atmospheric and Solar-Terrestrial Physics 2003 (see link given below)

At the United Nations Climate Change Conference in Copenhagen in December 2009 the nations of the world will discuss possible ways to slow down global climate change. The main goal will be to organize a coordinated reduction of man-made greenhouse gas emissions. With all nations contributing according to their ability.

But: Is global warming perhaps caused by the sun?

An important question concerns the physical cause of global warming. Is it primarily caused by changes in solar activity or by man-made greenhouse gasses? The answer has enormous consequences for the way mankind should react. If the dominant cause for global warming is solar activity, then there is no reason for mankind to waste resources in trying to reduce greenhouse gas emissions. And no reason to have the climate conference in Copenhagen. If, however, the dominant cause is man-made greenhouse gasses, then a reduction of emissions may be absolutely necessary in order to prevent a global climate catastrophe.

The overwhelming majority of scientists, represented by the United Nations Intergovernmental Panel on Climate Change (IPCC), has for many years collected and analyzed observational data and carried out model simulations in order to resolve this question and has arrived at the conclusion that the results overwhelmingly point at the increasing concentrations of greenhouse gases in the atmosphere as the cause. There are practically no observations which render it probable that solar influences play more than a minor role.

Now, in spite of the almost unanimous message from the world's scientific community, there is a small group of scientists who try to promote the solar theory. They are supported by a massive network of journalists, film makers, TV producers, authors, politicians and grass roots. This group is centered around two Copenhagen climatologists, Henrik Svensmark and Eigil Friis-Christensen.

Flawed science

I have followed the scientific work of these two researchers over many years. In the 1990's I was scientific advisor to the Danish Energy Agency. It was my task to scrutinize the steady flux of climate related scientific literature and keep the Agency informed about developments which should be taken into account in shaping Danish energy and climate policies.

In 1991 Eigil Friis-Christensen together with Knud Lassen, another Danish researcher, published an article in the scientific journal Science which attracted worldwide attention. It seemed to document a close agreement between data representing solar activity (solar cycle lengths), and terrestrial temperatures. The agreement was displayed on a graph which showed a solar and a terrestrial curve closely intertwined. What made the graph a sensation, was the fact, that the steep rise in temperature from about 1970, the 'global warming', was closely matched by a corresponding steep rise of the solar curve. This was seen by many as proof that global warming was caused by the sun. The graph has been reproduced extensively all over the world, both in the mass media and in scientific literature, and has helped to create a large community of believers, who claim that the sun is causing the global warming.

Regrettably, it took some years before a careful analysis of the article revealed that the conspicuous steep rise of the solar curve actually had nothing to do with the behavior of the sun, but had been created (accidentally?) by a change of the mathematical procedure used to calculate the points creating the steep rise. I published this finding in 2003 in The Journal of Atmospheric and Solar-Terrestrial Physics, but had already presented my critique in the year 2000 at a conference on "The Solar Cycle and Terrestrial Climate", arranged by the European Space Agency.

In the late 1990's a series of articles seemed to provide additional credibility to the 'solar theory'. In 1996 Henrik Svensmark and Eigil Friis-Christensen presented observations which apparently lent support to the solar theory. At a conference in Birmingham they showed that some solar related data (this time the intensity of galactic cosmic rays) correlated strongly with some terrestrial data (total cloud cover). The agreement was striking for the years 1984-90, which was the period for which data were available. However, as every scientist knows, an agreement only extending over a short time span, here seven years, can be misleading. So, to test a possible causal relationship, the authors in their later publications, two articles published in 1997 and 1998 respectively, added some more recent data, which they claimed demonstrated that the close agreement extended beyond the seven years.

However, close inspection of their work revealed two fatal flaws:

1) Most of the added data were totally irrelevant in the context of the article, but created the false impression that the close agreement with the solar curve did extend beyond the original seven years (see my paper for details). Actually, the authors' procedure is like adding bananas to a statistic on apples and then claiming the statistic to be on apples alone.

2) However, the authors had also added relevant data. These were all displayed in the 1997-article, but some of them were removed again in the 1998-article. Strangely enough, the removed data were precisely those data which indicated a beginning disagreement with the solar theory, a disagreement that would become dramatic when more observational data became available in the following years (See my 2003-article for details).

Svensmark has never tried to defend himself properly, i.e., by a peer reviewed reply article, against these serious charges. Friis-Christensen once tried to defend himself against the criticism of the 1991-Science article. However, the apparent rebuttal in his reply-article was only achieved by introducing two simple arithmetic errors, which were well hidden in the article and quite difficult to spot. The two arithmetic errors artificially created an agreement of the new observational data with the values of the 1991-article. Applying correct arithmetic the support of the solar theory totally vanishes (See my 2003-article for details).

The strong human appeal of solar theory

The solar theory apparently has a strong emotional appeal to an important segment of the public. And, opposition to it can lead to political reprisal with severe consequences for the funding of individual researchers and research institutes.

Several books and many TV 'documentaries' have appeared, promoting the solar theory. To mention a few: The TV documentary 'The Great Global Swindle' by Martin Durkin was shown on UK's Channel 4 in March 2007. And a whole series of films by Lars Mortensen: "The Climate Conflict" from 2001, broadcast in Denmark, Sweden, Norway, Finland, France, Germany, Belgium, Spain and Portugal. "Doomsday Called off" from 2004, broadcast in Denmark, Belgium, Finland, Canada, Norway, Middle East and Asia. And "The Cloud Mystery" from 2008, broadcast in Denmark, Norway, Finland, Sweden, France, Belgium, Australia, Poland, Greece, Italy, Israel and France.

Some readers may find this list long and boring. Others may find it scary. It can be seen as a threat to the authority of sound science, originating from a mixture of popular wishful thinking, populist deception and industrial interests. Many of these films are created with great artistic talent, and have – apparently – convinced millions of ordinary people and many political decision makers all over the world that global warming is caused by solar activity and not by human made greenhouse gasses. How can the world's politicians make responsible decisions, when their voters are seduced to believe in fairytales?

The myth – describing a small group of ingenious scientists, who have arrived at the ultimate truth about climate, who have identified the sun as the mighty culprit, and who are shunned by a stubborn, envious establishment of old, narrow-minded professors – has a strong appeal to many. It is good stuff for an artistic film maker. It can be molded into a moving story – mixing images of lonely heroes, brave, fighting underdogs, with beautiful pictures of the sun and clouds. And it turns out that neither the filmmaker nor the audience can be influenced by being told that the solemnly presented graphs on the screen are rigged.

Who is to blame?

Who is to blame for the development of this irrational cult of a postulated solar influence upon the Earth's climate? The IPCC is not without responsibility for providing the free ride for solar crusaders. Because the IPCC has never

made it clear, that the problem with the widely circulated, infamous figures of 1991 and 1998 - which probably have been the most important persuaders - is not a question of scientific uncertainty and differing opinion, but a case of manipulated data that have nothing to do with reality. Instead of merely describing Svensmark's contributions as 'controversial', some stronger words from the IPCC would have been appropriate. In a language that could be understood by ordinary citizens.

There are many other examples of the failure of the scientific community to prevent misinformation.

On the website of the European Organization for Nuclear Research (CERN), you can still find the original proposal for the so-called CLOUD project from 2000, an experiment designed to investigate a possible link between cosmic rays and clouds. An excellent scientific project. The front page of this proposal displays the names of 56 scientists - many of them well-known and well-regarded - from 9 countries. However, in the chapter describing the scientific motivation – which should contain the scientific essence of the proposal - the false conclusions of the manipulated articles from 1991 and 1998 are described in detail, illustrated by the misleading graphs. Without any cautioning of the unsuspecting reader! Did any of these scientists actually read the chapter on the scientific motivation for this multimillion Euro project? But, no matter what the scientists knew or did not know when this proposal was posted, for the ordinary visitor in year 2009 this inclusion must appear as a guarantee that the articles represent good science.

Another example of a certain irresponsibility of the scientific community: The Danish Meteorological Institute for many years proudly displayed the misleading 1991-graph on its website, as an example of its pioneering achievements in climate research. The motivation for this misinformation may have been a belief that the solar credentials would generate political goodwill and attract funding.

A question of trust

So, it must be recognized that not all research institutions have accepted proper responsibility to maintain the trust which the general public traditionally places in them. In the modern world, many scientific results are extremely difficult to verify independently. They may be produced by a group of several researchers working for months or even years with vast amounts of data, which have to be calibrated employing especially tailored computer programs. Often it is practically impossible for an outsider to verify the conclusions. That applies also to the referees, who have to decide on the publication of the work. So, trust is in the short run often all we have to judge the authenticity of claimed new developments. Trust in fellow scientists and trust in research institutions. And, at the Copenhagen conference on global climate the decision makers of the world, must be able to trust the scientific basis which is presented to them. They must be able to rely on it when building a strategy to fend off catastrophic climate developments. So, the scientific community should be careful not to squander this trust.

A few weeks ago, in Swedish Public Television, two of the world's leading climatologists were asked about Svensmark and his solar theory. Now, scientific dispute has a long tradition for expressing disagreement in polite and neutral terms. Only in rare cases blunt words surface, as when Jon Egill Kristjánsson, professor at The University of Oslo concluded : "It should not be taken seriously – to put it plain and simple." And Mike Lockwood of The Royal Society of London, who to begin with – years ago - supported the theory, said "... the change in the magnetic field since 1985 – it's moved in the wrong direction", which means that according to Svensmark's ideas we should have experienced a global cooling since then. And he added: "I would love it to be right! I would absolutely love it to be right! Unfortunately, wanting something doesn't change the scientific reality. One can't use spin or rhetoric or anything to change the scientific reality."

My 2003-article can be downloaded from the link:

http://stephenschneider.stanford.edu/Publications/PDF_Papers/Laut2003.pdf

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