

## SCIENTIFIC PROOF AND FALSIFIABILITY

*By Dr Timothy Ball*

They claim the climate science is over – the evidence is in and the theory that humans are causing global warming and climate change is proven. The statement, promoted by those with a clear political objective like Al Gore must originate from a scientific source. Certainly the most recent Intergovernmental Panel on Climate Change (IPCC) Report (the Fourth Assessment Report abbreviated as FAR or AR4) provides a basis. Their claim of certainty is based on computer model outputs, which they claim provide a 90% certainty that human CO<sub>2</sub> is causing climate change. A more important question is did science ever begin?

A major problem with the IPCC claim is the level of science used to create the model. The standard test for a model is validation, which requires demonstration of the ability of the model to re-create known conditions. In the case of climate this means accurately reproducing the climate conditions of a particularly distinctive and well-documented climate such as the most recent buildup of continental ice during the Pleistocene. More recently there are the Medieval Warm Period (MWP) from approximately 900 to 1300 A.D., and the cool period known as the Little Ice Age (LIA) from approximately 1450 to 1850 A.D. In fact, none of the computer climate models have been validated. Traditionally, this was referred to as hindsight forecasting. It argues that if a model cannot create past climates it cannot predict future climates.

There are two important concepts identified here; the role of validation of a theory, and a basic definition of science as the ability to predict. Both are part of a larger debate about science and scientific method that have surprisingly few changes through history.

Francis Bacon (1561 –1626) formalized the scientific method that goes back to Aristotle. This involved what is generally defined as Deductive Reasoning. You start with a hypothesis, which is a tentative explanation for an observation, phenomenon, or scientific problem that can be tested by further investigation.. Observations are then made to test the hypothesis, which is either confirmed or rejected. More correctly it is not rejected, but the null hypothesis is established.

### **Deductive Approach:**

Hypothesis – Theory – Observation – Confirmation.

The second general form of approach is called Inductive Reasoning. Here you move from general observation to determining a pattern from which an hypothesis is drawn and a theory evolves.

## **Inductive Approach:**

Observation – Pattern – Hypothesis – Theory.

In 1919 Karl Popper began to question the validity of Inductive Reasoning by asking two questions as he explained in an article titled “Science as Falsification” published in 1963. “When should a theory be ranked as scientific?” and “Is there a criterion for the scientific character or status of a theory?”

[http://www.stephenjaygould.org/ctrl/popper\\_falsification.html](http://www.stephenjaygould.org/ctrl/popper_falsification.html)

Recently I wrote an article in which I identified a major flaw with the theory of human-induced global warming or as it is commonly abbreviated, anthropogenic global warming (AGW). One critic accused me of using the entirely incorrect Popperian falsification approach. Popper advanced the idea that no matter how many supporting examples there were for a theory it only required one to falsify it. This meant that any theory should be disproved rather than proved. In the 1963 article Popper updated and summarized his 1919 conclusions. Item 5 says, “Every genuine test a theory is an attempt to falsify it, or to refute it.” However, he promptly modifies the statement, “Testability is falsifiability; but there are degrees of testability: some theories are more testable, more exposed to refutation, than others; they take, as it were, greater risks.” This statement appears applicable to the current anthropogenic global warming theory (AGW).

A major reason why it is less testable than others is because it does not follow either the deductive or the inductive reasoning approach. The most likely cause of the problem is the absolute dependence call for theory on computer models. They are deductive because they move from the more general, which is the model itself, they are inductive because the model provides the observations from which the theory is developed. They are inductive because the model is derived from observations. However, the observations are inadequate for the construction or to determine the pattern from which the theory must evolve.

It is much easier to test the model if we assume it best fits the deductive reasoning approach. This begins with a hypothesis that humans have become a major cause of climate change and leads to the IPCC climate change theory. These include that;

1. CO<sub>2</sub> is a greenhouse gas and causes the surface to be heated by the atmosphere in addition to the direct heating from the Sun.
2. If the level of CO<sub>2</sub> in the atmosphere increases global temperature will rise.
3. CO<sub>2</sub> in the atmosphere will increase because of the growing contribution from human activities.

If we apply Popper’s falsifiability to these assumptions then AGW fails at the third stage of the deductive approach. Observations in all records of any duration for

any time period show that temperature increases before CO2 increases, contradicting assumption 2. Despite this evidence all models continue to use the assumption. It is not surprising therefore that the hypothesis in the form of the models also fails the fundamental definition of science because their predictions are consistently wrong. It is also not surprising considering the lack of validation.

If either the deductive or inductive method was being used the prediction failure should lead to correction of the models. They try to make the model fit the observations, but it only so they appear to simulate reality. It does not include reassessing the assumptions. Remove assumption 2 and the entire theory collapses. The question is why won't they do what is scientifically correct? Popper provides an explanation in item 7 on his list. This reads, *"Some genuinely testable theories, when found to be false, are still upheld by their admirers – for example by introducing ad hoc some auxiliary assumption, or by reinterpreting the theory ad hoc in such a way that it escapes refutation. Such a procedure is always possible, but it rescues the theory from refutation only at the price of destroying, or at least lowering, its scientific status."* This leads back to a comment Popper makes at the beginning of his 1963 essay. *"The problem which troubled me at the time was neither, "When is a theory true?" nor "When is a theory acceptable?" My problem was different. I wish to distinguish between science and pseudoscience; knowing very well that science often errors and that pseudoscience may happen to stumble on the truth."*

The short answer to the question, did science ever begin with the climate theory that humans are causing warming or change, is no. The approach was neither deductive nor inductive. The theory was transposed to a model built on inadequate data or understanding of the mechanisms of climate. Because the models were not validated they are inadequate as models let alone as the basis for a theory. They also failed to make accurate predictions, a very basic definition of science. Finally, they fail as science and fit Popper's definition of pseudoscience because instead of adjusting to failures they continue to blindly and dogmatically pursue a failed hypothesis.

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